

Contract Provisions

For Construction of:

I-5

MP 87.42 TO MP 97.09

GRAND MOUND TO MAYTOWN STAGE TWO - REPLACE INTERCHANGE

THURSTON COUNTY

VOLUME 1 OF 2

A STATE PROJECT



**Washington State
Department of Transportation**

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

October 28, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
State Project**

Addendum No. 9

The Special Provisions, Addendum No. 8, and Proposal for this project are amended as follows:

Special Provisions

1. On page 159, line 9 is revised to read:

completed, and prior to ~~[the installation of irrigation lines and]~~ planting, all designated

Addendum #8

1. On Plan sheet 6, the quantities for Item No. 20 are revised to read:

Total Quantity	<u>20.00</u>	[23.00]
Sub-Total **	<u>20.00</u>	[23.00]
Group 1, Column 1	<u>2.00</u>	[3.00]
Group 1, Column 5	<u>16.00</u>	[17.00]
Group 2, Column 8	<u>2.00</u>	[3.00]

2. On Plan sheet 6, the quantities for Item No. 30 are revised to read:

Total Quantity	<u>13.00</u>	[14.00]
Sub-Total *	<u>11.00</u>	[10.00]
Sub-Total **	<u>2.00</u>	[4.00]
Group 1, Column 1	<u>1.00</u>	[3.00]
Group 2, Column 10	1.00	
Group 3, Column 13	<u>8.00</u>	[7.00]
Group 3, Column 14	3.00	

3. On Plan sheet 6, the quantities for Item No. 31 are revised to read:

Total Quantity	<u>32.00</u>	[29.00]
Sub-Total *	6.00	
Sub-Total **	<u>26.00</u>	[23.00]
Group 1, Column 1	<u>10.00</u>	[9.00]
Group 1, Column 3	5.00	
Group 1, Column 5	<u>8.00</u>	[7.00]

NOTE: This set of plans and specifications does not have this addendum incorporated in it.
Acknowledgment of receipt of each addendum is required.

Group 2, Column 8	<u>3.00</u>	[2.00]
Group 3, Column 13	<u>3.00</u>	[4.00]
Group 3, Column 14	<u>3.00</u>	[2.00]

4. On Plan sheet 103, the quantities and bid items for Drainage Codes DR6-3, DR6-4, and DR6-7 are revised to read:

~~[1 Each for Grate Inlet Type 2]~~ 1 Each for Catch Basin Type 2 48 In. Diam.

SHEET TOTAL: Grate Inlet Type 2	<u>7</u>	[10]
Catch Basin Type 2 48 In. Diam.	<u>14</u>	[11]

5. On Plan sheet 106, the quantities and bid items for Drainage Codes are revised to read as follows:

Code DR6-26:

~~[1 Each for Grate Inlet Type 2]~~ 1 Each for Catch Basin Type 2 48 In. Diam.

Code DR6-31:

1 Each for Grate Inlet Type 2 ~~[1 Each for Catch Basin Type 1L]~~

For Codes DR6-27, DR7-2, DR7-3, DR7-4, DR7-5, DR7-9, DR7-10, and DR7-11:
Add 1 Each for Catch Basin Type 2 48 In. Diam.

SHEET TOTAL: Grate Inlet Type 1L	<u>3</u>	[4]
Catch Basin Type 2 48 In. Diam.	<u>10</u>	[1]

6. On Plan sheet 109, the quantities and bid items for Drainage Codes are revised to read as follows:

Code DR9-2:

Add 1 Each for Catch Basin Type 1L

For Codes DR7-19, DR7-23, DR9-4, DR9-5, DR9-6, DR9-7, DR9-8, and DR9-9:
Add 1 Each for Catch Basin Type 2 48 In. Diam.

SHEET TOTAL: Catch Basin Type 1L	<u>10</u>	[9]
Catch Basin Type 2 48 In. Diam.	<u>8</u>	

PROJECT TOTAL: Grate Inlet Type 2	<u>20</u>	[23]
Catch Basin Type 1L	13	
Catch Basin Type 2 48 In. Diam.	<u>32</u>	[12]

7. On Plan sheet 119, the Drainage Code DR6-31 is revised to read as follows:

~~[Grate Inlet Type 1]~~ Grate Inlet Type 2

8. On Plan sheet 120, the Drainage Codes DR6-9 and DR6-26 are revised to read as follows:

ADDENDUM NO. 9

I-5

Grand Mound to Maytown

Stage Two – Replace Interchange

10C502

Proposal

1. On page 2, Item No. 20, the PLAN QUANTITY is revised to read:

20. [23.] EACH

2. On page 3, Item No. 30, the PLAN QUANTITY is revised to read:

13. [44.] EACH

3. On page 3, Item No. 31, the PLAN QUANTITY is revised to read:

32. [29.] EACH

Bidders are instructed to revised sheets 6, 103, 106, 109, 119, and 120 of the Plans, and pages 2 and 3 of the Proposal as revised sheets and pages have not been prepared for attachment to this addendum. If the bidders fail to make these corrections on the Proposal, the items will be corrected by the Department.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

KEVIN J. DAYTON
Olympic Region Administrator

Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504

October 22, 2010

ATTENTION: All Bidders and Planholders

I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
State Project

Addendum No. 8

The Special Provisions, Plans, and Proposal for this project are amended as follows:

Special Provisions

1. On page 121, the following is inserted after line 36:

Description

Section 2-03.1 is supplemented with the following:

(*****)

State Supplied Optional Material Source and Waste Site

The Contracting Agency will make available Pit J-149 as an optional Source of Material. Additionally, the site is available as an optional site for disposal of waste material from the project.

2. On page 121, the following is inserted after line 40:

(*****)

State Supplied Optional Material Source and Waste Site

Any work within Pit J-149 will only be allowed between 7:00 AM and 7:00 PM, Monday through Friday. Crushing operations, screening operations and hot mix asphalt plants are not allowed at Pit J-149.

Portions of Segments 1, 4 and 5 that have been completely mined to a floor elevation of 200 feet are available for waste material, as directed by the Engineer. Waste material shall be clean and free from concrete, asphalt, stumps and large woody debris. The waste material shall be placed in order to maintain free access from the existing access road at the bottom of the pit at elevation 200. Compaction Method A shall be used on all waste material. Waste material shall be placed no higher than elevation 220'.

Segments 2 and 3 are available for excavating borrow material. Mining operations shall not be allowed below elevation 200'. A scale for measurement and payment of materials removed from the pit shall be required in accordance with Section 1-09.2(1).

The Contractor will not have exclusive access to the pit site and shall plan their work accordingly. In the event that another contractor is working in Pit J-149 at the same time as the Contractor for this project, the Contractor shall cooperate with the other contractor by working in a different location or altering work schedules in the pit.

Upon completion of mining operations, the Contractor shall remove all debris and equipment and the area worked shall be dressed so the pit is left in a neat condition.

All costs to comply with the above conditions shall be included in the unit contract price per ton for Gravel Borrow Incl. Haul.

3. On page 122, the following is inserted after line 7:

Gravel Borrow Including Haul

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

(*****)

State Supplied Optional Material Source and Waste Site

The unprocessed material excavated from Pit J-149 may be used as a substitute for Bid Item 17, "Gravel Borrow Incl. Haul" in embankments, with the following exceptions:

- The material shall not be used to backfill temporary geosynthetic retaining walls, measured from the back face of wall to 1 foot outside of any reinforcement zone.
- The material shall not be used within 1 foot of Subgrade.
- The material shall not be used in embankments as described in Section 2-03.3(14)I.

4. On page 124, the following is inserted after line 40:

Description

Section 5-04.1 is supplemented with the following:

(*****)

Gibson Road Maintenance

In the event that the Contractor chooses to utilize Pit J-149, this bid item includes all work and materials required to restore Gibson Road to its pre-construction condition, as directed by the Engineer.

5. On page 127, the following is inserted after line 42:

(*****)

"Gibson Road Maintenance", will be paid by force account as provided in Section 1-09.6.

For the purpose of providing a common Proposal for all bidders, the Contracting Agency has entered an amount for the bid item "Gibson Road

Maintenance” in the bid proposal to become a part of the total bid by the Contractor.

6. On page 156, the following is inserted after line 15:

Stabilized Construction Entrance

Section 8-01.3(7) is supplemented with the following:

(*****)

Tire Wash

The Contractor shall furnish and operate a Tire Wash at Pit J-149. The tire wash system, placement, and maintenance plan shall be submitted by the Contractor and be approved in writing by the Engineer, prior to procurement and installation at Pit J-149.

The Tire Wash shall be an automatic, portable, and self-contained system. It shall utilize polymer flocking to maintain clear tire-wash water. It shall be installed at a location near the entrance of Pit J-149 as staked by the Engineer. A power and water source shall be provided for the Tire Wash System by the Contractor, at Contractor expense.

An automatic scraper-conveyor shall be installed to remove collected mud waste material from the Tire Wash System. The waste material may be disposed of in the waste section of the pit site, and shall be the responsibility of the Contractor. The Tire Wash System shall utilize recycled water and function upon the vehicle's entrance to and exit from the wash system. The wash system shall automatically activate when a vehicle enters it and deactivate when a vehicle leaves it.

All vehicles departing from the Pit Site shall stop and utilize the tire wash system.

7. On page 156, the following is inserted after line 34:

In Section 8-01.5, the paragraph following the bid item “Tire Wash” is supplemented with the following:

(*****)

All costs associated with constructing, operating, maintaining and removing the tire wash at Pit J-149 shall be included in Bid Item 17, “Gravel Borrow Incl. Haul”.

Plans

1. Plan sheets 6-10, 103–111, 119-124, 176-180, 191, and 391 are revised as shaded and noted on the attached sheets. Plan sheet 10A is added.

Proposal

1. On page 2, Item No. 18, the PLAN QUANTITY is revised.

2. On page 4, Item No. 38, the PLAN QUANTITY is revised. Item No. 39, the ITEM DESCRIPTION is revised.
3. On page 10, Item No. 126, the PLAN QUANTITY is revised.
4. On page 14, Item Nos. 178 and 179, the PLAN QUANTITY is revised.
5. On page 17, Item Nos. 216, 217, 218, 219, and 220 are added.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

KEVIN J. DAYTON
Olympic Region Administrator

Attachments:

Sheets 6-10, 10A, 103-111, 119-124, 176-180, 191, and 391 of the Plans (28 sheets, Rev. 10/19/10, 10/20/10)

Pages 2, 4, 10, 14, and 17 of the Proposal.

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

October 19, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
State Project**

Addendum No. 7

You are notified that the Special Provisions for the above referenced project are amended as follows:

The date of bid opening has been delayed to Wednesday, November 3, 2010 for a forthcoming addendum.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

**KEVIN J. DAYTON
Olympic Region Administrator**

NOTE: This set of plans and specifications does not have this addendum incorporated in it.
Acknowledgment of receipt of each addendum is required.

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

October 15, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
State Project**

Addendum No. 6

The Plans for this project are amended as follows:

Plans

1. On sheets 406, 407, 408, 409, 410, 413, and 414, all references to "STD. PLAN D-3a" are deleted and replaced by "STD. PLAN D-3.10-00".

Bidders are instructed to revised sheets 406 – 410, 413, and 414 of the Plans as revised sheets have not been prepared for attachment to this addendum.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

**KEVIN J. DAYTON
Olympic Region Administrator**

NOTE: This set of plans and specifications does not have this addendum incorporated in it.
Acknowledgment of receipt of each addendum is required.

Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504

October 7, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
10C502**

Addendum No. 5

The Special Provisions, Addendum No. 1, Addendum No. 3, Plans, and Proposal for this project are amended as follows:

Special Provisions

1. On page 119, line 25 is deleted.
2. On page 120, the following is inserted after line 40:

(September 8, 1997)

Removal of Pavement, Sidewalks, Curbs, and Gutters

Section 2-02.3(3) is supplemented with the following:

The approximate thickness of the *** asphalt concrete *** pavement is *** 0.60 feet. ***

3. On page 121, lines 46 through 49 are revised to read as follows:

Roadway Excavation Incl. Haul – Area for Contour Grading shall be used to construct the final contours as shown on the contour grading plans. All other roadway excavation material is not considered suitable for construction of roadway embankments.

4. On page 122, the following is inserted after line 7:

Earth Embankment Construction

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

(**)***

Roadway Excavation Incl. Haul – Area For Contour Grading. The Contractor shall excavate, construct embankments, and grade all contour grading areas as shown in the Plans and staked by the Engineer. Excavation material from contour grading shall be placed in adjacent embankment areas to establish the required finished contours. Method A compaction shall apply to the contour grading areas.

5. On page 130, line 38 is revised to read:

The fifth ~~second~~ paragraph of Section 9-19.1 is revised to read as follows:

6. On page 134, lines 32 and 33 are revised to read:

The precast crossbeam of Bridge No. 12/118 Repl. shall be considered a prestressed concrete girder and shall be constructed in accordance with this Section.

7. On page 135, line 34 is revised to read:

The precast columns, ~~and~~ crossbeam end panels, and girder diaphragms of Bridge No. 12/118 Repl. shall

8. On page 135, the following is inserted after line 44:

The Contractor shall construct the grout test joint as shown in the Plans. The test joint shall use the same type and size of shims planned for use in the bridge. The ducts shall be fitted with the same grout vents planned for use in the bridge. The Contractor shall, in the presence of the Engineer, perform the grouting of the test joint per the approved grouting operation Plan. The test joint shall be allowed to cure for a minimum of 3 days, after which the forms and duct plugs shall be removed. The grout coverage in the gap between the top and bottom form and the annular space between the pvc pipe and the metal duct shall be inspected. The test shall be considered successful if the joint and annular space is filled. Results from the test joint shall be used to modify the grouting operation Plan. These modifications may include but are not limited to, added grout vents, modified grout consistency, change of grout type, and revised joint forms. The modified grout operation Plan shall be submitted for approval. The Contractor shall not proceed with grouting operations to the bridge until a successful test of the grout test joint is completed. The test shall be conducted at least 2 weeks prior to the Contractor's scheduled bridge grouting.

9. On page 136, lines 12 through 14 and the associated table are deleted and replaced by the following:

Grout placed between column segments and column to crossbeam connection shall be pumpable and conform to Section 9-20.3(2). The minimum compressive strength shall be 6,000 psi at 7-days and 8,000 psi at 28-days. These compressive strengths shall be lab verified from the field-produced 2 inch cubes.

10. On page 137, line 45 is revised to read:

Conc. Class 4000 155 ~~175~~ C.Y.

11. On page 138, line 50 is revised to read:

accordance with Section 1-04.4. The unit contract price per linear foot for "Prestressed Conc. Girder" shall also include all costs in association with

furnishing and installing precast intermediate and end diaphragms for Bridge No. 12/118.

12. On page 140, lines 27 through page 141, line 30 are deleted.

13. On page 156, line 31 is revised to read:

be full compensation for all labor, tools, concrete, sand, [~~topsoil,~~] and other materials, and

14. On page 159, line 34 is revised to read:

Bioretention Treatment Soil Mix will be measured by the cubic yard [~~square-yard~~] by the neat line.

15. On page 159, line 46 is revised to read:

The contract price for "Bioretention Treatment [~~of~~] Soil Mix" per cubic yard [~~square yard~~] shall be full

16. On page 163, lines 5 through 15 are revised to read:

CCTV Encoder and Decoder

Encoders and decoders shall be:

Equipment Model Numbers:

Indigo Vision 9000 Transmitter 749116 [~~749418~~]

~~[Rack Card Transmitter/Receiver~~

~~[Indigo Vision 4 Space Rack 980103]~~

Indigo Vision 9000 Receiver Card 729117 [~~729407~~]

~~[Rack Card Receiver]~~

Indigo Vision 10 Channel Rack Chassis 980096

17. On page 188, lines 34 through 36 are revised to read:

1 each – Indigo Vision 10 [~~Space Rack~~] Channel Rack Chassis 980096

2 each - Kramer VM1055 Video Distribution Amplifier

6 each – Indigo Vision 9000 Receiver Card [~~729407~~] 729117

Addendum #1

1. Special Provisions, Item No. 18, number 7 is deleted and replaced by the following:

7. The Contractor shall install Indigo Vision 9000 Transmitter 749116 for camera communications.

Addendum #3

1. Special Provisions, Item No. 12, the heading and numbers 1 and 2 are revised to read as follows:

Abandon Existing Manholes

Section 7-05.3(2) is revised to read as follows:

(*****)

Existing manholes, catch basins, and inlets designated to be abandoned may be abandoned using one of the following methods:

1. The structure shall be broken down to a depth of 4-feet below the revised surface elevation and the structure backfilled with sand and compacted to 90 percent density as specified in Section 2-03.3(14)C. Debris resulting from breaking the upper part of the structure may be mixed with the sand, subject to approval of the Engineer. The ring and cover or frame and grate shall be salvaged and remain the property of the Contracting Agency. All other surplus material shall be disposed of by the Contactor in accordance with Section 2-03.3(7)C.
2. The structure may be removed completely and the resulting void backfilled with sand and compacted to 90 percent density as specified in Section 2-03.3(14)C. The ring and cover or frame and grate shall be salvaged and remain the property of the Contracting Agency. All other surplus material shall be disposed of by the Contactor in accordance with Section 2-03.3(7)C.

Plans

1. Plan sheets 6-12, 23, 38, 40, 43, 50, 52, 56, 74-82, 84-86, 92-102, 105, 108-111, 119-124, 126, 145-148, 152-156, 159, 162, 166, 167, 171, 173, 265, 267, 281, 390, and 391 are revised as shaded and noted on the attached sheets.
2. Plan sheets 24A, 94A, 173A, and 358A are added sheets.
3. Plan sheets 392, 393, and 394 are deleted.

Proposal

1. On page 1, Item No. 7, the PLAN QUANTITY is revised.
2. On page 2, Item Nos. 16, 17, and 18, the PLAN QUANTITY is revised.
3. On page 3, Item No. 24, the PLAN QUANTITY is revised.
4. On page 5, Item No. 51 is deleted. Item No. 58, the PLAN QUANTITY is revised.
5. On page 7, Item Nos. 76 and 79, the PLAN QUANTITY is revised. Item No. 78 is deleted.

6. On page 9, item No. 113, the PLAN QUANTITY is revised.
7. On page 10, Item Nos. 116, 119, and 123, the PLAN QUANTITY is revised.
8. On page 11, Item No. 132, the PLAN QUANTITY is revised.
9. On page 14, Item No. 183, the PLAN QUANTITY is revised.
10. On page 16, Item No. 204, the PLAN QUANTITY is revised. Item Nos. 209 and 210 are deleted.
11. On page 17, Item Nos. 213, 214, and 215 are added.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

KEVIN J. DAYTON
Olympic Region Administrator

Attachments:

Sheets 6-12, 23, 24A, 38, 40, 43, 50, 52, 56, 74-82, 84-86, 92-94A, 95-102, 105, 108-111, 119-124, 126, 145-148, 152-156, 159, 162, 166, 167, 171, 173, 173A, 265, 267, 281, 358A, 390, and 391 of the Plans (73 sheets, multiple revision dates).

Pages 1, 2, 3, 5, 7, 9, 10, 11, 14, 16, and 17 of the Proposal (Revised 10/7/10).

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

October 1, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
10C502**

Addendum No. 4

You are notified that the Special Provisions for the above referenced project are amended as follows:

The date of bid opening has been delayed to Wednesday, October 20, 2010 for a forthcoming addendum.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

**KEVIN J. DAYTON
Olympic Region Administrator**

Attachment: None

**NOTE: This set of plans and specifications does not have this addendum incorporated in it.
Acknowledgment of receipt of each addendum is required.**

Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504

September 24, 2010

ATTENTION: All Bidders and Planholders

I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
10C502

Addendum No. 3

The Special Provisions, Addendum #1, Plans, Proposal, and Wage Rates for this project are amended as follows:

Special Provisions

1. On page 102, line 16 is revised to read:

253-502-8934 [(253) 779-7065]

2. On page 113, lines 44 and 45 are revised to read as follows:

constructing any drainage feature associated with drainage structure codes DR4-3, DR7-1 through DR7-13, DR7-18, DR7-20 through DR7-22, DR9-1, DR9-2, DR9-4 through DR9-9 and DR9-17 through DR9-19. [~~DR2/2, DR2/3, DR6/4 through DR6/13 and DR8/1 through DR8/9~~]

3. On page 119, the following is inserted after line 16:

(*****)

This work shall include rubblizing the existing asphalt concrete pavement, and incorporating the material into the new roadway embankment, as designated in the Plans.

4. On page 119, the following is inserted after line 41:

(*****)

Rubblizing Existing Pavement

Existing asphalt concrete pavement to be rubblized as identified in the Plans or staked by the Engineer shall be broken into pieces not exceeding 18-inches in any dimension. No part of any piece shall be within 2-feet of the top, side or end surface of the embankment or any Structure.

Rubblized materials shall be compacted using a 10-ton compression roller or a vibratory roller having a dynamic force of at least 30,000-pounds impact per

vibration and at least 1,000-vibrations per minute. In either case, the roller shall make four passes of full coverage. Rollers must exert reasonably even pressure over the area covered. The Contractor shall limit the speed of the compression rollers to no more than 4 miles per hour, and the speed of the vibratory rollers to no more than 1.5 miles per hour.

5. On page 120, the following is inserted after line 50:

(*****)

Rubblization of asphalt conc. pavement will be measured by the square yard.

6. On page 121, the following is inserted after line 27:

(*****)

"Rubblization of Asphalt Conc. Pavement," per square yard

The unit contract price per square yard for "Rubblization of Asphalt Conc. Pavement" shall be full compensation for all labor, tools, and equipment required to complete the work as specified, including compaction of the rubblized pavement.

7. On page 124, lines 42 through page 125, line 14 are deleted.
8. On page 125, lines 18 through 27 are deleted.
9. On page 126, lines 20 and 21 are deleted.
10. On page 127, lines 37 through 42 are deleted.
11. On page 142, lines 44 and 45 are deleted and replaced by the following:

Materials for Temporary Geosynthetic Retaining Walls shall meet the requirements of the following Sections:

Gravel Borrow	9-03.14(1)
Construction Geosynthetic	9-33

12. On page 145, the following is inserted after line 45:

Abandon Existing Manholes

Section 7-05.3(2) is revised to read as follows:

(*****)

Existing manholes, catch basins, and inlets designated to be abandoned may be abandoned using one of the following methods:

1. The structure shall be broken down to a depth of 4-feet below the revised surface elevation and the structure backfilled with sand and compacted to 90 percent density as specified in Section 2-03.3(14)C. Debris resulting from breaking the upper part of the structure may be mixed with the sand, subject to approval of the Engineer. The ring and cover or frame and grate shall be salvaged and all other surplus material disposed of.

2. The structure may be removed completely and the resulting void backfilled with sand and compacted to 90 percent density as specified in Section 2-03.3(14)C. The ring and cover or frame and grate shall be salvaged and all other material disposed of.

With both options, all pipe connections shall be plugged in accordance with Section 7-08.3(4).

Salvaged material shall be delivered to the following location:

Olympic Region Taylor Towne Maintenance Facility
US 101 MP 352.7
0.10 miles south of Lynch Road

Measurement

Section 7-05.4 is supplemented with the following:

(*****)

Abandoning existing drainage structures will be measured per each for each structure abandoned as required.

Payment

Section 7-05.5 is supplemented with the following:

(*****)

"Abandon Existing Drainage Structure", per each.

The unit contract price per each for "Abandon Existing Drainage Structure" shall be full pay for all materials, labor, and equipment to perform the work as specified, including all costs associated with plugging of the pipes.

13. On page 149, lines 1 through 7 are revised to read as follows:

- C. Geomembrane installation shall proceed between ambient temperatures of 32° F and 104° F. Placement [~~can precede~~] may be allowed at temperatures below 32° F only after it has been verified by the Engineer that the material can be seamed according to the specification. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., fog, rain, dew) or in the presence of excessive winds, as determined by the installation supervisor.

14. On page 156, the following is inserted after line 33:

(*****)

"Seeding, Fertilizing and Mulching Mix ____", per acre.

15. On page 161, lines 31 through 43 are revised to read as follows:

Temporary Illumination Equipment and Materials

With the exception of lamps and wiring, the equipment and materials used in the temporary illumination system [~~does~~] do not have to be new. Equipment and

materials shall be of the type and grade specified within the Plans, these Special Provisions, and the Standard Specifications.

Timber pole locations [shall] will be staked in the field by the Engineer as shown in the Plans. Timber light standards may be relocated up to four feet from the location shown in the Plans at the discretion of the Engineer. Timber poles without light standards may be located as needed, provided no aerial conductor span exceeds 300 feet.

The [luminaries] luminaires shall be equipped with 180 degree house side shield as designated in the Plans to minimize spill light.

16. On page 161, lines 46 through 50 are revised to read as follows:

Temporary Signal Equipment and Materials

With the exception of lamps and wiring, the equipment and materials used in the temporary signal system [does] do not have to be new. Equipment and materials shall be of the type and grade specified within the Plans, these Special Provisions, and the Standard Specifications.

17. On page 162, lines 1 through 3 are revised to read as follows:

Timber poles locations [shall] will be staked in the field by the Engineer as shown in the Plans. Minimal adjustment of pole locations may be made at the discretion of the Engineer, provided no signal span exceeds 150 feet in length.

18. On page 172, lines 42 through 46 are revised to read as follows:

The temporary illumination system when no longer required, as determined by the Engineer, shall be removed and will [~~become~~] remain the property of the Contractor. Removal shall include timber light standards, luminaires, and cables. When poles or foundations are removed, they shall be backfilled and compacted in accordance with 8-02.3(2) to the level of the surrounding surface.

19. On page 173, lines 8 through 15 are revised to read as follows:

When no longer required, [~~the controller cabinets, all equipment contained within the controller cabinets, and all video detectors and their associated equipment~~] the controller cabinet, and all equipment contained therein, with the exception of equipment supplied by the Contractor, installed at the temporary signal at the intersection of US 12 and the southbound I-5 ramps shall remain the property of the Contracting Agency. The Contractor shall deliver this equipment to the Olympic Region Signal Shop, 5720 Capitol Blvd SE, Tumwater, WA during normal business hours.

20. On page 185, lines 31 through page 186, line 24 are deleted.

21. On page 186, lines 30 through 36 are revised to read as follows:

RWIS components Test

The RWIS components and cables shall be tested in accordance with [~~to~~] the manufacturer's specification after installation. All acceptance tests shall be

performed by the Contractor in the presence of the Engineer for each component. The RWIS components serial number and location shall be recorded with the test results on the manufacturer's form provided with the components. A hard copy of the test results shall be provided by the Contractor to the Contracting Agency.

22. On page 188, lines 26 through 28 are revised to read as follows:

Contractor Supplied Materials

The Contractor shall supply the Contracting Agency with the following [additional] required materials, to be installed by WSDOT at the TMC and ITS control cabinets.

23. On page 189, lines 15 through 19 are revised to read as follows:

Removed Equipment

The existing controller cabinets to be removed, and all equipment contained therein, with the exception of equipment supplied by the Contractor, shall remain the property of [WSDOT] the Contracting Agency. The Contractor shall deliver this equipment to the Olympic Region Signal Shop, 5720 Tumwater Blvd SE, Tumwater, WA, during normal business hours. [Contact] Point of contact is Olympic Region Signal Superintendent, Don Anders (360) 357-2616.

24. On page 197, lines 2 through 8 are revised to read as follows:

Standard junction boxes, pull boxes, and cable boxes shall be installed as close to the location specified in the plans as possible. Locations ~~can~~ may be field adjusted to match grade, curb or sidewalk edges, or to avoid obstructions, with the approval of the Engineer. The Contractor may install, at no expense to the Contracting Agency, such additional boxes as may be desired to facilitate the Work or to accommodate the requirements of the material used by the Contractor. Junction box installation shall conform to the details in the Standard Plans.

25. On page 207, the following is inserted after line 28:

(*****)

No specific unit of measurement will apply to the lump sum contract price for "VMS Warranty".

26. On page 207, lines 39 through 41 are revised to read as follows:

Removal of the existing illumination equipment, including the existing [temporary] timber high mast illumination system, powered from service SCA 527 shall be included in the lump sum payment for "Illumination System SCA 527."

27. On page 208, lines 17 through 20 are deleted.

28. On page 208, lines 36 through 43 are revised to read as follows:

The lump sum contract price for "Variable Message Sign System", shall be full pay for the construction of the complete electrical system, as described above and shown in the Plans, and herein specified, including excavation, backfilling, concrete foundations, conduit, wiring, restoring facilities destroyed or damaged

during construction, salvaging existing materials, and making all required tests.
~~[and for providing the warranty described herein]~~. 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.

29. On page 208, the following is inserted after line 44:

(*****)

"VMS Warranty", lump sum.

The lump sum contract price for "VMS Warranty" shall be full pay for the procurement of a 10-year VMS warranty from ADDCO, LLC dba IMAGO North America.

30. On page 209, the following is inserted after line 30:

(*****)

"Adjust Junction Box", per each.

The unit contract price per each for "Adjust Junction Box" shall be full pay for all costs necessary to make the adjustment including restoration of adjacent areas in a manner acceptable to the Engineer.

31. On page 252, the following is inserted after line 34:

1 – Econolite 56k Modem (P/N 34975G10); include minimum 6 foot long D-Sub 9 pin male-male cable

32. On page 252, lines 48 and 49 are revised to read as follows:

A cage mounting clear area for the controller unit shall be provided in Rack Cage #1. ~~[The area shall be protected with suitable insulating material.]~~ The area shall extend 1.5 inches in front of and 16 inches behind the EIA mounting angles.

33. On page 254, the following is inserted after line 31:

The locks shall have rectangular, spring-loaded bolts. The bolts shall have a 0.281 in throw and shall be 0.75 in wide by 0.75 in thick (tolerance is +/- 0.035 in).

34. On page 257, lines 2 through 16 are deleted.

35. On page 264, lines 31 through 33 are deleted.

36. On page 265, the following Appendix is added after line 22:

APPENDIX J:

WSDOT Railroad Agreement RR-00452 with City of Tacoma

Addendum #1

1. Special provisions, Item No. 18, number 8 is revised to read as follows:
 8. The Cisco Switch will [shall] be installed by others for the communications with the fiber optic cable. ~~[Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet model D9130 WDM for Data Station communications.]~~
2. Special provisions, Item No. 19, number 7 is revised to read as follows:
 7. The Cisco Switch will [shall] be installed by others for the communications with the fiber optic cable. ~~[Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet. Model D9130 WDM for Ramp Meter and Data Station.]~~

Plans

1. Plan sheets 6-10, 75, 78, 80, 81, 84, 85, 87, 103, 106, 109, 110, 115, 119-124, 126, 133, 134, 152-155, 172, 173, 176, 180, 189, 206, 355, 356, and 387 are revised as shaded and noted on the attached sheets.
2. Attached plan sheets 175A and 191A are new sheets.

Proposal

1. On page 2, Item No. 10 is deleted. Item Nos. 14, 15, and 22, the PLAN QUANTITY is revised.
2. On page 3, Item Nos. 27, 28, 30, 31, 32, 34, and 35, the PLAN QUANTITY is revised.
3. On page 4, Item Nos. 38, and 41 through 44, the PLAN QUANTITY is revised.
4. On page 5, Item Nos. 54, 57, and 58, the PLAN QUANTITY is revised.
5. On page 6, Item Nos. 61 through 63, and 67, the PLAN QUANTITY is revised.
6. On page 7, Item No. 76, the PLAN QUANTITY is revised. Item Nos. 79 through 82, the ITEM DESCRIPTION is revised.
7. On page 9, Item No. 112, the PLAN QUANTITY is revised.
8. On page 10, Item No. 120 is deleted. Item Nos. 116, 119, 122, 126, and 129, the PLAN QUANTITY is revised.
9. On page 11, Item Nos. 134, 136, 139, and 142, the PLAN QUANTITY is revised.
10. On page 12, Item No. 145, the PLAN QUANTITY is revised.
11. On page 14, Item Nos. 181 and 183, the PLAN QUANTITY is revised.

ADDENDUM NO. 3

I-5

Grand Mound to Maytown
Stage Two – Replace Interchange
10C502

12. On page 15, Item Nos. 191 and 195, the PLAN QUANTITY is revised.
13. On page 16, Item No. 205, the PLAN QUANTITY is revised. Item Nos. 207 through 211 are added.
14. On page 17, Item No. 212 is added.

Wage Rates

1. The Journey Level Prevailing Wage Rates, pages 1 through 16 are deleted in their entirety and replaced by the attached Washington State Journey Level Prevailing Wage Rates, pages 1 through 14.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

KEVIN J. DAYTON
Olympic Region Administrator

Attachments:

Sheets 6-10, 75, 78, 80, 81, 84, 85, 87, 103, 106, 109, 110, 115, 119-124, 126, 133, 134, 152-155, 172, 173, 175A, 176, 180, 189, 191A, 206, 355, 356, and 387 of the Plans (41 sheets, multiple revision dates).

Pages 2-7, 9-12, and 14-17 of the Proposal.

Pages 1-14 of the Washington State Journey Level Prevailing Wage Rates for Effective Date 10/14/2010.

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

September 18, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage Two – Replace Interchange
10C502**

Addendum No. 2

You are notified that the Special Provisions for the above referenced project are amended as follows:

The date of bid opening has been delayed to Thursday, October 14, 2010 for a forthcoming addendum.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

**KEVIN J. DAYTON
Olympic Region Administrator**

Attachment: None

**NOTE: This set of plans and specifications does not have this addendum incorporated in it.
Acknowledgment of receipt of each addendum is required.**

**Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504**

September 2, 2010

ATTENTION: All Bidders and Planholders

**I-5
Grand Mound to Maytown
Stage 2 – Replace Interchange
10C502**

Addendum No. 1

The Amendments, Special Provisions, Plans, and Proposal for this project are amended as follows:

Amendments

1. On page 1, the following text is added after line 14:

**SECTION 1-01, DEFINITIONS AND TERMS
August 2, 2010**

1-01.2(1) Associations and Miscellaneous

The abbreviation and definition "AREA American Railway Engineering Association" is replaced with the following:

AREMA American Railway Engineering and Maintenance Association

2. On page 7, the following text is added after line 10:

**SECTION 2-09, STRUCTURE EXCAVATION
August 2, 2010**

2-09.3(2) Classification of Structure Excavation

Item number 1 is revised to read:

1. **Class A.** Structure excavation required for bridge and retaining wall footings, geosynthetic retaining wall footings, structural earth wall and sign structure footings, pile or drilled shaft caps, seals, wingwall footings, detention vaults, and noise barrier wall footings shall be classified as Structure excavation Class A. If the excavation requires a cofferdam, structural shoring, or extra excavation, the work outside the neat lines of

the Structure excavation Class A shall be classified as shoring or extra excavation Class A.

3. On page 7, the following text is added after line 37:

SECTION 5-02, BITUMINOUS SURFACE TREATMENT
August 2, 2010

5-02.5 Payment

The following pay item and related statements are deleted:

“Asphalt Emulsion Price Adjustment”, by calculation.

4. On page 9, the following text is added after line 47:

SECTION 6-01, GENERAL REQUIREMENTS FOR STRUCTURES
August 2, 2010

6-01.6 Load Restrictions on Bridges Under Construction

In the first paragraph “roadway deck” is deleted and replaced with “bridge deck”.

6-01.8 Approaches to Movable Spans

In the first paragraph “roadway” is deleted and replaced with “bridge deck”.

5. On page 24, the following text is added after line 34:

SECTION 6-13, STRUCTURAL EARTH WALLS
August 2, 2010

6-13.3(3) Excavation and Foundation Preparation

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

Excavation shall conform to Section 2-09.3(3).

6-13.4 Measurement

The fourth paragraph is deleted

6-13.5 Payment

The bid items “Structure Excavation Class B”, per cubic yard, “Structure Excavation Class B Incl. Haul”, per cubic yard, and “Shoring Or Extra Excavation Class B”, per square foot, are deleted from this section.

SECTION 6-14, GEOSYNTHETIC RETAINING WALLS
August 2, 2010

6-14.3(3) Excavation and Foundation Preparation

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

Excavation shall conform to Section 2-09.3(3).

6-14.4 Measurement

The fifth paragraph is deleted

6-14.5 Payment

The bid items "Structure Excavation Class B", per cubic yard, "Structure Excavation Class B Incl. Haul", per cubic yard, and "Shoring Or Extra Excavation Class B", per square foot, are deleted from this section.

SECTION 6-16, SOLDIER PILE AND SOLDIER PILE TIEBACK WALLS

August 2, 2010

6-16.5 Payment

The first sentence in the paragraph following the bid item "Furnishing Soldier Pile _____", per linear foot, is revised to read:

All costs in connection with furnishing soldier pile assemblies shall be included in the unit contract price per linear foot for "Furnishing Soldier Pile - _____", including fabricating and painting the pile assemblies, and field splicing and field trimming the soldier piles.

6. On page 42, the following text is added after line 8:

SECTION 8-09, RAISED PAVEMENT MARKERS

August 2, 2010

8-09.3(1) Surface Preparation

In the first paragraph, the second procedure is revised to read:

When markers are placed on new cement concrete pavement, any curing compound shall be removed in accordance with the requirements of this section. All liquid membrane-forming compounds shall be removed from the Portland cement concrete pavement to which Raised Pavement Markers are to be bonded. Curing compound removal shall not be started until the pavement has attained sufficient flexural strength for opening for traffic to be allowed on it. The Contractor shall submit a proposed removal method to the Project Engineer and shall not begin the removal process until the Project Engineer has approved the removal method.

SECTION 8-10, GUIDE POSTS

August 2, 2010

8-10.3 Construction Requirements

The second paragraph is supplemented with the following:

When guide posts are placed on new cement concrete pavement, any curing compound shall be removed. All liquid membrane-forming compounds shall be removed from the Portland cement concrete pavement to which guide posts are to be bonded. Curing compound removal shall not be started until

the pavement has attained sufficient flexural strength for traffic to be allowed on it. The Contractor shall submit a proposed removal method to the Project Engineer and shall not begin the removal process until the Project Engineer has approved the removal method. The final guide post lengths will be determined or verified by the Engineer at the request of the Contractor.

SECTION 8-11, GUARDRAIL

August 2, 2010

8-11.3(1)A Erection of Posts

The second paragraph is supplemented with the following sentence:

New installations of guardrail shall have steel posts or as otherwise shown in the Plans.

8-11.3(1)D Terminal and Anchor Installation

The fifth paragraph is supplemented with the following sentence:

For new terminal installations steel posts shall be used unless shown otherwise in the Plans.

7. On page 45, the following text is added after line 42:

SECTION 8-22, PAVEMENT MARKING

August 2, 2010

8-22.1 Description

In the second paragraph, the last sentence is revised to read:

Traffic letters used in word messages shall be sized as shown in the Plans.

8-22.4 Measurement

In the sixth paragraph "Painted Line" is revised to read "Paint Line".

8. On page 46, the following text is added after line 1:

SECTION 9-02, BITUMINOUS MATERIALS

August 2, 2010

9-02.1(9) Coal Tar Pitch Emulsion, Cationic Asphalt Emulsion Blend Sealer

This section including title is revised to read:

9-02.1(9) Vacant

9. On page 49, the following text is added after line 20:

SECTION 9-06, STRUCTURAL STEEL AND RELATED MATERIALS
August 2, 2010

9-06.5(3) High Strength Bolts

The first paragraph is revised to read:

High-strength bolts for structural steel joints shall conform to either AASHTO M 164 Type 1 or 3 or AASHTO M 253 Type 1 or 3, as specified in the Plans or Special Provisions. Tension control bolt assemblies, meeting all requirements of ASTM F 1852 may be substituted where AASHTO M 164 high strength bolts and associated hardware are specified.

The second paragraph is deleted.

The third paragraph is revised to read:

Bolts conforming to AASHTO M 253 and assemblies conforming to ASTM F 1852 shall not be galvanized.

The fourth paragraph is revised to read:

Bolts for unpainted and nongalvanized structures shall conform to either AASHTO M 164 Type 3, AASHTO M 253 Type 3, or ASTM F 1852 Type 3, as specified in the Plans or Special Provisions.

The fifth paragraph is revised to read:

Nuts for high strength bolts shall meet the following requirements:

AASHTO M 164 Bolts

Type 1 (black)

AASHTO M 291 Grade C, C3, D, DH and DH3

AASHTO M 292 Grade 2H

Type 3 (black weathering)

AASHTO M 291 Grade C3 and DH3

Type 1 (hot-dip galvanized)

AASHTO M 291 Grade DH

AASHTO M 292 Grade 2H

AASHTO M 253 Bolts

Type 1 (black)

AASHTO M 291 Grade DH, DH3

AASHTO M 292 Grade 2H

Type 3 (black weathering)

AASHTO M 291 Grade DH3

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

Washers for AASHTO M 164 and AASHTO M 253 bolts shall meet the requirements of AASHTO M 293 and may be circular, beveled, or extra thick as required.

The last sentence in the eleventh paragraph is revised to read:

Approval from the Engineer to use lock-pin and collar fasteners shall be received by the Contractor prior to use.

The number 2 foot note reference in the table is deleted.

The last row of the table is revised to read:

*Manufacturer's Certificate of Compliance — samples not required.
1 Nuts, washers, load indicator devices, and tension control bolt assemblies shall be sampled at the same frequency as the bolts.

Special Provisions

1. On page 99, lines 17 and 18 are revised to read as follows:

Puget Sound Energy will relocate three utility poles [~~located at~~] currently located at Stations:

2. On page 116, line 24 is revised to read as follows:

HMA Cl. ½ In. PG64-22 [~~2-90~~] 0.90 gal/ton

3. On page 119, lines 42 through 52 are deleted.

4. On page 121, lines 51 and 52 are revised to read as follows:

Pond Excavation materials from Pond 5 are [~~is~~] considered suitable for construction of roadway embankments. All other pond excavation is not considered suitable for construction of roadway embankments.

5. On page 121, lines 1 through 7 are deleted.

6. On page 121, lines 29 through 33 are deleted.

7. On page 122, lines 4 through 7 are revised to read as follows:

Ponds shall be excavated to the lines and grades detailed in the Plans. [~~Except for Pond Excavation materials from Pond 5, all other Pond Excavation~~] With the exception of Pond 5, excavated material shall not be used for embankment construction and shall be disposed of in accordance with Section 2-03.3(7)C.

Excavated materials from Pond 5 may be used in construction of embankments of the C1 Line, G1 Line or F1 line as shown in the construction staging plans.

8. On page 122, the following text is added after line 9:

(*****)

The First sentence of section 2-03.4 is revised to read:

Roadway excavation, channel excavation, ditch excavation, unsuitable foundation excavation, pond excavation and common borrow items will be measured by the cubic yard

(*****)

The Fourth sentence of section 2-03.4 is revised to read:

For Roadway excavation, channel excavation, ditch excavation and pond excavation items, the original ground will be compared with the planned finished section shown in the Plans.

9. On page 122, lines 36 through 38 are revised to read as follows:

The unit contract price per cubic yard for "Pond Excavation Incl. Haul" shall be full compensation incurred for excavating, dewatering, loading, placing or otherwise [and] disposing of the material [offsite].

10. On page 145, line 29 is revised to read as follows:

Media filter drain will be measured by the square yard to the limits of "Media Filter Drain" as shown in the plans [by ground slope measurement].

11. On page 159, the following text is added after line 50:

CURBS, GUTTERS, and SPILLWAYS

Payment

Section 8-04.5 is supplement with the following:

(*****)

"Modified Cement Conc. Traffic Curb and Gutter – I1 Line" per linear foot

The unit contract price for "Modified Cement Conc. Traffic Curb and Gutter – I1 Line" shall be full compensation for all labor, equipment and materials necessary to furnish, and install "Modified Cement Conc. Traffic Curb and Gutter – I1 Line" as shown in the plans, including curb breaks and concrete pads.

12. On page 163, lines 37 and 38 are revised to read as follows:

Remote Road Surface [State] Temperature Sensor [DSC444] DST111
Sensor Adapter for [DCS444] DST111 DRA411

13. On page 176, lines 4 through 8 are revised to read as follows:

~~[In all cable vaults and at all splice locations; 100 feet of cable slack shall be left by the Contractor. In all pullboxes 50 foot length of slack shall be left by the Contractor.]~~ Slack fiber optic cable shall be coiled and secured with tie wraps to

racking hardware. No slack in the cable is required when pulling through NEMA junction boxes. No extra slack shall be left in the cabinets.

14. On page 182, lines 19 and 20 are deleted.

15. On page 188, lines 30 through 31 are revised to read as follows:

[4 each - Digi TS DB-25M Modem Adapter	Model # 76000700]
[4 each - Digi TS DB-9M Modem Adapter	Model # 76001742]
<u>8 each - RJ-45 to DB-9 Male, Straight, 4' Cable</u>	<u>Model # 76000240</u>
<u>8 each - RJ-45 to DB-25 Male, Straight, 4' Cable</u>	<u>Model # 76000199</u>

16. On page 188, the following text is added after line 36:

12 each -Cisco: Catalyst 2960 Series Switch 8 10/100 + 1 T/SFP LAN Base Image
Model # WS-C2960-8TC-L
24 each - Cisco: 1000BASE-ZX SFP Laser
Model # GLC-ZX-SM=
1 each - Cisco: Catalyst 3750 Series Switch 12 SFP + IPB Image
Model # WS-C3750G-12S-s

17. On page 188, lines 47 through 51 are revised to read as follows:

The Contractor shall coordinate with the OR ITS Maintenance Supervisor 48 hours prior to needing access to existing ITS control cabinets, installation of Cisco equipment, and all ITS testing. OR ITS supervisor or his appointee will be present when access to existing control cabinets is required and during all ITS testing. The OR ITS Maintenance contact during normal working hours (7:00 AM to 3:30 PM) is:

18. On page 230, lines 13 through 24 are revised to read as follows:

7. The Contractor shall install [~~GE/IFS Fiber Optics transceiver in the control cabinet model D7430 WDM and~~] Indigo Vision encoder VP800 for camera communications.
8. The Cisco Switch shall be installed by others for the communications with the fiber optic cable. [~~Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet model D9130 WDM for Data Station communications.~~]
9. The Contractor shall install a rack - mounted fiber optic patch panel in the control cabinet as specified in the Plans. [~~The Contractor shall use an ST/UPC patch cord from the patch panel to the GE/IFS transceiver.~~] Fiber optic cables entering into control cabinets shall have fusion spliced pigtailed terminating in the interconnection sleeves.

19. On page 231, lines 29 through 36 are revised to read as follows:

7. The Cisco Switch shall be installed by others for the communications with the fiber optic cable. [Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet. Model D9130 WDM for Ramp Meter and Data Station.]
 8. The Contractor shall install a rack - mounted fiber optic patch panel in the control cabinet as specified in the Plans. ~~[The Contractor shall use an ST/UPC patch cord from the patch panel to the GE/IFS transceiver.]~~ Fiber optic cables entering into control cabinets shall have fusion spliced pigtails terminating in the interconnection sleeves.
20. On page 246, lines 45 through 48 are revised to read as follows:
- Each cable shall contain the total number of optical fibers as specified in the Plans. ~~[For all 12-count fiber optic cables, the fibers shall be placed in loose buffer tubes in groups of 6. For all 48-count and 96-count fiber optic cables]~~ All fiber optic cables greater than a 12-count shall be placed in loose buffer tubes in [group] groups of 12.
21. On page 248, lines 32 through page 249, line 15 are deleted and replaced with the following:
- Combined Fiber Optic Patch Panel and Splice Tray Housing**
The fiber optic patch panel shall be designed to hold the minimum number of ST/UPC fiber optic interconnection sleeves as specified in the plans. The splice trays shall be designed to hold the minimum number of splices as specified in the plans. The patch panel shall allow for full access to the splice trays and both sides of the fiber optic interconnection sleeves from the front of the patch panel. The splice trays and the fiber optic interconnection sleeves shall be enclosed on all sides by the patch panel when the patch panel is closed. The patch panel shall not exceed 6 inches in height.
- Fiber Optic Patch Panel**
The fiber optic patch panel shall be designed to hold the minimum number of ST/UPC fiber optic interconnection sleeves as specified in the plans. The patch panel shall allow for full access to both sides of the fiber optic interconnection sleeves from the front of the patch panel. The fiber optic interconnection sleeves shall be enclosed on all sides by the patch panel when the patch panel is closed. The patch panel shall not exceed 6 inches in height.
- Splice Tray Housing**
The splice tray housing shall be designed to hold the minimum of 12-count splice trays as loose buffer tubes specified in the plans. The splice tray housing shall be enclosed on all sides when closed. The Splice Tray Housing shall be no more than 12 inches in height.
22. On page 249, line 26 is deleted.
23. On page 251, the following text is added after line 41:
10. The 170E controller shall have an Ethernet communication module.

24. On page 263, line 6 is revised to read as follows:

One ~~[48]~~ 24 Port Patch Panel (see special provision for Fiber Optic Cable)

25. On page 265, the following text is added after line 23:

STANDARD PLANS

August 2, 2010

The State of Washington Standard Plans for Road, Bridge and Municipal Construction M21-01 transmitted under Publications Transmittal No. PT 09-013, effective August 2, 2010 is made a part of this contract.

The Standard Plans are revised as follows:

B-10.20 and B10.40

Substitute "step" in lieu of "handhold" on plan

C-3, C-3B, C-3C

Note 1 is revised as follows: replace reference F-2b with F-10.42

C-14a

SECTION B, callout – 1½" PVC CONDUIT (TYP.) is revised to read: 1¼" PVC CONDUIT (TYP.)

callout (mark) 8 #9 ~ 36" (TYP.) is revised to read: callout (mark) 8 #8 ~ 36" (TYP.)

EPOXY BAR EXPANSION JOINT DETAIL, callout (mark) W #9 (epoxy coated symbol) ~ 36" (TYP.) is revised to read: callout (mark) 8 #8 (epoxy coated symbol) ~ 36" (TYP.)

D-3a

Deleted

D-3b

Key Note 7, reference D-3a is revised to D-3.10

TYPICAL SECTION, lower left corner, reference D-3a is revised to D-3.10

D-3c

Key Note 7, reference D-3a is revised to D-3.10

TYPICAL SECTION, lower left corner, references (2x) D-3a are revised to D-3.10

F-40.10

Deleted

F-40.18

Deleted

F-40.20

Deleted

F-42.10

Deleted

G-24.40

Existing callout - CORNER BOLT (TYP.)

New callout - CORNER BOLT OR SHOULDER BOLT (TYP.)

G-24.60

ELEVATION, upper left corner, callout W6x12 STEEL SIGN POST (TYP.) is revised to read: W6x9 (TP-A) W6x12 (TP-B) STEEL SIGN POST (TYP.)

J-1f

Note 2, reference to J-7d is revised to J-15.15

J-3b

Sheet 2 of 2, Plan View of Service Cabinet, Boxed Note,

"SEE STANDARD PLAN J-6C..." is revised to read:

"SEE STANDARD PLAN J-10.10..."

J-6c

Deleted

J-7c

Note 3, reference to J-7d is revised to J-15.15

J-7d

Deleted

J-16a

Deleted

J-16b

Key Note 1, reference to J-16a is revised to J-40.36

J-16c

Key Note 1, reference to J-16a is revised to J-40.36

K-80.30

In the NARROW BASE, END view, the reference to Std. Plan C-8e is revised to Std. Plan K-80.35

L-20.10, Sheet 1

Delete all references to tension cable and substitute tension wire.

Add knuckled selvage is required on the top edge of the fence fabric.

L-20.10, Sheet 2

Delete all references to tension cable and substitute tension wire.

All rope thimbles, wire rope clips and seizing are not required.

L-30.10, Sheet 1

Delete all references to tension cable and substitute tension wire.

L-30.10, Sheet 2

Delete all references to tension cable and substitute tension wire.

All rope thimbles, wire rope clips and seizing are not required.

M-1.60

COLLECTOR DISTRIBUTOR ROAD OFF- CONNECTION, taper dimensions of 225' MIN. is changed to 300' MIN.

M-65.10

PERSPECTIVE VIEW, add dim. "SEE NOTE 1" to right side of PERSPECTIVE VIEW.

To clarify that the requirement must be met on both sides of the roadway

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.....8/07/07	A-30.35-00.....10/12/07	A-50.20-01.....9/22/09
A-10.20-00.....10/05/07	A-40.00-00.....8/11/09	A-50.30-00.....11/17/08
A-10.30-00.....10/05/07	A-40.10-01.....8/11/09	A-50.40-00.....11/17/08
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A-30.10-00.....11/08/07	A-40.20-00.....9/20/07	A-60.20-01.....8/11/09
A-30.15-00.....11/08/07	A-40.50-00.....11/08/07	A-60.30-00.....11/08/07
A-30.30-00.....11/08/07	A-50.10-00.....11/17/08	A-60.40-00.....8/31/07
B-5.20-00.....6/01/06	B-30.50-00.....6/01/06	B-75.20-01.....6/10/08
B-5.40-00.....6/01/06	B-30.70-01.....8/31/07	B-75.50-01.....6/10/08
B-5.60-00.....6/01/06	B-30.80-00.....6/08/06	B-75.60-00.....6/08/06
B-10.20-00.....6/01/06	B-30.90-01.....9/20/07	B-80.20-00.....6/08/06
B-10.40-00.....6/01/06	B-35.20-00.....6/08/06	B-80.40-00.....6/01/06
B-10.60-00.....6/08/06	B-35.40-00.....6/08/06	B-82.20-00.....6/01/06
B-15.20-00.....6/01/06	B-40.20-00.....6/01/06	B-85.10-01.....6/10/08
B-15.40-00.....6/01/06	B-40.40-01.....6/16/10	B-85.20-00.....6/01/06
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B-20.40-02.....6/10/08	B-50.20-00.....6/01/06	B-85.50-01.....6/10/08
B-20.60-02.....6/10/08	B-55.20-00.....6/01/06	B-90.10-00.....6/08/06
B-25.20-00.....6/08/06	B-60.20-00.....6/08/06	B-90.20-00.....6/08/06
B-25.60-00.....6/01/06	B-60.40-00.....6/01/06	B-90.30-00.....6/08/06
B-30.10-00.....6/08/06	B-65.20-00.....6/01/06	B-90.40-00.....6/08/06
B-30.20-01.....11/21/06	B-65.40-00.....6/01/06	B-90.50-00.....6/08/06
B-30.30-00.....6/01/06	B-70.20-00.....6/01/06	B-95.20-01.....2/03/09
B-30.40-00.....6/01/06	B-70.60-00.....6/01/06	B-95.40-00.....6/08/06
C-1.....2/10/09	C-4e.....2/20/03	C-14i.....2/10/09

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C-1c.....5/30/97	C-6.....5/30/97	C-15a.....7/3/08
C-1d.....10/31/03	C-6a.....10/14/09	C-15b.....7/3/08
C-2.....1/06/00	C-6c.....1/06/00	C-16a.....6/3/10
C-2a.....6/21/06	C-6d.....5/30/97	C-16b.....6/3/10
C-2b.....6/21/06	C-6f.....7/25/97	C-20.14-01.....10/14/09
C-2c.....6/21/06	C-7.....10/31/03	C-20.15-00.....10/14/09
C-2d.....6/21/06	C-7a.....10/31/03	C-20.18-00.....10/14/09
C-2e.....6/21/06	C-8.....2/10/09	C-20.19-00.....10/14/09
C-2f.....3/14/97	C-8a.....7/25/97	C-20.40-01.....10/14/09
C-2g.....7/27/01	C-8b.....2/10/09	C-20.42-01.....10/14/09
C-2h.....3/28/97	C-8e.....2/21/07	C-22.14-01.....6/3/10
C-2i.....3/28/97	C-8f.....6/30/04	C-22.16-01.....6/3/10
C-2j.....6/12/98	C-10.....6/3/10	C-22.40-02.....6/16/10
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C-3a.....10/04/05	C-14b.....7/26/02	C-25.80-01.....7/3/08
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		C-90.10-00.....7/3/08
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D-2.06-01.....1/06/09	D-2.48-00.....11/10/05	D-3c.....6/30/04
D-2.08-00.....11/10/05	D-2.60-00.....11/10/05	D-4.....12/11/98
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D-2.36-02.....1/06/09	D-2.88-00.....11/10/05	D-15.10-01.....12/02/08
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D-2.40-00.....11/10/05	D-3.....6/16/10	D-15.30-01.....12/02/08
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 G-24.40-01.....12/02/08
 G-24.50-00.....11/08/07

G-24.60-00.....11/08/07
 G-25.10-01.....1/06/09
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 G-50.10-00.....11/08/07
 G-60.10-00.....8/31/07
 G-60.20-00.....8/31/07
 G-60.30-00.....8/31/07
 G-70.10-00.....10/5/07

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 G-70.30-00.....10/5/07
 G-90.10-00.....1/06/09
 G-90.20-00.....1/06/09
 G-90.30-00.....1/06/09
 G-90.40-01.....10/14/09
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 I-40.20-00.....9/20/07
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 J-20.15-00.....10/14/09
 J-20.16-00.....10/14/09
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 J-20.26-00.....10/14/09
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 J-22.16-01.....6/3/10
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 J-26.15-00.....6/16/10
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 J-28.22-00.....8/07/07
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 J-28.26-01.....12/02/08
 J-28.30-01.....10/14/09

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K-24.40-01.....10/12/07	K-34.20-00.....2/15/07	K-80.20-00.....12/20/06
K-24.60-00.....2/15/07	K-36.20-00.....2/15/07	K-80.30-00.....2/21/07
K-24.80-01.....10/12/07	K-40.20-00.....2/15/07	K-80.35-00.....2/21/07
K-26.20-00.....2/15/07	K-40.40-00.....2/15/07	K-80.37-00.....2/21/07
L-10.10-00.....2/21/07	L-40.10-00.....2/21/07	L-70.10-01.....5/21/08
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M-2.40-01.....1/30/07	M-17.10-02.....7/3/08	M-40.50-00.....9/20/07
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M-3.10-02.....2/10/09	M-20.20-01.....1/30/07	M-60.10-00.....9/05/07
M-3.20-01.....1/30/07	M-20.30-02.....10/14/09	M-60.20-01.....2/03/09
M-3.30-02.....2/10/09	M-20.40-01.....1/30/07	M-65.10-01.....5/21/08
M-3.40-02.....2/10/09	M-20.50-01.....1/30/07	M-80.10-00.....6/10/08
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Plans

1. Plan sheets 6 through 10, 13, 21 through 24, 28, 29, 33, 34, 39, 41, 42, 45, 64, 66 through 69, 74 through 81, 85 through 88, 116, 117, 152 through 155, 162, 164, 165, 173, 175, 187, 189, 235, 236, 237, 243, 254, 257, 258, 281, 286, 345, 346, 428, 431, 433, 434, 435, 438, 464, and 465 are revised as noted on the attached sheets.
2. Plan sheets 271 and 273 through 280 are deleted and replaced with the attached sheets.

Proposal

1. On page 1, item no. 3, is deleted.
2. On page 2, item no. 13 is deleted.
3. On page 10, item nos. 116 through 119, and 127, the PLAN QUANTITY is revised.
4. On page 14, item nos. 183 and 184, the PLAN QUANTITY is revised.

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5. On page 15, item nos. 185 and 193, the PLAN QUANTITY is revised.
6. On page 16, item no. 206, is added.

Bidders shall furnish the Secretary of Transportation with evidence of the receipt of this addendum. This addendum will be incorporated in the contract when awarded and when formally executed.

KEVIN J. DAYTON
Olympic Region Administrator

Attachment:

Plan sheets 6-10, 13, 21-24, 28, 29, 33, 34, 39, 41, 42, 45, 64, 66-69, 74-81, 85-88, 116, 117, 152-155, 162, 164, 165, 173, 175, 187, 189, 235, 236, 237, 243, 254, 257, 258, 271, 273-281, 286, 345, 346, 428, 431, 433, 434, 435, 438, 464, and 465 of the plans (76 sheets).

Pages 1, 2, 10, 14-16 of the Proposal

Washington State
Department of Transportation
Olympic Region
Olympia, Washington 98504

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GRAND MOUND TO MAYTOWN
STAGE 2 – REPLACE INTERCHANGE
10C502
Thurston County**

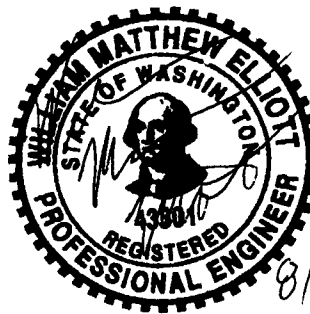
Notice to All Planholders

The Project Engineer's office assigned to answer questions regarding these bid documents and to show this project to prospective bidders is:

Marylou Nebergall, PE
821 Airport Ct. SE
Olympia, WA 98501-6805
(360) 570-6752

**Kevin J. Dayton, P.E.
Olympic Region Administrator**

As the Engineer in direct responsible charge of developing these contract provisions, I certify these provisions have been developed or incorporated into this project under my supervision or as a result of certified specifications provided by other licensed professionals.



8/10/10

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STAGE 2 – REPLACE INTERCHANGE
10C502**

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1 **INTRODUCTION**

2 The following Amendments and Special Provisions shall be used in conjunction with the
3 2010 Standard Specifications for Road, Bridge, and Municipal Construction.
4

5 **AMENDMENTS TO THE STANDARD SPECIFICATIONS**
6

7 The following Amendments to the Standard Specifications are made a part of this contract
8 and supersede any conflicting provisions of the Standard Specifications. For informational
9 purposes, the date following each Amendment title indicates the implementation date of the
10 Amendment or the latest date of revision.
11

12 Each Amendment contains all current revisions to the applicable section of the Standard
13 Specifications and may include references which do not apply to this particular project.
14

15 **SECTION 1-02, BID PROCEDURES AND CONDITIONS**
16 **January 4, 2010**

17 **1-02.7 Bid Deposit**

18 In the first paragraph, the third sentence is revised to read:
19

20 For projects scheduled for bid opening in Olympia, the proposal bond may be in hard
21 copy or electronic format via Surety2000.com or Insurevision.com and BidX.com.
22

23 **1-02.9 Delivery of Proposal**

24 In the first paragraph, the first sentence is revised to read:
25

26 For projects scheduled for bid opening in Olympia, each Proposal shall be sealed and
27 submitted in the envelope provided with it, or electronically via Expedite software and
28 BidX.com at the location and time identified in Section 1-02.12.
29

30 The following new paragraph is inserted after the first paragraph:
31

32 For projects scheduled for bid opening in the Region, each Proposal shall be sealed
33 and submitted in the envelope provided with it, at the location and time identified in
34 Section 1-02.12. The Bidder shall fill in all blanks on this envelope to ensure proper
35 handling and delivery.
36

37 **SECTION 1-06, CONTROL OF MATERIALS**
38 **April 5, 2010**

39 **1-06.1 Approval of Materials Prior to Use**

40 This section is supplemented with the following new sub-section:
41

42 **1-06.1(4) Fabrication Inspection Expense**

43 In the event the Contractor elects to have items fabricated beyond 300 miles from
44 Seattle, Washington the Contracting Agency will deduct from payment due the
45 Contractor costs to perform fabrication inspection on the following items:
46

- 47
 - Steel Bridges and Steel Bridge components
 - 48 • Cantilever Sign Structures and Sign Bridges
 - 49 • Cylindrical, Disc, Pin, and Spherical Bearings

- Modular Expansion Joints
- Additional items as may be determined by the Engineer.

The deductions for fabrication inspection costs will be as shown in the Payment Table below.

Zone	Place of Fabrication	Reduction in Payment
1	Within 300 airline miles from Seattle	None
2	Between 300 and 3,000 airline miles from Seattle	\$700.00 per *inspection day
3	Over 3,000 airline miles from Seattle	\$1,000 per *inspection day, but not less than \$2,500 per trip

*Note - An inspection day includes any calendar day or portion of a calendar day spent inspecting at or traveling to and from a place of fabrication.

Where fabrication of an item takes place in more than one zone, the reduction in payment will be computed on the basis of the entire item being fabricated in the furthest of zones where any fabrication takes place on that item.

The rates for Zone 2 and 3 shall be applied for the full duration time of all fabrication inspection activities to include but not limited to; plant approvals, prefabrication meetings, fabrication, coatings and final inspection.

1-06.2(2)A General

Table 2 "Pay Factors" on page 1-39 is revised to read:

Table 2
Pay Factors

PAY FACTOR	Minimum Required Percent of Work Within Specification Limits for a Given Factor (PU + PL) - 100														
Category	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10 to n=11	n=12 to n=14	n=15 to n=17	n=18 to n=22	n=23 to n=29	n=30 to n=42	n=43 to n=66	n=67 to ∞
1.05						100	100	100	100	100	100	100	100	100	100
1.04					100	99	97	95	96	96	96	97	97	97	97
1.03				100	98	96	94	92	93	93	94	95	95	96	96
1.02				99	97	94	91	89	90	91	92	93	93	94	94
1.01	100	100	100	98	95	92	89	87	88	89	90	91	92	92	93
1.00	69	75	78	80	82	83	84	85	86	87	88	89	90	91	92
0.99	66	72	76	78	80	81	82	83	84	85	86	87	89	90	91
0.98	64	70	74	76	78	79	80	81	82	84	85	86	87	88	90
0.97	63	68	72	74	76	77	78	79	81	82	83	84	86	87	88
0.96	61	67	70	72	74	75	76	78	79	81	82	83	84	86	87
0.95	59	65	68	71	72	74	75	76	78	79	80	82	83	84	86
0.94	58	63	67	69	71	72	73	75	76	78	79	80	82	83	85
0.93	57	62	65	67	69	71	72	73	75	76	78	79	80	82	84
0.92	55	60	63	66	68	69	70	72	73	75	76	78	79	81	82
0.91	54	59	62	64	66	68	69	70	72	74	75	76	78	79	81
0.90	53	57	61	63	65	66	67	69	71	72	74	75	77	78	80
0.89	51	56	59	62	63	65	66	68	69	71	72	74	75	77	79
0.88	50	55	58	60	62	64	65	66	68	70	71	73	74	76	78
0.87	49	53	57	59	61	62	63	65	67	68	70	71	73	75	77
0.86	48	52	55	58	59	61	62	64	66	67	69	70	72	74	76

(Continued)

1 Table 2 "Pay Factors" on page 1-40 is revised to read:

2

Table 2															
Pay Factors (continued)															
PAY FACTOR	Minimum Required Percent of Work Within Specification Limits for a Given Factor (P _U + P _L) - 100														
Category	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10 to n=11	n=12 to n=14	n=15 to n=17	n=18 to n=22	n=23 to n=29	n=30 to n=42	n=43 to n=66	n=67 to ∞
0.85	46	51	54	56	58	60	61	62	64	66	67	69	71	72	75
0.84	45	49	53	55	57	58	60	61	63	65	66	68	70	71	73
0.83	44	48	51	54	56	57	58	60	62	64	65	67	69	70	72
0.82	43	47	50	53	54	56	57	59	61	62	64	66	67	69	71
0.81	41	46	49	51	53	55	56	58	59	61	63	64	66	68	70
0.80	40	44	48	50	52	54	55	56	58	60	62	63	65	67	69
0.79	39	43	46	49	51	52	54	55	57	59	61	62	64	66	68
0.78	38	42	45	48	50	51	52	54	56	58	59	61	63	65	67
0.77	36	41	44	46	48	50	51	53	55	57	58	60	62	64	66
0.76	35	39	43	45	47	49	50	52	54	56	57	59	61	63	65
0.75	33	38	42	44	46	48	49	51	53	54	56	58	60	62	64
REJECT	Values Less Than Those Shown Above														
Reject Quality Levels Less Than Those Specified for a 0.75 Pay Factor															
Note: If the value of (P _U + P _L) - 100 does not correspond to a (P _U + P _L) - 100 value in this table, use the next smaller (P _U + P _L) - 100 value.															

3

4

5 SECTION 1-07, LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

6 August 2, 2010

7 1-07.2 Sales Tax

8 The third sentence in the first paragraph is revised to read:

9

10 The Contractor should contact Vendor Payments (a division of Accounting & Financial
11 Services) of the Department of Transportation in Olympia, Washington for answers to
12 questions in this area.

13

14 The first sentence in the third paragraph is revised to read:

15

16 The Contracting Agency will pay the retained percentage only if the Contractor has
17 obtained from the State Department of Revenue a certificate showing that all Contract-
18 related taxes have been paid (RCW 60.28.051).

19

20 1-07.9(1) General

21 The second sentence in the fourth paragraph is revised to read:

22

23 When the project involves highway Work, heavy Work and building Work, the Contract
24 Provisions may list a Federal wage and fringe benefit rate for the highway Work, a
25 separate Federal wage and fringe benefit rate for both the heavy Work and the building
26 Work.

27

28 1-07.13(4) Repair of Damage

29 The last sentence in the first paragraph is revised to read:

30

31 For damage qualifying for relief under Sections 1-07.13(1), 1-07.13(2), 1-07.13(3), or 8-
32 17.5, payment will be made in accordance with Section 1-09.4 using the estimated Bid
33 item "Reimbursement for Third Party Damage".

34

1 **1-07.15 Temporary Water Pollution/Erosion Control**

2 The fourth paragraph is deleted.

4 **1-07.15(1) Spill Prevention, Control and Countermeasures Plan**

5 The third sentence in the first paragraph is revised to read:

7 No on-site construction activities may commence until the Contracting Agency accepts a
8 SPCC Plan for the project.

10 In item number 10., the first paragraph below the pay item "SPCC Plan," lump sum is revised
11 to read:

13 When the written SPCC Plan is accepted by the Contracting Agency, the Contractor
14 shall receive 50-percent of the lump sum Contract price for the plan.

16 **1-07.16(2) Vegetation Protection and Restoration**

17 The second paragraph is revised to read:

19 Damage which may require replacement of vegetation includes torn bark stripping,
20 broken branches, exposed root systems, cut root systems, poisoned root systems,
21 compaction of surface soil and roots, puncture wounds, drastic reduction of surface
22 roots or leaf canopy, changes in grade greater than 6-inches, or any other changes to
23 the location that may jeopardize the survival or health of the vegetation to be preserved.

25 The third paragraph is revised to read:

27 When large roots of trees designated to be saved are exposed by the Contractor's
28 operation, they shall be wrapped with heavy, moist material such as burlap or canvas for
29 protection and to prevent excessive drying. The material shall be kept moist and
30 securely fastened until the roots are covered to finish grade. All material and fastening
31 material shall be removed from the roots before covering. All roots 1-inch or larger in
32 diameter, which are damaged, shall be pruned with a sharp saw or pruning shear.
33 Damaged, torn, or ripped bark shall be removed as ordered by the Engineer at no
34 additional cost to the Contracting Agency.

36 The fourth paragraph is revised to read:

38 Any pruning activity required to complete the Work as specified shall be performed by a
39 Certified Arborist as designated by the Engineer.

41 **SECTION 1-08, PROSECUTION AND PROGRESS**

42 **April 5, 2010**

43 **1-08.1 Subcontracting**

44 The second and third sentences in the eighth paragraph are revised to read:

46 This Certification shall be submitted to the Project Engineer on WSDOT form 421-023,
47 "Quarterly Report of Amounts Paid as MBE/WBE Participants", quarterly for the State
48 fiscal quarters: January 1 through March 31, April 1 through June 30, July 1 through
49 September 30, October 1 through December 31, and for any remaining portion of a
50 quarter through Physical Completion of the Contract. The report is due 20 calendar days

1 following the fiscal quarter end or 20-calendar days after Physical Completion of the
2 Contract.

3
4 The last sentence in the ninth paragraph is revised to read:

5
6 When required, this "Quarterly Report of Amounts Credited as DBE Participation" is in
7 lieu of WSDOT form 421-023, "Quarterly Report of Amounts Paid as MBE/WBE
8 Participants".

9
10 **1-08.5 Time for Completion**

11 The last two sentences in the first paragraph are revised to read:

12
13 When any of these holidays fall on a Sunday, the following Monday shall be counted a
14 nonworking day. When the holiday falls on a Saturday, the preceding Friday shall be
15 counted a nonworking day. The days between December 25 and January 1 will be
16 classified as nonworking days.

17
18 **SECTION 1-09, MEASUREMENT AND PAYMENT**
19 **August 2, 2010**

20 **1-09.9 Payments**

21 The first paragraph is revised to read:

22
23 The basis of payment will be the actual quantities of Work performed according to the
24 Contract and as specified for payment.

25
26 The Contractor shall submit a breakdown of the cost of lump sum items to enable the
27 Project Engineer to determine the Work performed on a monthly basis. Lump sum item
28 breakdowns shall be submitted prior to the first progress payment that includes payment
29 for the Bid Item in question. A breakdown is not required for lump sum items that
30 include a basis for incremental payments as part of the respective Specification. Absent
31 a lump sum breakdown the Project Engineer will make a determination based on
32 information available. The Project Engineer's determination of the cost of work shall be
33 final.

34
35 In the third paragraph, the second sentence is deleted.

36
37 **1-09.11(1)A Disputes Review Board Membership**

38 This section is supplemented with the following new paragraph:

39
40 The Contracting Agency and Contractor shall indemnify and hold harmless the Board
41 Members from and against all claims, damages, losses and expenses, including but not
42 limited to attorney's fees arising out of and resulting from the actions and
43 recommendations of the Board.

44
45 **SECTION 1-10, TEMPORARY TRAFFIC CONTROL**
46 **April 5, 2010**

47 In Division 1-10, all references to "truck mounted" are revised to read "transportable".

48
49 **1-10.2(3) Conformance to Established Standards**

50 In the fifth paragraph, the reference "(TMA's)" is deleted.

1
2 **1-10.3(2)C Lane Closure Setup/Takedown**

3 In the second paragraph, the reference to "TMA/arrow board" is revised to read
4 "transportable attenuator/arrow board".
5

6 **1-10.3(3)A Construction Signs**

7 In the fourth paragraph "height" is replaced with "top of the ballast".
8

9 **1-10.3(3)J Truck Mounted Attenuator**

10 The title for this section is revised to read:
11

12 **1-10.3(3)J Transportable Attenuator**
13

14 In the second and fourth paragraphs, the references to "TMA" are revised to read
15 "Transportable Attenuator".
16

17 In the first paragraph, the first sentence is revised to read:
18

19 Where shown on an approved traffic control plan or where ordered by the Engineer, the
20 Contractor shall provide, operate, and maintain transportable impact attenuators as
21 required in Section 9-35.12.
22

23 In the third paragraph, the reference to "truck's" is revised to read "host vehicle's".
24

25 **1-10.4(2) Item Bids with Lump Sum for Incidentals**

26 All references to "Truck Mounted Impact Attenuator(s)" are revised to read "Transportable
27 Attenuator(s)".
28

29 In the eighth paragraph, the first sentence is revised to read:
30

31 "Transportable Attenuator" will be measured per each one time only for each host
32 vehicle with mounted or attached impact attenuator used on the project.
33

34 In the last sentence of the ninth paragraph, the reference to "TMA" is replaced with
35 "transportable attenuator".
36

37 **1-10.5(2) Item Bids with Lump Sum for Incidentals**

38 All references to "truck mounted impact attenuator(s)" are revised to read "transportable
39 attenuator(s)".
40

41 **SECTION 2-01, CLEARING, GRUBBING, AND ROADSIDE CLEANUP**

42 **April 5, 2010**

43 **2-01.3(2) Grubbing**

44 In the first paragraph Item 2. e. is revised to read:
45

- 46 e. Upon which embankments will be placed except stumps may be close-cut or
47 trimmed as allowed in Section 2-01.3(1) item 3.
48

SECTION 2-02, REMOVAL OF STRUCTURES AND OBSTRUCTIONS

January 4, 2010

2-02.3 Construction Requirements

The fourth paragraph is revised to read:

The Contractor may dispose of waste material in Contracting Agency owned sites if the Special Provisions or the Engineer permits it. Otherwise, the Contractor shall arrange to dispose of waste at no expense to the Contracting Agency and the disposal shall meet the requirements of Section 2-03.3(7)C.

SECTION 5-01, CEMENT CONCRETE PAVEMENT REHABILITATION

August 2, 2010

5-01.2 Materials

The referenced section for the following item is revised to read:

Dowel Bars 9-07.5(1)

5-01.3(4) Replace Portland Cement Concrete Panel

The thirteenth paragraph is revised to read:

The tie bar and dowel bar holes shall be blown clean with compressed air before grouting. The bar shall be centered in the hole and all voids around the bar completely filled with grout. Dams, if needed, shall be placed at the front of the holes to confine the grout and center the bars in the holes. The dams shall permit the escape of air without leaking grout and shall not be removed until grout has cured in the hole.

5-01.3(6) Dowel Bar Retrofit

The last paragraph is deleted.

5-01.3(9) Portland Cement Concrete Pavement Grinding

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

Grind one pass along the edge adjacent to Portland Cement Concrete Pavement (PCCP) placed in accordance with Section 5-05, before the PCCP is placed.

The second sentence in the second paragraph is deleted.

SECTION 5-04, HOT MIX ASPHALT

April 5, 2010

5-04.3(8)A1 General

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

Statistical evaluation will be used for a class of HMA with the same PG grade of asphalt binder, when the Proposal quantities exceed 4,000-tons.

The third paragraph is revised to read:

Nonstatistical evaluation will be used for the acceptance of HMA when the Proposal quantities for a class of HMA, with the same PG grade of asphalt binder, are 4,000-tons or less.

5-04.3(8)A4 Definition of Sampling Lot and Sublot

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

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance with a maximum of 15 sublots per lot; the final lot for a mix design may be increased to 25 sublots

5-04.3(10)B1 General

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

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance with a maximum of 15 sublots per lot; the final lot for a mix design may be increased to 25 sublots.

SECTION 5-05, CEMENT CONCRETE PAVEMENT

August 2, 2010

5-05.3(1) Concrete Mix Design For Paving

In number 3.c., the last paragraph is deleted.

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

All references to "AASHTO T 22" are revised to read "WSDOT FOP for AASHTO T 22".

In the fifth paragraph "WAQTC FOP for TM 2" is revised to read "WAQTC TM 2".

The eighth paragraph is revised to read:

Acceptance testing for compliance of air content and 28-day compressive strength shall be conducted from samples prepared according to WSDOT FOP for WAQTC TM 2. Air content shall be determined by conducting WSDOT FOP for WAQTC /AASHTO T 152. Compressive Strength shall be determined by WSDOT FOP for AASHTO T 23 and WSDOT FOP for AASHTO T 22.

5-05.3(11) Finishing

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

On projects requiring less than 500-square yards of cement concrete pavement or irregular areas the surface finish may be either longitudinal tining or be given a final finish surface by texturing with a comb perpendicular to the centerline of the pavement.

The third sentence in the third paragraph is deleted.

The last sentence in the third paragraph is revised to read:

Regardless of the surface finish, if the pavement has a raised curb without a formed concrete gutter, the texturing shall end 2-feet from the curb line.

This section is supplemented with the following two new paragraphs:

The standard method of surface finish shall be longitudinal tining. In advance of curing operations, where longitudinal tining is required, the pavement shall be given an initial and a final texturing. Initial texturing shall be performed with a burlap drag or broom device that will produce striations parallel with centerline. Final texturing shall be performed with a spring steel tine device that will produce grooves parallel with the centerline. The spring steel tine device shall be operated within 5-inches, but not closer than 3-inches, of pavement edges.

Burlap drags, brooms and tine devices shall be installed on self-propelled equipment having external alignment control. The installation shall be such that when texturing, the area of burlap in contact with the pavement surface shall be maintained constant at all times. Broom and tine devices shall be provided with positive elevation control. Downward pressure on pavement surface shall be maintained at all times during texturing so as to achieve uniform texturing without measurable variations in pavement profile. Self-propelled texturing machines shall be operated so that travel speed when texturing is maintained constant. Failure of equipment to conform to all provisions in this paragraph shall constitute cause for stopping placement of concrete until the equipment deficiency or malfunction is corrected. Spring steel tines of the final texturing device shall be rectangular in cross section, $\frac{3}{32}$ to $\frac{1}{8}$ inch wide, on $\frac{3}{4}$ inch centers, and of sufficient length, thickness and resilience to form grooves approximately $\frac{3}{16}$ inch deep in the fresh concrete surface. Final texture shall be uniform in appearance with substantially all of the grooves having a depth between $\frac{1}{16}$ inch and $\frac{5}{16}$ inch.

5-05.3(12) Surface Smoothness

The first paragraph is revised to read:

The pavement smoothness will be checked with equipment furnished and operated by the Contractor, under supervision of the Engineer, within 48-hours following placement of concrete. Smoothness of all pavement placed except Shoulders, ramp tapers, intersections, tight horizontal curves, and small or irregular areas as defined by Section 5-05.3(3) unless specified otherwise, will be measured with a recording profilograph, as specified in Section 5-05.3(3), parallel to centerline, from which the profile index will be determined in accordance with WSDOT Test Method 807. Tight horizontal curves are curves having a centerline radius of curve less than 1,000 feet and pavement within the superelevation transition of those curves.

5-05.3(13)A Curing Compound

The tenth paragraph is deleted.

5-05.3(16) Protection of Pavement

All references to "AASHTO T 22" are revised to read "WSDOT FOP for AASHTO T 22".

5-05.3(17) Opening to Traffic

All references to "AASHTO T 22" are revised to read "WSDOT FOP for AASHTO T 22".

SECTION 6-02, CONCRETE STRUCTURES

August 2, 2010

In Division 6-02, all references to "roadway slab", "roadway deck" and "deck slab" are deleted and replaced with "bridge deck".

1
2 **6-02.3(1) Classification of Structural Concrete**

3 The first paragraph is deleted and replaced with the following two new paragraphs:
4

5 The class of concrete to be used shall be as noted in the Plans and these
6 Specifications. The Class includes the specified minimum compressive strength in psi at
7 28 days (numerical class) and may include a letter suffix to denote structural concrete
8 for a specific use. Letter suffixes include A for bridge approach slabs, D for bridge
9 decks, P for piling and shafts, and W for underwater. The numerical class without a
10 letter suffix denotes structural concrete for general purposes.
11

12 Concrete of a numerical class greater than 4000 shall conform to the requirements
13 specified for either Class 4000 (if general purpose) or for the appropriate Class 4000
14 with a letter suffix, as follows:
15

- 16 1. Mix ingredients and proportioning specified in Section 6-02.3(2) and Section 6-
17 02.3(2)A.
- 18 2. Consistency requirements specified in Section 6-02.3(4)C.
- 19 3. Curing requirements specified in 6-02.3(11).
20
21
22

23 **6-02.3(2) Proportioning Materials**

24 The table following the third paragraph is supplemented with the following:
25

Lean Concrete	35	40

26
27 **6-02.3(2)D Lean Concrete**

28 This section is revised to read:
29

30 Lean concrete shall have a minimum cementitious material content of between
31 145 and 200-pounds per cubic yard and have a maximum water/cement ratio of
32 2.
33

34 **6-02.3(6) Placing Concrete**

35 The third paragraph is revised to read:
36

37 All foundations, forms, and contacting concrete surfaces shall be moistened with water
38 just before the concrete is placed. Any standing water on the foundation, on the
39 concrete surface, or in the form shall be removed.
40

41 The following new sentence is added after the fourth sentence in the fourth paragraph:
42

43 The submittal to the Engineer shall include justification that the concrete mix design will
44 remain fluid for interruptions longer than 30-minutes between placements.
45

46 **6-02.3(6)D Protection Against Vibration**

47 The first paragraph is revised to read:
48

Freshly placed concrete shall not be subjected to excessive vibration and shock waves during the curing period until it has reached a 2000-psi minimum compressive strength for structural concrete and lower strength classes of concrete.

6-02.3(10)D Concrete Placement, Finishing, and Texturing

The following paragraph is inserted at the beginning of this section:

Before placing bridge approach slab concrete, the subgrade shall be constructed in accordance with Sections 2-06 and 5-05.3(6).

6-02.3(11) Curing Concrete

In the fifth paragraph "Type 1D" is revised to read "Type 1D, Class B".

6-02.3(17)F Bracing

Under the heading "Temporary Bracing for Bridge Girders", the table is revised to read:

Girder Series	Distance in Inches
W42G	30
W50G	42
W58G	63
W74G	66
Prestressed concrete tub girders with webs with flanges	30
WF36G, WF42G, WF50G, WF58G, WF66G, WF74G, WF83G, WF95G, and WF100G	70
W32BTG, W38BTG, and W62BTG	70
WF74PTG, WF83PTG, WF95PTG, and WF100PTG	70

6-02.3(17)N Removal of Falsework and Forms

The first paragraph including table is revised to read:

If the Engineer does not specify otherwise, the Contractor may remove forms based on an applicable row of criteria in the table below. Both compressive strength and minimum time criteria must be met if both are listed in the applicable row. The minimum time shall be from the time of the last concrete placement the forms support. In no case shall the Contractor remove forms or falsework without the Engineer's approval.

Concrete Placed In	Percent of Specified Minimum Compressive Strength ¹	Minimum Compressive Strength ¹	Minimum Time
Columns, walls, non-sloping box girder webs, abutments, footings, pile caps,, traffic and pedestrian barriers, and any other side form not supporting the concrete weight.	—	—	3 days
Columns, walls, non-sloping box girder webs, abutments, traffic and pedestrian barriers, and any other side form not supporting the concrete weight or other loads.	—	1400 psi	18 hours
Side forms of footings, pile caps, and shaft caps. ²	—	—	18 hours
Crossbeams, shaft caps, struts, inclined columns and inclined walls.	80	—	5 days
Bridge decks supported on wood or steel stringers or on steel or prestressed concrete girders. ³	80	—	10 days
Box girders, T-beam girders, and flat-slab Superstructure. ³	80	—	14 days
Arches. ³	80	—	21 days
1 Strength shall be proved by test cylinders made from the last concrete placed into the form. The cylinders shall be cured according to WSDOT FOP for AASHTO T 23. 2 Curing compound shall be immediately applied to the sides when forms are removed. 3 Where continuous spans are involved, the time for all spans will be determined by the last concrete placed affecting any span.			

The third and fourth paragraphs are deleted.

The fifth paragraph is revised to read:

Curing shall comply as required in Section 6-02.3(11). The concrete surface shall not become dry during form removal if removed during the cure period.

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

In the fourth paragraph "9-20.3(4)" is revised to read "Section 9-20.3(4)".

6-02.3(24) Reinforcement

This first paragraph is revised to read:

Although a bar list is normally included in the Plans, the Contracting Agency does not guarantee its accuracy and it shall be used at the Contractor's risk. Reinforcement fabrication details shall be determined from the information provided in the Plans.

The third paragraph is deleted.

6-02.3(24)C Placing and Fastening

The eighth paragraph is revised to read:

Mortar blocks may be accepted based on a Manufacturer's Certificate of Compliance.

The 14th paragraph is revised to read:

Clearances for main bars shall be at least:

4-inches between:	Bars and the surface of any concrete masonry exposed to the action of salt or alkaline water.
3-inches between:	Bars and the surface of any concrete deposited against earth without intervening forms.
2-½-inches between:	Adjacent bars in a layer. Bridge deck bars and the top of the bridge deck.
2-inches between:	Adjacent layers. Bars and the surface of concrete exposed to earth. Reinforcing bars and the faces of forms for exposed aggregate finish.
1-½-inches between:	Bars and the surface of concrete when not specified otherwise in this Section or in the Plans. Barrier and curb bars and the surface of concrete.
1-inch between:	Slab bars and the bottom of the slab. Slab bars and the top surface of the bottom slab of a cast-in-place concrete box girder.

The following new paragraph is inserted after the 14th paragraph:

Cover to ties and stirrups may be ½-inch less than the values specified for main bars but shall not be less than 1-inch.

6-02.3(24)F Mechanical Splices

Items 1, 2, and 3 in the fourth paragraph are revised to read:

1. Mechanical splices shall develop at least 125 percent of the specified yield strength of the unspliced bar. The ultimate tensile strength of the mechanical splice shall exceed that of the unspliced bar.

- 1 2. The total slip of the bar within the spliced sleeve of the connector after loading in
2 tension to 30.0 ksi and relaxing to 3.0 ksi shall not exceed the following measured
3 displacements between gage points clear of the splice sleeve:
4
5 a. 0.01 inches for bar sizes up to No. 14.
6
7 b. 0.03 inches for No. 18 bars.
8
9 3. The maximum allowable bar size for mechanical laps splices shall be No. 6.

10
11 **6-02.3(25) Prestressed Concrete Girders**

12 Under the heading "**Prestressed Concrete Wide Flange I Girder**" the last sentence is
13 revised to read:
14

15 WSDOT standard girders in this category include Series WF36G, WF42G, WF50G,
16 WF58G, WF66G, WF74G, WF83G, WF95G and WF100G.
17

18 Under the heading "**Spliced Prestressed Concrete Girder**" the last sentence is revised to
19 read:
20

21 WSDOT standard girders in this category include Series WF74PTG, WF83PTG,
22 WF95PTG and WF100PTG.
23

24 **6-02.3(25)L Handling and Storage**

25 In the third sentence of the second paragraph, the reference to "1-foot-9-inches" is revised to
26 read "3-foot-0-inches".
27

28 **6-02.3(25)N Prestressed Concrete Girder Erection**

29 The seventh paragraph is supplemented with the following:
30

31 The aspect ratio (height/width) of oak block wedges at the girder centerline shall not
32 exceed 1.0.
33

34 **6-02.3(26)E Ducts**

35 Beneath the heading "**Ducts for Internal Embedded Installation**" the second sentence in
36 the second paragraph is revised to read:
37

38 Polypropylene ducts shall conform to ASTM D 4101 with a cell classification range of
39 PP0340B14541 to PP0340B67884.
40

41 This section is supplemented with the following:
42

43 All duct splices, joints, couplings and connections to anchorages shall be made with
44 devices or methods (mechanical couplers, plastic sleeves, shrink sleeve) that are
45 approved by the duct manufacturer and produce a smooth interior alignment with no lips
46 or kinks. All connections and fittings shall be air and mortar tight. Taping is not
47 acceptable for connections and fittings.
48

49 **6-02.3(27) Concrete for Precast Units**

50 In the third paragraph "Section 9-12" is revised to read "Section 9-05.50".
51

1 **6-02.3(28)F Tolerances**

2 The reference to "PCI-MNL-166" is revised to read "PCI-MNL-116".

4 **SECTION 6-03, STEEL STRUCTURES**

5 **August 2, 2010**

6 **6-03.3(25) Repair Welding**

7 In the first paragraph "2002" is revised to read "2008".

9 **6-03.3(25)A Welding Inspection**

10 In the first paragraph "2002" is revised to read "2008".

12 In the paragraph below the heading "**Radiographic Inspection**" "2002 Structural" is revised
13 to read "2008 Bridge".

15 **6-03.3(29) Vacant**

16 This section including title is revised to read:

18 **Welded Shear Connectors**

19 All welded shear connectors on steel girder top flanges shall be installed in the field
20 after the forms for the concrete bridge deck are in place. The steel surface to be welded
21 shall be prepared to SSPC-SP 11, power tool cleaning, just prior to welding.
22 Installation, production control, and inspection of welded shear connectors shall
23 conform to Chapter 7 of the AASHTO/AWS D1.5M/D1.5:2008 Bridge Welding Code.
24 After the welded shear connectors are installed, the weld and the disturbed steel
25 surface shall be cleaned and painted in accordance with Section 6-07.3(9)l.

27 **6-03.3(33) Bolted Connections**

28 This section is revised to read:

30 Fastener components shall consist of bolts, nuts, washers, tension control bolt
31 assemblies, and direct tension indicators. Fastener components shall meet the
32 requirements of Section 9-06.5(3).

34 The Contractor shall submit documentation of the bolt tension calibrator for approval by
35 the Engineer and shall include brand, capacity, model, date of last calibration, and
36 manufacturer's instructions for use. The Contractor shall be responsible to supply the
37 approved bolt tension calibrator and all accompanying hardware and calibrated torque
38 wrenches to conduct all testing and inspection described herein. Use of the bolt tension
39 calibrator shall comply with manufacturer's recommendations.

41 Fastener components shall be protected from dirt and moisture in closed containers at
42 the site of installation. Only as many fastener components as are anticipated to be
43 installed during the Work shift shall be taken from protected storage. Fastener
44 components that are not incorporated into the Work shall be returned to protected
45 storage at the end of the Work shift. Fastener components shall not be cleaned or
46 modified from the as-delivered condition. Fastener components that accumulate rust or
47 dirt shall not be incorporated into the Work. Tension control bolt assemblies shall not be
48 relubricated, except by the manufacturer.

All bolted connections are slip critical. Painted structures require either Type 1 or Type 3 bolts. Unpainted structures require Type 3 bolts. AASHTO M 253 bolts shall not be galvanized or be used in contact with galvanized metal. Washers are required under turned elements for bolted connections and as required in the following:

1. Washers shall be used under both the head and the nut when AASHTO M 253 bolts are to be installed in structural carbon steel, as specified in Section 9-06.1.
2. Where the outer face of the bolted parts has a slope greater than 1:20 with respect to a plane normal to the bolt axis, a beveled washer shall be used.
3. Washers shall not be stacked unless otherwise approved by the Engineer.
4. It is acceptable to place a washer under the unturned element.

All galvanized nuts shall be lubricated by the manufacturer with a lubricant containing a visible dye so a visual check for the lubricant can be made at the time of field installation. Black bolts shall be lubricated by the manufacturer and shall be "oily" to the touch when installed.

After assembly, bolted parts shall fit solidly together. They shall not be separated by washers, gaskets, or any other material. Assembled joint surfaces, including those next to bolt heads, nuts, and washers, shall be free of loose mill scale, burrs, dirt, and other foreign material that would prevent solid seating.

When all bolts in a joint are tight, each bolt shall carry at least the proof load shown in Table 3 below:

Table 3 Minimum Bolt Tension		
Bolt Size (inches)	AASHTO M 164 and ASTM F 1852 (pounds)	AASHTO M 253 (pounds)
$1/2$	12,050	14,900
$5/8$	19,200	23,700
$3/4$	28,400	35,100
$7/8$	39,250	48,500
1	51,500	63,600
$1 1/8$	56,450	80,100
$1 1/4$	71,700	101,800
$1 3/8$	85,450	121,300
$1 1/2$	104,000	147,500

Prior to final tightening of any bolts in a bolted connection, the connection shall be compacted to a snug-tight condition. Snug tight shall include bringing all plies of the connection into firm contact and snug-tightening all bolts in accordance with Section 6-03.3(32).

Final tightening may be done by either the turn-of-nut method, the direct-tension indicator method, or twist off type tension control structural bolt/nut/washer assembly method. Preferably, the nut shall be turned tight while the bolt is prevented from rotating. However, if required by either turn-of-nut or direct-tension-indicator methods, because of bolt entering and/or wrench operational clearances, tightening may be done by turning the bolt while the nut is prevented from rotating.

1. **Turn-of-Nut Method.** After all specified bolting conditions satisfied, and before final tightening, the Contractor shall match-mark with crayon or paint the outer face of each nut and the protruding part of the bolt. Each bolt shall be final tightened to the specified minimum tension by rotating the amount specified in Table 4. To ensure that this tightening method is followed, the Engineer will (1) observe as the Contractor installs, snug-tightens, and final tightens all bolts and (2) inspect each match-mark.

Table 4 Turn-of-Nut Tightening Method Nut Rotational from Snug-Tight Condition			
Bolt Length	Disposition of Outer Faces of Bolted Parts		
	Condition 1	Condition 2	Condition 3
$L \leq 4D$	$\frac{1}{3}$ turn	$\frac{1}{2}$ turn	$\frac{2}{3}$ turn
$4D < L \leq 8D$	$\frac{1}{2}$ turn	$\frac{2}{3}$ turn	$\frac{5}{6}$ turn
$8D < L \leq 12D$	$\frac{2}{3}$ turn	$\frac{5}{6}$ turn	1 turn

Bolt length measured from underside of head to top of nut.

Condition 1 — both faces at right angles to bolt axis.

Condition 2 — one face at right angle to bolt axis, one face sloped no more than 1:20, without bevel washer.

Condition 3 — both faces sloped no more than 1:20 from right angle to bolt axis, without bevel washer.

Nut rotation is relative to the bolt regardless of which element (nut or bolt) is being turned. Tolerances permitted plus or minus 30 degrees ($\frac{1}{12}$ turn) for final turns of $\frac{1}{2}$ turn or less; plus or minus 45 degrees ($\frac{1}{8}$ turn) for final turns of $\frac{2}{3}$ turn or more.

D = nominal bolt diameter of bolt being tightened.

When bolt length exceeds 12D, the rotation shall be determined by actual tests in which a suitable tension device simulates actual conditions.

2. **Direct-Tension-Indicator Method.** Direct-Tension-Indicators (DTIs) shall not be used under the turned element. DTIs shall be placed under the bolt head with the protrusions facing the bolt head when the nut is turned. DTIs shall be placed under the nut with the protrusions facing the nut when the bolt is turned.

Table 5 Direct Tension Indicator Requirements						
Bolt Size, inches	DTI Spaces		Maximum Snug- tight Refusals		Minimum Final Tighten Refusals	
	M 164	M 253	M 164	M 253	M 164	M 253
1/2	4	5	1	2	2	3
5/8	4	5	1	2	2	3
3/4	5	6	2	2	3	3
7/8	5	6	2	2	3	3
1	6	7	2	3	3	4
1-1/8	6	7	2	3	3	4
1-1/4	7	8	3	3	4	4
1-3/8	7	8	3	3	4	4
1-1/2	8	9	3	4	4	5

Gap refusal shall be measured with a 0.005 inch tapered feeler gage. After all specified bolting conditions are satisfied, the snug-tightened gaps shall meet Table 5 snug-tight limits.

Each bolt shall be final-tightened to meet Table 5 final tighten limits. If the bolt is tensioned so that no visible gap in any space remains, the bolt and DTI shall be removed and replaced by a new properly tensioned bolt and DTI.

The Contractor shall tension all bolts, inspecting all DTIs with a feeler gage, in the presence of the Engineer. DTIs shall be installed by 2 or more person crews with 1 individual preventing the element at the DTI from turning, and measuring the gap of the DTI to determine the proper tension of the bolt.

If a bolt, that has had its DTI brought to full load, loosens during the course of bolting the connection, it shall be rejected. Reuse of the bolt and nut are subject to the provisions of this section. The used DTI shall not be reinstalled.

3. **Twist Off Type Tension Control Structural Bolt/Nut/Washer Assembly Method (Tension Control Bolt Assembly).** Tension control bolt assemblies shall include the bolt, nut, and washer(s) packaged and shipped as a single assembly. Tension control bolt assembly components shall not be interchanged for testing or installation and shall comply with all provisions of ASTM F 1852.

The tension control bolts shall incorporate a design feature intended to either indirectly indicate, or to automatically provide, the minimum tension specified in Table 3 of Section 6-03.3(33).

The Contractor shall submit the tension control bolt assembly to the Engineer for approval with bolt capacities, type of bolt, nut, and washer lubricant, method of

1 packaging and protection of the lubricated bolt, installation equipment, calibration
2 equipment, and installation procedures.

3
4 The tension control bolt manufacturer's installation procedure shall be followed for
5 installation of bolts in the verification testing device, in all calibration devices, and in
6 all structure connections.

7
8 In some cases, proper tensioning of the bolts may require more than one cycle of
9 systematic partial tightening prior to final yield or fracture of the tension control
10 element of each bolt. If yield or fracture of the tension control element of a bolt
11 occurs prior to the final tightening cycle, that bolt shall be replaced with a new one.

12
13 Additional field verification testing shall be performed as requested by the Engineer.

14
15 All bolts and connecting hardware shall be stored and handled in a manner to
16 prevent corrosion and loss of lubricant. Bolts which are installed without the same
17 lubricant coating as tested under the verification test will be rejected and shall be
18 removed from the joint and be replaced with new lubricated bolts at no additional
19 cost to the Contracting Agency.

20
21 AASHTO M 253 bolts, galvanized AASHTO M 164 bolts, and ASTM F 1852 tension
22 control bolt assemblies shall not be reused. Black AASHTO M 164 bolts may be reused
23 once if approved by the Engineer. All bolts to be reused shall have their threads
24 inspected for distortion by reinstalling the used nut on the bolt and turning the nut for the
25 full length of the bolt threads by hand. Bolts to be reused shall be relubricated in
26 accordance with the manufacturer's recommendations and as approved by the
27 Engineer. Used bolts shall be subject to a rotational capacity test as specified in Section
28 6-03.3(33)A Pre-Erection Testing. Touching up or retightening bolts previously tightened
29 by the turn-of-nut method, which may have been loosened by the tightening of adjacent
30 bolts shall not be considered as reuse, provided the snugging up continues from the
31 initial position and does not require greater rotation, including the tolerance, than that
32 required by Table 4.

33 34 **6-03.3(33)A Pre-Erection Testing**

35 This section is revised to read:

36
37 High strength bolt assemblies (bolt, nut, direct tension indicator, and washer), black and
38 galvanized, shall be subjected to a field rotational capacity test, as outlined below, prior
39 to any permanent fastener installation. For field installations, the rotational capacity test
40 shall be conducted at the jobsite. Each combination of bolt production lot, nut
41 production lot, washer production lot, and direct tension indicator production lot shall be
42 tested as an assembly, except tension control bolt assemblies which shall be tested as
43 supplied by the manufacturer. Each rotational capacity test shall include three
44 assemblies. Once an assembly passes the rotational capacity test, it is approved for
45 use for the remainder of the project, unless the Engineer deems further testing is
46 necessary. All tests shall be performed in a bolt tension calibrator by the Contractor in
47 the presence of the Engineer. High-strength bolt assemblies used in this test shall not
48 be reused. The bolt assemblies shall meet the following requirements after being
49 pretensioned to 15 percent of the minimum bolt tension in Table 3. The assembly shall
50 be considered as nonconforming if the assembly fails to pass any one of the following
51 specified requirements.

1. The measured torque to produce the minimum bolt tension shall not exceed the maximum allowed torque value obtained by the following equation.
Torque = 0.25 PD
Where: Torque = Calculated Torque (foot-pounds)
P = Measured Bolt Tension (pounds)
D = Normal Bolt Diameter (feet)
2. After placing the assembly through two cycles of the required number of turns, where turns are measured from the 15 percent pretension condition, as indicated in Table 4 of Section 6-03.3(33),
 - a. The maximum recorded tension after the two turns shall be equal to or greater than 1.15 times the minimum bolt tension listed in Table 3 of Section 6.03.3(33).
 - b. Each assembly shall be successfully installed to the specified number of turns.
 - c. The fastener components in the assembly shall not exhibit shear failure or stripping of the threads as determined by visual examination of bolt and nut threads following removal.
 - d. The bolts in the assembly shall not exhibit torsional or torsional/tension failure.
3. If any specimen fails, the assembly will be rejected. Elongation of the bolt between the bolt head and the nut is not considered to be a failure.

Bolts that are too short to test in the bolt tension calibrator shall be tested in a steel joint. The Contractor shall (1) install the high-strength bolt assemblies (bolt, nut, direct tension indicator and washer) in a steel joint of the proper thickness, (2) tighten to the snug tight condition, (3) match-mark the outer face of each nut and the protruding part of the bolt with crayon or paint, (4) rotate to the requirements of Table 4, and (5) record the torque that is required to achieve the required amount of rotation. The assembly shall be considered as non-conforming if the assembly fails to pass any one of the following specified requirements.

1. The recorded torque to produce the minimum rotation shall not exceed the maximum allowed torque value obtained by the following equation.
Torque = 0.25 PD
Where: Torque = Calculated Maximum Allowed Torque (foot-pounds)
P = Specified Bolt Tension per Table 3, multiplied by a factor of 1.15 (pounds)
D = Normal Bolt Diameter (feet)
2. After placing the assembly through two cycles of the required number of turns, where turns are measured from the snug tight condition specified in Section 6-03.3(32),
 - a. Each assembly shall be successfully installed to the specified number of turns.

- 1 b. The fastener components in the assembly shall not exhibit shear
2 failure or stripping of the threads as determined by visual examination
3 of bolt and nut threads following removal.
4
5 c. The bolts in the assembly shall not exhibit torsional or
6 torsional/tension failure.
7
8 3. If any specimen fails, the assembly will be rejected. Elongation of the bolt
9 between the bolt head and the nut is not considered to be a failure.
10
11 The Contractor shall submit the manufacturer's detailed procedure for pre-erection
12 (rotational capacity) testing of tension control bolt assemblies to the Engineer for
13 approval and shall have an approved procedure prior to testing.
14
15 Three DTIs, per lot, shall be tested in a bolt tension calibrator. The bolts shall be
16 tensioned to 105-percent of the tension shown in Table 3 of Section 6-03.3(33). If all of
17 the DTI protrusions are completely crushed (all 5 openings with zero gap), this lot of
18 DTIs is rejected.
19
20 **6-03.3(33)B Bolting Inspection**
21 The first paragraph is revised to read:
22
23 The Contractor, in the presence of the Engineer, shall inspect the tightened bolt using a
24 calibrated inspection torque wrench, regardless of bolting method. The Contractor shall
25 supply the inspection torque wrench.
26
27 The first sentence in the second paragraph is revised to read:
28
29 If the bolts to be installed are not long enough to fit in the bolt tension calibrator, five
30 bolts of the same grade, size, and condition as those under inspection shall be tested
31 using Direct-Tension-Indicators (DTIs) to measure bolt tension.
32
33 The first sentence in the third paragraph is revised to read:
34
35 Five representative bolts/nuts/washers and DTIs, if used (provided by the Contractor) of
36 the same grade, size, and condition as those under inspection shall be placed
37 individually in a bolt tension calibrator to measure bolt tension.
38
39 The fourth and fifth sentences in the third paragraph are revised to read:
40
41 In the bolt tension calibrator, each bolt shall be tightened by any convenient means to
42 the specified tension. The inspection torque wrench shall then be applied to the
43 tightened bolt to determine the torque required to turn the nut or head 5 degrees
44 (approximately 1-inch at a 12-inch radius) in the tightening direction.
45
46 The fourth paragraph is revised to read:
47
48 Ten percent (at least two), or as specified by the Engineer, of the tightened bolts on the
49 Structure represented by the test bolts shall be selected at random in each connection.
50 The job-inspection torque shall then be applied to each with the inspecting wrench
51 turned in the tightening direction, with no restraint applied to the opposite end of the
52 bolt. If this torque turns no bolt head or nut, the Contracting Agency will accept the

1 connection as being properly tightened. If the torque turns one or more bolt heads or
2 nuts, the job-inspection torque shall then be applied to all bolts in the connection.
3 Except for tension control bolt assemblies and DTIs with zero gap at all protrusion
4 spaces, any bolt whose head or nut turns at this stage shall be tightened and
5 reinspected. Any tension control bolt assemblies or DTIs that have zero gap at all
6 protrusion spaces shall be replaced if the head or nut turns at this stage.
7

8 This section is supplemented with the following new paragraph:
9

10 The Contractor shall submit the manufacturer's detailed procedure for routine
11 observation to ensure proper use of the tension control bolt assemblies to the Engineer
12 for approval and shall have an approved procedure prior to any assembling of bolted
13 connections.
14

15 **6-03.3(39) Swinging the Span**

16 In the first paragraph "roadway slabs" is revised to read "bridge deck".
17

18 **SECTION 6-07, PAINTING**

19 **August 2, 2010**

20 **6-07.3(2)C Paint System Manufacturer and Paint System Information Submittal** 21 **Component**

22 Item 1 in the first paragraph is supplemented with the following:
23

- 24 h. Minimum wet film thickness for each coat to achieve the specified minimum dry film
25 thickness.
26

27 **6-07.3(9)G Application of Shop Primer Coat**

28 In the second paragraph, the second, third, and fourth sentences are deleted.
29

30 **6-07.3(9)I Application of Field Coatings**

31 The following new paragraph is inserted preceding the first paragraph:
32

33 Prior to applying field coatings, the Contractor shall field install welded shear connectors
34 on the steel girder top flanges in accordance with Section 6-03.3(29) and as shown in
35 the Plans. After installation of the welded shear connectors, the weld and the disturbed
36 surface of the steel girder top flange shall be cleaned in accordance with SSPC-SP 11
37 and primed.
38

39 **6-07.3(10)H Paint System**

40 In the first sentence of the first paragraph "new steel" is revised to read "existing steel".
41

42 **6-07.3(10)K Coating Thickness**

43 This section is revised to read:
44

45 The minimum dry film thickness of each coat (primer, intermediate, top, and all stripe
46 coats) shall not be less than 3.0 mils. The dry film thickness shall not be thicker than
47 the paint manufacturer's recommended maximum thickness.
48

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

Film thickness, wet and dry, will be measured by gages conforming to Section 6-07.3(8)A. Wet measurements will be taken immediately after the paint is applied in accordance with ASTM D 4414. Dry measurements will be taken after the coating is dry and hard in accordance with SSPC Paint Application Specification Section No. 2.

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

Coating thickness measurements may be made by the Engineer after the application of each coat and before the application of the succeeding coat. In addition, the Engineer may inspect for uniform and complete coverage and appearance. One hundred percent of all thickness measurements shall meet or exceed the minimum wet film thickness. In areas where wet film thickness measurements are impractical, dry film thickness measurements may be made. If a question arises about an individual coat thickness or coverage, it may be verified by the use of a Tooke gauge in accordance with ASTM D 4138.

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

SECTION 6-09, MODIFIED CONCRETE OVERLAYS

August 2, 2010

6-09.3(1)E Air Compressor

In the first paragraph "roadway" is deleted and replaced with "bridge".

6-09.3(6) Further Deck Preparation

In the second paragraph, item number 3. and 4. are revised to read:

3. Existing non-concrete patches as authorized by the Engineer.
4. Additionally, for concrete surfaces scarified by rotomilling only, exposure of reinforcing steel to a depth of one-half of the periphery of a bar for a distance of 12-inches or more along the bar.

6-09.3(6)B Deck Repair Preparation

In the first paragraph, the second sentence is revised to read:

For concrete surfaces scarified by rotomilling, concrete shall be removed to provide a ¾-inch minimum clearance around the top mat of steel reinforcing bars only where unsound concrete exists around the top mat of steel reinforcing bars, or if the bond between concrete and the top mat of steel is broken.

SECTION 6-10, CONCRETE BARRIER

January 4, 2010

6-10.3(1) Precast Concrete Barrier

In the 12th paragraph, the first sentence is revised to read:

Only 1 section less than 20-feet long for single slope barrier and 10-feet long for all other barriers may be used in any single run of precast barrier, and it must be at least 8-feet long.

6-10.3(6) Placing Concrete Barrier

The first paragraph is revised to read:

Precast concrete barrier Type 2, 3, 4 and transitions shall rest on a paved foundation shaped to a uniform grade and section. The foundation surface for precast concrete barrier Type 2, 3, 4 and transitions shall meet this test for uniformity:

When a 10-foot straightedge is placed on the surface parallel to the centerline for the barrier, the surface shall not vary more than ¼-inch from the lower edge of the straightedge. If deviations exceed ¼-inch, the Contractor shall correct them as required in Section 5-04.3(13).

In the second paragraph, the first sentence is revised to read:

The Contractor shall align the joints of all precast barrier segments so that they offset no more than ¼-inch transversely and no more than ¾-inch vertically.

SECTION 6-12, NOISE BARRIER WALLS

April 5, 2010

6-12.3(6) Precast Concrete Panel Fabrication and Erection

The second sentence of the first paragraph in Item 3 is revised to read:

The Contractor shall cast the precast concrete panels horizontally.

SECTION 6-17, PERMANENT GROUND ANCHORS

January 4, 2010

6-17.3(7) Installing Permanent Ground Anchors

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

The tendon shall be inserted into the drill hole to the desired depth prior to grouting.

In the third paragraph, the following sentence is inserted after the first sentence:

Wet setting of permanent ground anchors will not be allowed.

1 **SECTION 7-02, CULVERTS**

2 **January 4, 2010**

3 **7-02.2 Materials**

4 In the first paragraph, the following two items are inserted after the item "Corrugated
5 Polyethylene Culvert Pipe 9-05.19":

6

7	Steel Rib Reinforced Polyethylene Culvert Pipe	9-05.21
8	High Density Polyethylene (HDPE) Pipe	9-05.23

9

10 **7-02.5 Payment**

11 This section is supplemented with the following:

- 12
- 13 "Steel Rib Reinforced Polyethylene Culvert Pipe ____ In. Diam.", per linear foot.
- 14 "High Density Polyethylene (HDPE) Pipe ____ In. Diam.", per linear foot.
- 15

16 **SECTION 7-04, STORM SEWERS**

17 **January 4, 2010**

18 **7-04.2 Materials**

19 In the first paragraph, the following two items are inserted after the item "Corrugated
20 Polyethylene Storm Sewer Pipe 9-05.20":

21

22	Steel Rib Reinforced Polyethylene Storm Sewer Pipe	9-05.22
23	High Density Polyethylene (HDPE) Pipe	9-05.23

24

25 **7-04.5 Payment**

26 This section is supplemented with the following:

- 27
- 28 "Steel Rib Reinforced Polyethylene Storm Sewer Pipe ____ In. Diam.", per linear foot.
- 29 "High Density Polyethylene (HDPE) Pipe ____ In. Diam.", per linear foot.
- 30

31 **SECTION 8-01, EROSION CONTROL AND WATER POLLUTION CONTROL**

32 **August 2, 2010**

33 **8-01.2 Materials**

34 In the first paragraph, the following is inserted after the first sentence:

35

36	Corrugated Polyethylene Drain Pipe	9-05.1(6)

37

38 **8-01.3(1) General**

39 In the sixth paragraph, the first sentence is revised to read:

40

41 When natural elements rut or erode the slope, the Contractor shall restore and repair
42 the damage with the eroded material where possible, and remove and dispose of any
43 remaining material found in ditches and culverts.

44

45 In the seventh paragraph the first two sentences are deleted.

46

47 The table in the seventh paragraph is revised to read:

48

Western Washington (West of the Cascade Mountain crest)

May 1 through September 30	17 Acres
October 1 through April 30	5 Acres

Eastern Washington (East of the Cascade Mountain crest.)

April 1 through October 31	17 Acres
November 1 through March 31	5 Acres

The eighth paragraph is revised to read:

The Engineer may increase or decrease the limits based on project conditions.

The ninth paragraph is revised to read:

Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff.

The 10th paragraph is revised to read:

Erodible earth not being worked, whether at final grade or not, shall be covered within the specified time period, (see the tables below) using an approved soil covering practice.

Western Washington (West of the Cascade Mountain crest)

October 1 through April 30	2-days maximum
May 1 to September 30	7-days maximum

Eastern Washington (East of the Cascade Mountain crest.)

October 1 through June 30	5-days maximum
July 1 through September 30	10-days maximum

8-01.3(1)A Submittals

This section is revised to read:

When a Temporary Erosion and Sediment Control (TESC) Plan is included in the Plans, the Contractor shall either adopt or modify the existing TESC Plan. If modified, the Contractor's TESC Plan shall meet all requirements of Chapter 6-2 of the current edition of the WSDOT Highway Runoff Manual. The Contractor shall provide a schedule for TESC Plan implementation and incorporate it into the Contractor's progress schedule. The Contractor shall obtain the Engineer's approval of the TESC Plan and schedule prior to the beginning of Work. The TESC Plan shall cover all areas that maybe affected inside and outside the limits of the project (including all Contracting Agency-provided sources, disposal sites, and haul roads, and all nearby land, streams, and other bodies of water).

The Contractor shall allow at least 5-working days for the Engineer to review any original or revised TESC Plan. Failure to approve all or part of any such Plan shall not make the Contracting Agency liable to the Contractor for any Work delays.

8-01.3(1)B Erosion and Sediment Control (ESC) Lead

In the last paragraph, "Form Number 220-030 EF" is revised to read "WSDOT Form Number 220-030 EF".

8-01.3(1)C Water Management

In number 2., the reference to "Standard Specification" is revised to read "Section".

Number 3., is revised to read:

3. Offsite Water

Prior to disruption of the normal watercourse, the Contractor shall intercept the offsite stormwater and pipe it either through or around the project site. This water shall not be combined with onsite stormwater. It shall be discharged at its pre-construction outfall point in such a manner that there is no increase in erosion below the site. The method for performing this Work shall be submitted by the Contractor for the Engineer's approval.

8-01.3(1)D Dispersion/Infiltration

This section is revised to read:

Water shall be conveyed only to dispersion or infiltration areas designated in the TESC Plan or to sites approved by the Engineer. Water shall be conveyed to designated dispersion areas at a rate such that, when runoff leaves the area, and enters waters of the State, turbidity standards are achieved. Water shall be conveyed to designated infiltration areas at a rate that does not produce surface runoff.

8-01.3(2)B Seeding and Fertilizing

The fourth paragraph is revised to read:

The seed applied using a hydroseeder shall have a tracer added to visibly aid uniform application. This tracer shall not be harmful to plant, aquatic or animal life. If HECP Type 3 Mulch is used as a tracer, the application rate shall not exceed 250-pounds per acre.

In the fifth paragraph, "hydro seeder" is revised to read "hydroseeder".

8-01.3(2)D Mulching

In the second paragraph, the second sentence is revised to read:

Wood strand mulch shall be applied by hand or by straw blower on seeded areas.

In the third paragraph, "1" is revised to read "a single" and "hydro seeder" is revised to read "hydroseeder".

The fourth paragraph is revised to read:

Temporary seed applied outside the application windows established in 8-01.3(2)F shall be covered with a mulch containing either HECP Type 2 Mulch or HECP Type 1 Mulch, as designated by the Engineer.

8-01.3(2)E Tacking Agent and Soil Binders

The following new paragraph is inserted at the beginning of this Section:

Tacking agent or soil binders applied using a hydroseeder shall have a mulch tracer added to visibly aid uniform application. This tracer shall not be harmful to plant, aquatic or animal life. If HECP Type 3 Mulch is used as a tracer, the application rate shall not exceed 250-pounds per acre.

The second sentence in the first paragraph below "**Soil Binding Using Polyacrylamide (PAM)**" is revised to read:

A minimum of 200-pounds per acre of HECP Type 3 Mulch shall be applied with the dissolved PAM.

In the second paragraph below "**Soil Binding Using Polyacrylamide (PAM)**", "within" is revised to read "after".

The paragraph "**Soil Binding Using Bonded Fiber Matrix (BFM)**" including title is revised to read:

Soil Binding Using HECP Type 2 Mulch

The HECP Type 2 Mulch shall be hydraulically applied in accordance with the manufacturer's installation instructions. The HECP Type 2 Mulch may require a 24 to 48 hour curing period to achieve maximum performance and shall not be applied when precipitation is predicted within 24 to 48 hours, or on saturated soils, as determined by the Engineer.

The last paragraph including titled is revised to read:

Soil Binding Using HECP Type 1 Mulch

The HECP Type 1 Mulch shall be hydraulically applied in accordance with the manufacturer's installation instructions and recommendations.

8-01.3(2)F Dates for Application of Final Seed, Fertilizer, and Mulch

The first paragraph is revised to read:

Unless otherwise approved by the Engineer, the final application of seeding, fertilizing, and mulching of slopes shall be performed during the following periods:

Western Washington¹

(West of the Cascade Mountain crest)

March 1 through May 15

September 1 through October 1

Eastern Washington

(East of the Cascade Mountain crest)

October 1 through November 15 only

¹ Where Contract timing is appropriate, seeding, fertilizing, and mulching shall be accomplished during the fall period listed above. Written permission to seed after October 1 will only be given when Physical Completion of the project is imminent and the environmental conditions are conducive to satisfactory growth.

8-01.3(2)G Protection and Care of Seeded Areas

The first paragraph is revised to read:

1 The Contractor shall be responsible to ensure a healthy stand of grass. The Contractor
2 shall restore eroded areas, clean up and properly dispose of eroded materials, and
3 reapply the seed, fertilizer, and mulch, at no additional cost to the Contracting Agency.
4

5 In the second paragraph, number 1. is revised to read:
6

- 7 1. At the Contractor's expense, seed, fertilizer and mulch shall be reapplied in areas
8 that have been damaged through any cause prior to final inspection, and reapplied
9 to areas that have failed to receive a uniform application at the specified rate.
10

11 **8-01.3(2)H Inspection**

12 The first sentence is revised to read:
13

14 Inspection of seeded areas will be made upon completion of seeding, temporary
15 seeding, fertilizing, and mulching.
16

17 The third sentence is revised to read:
18

19 Areas that have not received a uniform application of seed, fertilizer, or mulch at the
20 specified rate, as determined by the Engineer, shall be reseeded, refertilized, or
21 remulched at the Contractor's expense prior to payment.
22

23 **8-01.3(2)I Mowing**

24 In the first paragraph, the last sentence is revised to read:
25

26 Trimming around traffic facilities, Structures, planting areas, or other features extending
27 above ground shall be accomplished preceding or simultaneously with each mowing.
28

29 **8-01.3(3) Placing Erosion Control Blanket**

30 In the first sentence, "Standard" is deleted.
31

32 The second sentence is revised to read:
33

34 Temporary erosion control blankets, having an open area of 60-percent or greater, may
35 be installed prior to seeding.
36

37 **8-01.3(4) Placing Compost Blanket**

38 In the first paragraph, "before" is revised to read "prior to".
39

40 The last sentence is revised to read:
41

42 Compost shall be Coarse Compost.
43

44 **8-01.3(5) Placing Plastic Covering**

45 The first sentence is revised to read:
46

47 Plastic shall be placed with at least a 12-inch overlap of all seams.
48

49 **8-01.3(6)A Geotextile-Encased Check Dam**

50 The first paragraph is deleted.
51

1 **8-01.3(6)B Rock Check Dam**

2 This section including title is revised to read:

4 **8-01.3(6)B Quarry Spall Check Dam**

5 The rock used to construct rock check dams shall meet the requirements for quarry
6 spalls.

8 **8-01.3(6)D Wattle Check Dam**

9 This section is revised to read:

11 Wattle check dams shall be installed in accordance with the Plans.

13 **8-01.3(6)E Coir Log**

14 This section is revised to read:

16 Coir logs shall be installed in accordance with the Plans.

18 **8-01.3(9)A Silt Fence**

19 In the second paragraph, the second sentence is revised to read:

21 The strength of the wire or plastic mesh shall be equivalent to or greater than what is
22 required in Section 9-33.2(1), Table 6 for unsupported geotextile (i.e., 180 lbs. grab
23 tensile strength in the machine direction).

25 **8-01.3(9)B Gravel Filter, Wood Chip or Compost Berm**

26 In the second paragraph, the last sentence is deleted.

28 The third paragraph is revised to read:

30 The Compost Berm shall be constructed in accordance with the detail in the Plans.
31 Compost shall be Coarse Compost.

33 **8-01.3(9)C Straw Bale Barrier**

34 This section is revised to read:

36 Straw Bale Barriers shall be installed in accordance with the Plans.

38 **8-01.3(9)D Inlet Protection**

39 This section is revised to read:

41 Inlet protection shall be installed below or above, or as a prefabricated cover at each
42 inlet grate, as shown in the Plans. Inlet protection devices shall be installed prior to
43 beginning clearing, grubbing, or earthwork activities.

45 Geotextile fabric in all prefabricated inlet protection devices shall meet or exceed the
46 requirements of Section 9-33.2, Table 1 for Moderate Survivability, and the minimum
47 filtration properties of Table 2.

49 When the depth of accumulated sediment and debris reaches approximately ½ the
50 height of an internal device or ⅓ the height of the external device (or less when so

1 specified by the manufacturers) or as designated by the Engineer, the deposits shall be
2 removed and stabilized on site in accordance with Section 8-01.3(16).
3

4 **8-01.3(10) Wattles**

5 In the first paragraph, the third sentence is revised to read:
6

7 Excavated material shall be spread evenly along the uphill slope and be compacted
8 using hand tamping or other method approved by the Engineer.
9

10 This section is supplemented with the following new paragraph:
11

12 The Contractor shall exercise care when installing wattles to ensure that the method of
13 installation minimizes disturbance of waterways and prevents sediment or pollutant
14 discharge into waterbodies.
15

16 **8-01.3(12) Compost Sock**

17 In the first paragraph, "sock" is revised to read "socks" and "streambed" is revised to read
18 "waterbodies".
19

20 In the second paragraph "bank" is revised to read "slope".
21

22 In the third paragraph "and" is revised to read "or".
23

24 This section is supplemented with the following new paragraph:
25

26 Compost for Compost Socks shall be Coarse Compost.
27

28 **8-01.3(14) Temporary Pipe Slope Drain**

29 The first paragraph is revised to read:
30

31 Temporary pipe slope drain shall be Corrugated Polyethylene Drain Pipe and shall be
32 constructed in accordance with the Plans
33

34 The last paragraph is revised to read:
35

36 Placement of outflow of the pipe shall not pond water on road surface.
37

38 **8-01.3(15) Maintenance**

39 In the fourth paragraph, the last sentence is revised to read:
40

41 Clean sediments may be stabilized on site using approved BMPs as approved by the
42 Engineer.
43

44 **8-01.3(16) Removal**

45 In the second paragraph, the last sentence is revised to read:
46

47 This may include, but is not limited to, ripping the soil, incorporating soil amendments,
48 and seeding with the specified seed.
49

50 **8-01.4 Measurement**

51 The eighth paragraph is revised to read:
52

1 Silt fence, gravel filter, compost berms, and wood chip berms will be measured by the
2 linear foot along the ground line of completed barrier.

3 4 **8-01.5 Payment**

5 The following bid items are relocated after the bid item "Check Dam":

6
7 "Inlet Protection", per each.

8
9 "Gravel Filter Berm", per linear foot.

10
11 The following new paragraph is inserted before the bid item "Stabilized Construction
12 Entrance":

13
14 The unit Contract price per linear foot for "Check Dam" and "Gravel Filter Berm" and per
15 each for "Inlet Protection" shall be full pay for all equipment, labor and materials to
16 perform the Work as specified, including installation, removal and disposal at an
17 approved disposal site.

18
19 The paragraph after the bid item "Temporary Curb" is revised to read:

20
21 The unit Contract price per linear foot for temporary curb shall include all costs to install,
22 maintain, remove, and dispose of the temporary curb.

23
24 The following bid item is inserted after the bid item "Mulching with Pam":

25
26 "Mulching with HECP Type 3 Mulch", per acre.

27
28 The bid item "Mulching with BFM" is revised to read:

29
30 "Mulching with HECP Type 2 Mulch"

31
32 The bid item "Mulching with MBFM/FRM" is revised to read:

33
34 "Mulching with HECP Type 1 Mulch"

35 36 **SECTION 8-02, ROADSIDE RESTORATION** 37 **January 4, 2010**

38 **8-02.3(2) Roadside Work Plan**

39 In the first paragraph, the second sentence is revised to read:

40
41 The roadside work plan shall define the Work necessary to provide all Contract
42 requirements, including: wetland excavation, soil preparation, habitat, Structure
43 placement, planting area preparation, seeding area preparation, bark mulch and
44 compost placement, seeding, planting, plant replacement, irrigation, and weed control in
45 narrative form.

46
47 The first sentence under "**Progress Schedule**" is revised to read:

48
49 A progress schedule shall be submitted in accordance with Section 1-08.3. The
50 Progress Schedule shall include the planned time periods for Work necessary to provide
51 all Contract requirements in accordance with Sections 8-01, 8-02, and 8-03.

The first sentence under "**Weed and Pest Control Plan**" is revised to read:

The Weed and Pest Control Plan shall be submitted and approved prior to starting any Work defined in Sections 8-01, and 8-02.

In the third paragraph under "**Weed and Pest Control Plan**" the first and second sentences are revised to read:

The plan shall be prepared and signed by a licensed Commercial Pest Control Operator or Consultant when chemical pesticides are proposed. The plan shall include methods of weed control; dates of weed control operations; and the name, application rate, and Material Safety Data Sheets of all proposed herbicides.

The last paragraph under "**Plant Establishment Plan**" is deleted.

8-02.3(2)A Chemical Pesticides

This section is deleted.

8-02.3(2)B Weed and Pest Control

This section is deleted.

8-02.3(3) Planting Area Weed Control

This section including title is revised to read:

8-02.3(3) Weed and Pest Control

The Contractor shall control weed and pest species within the project area using integrated pest management principles consisting of mechanical, biological and chemical controls that are outlined in the Weed and Pest Control Plan or as designated by the Engineer.

Those weeds specified as noxious by the Washington State Department of Agriculture, the local Weed District, or the County Noxious Weed Control Board and other species identified by the Contracting Agency shall be controlled on the project in accordance with the weed and pest control plan.

The Contractor shall control weeds not otherwise covered in accordance with Section 8-02.3(3)A, **Planting Area Weed Control** in all areas within the project limits, including erosion control seeding area and vegetation preservation areas, as designated by the Engineer.

This section is supplemented with the following new sub-sections:

8-02.3(3)A Planting Area Weed Control

All planting areas shall be prepared so that they are weed and debris free at the time of planting and until completion of the project. The planting areas shall include the entire ground surface, regardless of cover, all planting beds, areas around plants, and those areas shown in the Plans.

All applications of post-emergent herbicides shall be made while green and growing tissue is present. Should unwanted vegetation reach the seed stage, in violation of these Specifications, the Contractor shall physically remove and bag the seed heads. All

1 physically removed vegetation and seed heads shall be disposed of off site at no cost to
2 the Contracting Agency.

3
4 Weed barrier mats shall be installed as shown in the Plans. Mats shall be 3-feet square
5 and shall be secured by a minimum of 5-staples per mat. Mats and staples shall be
6 installed according to the manufacturer's recommendations.
7

8 **8-02.3(3)B Chemical Pesticides**

9 Application of chemical pesticides shall be in accordance with the label
10 recommendations, the Washington State Department of Ecology, local sensitive area
11 ordinances, and Washington State Department of Agriculture laws and regulations. Only
12 those herbicides listed in the table *Herbicides Approved for Use on WSDOT Rights of*
13 *Way* at http://www.wsdot.wa.gov/Maintenance/Roadside/herbicide_use.htm may be
14 used.
15

16 The applicator shall be licensed by the State of Washington as a Commercial Applicator
17 or Commercial Operator with additional endorsements as required by the Special
18 Provisions or the proposed weed control plan. The Contractor shall furnish the Engineer
19 evidence that all operators are licensed with appropriate endorsements, and that the
20 pesticide used is registered for use by the Washington State Department of Agriculture.
21 All chemicals shall be delivered to the job site in the original containers. The licensed
22 applicator or operator shall complete a Commercial Pesticide Application Record (DOT
23 Form 540-509) each day the pesticide is applied, and furnish a copy to the Engineer by
24 the following business day.
25

26 The Contractor shall ensure confinement of the chemicals within the areas designated.
27 The use of spray chemical pesticides shall require the use of anti-drift and activating
28 agents, and a spray pattern indicator unless otherwise allowed by the Engineer.
29

30 The Contractor shall assume all responsibility for rendering any area unsatisfactory for
31 planting by reason of chemical application. Damage to adjacent areas, either on or off
32 the Highway Right of Way, shall be repaired to the satisfaction of the Engineer or the
33 property owner, and the cost of such repair shall be borne by the Contractor.
34

35 **8-02.3(5) Planting Area Preparation**

36 In the first paragraph, the second sentence is revised to read:
37

38 Material displaced by the Contractor's operations that interferes with drainage shall be
39 removed from the channel and disposed of as approved by the Engineer.
40

41 **8-02.3(7) Layout of Planting**

42 The second paragraph is deleted.
43

44 **8-02.3(8) Planting**

45 In the second paragraph, the first and second sentences are revised to read:
46

47 Under no circumstances will planting be permitted during unsuitable soil or weather
48 conditions as determined by the Engineer. Unsuitable conditions may include frozen
49 soil, freezing weather, saturated soil, standing water, high winds, heavy rains, and high
50 water levels.
51

52 The fourth paragraph is revised to read:

1
2 Plants shall not be placed below the finished grade.
3
4 The fifth paragraph is revised to read:
5
6 Planting hole sizes for plant material shall be in accordance with the details shown in
7 the Plans. Any glazed surface of the planting hole shall be roughened prior to planting.
8
9 The following new paragraph is inserted after the fifth paragraph:
10
11 All cuttings shall be planted immediately if buds begin to swell.
12
13 **8-02.3(9) Pruning, Staking, Guying, and Wrapping**
14 In the first paragraph, the last sentence is revised to read:
15
16 All other pruning shall be performed only after the plants have been in the ground at
17 least one year and when plants are dormant.
18
19 **8-02.3(13) Plant Establishment**
20 In the third paragraph, the first sentence is revised to read:
21
22 During the first-year plant establishment period, the Contractor shall perform all Work
23 necessary to ensure the resumption and continued growth of the transplanted material.
24
25 In the fourth paragraph, "propose" is revised to read "submit".
26
27 **8-02.3(15) Live Fascines**
28 In the first paragraph, the fourth sentence is revised to read:
29
30 Dead branches may be placed within the live fascine and on the side exposed to the air.
31
32 In the second paragraph, the third sentence is deleted.
33
34 In the second paragraph, the seventh sentence is revised to read:
35
36 The live stakes shall be driven through the live fascine vertically into the slope.
37
38 **8-02.3(16)A Lawn Installation**
39 In the third paragraph, the last two items "West of the summit of the Cascade Range - March
40 1 to October 1." and "East of the summit of the Cascade Range - April 15 to October 1." are
41 revised to read:
42
43 Western Washington Eastern Washington
44 (West of the Cascade Mountain crest) (East of the Cascade Mountain crest)
45 March through May 15 October 1 through November 15
46 September 1 through October 1
47
48 The fifth paragraph is revised to read:
49
50 Topsoil for seeded or sodded lawns shall be placed at the depth and locations as shown
51 in the Plans. The topsoil shall be cultivated to the specified depth, raked to a smooth

1 even grade without low areas that trap water and compacted, all as approved by the
2 Engineer.

3
4 In the sixth paragraph, the last sentence is revised to read:

5
6 Following placement, the sod shall be rolled with a smooth roller to establish contact
7 with the soil.

8 9 **8-02.4 Measurement**

10 The seventh paragraph is revised to read:

11
12 Fine compost, medium compost and coarse compost will be measured by the cubic
13 yard in the haul conveyance at the point of delivery.

14 15 **8-02.5 Payment**

16 The following new paragraph is inserted above the paragraph beginning with "Payment shall
17 be increased to 90-percent.....":

18
19 Plant establishment milestones are achieved when plants meet conditions described in
20 Section 8-02.3(13).

21
22 The following is inserted after the bid item "Fine Compost":

23
24 "Medium Compost", per cubic yard.

25
26 The paragraph for the bid item "Weed Control" is revised to read:

27
28 "Weed and Pest Control", will be paid in accordance with Section 1-09.6.

29
30 The following new paragraph is inserted after the bid item "Soil Amendment":

31
32 The unit Contract price per cubic yard for "Soil Amendment" shall be full pay for
33 furnishing and incorporating the soil amendment into the existing soil.

34
35 The following new paragraph is inserted after the bid item "Bark or Wood Chip Mulch":

36
37 The unit Contract price per cubic yard for "Bark or Wood Chip Mulch" shall be full pay
38 for furnishing and spreading the mulch onto the existing soil.

39 40 **SECTION 8-03, IRRIGATION SYSTEMS**

41 **January 4, 2010**

42 **8-03.1 Description**

43 In this section, "staked" is revised to read "approved by the Engineer."

44 45 **8-03.3 Construction Requirements**

46 The second paragraph is revised to read:

47
48 Potable water supplies shall be protected against cross connections in accordance with
49 applicable Washington State Department of Health rules and regulations and approval
50 by the local health authority.
51

1 **8-03.3(1) Layout of Irrigation System**

2 This section is revised to read:

3
4 The Contractor shall stake the irrigation system following the schematic design shown in
5 the Plans. Approval must be obtained from the Engineer. Alterations and changes in the
6 layout may be expected in order to conform to ground conditions and to obtain full and
7 adequate coverage of plant material with water. However, no changes in the system as
8 planned shall be made without prior authorization by the Engineer.
9

10 This section is supplemented with the following new sub-section:

11
12 **8-03.3(1)A Locating Irrigation Sleeves**

13 Existing underground irrigation sleeve ends shall be located by potholing. Irrigation
14 sleeves placed during general construction prior to installation of the irrigation system
15 shall be marked at both ends with a 2x4x24-inch wood stake extending 6-inches out of
16 the soil and painted blue on the exposed end.
17

18 **8-03.3(2) Excavation**

19 In the first paragraph, the fourth sentence is revised to read:

20
21 Trenches through rock or other material unsuitable for trench bottoms and sides shall be
22 excavated 6-inches below the required depth and shall be backfilled to the top of the
23 pipe with sand or other suitable material free from rocks or stones. Backfill material shall
24 not contain rocks 2-inches or greater in diameter or other materials that can damage
25 pipe.
26

27 The second paragraph is revised to read:

28
29 The Contractor shall exercise care when excavating pipe trenches near existing trees to
30 minimize damage to tree roots. Where roots are 1-1/2-inches or greater in diameter, the
31 trench shall be hand excavated and tunneled under the roots. When large roots are
32 exposed, they shall be wrapped with heavy, moist material, such as burlap or canvas,
33 for protection and to prevent excessive drying. The material must be kept moist until the
34 trench is backfilled. Trenches dug by machines adjacent to trees having roots less than
35 1-1/2-inches in diameter shall have severed roots cleanly cut. Trenches having exposed
36 tree roots shall be backfilled within 24-hours unless adequately protected by moist
37 material as approved by the Engineer. All material and fastenings used to cover the
38 roots shall be removed before backfilling.
39

40 The third paragraph is revised to read:

41
42 Detectable marking tape shall be placed in all trenches 6-inches directly above, parallel
43 to, and along the entire length of all nonmetallic water pipes, and all nonmetallic and
44 aluminum sleeves, conduits and casing pipe. The width of the tape and installation
45 depth shall be as recommended by the manufacturer for the depth of installation or as
46 shown in the Plans.
47

48 **8-03.3(3) Piping**

49 This section is revised to read:

50
51 All water lines shall be a minimum of 18-inches below finished grade measured from the
52 top of the pipe or as shown in the Plans. All live water mains to be constructed under

existing pavement shall be placed in steel casing jacked under pavement as shown in the Plans. All PVC or polyethylene pipe installed under areas to be paved shall be placed in irrigation sleeves. Irrigation sleeves shall extend a minimum of 2-feet beyond the limits of pavement. All jacking operations shall be performed in accordance with an approved jacking plan. Where possible; mains and laterals or section piping shall be placed in the same trench. All lines shall be placed a minimum of 3-feet from the edge of concrete sidewalks, curbs, guardrail, walls, fences, or traffic barriers. Pipe pulling will not be allowed for installation and placement of irrigation pipe.

Mainlines and lateral lines shall be defined as follows:

Mainlines: All supply pipe and fittings between the water meter and the irrigation control valves.

Lateral Lines: All supply pipe and fittings between the irrigation control valves and the connections to the irrigation heads. Swing joints, thick walled PVC or polyethylene pipe, flexible risers, rigid pipe risers, and associated fittings are not considered part of the lateral line but incidental components of the irrigation heads.

8-03.3(4) Jointing

In the second paragraph, the third sentence is revised to read:

Threaded galvanized steel joints shall be constructed using either a nonhardening, nonseizing multipurpose sealant or Teflon tape or paste as recommended by the pipe manufacturer, or as shown in the Plans.

In the last sentence of the second paragraph, "will" is revised to read "shall".

In the fourth sentence of the third paragraph, "will" is revised to read "shall" and "at" is revised to read "of".

In the fifth paragraph, the first sentence is revised to read:

On PVC or polyethylene-to-metal connections, work the metal connection first.

In the fifth paragraph, the third sentence is revised to read:

Connections between metal and PVC or polyethylene are to be threaded utilizing female threaded PVC adapters with threaded schedule 80-PVC nipple only.

In the sixth paragraph, the second sentence is revised to read:

The ends of the polyethylene pipe shall be cut square, reamed smooth inside and out, and inserted to the full depth of the fitting.

8-03.3(5) Installation

The following new paragraph is inserted after the third paragraph:

All automatic control valves, flow control valves, and pressure reducing valves shall be installed in appropriate sized valve boxes. Manual control valves shall be installed in an appropriate sized valve box and where appropriate, upstream of the automatic control

1 valves. Manual and automatic valves installed together shall be in an appropriate sized
2 box with 3-inches of clearance on all sides.

3
4 The fourth paragraph is revised to read:

5
6 Final position of valve boxes, capped sleeves, and quick coupler valves shall be
7 between ½-inch and 1-inch above finished grade or mulch, or as shown in the Plans.

8
9 The following new paragraph is inserted after the fourth paragraph:

10
11 Quick coupler valves and hose bibs shall be installed in valve boxes, either separately
12 or within a control valve assembly box upstream of the control valves. Valves, quick
13 couplers, and hose bibs shall have 3-inches of clearance on all sides within the valve
14 box.

15
16 In the fifth paragraph "an" is revised to read "a minimum".

17
18 The following new paragraph is inserted after the fifth paragraph:

19
20 Automatic controller pedestals or container cabinets shall be installed on a concrete
21 base as shown in the Plans or in accordance with the manufacturer's recommendations.
22 Provide three 1-inch diameter galvanized metal or PVC electrical wire conduits through
23 the base and 3-inches minimum beyond the edge or side of the base both inside and
24 outside of the pedestal.

25
26 **8-03.3(6) Electrical Wire Installation**

27 This section is revised to read:

28
29 All electrical work shall conform to the National Electric Code, NEMA Specifications and
30 in accordance with Section 8-20. Electrical wiring between the automatic controller and
31 automatic valves shall be direct burial and may share a common neutral. Separate
32 control conductors shall be run from the automatic controller to each valve. When more
33 than one automatic controller is required, a separate common neutral shall be provided
34 for each controller and the automatic valves which it controls. Electrical wire shall be
35 installed in the trench adjacent to or above the irrigation pipe, but no less than 12-inches
36 deep. Plastic tape or nylon tie wraps shall be used to bundle wires together at 10-foot
37 intervals. If it is necessary to run electrical wire in a separate trench from the irrigation
38 pipe, the wire shall be placed at a minimum depth of 18-inches and be "snaked" from
39 side to side in the trench. Each circuit shall be identified at both ends and at all splices
40 with a permanent marker identifying zone and/or station.

41
42 Wiring placed under pavement and walls, or through walls, shall be placed in an
43 electrical conduit or within an irrigation sleeve. Electrical conduit shall not be less than
44 1-inch in diameter, and shall meet conduit specifications for PVC conduit as required in
45 Section 9-29.1.

46
47 Splices will be permitted only in approved electrical junction boxes, valve boxes, pole
48 bases, or within control equipment boxes or pedestals. A minimum of 18-inches of
49 excess conductor shall be left at all splices, terminals and control valves to facilitate
50 inspection and future splicing. The excess wire shall be neatly coiled to fit easily into the
51 boxes.

52

1 All 120-volt electrical conductors and conduit shall be installed by a certified electrician
2 including all wire splices and wire terminations.

3
4 All wiring shall be tested in accordance with Section 8-20.3(11).

5
6 Continuity ground and functionality testing shall be performed for all 24-volt direct burial
7 circuits. The Megger test, confirming insulation resistance of not less than 2 megohms
8 to ground in accordance with Section 8-20.3(11), is required.
9

10 **8-03.3(7) Flushing and Testing**

11 In the first paragraph "correct" is revised to read "as accurate" and "ordered" is revised to
12 read "required".
13

14 The third paragraph is revised to read:

15 **Main Line Flushing**

16 All main supply lines shall receive two fully open flushing's to remove debris that may
17 have entered the line during construction: The first before placement of valves and the
18 second after placement of valves and prior to testing.
19
20

21 The fourth paragraph is revised to read:

22 **Main Line Testing**

23 All main supply lines shall be purged of air and tested with a minimum static water
24 pressure of 150-psi for 60-minutes without introduction of additional service or pumping
25 pressure. Testing shall be done with one pressure gauge installed on the line, in the
26 location required by the Engineer. For systems using a pump, an additional pressure
27 gauge shall be installed at the pump when required by the Engineer. Lines that show
28 loss of pressure exceeding 5-psi at the ends of specified test periods will be rejected.
29
30

31 The fifth paragraph is deleted.

32
33 In the sixth paragraph, "any" is revised to read "all".
34

35 In the seventh paragraph, the second sentence is revised to read:

36
37 The operating line pressure shall be maintained for 30-minutes with valves closed and
38 without introduction of additional service or pumping pressure.
39

40 In the eighth paragraph, the fourth and fifth sentences are revised to read:

41
42 The Contractor shall then conduct a thorough inspection of all sprinkler heads, emitters,
43 etc., located downstream of the break or disruption of service, and make all needed
44 repairs to ensure that the entire irrigation system is operating properly.
45

46 **8-03.3(8) Adjusting System**

47 In the first paragraph, the last sentence is revised to read:

48
49 Unless otherwise specified, sprinkler spray patterns will not be permitted to apply water
50 to pavement, walks, or Structures.
51

1 **8-03.3(11) System Operation**

2 In the first paragraph, the last sentence is revised to read:

3
4 The final inspection of the irrigation system will coincide with the end of the Contract or
5 the end of first-year plant establishment, which ever is later.

6
7 In the second paragraph "ordered" is revised to read "required".

8
9 In the third paragraph, the last sentence is revised to read:

10
11 Potable water shall not flow through the cross-connection control device to any
12 downstream component until tested and approved for use by the local health authority
13 in accordance with Section 8-03.3(12).

14
15 The fourth paragraph is revised to read:

16
17 In the spring, when the drip irrigation system is in full operation, the Contractor shall
18 make a full inspection of all emitters, and irrigation heads. This shall involve visual
19 inspection of each emitter and irrigation head under operating conditions. All
20 adjustments, flushing, or replacements to the system shall be made at this time to
21 ensure the proper operation of all emitters and irrigation heads.

22
23 **8-03.3(12) Cross Connection Control Device Installation**

24 In the first sentence of the first paragraph "serving utility" is revised to read "local health
25 authority".

26
27 **8-03.3(13) Irrigation Water Service**

28 The first paragraph is revised to read:

29
30 All water meter(s) shall be installed by the serving utility. The Contracting Agency shall
31 arrange for a water meter installation(s) for the irrigation system at the locations and
32 sizes as shown in the Plans at no cost to the Contractor. It shall be the Contractor's
33 responsibility to contact the Engineer to schedule the water meter installation. The
34 Contractor shall provide a minimum of 60-calendar days notice to the Engineer prior to
35 the desired water meter installation date.

36
37 In the second paragraph, "will" is revised to read "shall".

38
39 **8-03.3(14) Irrigation Electrical Service**

40 The first paragraph is revised to read:

41
42 The Contracting Agency shall arrange for electrical service connection(s) for operation
43 of the automatic electrical controller(s) at the locations as shown in the Plans. The
44 Contractor shall splice and run conduit and wire from the electrical service
45 connection(s), or service cabinet to the automatic electrical controller and connect the
46 conductors to the circuit(s) per the controller manufacturer's diagrams or
47 recommendations.

48
49 In the second paragraph, "conduit" is revised to read "conduits".

SECTION 8-08, RUMBLE STRIPS

April 5, 2010

8-08.3 Construction Requirements

In the fourth paragraph, the first and second sentences are combined to read:

When shown in the Plans, the rumble strips shall be fog sealed in accordance with the requirements of Section 5-02 following the completion of the shoulder rumble strip.

SECTION 8-14, CEMENT CONCRETE SIDEWALKS

April 5, 2010

8-14.3(5) Curb Ramp Detectable Warning Surface Retrofit

This section including heading is revised to read:

8-14.3(5) Detectable Warning Surface

Detectable warning surfaces shall consist of truncated domes as shown in the Plans. Where a detectable warning surface is to be applied, the Contractor shall attach the detectable warning surface to the pavement surface according to the manufacturer's recommendations. The detectable warning surface shall be located as shown in the Plans.

The Contractor shall use one of the detectable warning surface products listed in the Qualified Products List or submit another product for approval by the Project Engineer. If the Plans require, the detectable warning surface shall be capable of being bonded to a cement concrete surface or to an asphalt concrete surface. Vertical edges of the detectable warning surface shall be flush with the adjoining surface to the extent possible (otherwise not be more than 1/4-inch above the surface of the pavement) after installation.

8-14.4 Measurement

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

Cement concrete curb ramp type _____ will be measured per each for the complete curb ramp type installed and includes the installation of the detectable warning surface.

The second paragraph is revised to read:

Detectable warning surface will be measured by the square foot of detectable warning surface material installed as shown in the Plans.

8-14.5 Payment

The pay item "Cement Conc. Curb Ramp Type_____" is supplemented with the following new paragraph:

The unit Contract price per each for "Cement Concrete Curb Ramp Type_____", shall be full pay for installing the curb ramp as specified including the "Detectable Warning Surface".

The pay item "Curb Ramp Detectable Warning Surface Retrofit" is revised to read "Detectable Warning Surface".

SECTION 8-15, RIPRAP
January 4, 2010

8-15.2 Materials

The referenced sections for the following items are revised to read:

Heavy Loose Riprap	9-13
Light Loose Riprap	9-13
Hand Placed Riprap	9-13
Sack Riprap	9-13
Quarry Spalls	9-13

SECTION 8-17, IMPACT ATTENUATOR SYSTEMS
April 5, 2010

8-17.4 Measurement

The first paragraph is supplemented with the following new sentence:

Only the maximum number of temporary impact attenuators installed at any one time within the project limits will be measured for payment.

8-17.5 Payment

In the second paragraph following the bid item "Resetting Impact Attenuator", the first sentence is revised to read:

If an impact attenuator is damaged by a third party, repairs shall be made in accordance with Section 1-07.13(4) under the Bid item "Reimbursement For Third Party Damage".

SECTION 8-20, ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL
August 2, 2010

8-20.1 Description

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

3. Intelligent Transportation Systems (ITS)

8-20.3(4) Foundations

In the 12th paragraph, item number 2 is revised to read:

2. The top heavy-hex nuts for type ASTM F1554 grade 105 anchor bolts shall be tightened by the Turn-Of-Nut Tightening Method to minimum rotation of ¼-turn (90 degrees) and a maximum rotation of ½-turn (120 degrees) past snug tight. Permanent marks shall be set on the base plate and nuts to indicate nut rotation past snug tight.

In the 12th paragraph, the following is inserted after item number 2:

3. The top hex nuts for type ASTM F1554 grade 55 anchor bolts shall be tightened by the Turn-of-Nut Tightening Method to minimum rotation of 1/8-turn (45 degrees)

and a maximum rotation of 1/6-turn (60 degrees) past snug tight. Permanent marks shall be set on the base plate and nuts to indicate nut rotation past snug tight.

8-20.3(5) Conduit

In the fifth sentence of the fourth paragraph, "conforms" is revised to read "conforming".

8-20.3(6) Junction Boxes, Cable Vaults, and Pull boxes

In item number 2 of the second paragraph, "top course" is deleted and "per" is revised to read "in accordance with".

8-20.3(8) Wiring

The following new two paragraphs are inserted after the first table:

Splices and taps on underground circuits shall be made with solderless crimp connectors meeting the requirements of Section 9-29.12.

Only one conductor or one multi conductor cable per wire entrance will be allowed in any rigid mold splice.

In the eleventh paragraph item number 5 is revised to read:

5. Video detection camera lead-in cable - the numbers of the phases the camera served.

In the eleventh paragraph the following is added after item number 5:

6. For ITS cameras – the number of the camera indicated in the Contract and the number of the associated cabinet as indicated on the Plans.
7. Communication cable -- labeled as Comm.

This section is supplemented with the following new paragraph:

Installation of coaxial or coaxial/Siamese cable or data cables with a 600 VAC rating will be allowed in the same raceway with 480 VAC illumination cable.

8-20.4 Measurement

The first sentence is revised to read:

No specific unit of measurement will apply to the lump sum items for illumination system, intelligent transportation system (ITS), or traffic signal systems, but measurement will be for the sum total of all items for a complete system to be furnished and installed.

The second paragraph is revised to read:

Conduit of the kind and diameter specified will be measured, through the junction boxes, by the linear foot of conduit placed, unless the conduit is included in an illumination system, signal system, Intelligent Transportation (ITS) or other type of electrical system lump sum Bid item.

8-20.5 Payment

All references to "Intelligent Transportation System" are revised to read "ITS".

The paragraph after the bid item, "Conduit Pipe____In. Diam." per linear foot, is revised to read:

The unit Contract price per linear foot for "Conduit Pipe____ In. Diam." shall be full pay for furnishing all pipe, pipe connections, elbows, bends, caps, reducers, conduits, unions, junction boxes and fittings; for placing the pipe in accordance with the above provisions, including all excavation, jacking or drilling required, backfilling of any voids around casing, conduits, pits or the trenches, restoration of native vegetation disturbed by the operation, chipping of pavement, and bedding of the pipe; and all other Work necessary for the construction of the conduit, except that when conduit is included on any project as an integral part of an illumination, traffic signal, or ITS systems and the conduit is not shown as a pay item, it shall be included in the lump sum price for the system shown.

SECTION 8-21, PERMANENT SIGNING
August 2, 2010

8-21.3(4) Sign Removal

In the fourth paragraph, the following sentence is inserted after the second sentence:

Where signs are removed from existing overhead sign Structures, the existing vertical sign support braces shall also be removed.

In the fourth paragraph, the third sentence is revised to read:

Aluminum signs, wood signs, wood sign posts, wood structures, metal sign posts, wind beams, and other metal structural members, and all existing fastening hardware connecting such members being removed, shall become the property of the Contractor and shall be removed from the project.

8-21.3(9)F Foundations

In the ninth paragraph, the following new statement is inserted as number 1. Existing numbers 1 through 6 of the ninth paragraph shall be renumbered to 2 through 7.

1. Foundation excavations shall conform to the requirements of Section 2-09.3(3).

In the tenth paragraph, item number 2. is revised to read:

2. Steel reinforcement, including spiral reinforcing, shall conform to Section 9-07.2.

SECTION 9-01, PORTLAND CEMENT
April 5, 2010

9-01.2(1) Portland Cement

In the first paragraph, all the text after "shall not exceed 8-percent by weight" is deleted and the paragraph ends.

In the second paragraph, "per" is revised to read "in accordance with".

SECTION 9-03, AGGREGATES
August 2, 2010

In this Division, all references to "AASHTO TP 61" are revised to read "AASHTO T 335".

9-03.11(2) Streambed Cobbles

The first paragraph is revised to read:

Streambed cobbles shall be clean, naturally occurring water rounded gravel material. Streambed cobbles shall have a well graded distribution of cobble sizes and conform to one or more of the following gradings as shown in the Plans:

Approximate Size Note 1	Percent Passing				
	4" Cobbles	6" Cobbles	8" Cobbles	10" Cobbles	12" Cobbles
12"					100
10"				100	70-90
8"			100	70-90	
6"		100	70-90		
5"		70-90			30-60.
4"	100			30-60.	
3"	70-90		30-60.		
2"		30-60.			
1½"	20-50				
¾"	10 max.	10 max.	10 max.	10 max.	10 max.

In the second paragraph, "determine" is revised to read "determined".

SECTION 9-04, JOINT AND CRACK SEALING MATERIALS
August 2, 2010

9-04.2(1) Hot Poured Joint Sealants

This section is revised to read:

Hot poured joint sealants shall meet the requirements of AASHTO M 324 Type IV except for the following:

1. The Cone Penetration at 25°C shall be 130 maximum.
2. The extension for the bond, non immersed, shall be 100%.
3. The hot poured joint sealant shall have a minimum Cleveland Open Cup Flash Point of 205°C in accordance with AASHTO T 48

Hot poured joint sealants shall be sampled in accordance with ASTM D 5167 and tested in accordance with ASTM D 5329.

9-04.11 Butyl Rubber

This section including title is revised to read:

9-04.11 Butyl Rubber and Nitrile Rubber

Butyl rubber shall conform to ASTM D 2000, M1 BA 610. If the Engineer determines that the area will be exposed to petroleum products Nitrile rubber shall be utilized and conform to ASTM D 2000, M1 BG 610.

SECTION 9-05, DRAINAGE STRUCTURES, CULVERTS, AND CONDUITS

January 4, 2010

9-05.12(2) Profile Wall PVC Culvert Pipe, Profile Wall PVC Storm Sewer Pipe, and Profile Wall PVC Sanitary Sewer Pipe

In the fourth paragraph, the word "producer's" is revised to read "Manufacturer's".

9-05.13 Ductile Iron Sewer Pipe

The second and third paragraphs are revised to read:

Ductile iron pipe shall conform to ANSI A 21.51 or AWWA C151 and shall be cement mortar lined and have a 1- mil seal coat per AWWA C104, or a Ceramic Filled Amine cured Novalac Epoxy lining, as indicated on the Plans or in the Special Provisions. The ductile iron pipe shall be Special Thickness Class 50, Minimum Pressure Class 350, or the Class indicated on the Plans or in the Special Provisions.

Nonrestrained joints shall be either rubber gasket type, push on type, or mechanical type meeting the requirements of AWWA C111.

Division 9-05 is supplemented with the following new sections:

9-05.21 Steel Rib Reinforced Polyethylene Culvert Pipe

Steel rib reinforced polyethylene culvert pipe shall meet the requirements of ASTM F2562 Class 1 for steel reinforced thermoplastic ribbed pipe and fittings for pipe 24-inch to 60-inch diameter with silt-tight joints.

Silt-tight joints for steel reinforced polyethylene culvert pipe shall be made with a bell/bell or bell and spigot coupling and incorporate the use of a gasket conforming to the requirements of ASTM F 477. All gaskets shall be installed on the pipe by the manufacturer.

Qualification for each manufacturer of steel reinforced polyethylene culvert pipe requires an approved joint system and a formal quality control plan for each plant proposed for consideration.

A Manufacturer's Certificate of Compliance shall be required and shall accompany the materials delivered to the project. The certificate shall clearly identify production lots for all materials represented. The Contracting Agency may conduct verification tests of pipe stiffness or other properties as it deems appropriate.

1
2 **9-05.22 Steel Rib Reinforced Polyethylene Storm Sewer Pipe**

3 Steel rib reinforced polyethylene storm sewer pipe shall meet the requirements of ASTM
4 F2562 Class 1 for steel reinforced thermoplastic ribbed pipe and fittings. The maximum
5 diameter for steel reinforced polyethylene storm sewer pipe shall be the diameter for
6 which a manufacturer has submitted a qualified joint. Qualified manufacturers and
7 approved joints are listed in the Qualified Products Lists. Fittings shall be rotationally
8 molded, injection molded, or factory welded.
9

10 All joints for steel reinforced polyethylene storm sewer pipe shall be made with a bell
11 and spigot coupling and conform to ASTM D 3212 using elastomeric gaskets
12 conforming to ASTM F 477. All gaskets shall be installed on the pipe by the
13 manufacturer.
14

15 Qualification for each manufacturer of steel reinforced polyethylene storm sewer pipe
16 requires joint system conformance to ASTM D 3212 using elastomeric gaskets
17 conforming to ASTM F 477 and a formal quality control plan for each plant proposed for
18 consideration.
19

20 A Manufacturer's Certificate of Compliance shall be required and shall accompany the
21 materials delivered to the project. The certificate shall clearly identify production lots for
22 all materials represented. The Contracting Agency may conduct verification tests of pipe
23 stiffness or other properties as it deems appropriate.
24

25 **9-05.23 High Density Polyethylene (HDPE) Pipe**

26 HDPE pipe shall be manufactured from resins meeting the requirements of ASTM
27 D3350 with a cell classification of 345464C and a Plastic Pipe Institute (PPI)
28 designation of PE 3408.
29

30 The pipes shall have a minimum standard dimension ratio (SDR) of 32.5.
31

32 HDPE pipe shall be joined into a continuous length by an approved joining method.
33

34 The joints shall not create an increase in the outside diameter of the pipe. The joints
35 shall be fused, snap together or threaded. The joints shall be water tight, rubber
36 gasketed if applicable, and pressure testable to the requirements of ASTM D 3212.
37

38 Joints to be welded by butt fusion, shall meet the requirements of ASTM F 2620 and the
39 manufacturer's recommendations. Fusion equipment used in the joining procedure
40 shall be capable of meeting all conditions recommended by the pipe manufacturer,
41 including but not limited to fusion temperature, alignment, and fusion pressure. All field
42 welds shall be made with fusion equipment equipped with a Data Logger. Temperature,
43 fusion pressure and a graphic representation of the fusion cycle shall be part of the
44 Quality Control records. Electro fusion may be used for field closures as necessary.
45 Joint strength shall be equal or greater than the tensile strength of the pipe.
46

47 Fittings shall be manufactured from the same resins and Cell Classification as the pipe
48 unless specified otherwise in the Plans or Specifications. Butt fusion fittings and
49 Flanged or Mechanical joint adapters shall have a manufacturing standard of ASTM
50 D3261. Electro fusion fittings shall have a manufacturing standard of ASTM F1055.
51

1 HDPE pipe to be used as liner pipe shall meet the requirements of AASHTO M 326 and
2 this specification.

3
4 The supplier shall furnish a Manufacturer's Certification of Compliance stating the
5 materials meet the requirements of ASTM D 3350 with the correct cell classification with
6 the physical properties listed above. The supplier shall certify the dimensions meet the
7 requirements of ASTM F 714 or as indicated in this Specification or the Plans.

8
9 At the time of manufacture, each lot of pipe, liner, and fittings shall be inspected for
10 defects and tested for Elevated Temperature Sustain Pressure in accordance with
11 ASTM F 714. The Contractor shall not install any pipe that is more than 2 years old
12 from the date of manufacture.

13
14 At the time of delivery, the pipe shall be homogeneous throughout, uniform in color, free
15 of cracks, holes, foreign materials, blisters, or deleterious faults.

16
17 Pipe shall be marked at 5 foot intervals or less with a coded number which identifies the
18 manufacturer, SDR, size, material, machine, and date on which the pipe was
19 manufactured.

20
21 **SECTION 9-07, REINFORCING STEEL**
22 **August 2, 2010**

23 **9-07.1(1)A Acceptance of Materials**

24 The following new paragraph is inserted before the first paragraph:

25
26 Reinforcing steel rebar manufacturers shall comply with the requirements of AASHTO
27 PP 45, "Standard Recommended Procedure for Qualification of Deformed and Plain
28 Steel Bar Producing Mills" and the National Transportation Product Evaluation Program
29 (NTPEP) Work Plan for Reinforcing Steel (rebar) Manufacturers. Reinforcing steel
30 rebar manufacturers shall participate in the NTPEP Audit Program for Reinforcing Steel
31 (rebar) Manufacturers and be listed on the NTPEP audit program website displaying
32 that they are NTPEP compliant.

33
34 **9-07.5(1) Epoxy Coated Dowel Bars (For Cement Concrete Pavement)**

35 This section's title is revised to read:

36
37 **9-07.5(1) Epoxy Coated Dowel Bars (For Cement Concrete Pavement**
38 **Rehabilitation)**

39
40 The following is inserted after the third sentence of the first paragraph:

41
42 The Contractor shall furnish a written certification that properly identifies the material,
43 the number of each batch of coating material used, quantity represented, date of
44 manufacture, name and address of manufacturer, and a statement that the supplied
45 coating material meets the requirements of ASTM A 934.
46

SECTION 9-08, PAINTS AND RELATED MATERIALS

January 4, 2010

9-08.1(2)C Inorganic Zinc Rich Primer

In the first paragraph, the reference to "Type II" is revised to read "Type I".

9-08.1(2)D Organic Zinc Rich Primer

This section is revised to read:

Organic zinc rich primer shall be a high performance two-component epoxy conforming to SSPC Paint 20 Type II.

SECTION 9-14, EROSION CONTROL AND ROADSIDE PLANTING

August 2, 2010

Section 9-14 is deleted in its entirety and replaced with the following:

9-14.1 Soil

9-14.1(1) Topsoil Type A

Topsoil Type A shall be as specified in the Special Provisions.

9-14.1(2) Topsoil Type B

Topsoil Type B shall be native topsoil taken from within the project limits either from the area where roadway excavation is to be performed or from strippings from borrow, pit, or quarry sites, or from other designated sources. The general limits of the material to be utilized for topsoil will be indicated in the Plans or in the Special Provisions. The Engineer will make the final determination of the areas where the most suitable material exists within these general limits. The Contractor shall reserve this material for the specified use. Material for Topsoil Type B shall not be taken from a depth greater than 1 foot from the existing ground unless otherwise designated by the Engineer.

In the production of Topsoil Type B, all vegetative matter less than 4 feet in height, shall become a part of the topsoil. Prior to topsoil removal, the Contractor shall reduce the native vegetation to a height not exceeding 1 foot. Noxious weeds, as designated by authorized State and County officials, shall not be incorporated in the topsoil, and shall be removed and disposed of as designated elsewhere or as approved by the Engineer.

9-14.1(3) Topsoil Type C

Topsoil Type C shall be native topsoil meeting the requirements of Topsoil Type B but obtained from a source provided by the Contractor outside of the Contracting Agency owned right of way.

9-14.2 Seed

Grasses, legumes, or cover crop seed of the type specified shall conform to the standards for "Certified" grade seed or better as outlined by the State of Washington Department of Agriculture "Rules for Seed Certification," latest edition. Seed shall be furnished in standard containers on which shall be shown the following information:

1. Common and botanical names of seed
2. Lot number

3. Net weight
- 4 Pure live seed

All seed vendors must have a business license issued by the Washington State Department of Licensing with a "seed dealer" endorsement. Upon request, the Contractor shall furnish the Engineer with copies of the applicable licenses and endorsements.

Upon request, the Contractor shall furnish to the Engineer duplicate copies of a statement signed by the vendor certifying that each lot of seed has been tested by a recognized seed testing laboratory within six months before the date of delivery on the project. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.

9-14.3 Fertilizer

Fertilizer shall be a standard commercial grade of organic or inorganic fertilizer of the kind and quality specified. It may be separate or in a mixture containing the percentage of total nitrogen, available phosphoric acid, water-soluble potash, or sulfur in the amounts specified. All fertilizers shall be furnished in standard unopened containers with weight, name of plant nutrients, and manufacturer's guaranteed statement of analysis clearly marked, all in accordance with State and Federal laws.

Fertilizer shall be supplied in one of the following forms:

- 1 A dry free-flowing granular fertilizer, suitable for application by agricultural fertilizer spreader.
- 2 A soluble form that will permit complete suspension of insoluble particles in water, suitable for application by power sprayer.
- 3 A homogeneous pellet, suitable for application through a ferti-blast gun.
- 4 A tablet or other form of controlled release with a minimum of a six month release period.
- 5 A liquid suitable for application by a power sprayer or hydroseeder.

9-14.4 Mulch and Amendments

All amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis and name. In lieu of containers, amendments may be furnished in bulk. A manufacturer's certificate of compliance shall accompany each delivery. Compost and other organic amendments shall be accompanied with all applicable health certificates and permits.

9-14.4(1) Straw

Straw shall be in an air dried condition free of noxious weeds, seeds, and other materials detrimental to plant life. Hay is not acceptable.

All straw material shall be Certified Weed Free Straw using North American Weed Management Association (NAWMA) standards or the Washington Wilderness Hay and Mulch (WWHAM) program run by the Washington State Noxious Weed Control Board. Information can be found at <http://www.nwcb.wa.gov/http://www.nwcb.wa.gov/>

1
2 In lieu of Certified Weed Free Straw, the Contractor shall provide documentation that the
3 material is steam or heat treated to kill seeds, or shall provide U.S., Washington, or
4 other State's Department of Agriculture laboratory test reports, dated within 90 days
5 prior to the date of application, showing there are no viable seeds in the straw.
6

7 Straw mulch shall be suitable for spreading with mulch blower equipment.
8

9 **9-14.4(2) Hydraulically Applied Erosion Control Products (HECPs)**

10 All HECPs shall be biodegradable and in a dry condition free of noxious weeds, seeds,
11 chemical printing ink, germination inhibitors, herbicide residue, chlorine bleach, rock,
12 metal, plastic, and other materials detrimental to plant life. Up to 5 percent by weight
13 may be photodegradable material.
14

15 The HECP shall be suitable for spreading with a hydroseeder.
16

17 All HECPs shall be furnished premixed by the manufacturer with Type A or Type B
18 Tackifier as specified in 9-14.4(7). Under no circumstances will field mixing of additives
19 or components be acceptable.
20

21 The Contractor shall provide test results, dated within three years prior to the date of
22 application, from an independent, accredited laboratory, as approved by the Engineer,
23 showing the product meets the following requirements:
24

Properties	Test Method	Requirements		
Acute Toxicity	EPA-821-R-02-012 Methods for Measuring Acute Toxicity of Effluents. Test leachate from recommended application rate receiving 2 inches of rainfall per hour using static test for No-Observed-Adverse-Effect-Concentration (NOEC)	Four replicates are required with No statistically significant reduction in survival in 100% leachate for a Daphnid at 48 hours and <i>Oncorhynchus mykiss</i> (rainbow trout) at 96 hours.		
Solvents	EPA 8260B	Benzene - < 0.03 mg/kg Methylene chloride - < 0.02 mg/kg Naphthalene - < 5 mg/kg Tetrachloroethylene - < 0.05 mg/kg Toluene - < 7 mg/kg Trichloroethylene - < 0.03 mg/kg Xylenes - < 9 mg/kg		
Heavy Metals	EPA 6020A Total Metals	Antimony - < 4 mg/kg Arsenic - < 6 mg/kg Barium - < 80 mg/kg Boron - < 100 mg/kg Cadmium - < 2 mg/kg Chromium - < 2 mg/kg Copper - < 5 mg/kg Lead - < 5 mg/kg Mercury - < 2 mg/kg Nickel - < 2 mg/kg Selenium - < 10 mg/kg Strontium - < 30 mg/kg Zinc - < 5 mg/kg		
Water Holding Capacity	ASTM D 7367	900 percent minimum		
Organic Matter Content	ASTM D 586	90 percent minimum		
Moisture Content	ASTM D 644	15 percent maximum		
Seed Germination Enhancement	ASTM D 7322	HECP Type 1	HECP Type 2	HECP Type 3
		420 percent minimum	400 percent minimum	200 percent minimum

If the HECP contains cotton or straw, the Contractor shall provide documentation that the material has been steam or heat treated to kill seeds, or shall provide U.S., Washington, or other State's Department of Agriculture laboratory test reports, dated within 90 days prior to the date of application, showing there are no viable seeds in the mulch.

The HECP shall be manufactured in such a manner that when agitated in slurry tanks with water, the fibers will become uniformly suspended, without clumping, to form a homogeneous slurry. When hydraulically applied, the material shall form a strong moisture-holding mat that allows the continuous absorption and infiltration of water.

The HECP shall contain a dye to facilitate placement and inspection of the material. Dye shall be non-toxic to plants, animals, and aquatic life and shall not stain concrete or painted surfaces.

The HECF shall be furnished with a Material Safety Data Sheet (MSDS) that demonstrates that the product is not harmful to plants, animals, and aquatic life.

9-14.4(2)A HECF Type 1 Mulch

HECF Type 1 Mulch shall demonstrate the ability to adhere to the soil and create a blanket-like mass within two hours of application and shall bond with the soil surface to create a continuous, porous, absorbent, and flexible erosion resistant blanket that allows for seed germination and plant growth and conforms to the requirements in Table ¹ HECF Type 1 Mulch Test Requirements.

The Contractor shall provide test results documenting the mulch meets the requirements in Table ¹ HECF Type 1 Mulch Test Requirements.

Prior to January 1, 2012, the Contractor shall supply independent ASTM D 6459 test results from one of the following testing facilities:

National Transportation Product Evaluation Program (NTPEP)
Utah State University's Utah Water Research Laboratory
Texas Transportation Institute
San Diego State University's Soil Erosion Research Laboratory
TRI Environmental, Inc

Effective January 1, 2012, the Contractor shall supply independent test results from the National Transportation Product Evaluation Program (NTPEP).

Table ¹ HECF Type 1 Mulch Test Requirements

Properties	Test Method	Requirements
Performance in Protecting Slopes from Rainfall-Induced Erosion	ASTM D 6459 - Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle	C Factor = 0.01 maximum using Revised Universal Soil Loss Equation (RUSLE)

9-14.4(2)B HECF Type 2 Mulch

Within 48 hours of application, the HECF Type 2 Mulch shall bond with the soil surface to create a continuous, absorbent, flexible erosion resistant blanket that allows for seed germination and plant growth and conform to the requirements in Table ² HECF Type 2 Mulch Test Requirements.

The Contractor shall provide test results documenting the mulch meets the requirements in Table ² HECF Type 2 Mulch Test Requirements.

Prior to January 1, 2012, the Contractor shall supply independent ASTM D 6459 test results from one of the following testing facilities:

National Transportation Product Evaluation Program (NTPEP)
Utah State University's Utah Water Research Laboratory
Texas Transportation Institute
San Diego State University's Soil Erosion Research Laboratory
TRI Environmental, Inc

Effective January 1, 2012, the Contractor shall supply independent test results from the National Transportation Product Evaluation Program (NTPEP).

Table ² HECF Type 2 Mulch Test Requirements

Properties	Test Method	Requirements
Performance in Protecting Slopes from Rainfall-Induced Erosion	ASTM D 6459 - Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle	C Factor = 0.05 maximum using Revised Universal Soil Loss Equation (RUSLE)

9-14.4(2)C HECF Type 3 Mulch

The Contractor shall provide test results documenting the mulch meets the requirements in Table ³ HECF Type 3 Mulch Test Requirements.

Prior to January 1, 2012, the Contractor shall supply independent ASTM D 6459 test results from one of the following testing facilities:

National Transportation Product Evaluation Program (NTPEP)
 Utah State University's Utah Water Research Laboratory
 Texas Transportation Institute
 San Diego State University's Soil Erosion Research Laboratory
 TRI Environmental, Inc

Effective January 1, 2012, the Contractor shall supply independent test results from the National Transportation Product Evaluation Program (NTPEP).

Table ³ HECF Type 3 Mulch Test Requirements

Properties	Test Method	Requirements
Performance in Protecting Slopes from Rainfall-Induced Erosion	ASTM D 6459 - Test in one soil type. Soil tested shall be sandy loam as defined by the National Resources Conservation Service (NRCS) Soil Texture Triangle	C Factor = 0.15 maximum using Revised Universal Soil Loss Equation (RUSLE)

9-14.4(3) Bark or Wood Chips

Bark or wood chip mulch shall be derived from Douglas fir, pine, or hemlock species. It shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust shall not be used as mulch.

Bark or wood chips, when tested, shall be according to WSDOT Test Method T 123 prior to placement and shall meet the following loose volume gradation:

Sieve Size	Percent Passing	
	Minimum	Maximum
2"	95	100
No. 4	0	30

9-14.4(4) Wood Strand Mulch

Wood strand mulch shall be a blend of angular, loose, long, thin wood pieces that are frayed, with a high length-to-width ratio and shall be derived from native conifer or deciduous trees. A minimum of 95 percent of the wood strand shall have lengths between 2 and 10 inches. At least 50 percent of the length of each strand shall have a width and thickness between 1/16 and 1/2 inch. No single strand shall have a width or thickness greater than 1/2 inch.

The mulch shall not contain salt, preservatives, glue, resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood chips or shavings will not be acceptable. Products shall be tested according to WSDOT Test Method 125 prior to acceptance.

9-14.4(5) Lime

Agriculture lime shall be of standard manufacture, flour grade or in pelletized form, meeting the requirements of ASTM C 602.

9-14.4(6) Gypsum

Gypsum shall consist of Calcium Sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) in a pelletized or granular form. 100 percent shall pass through a No. 8 sieve.

9-14.4(7) Tackifier

Tackifiers are used as a tie-down for soil, compost, seed, and/or mulch. Tackifier shall contain no growth or germination inhibiting materials, and shall not reduce infiltration rates. Tackifier shall hydrate in water and readily blend with other slurry materials and conform to the requirements in Table 4 Tackifier Test Requirements.

The Contractor shall provide test results documenting the tackifier meets the requirements in Table 4 Tackifier Test Requirements.

Before January 1, 2012, the Contractor shall supply independent ASTM D 6459 test results from one of the following testing facilities:

National Transportation Product Evaluation Program (NTPEP)
Utah State University's Utah Water Research Laboratory
Texas Transportation Institute
San Diego State University's Soil Erosion Research Laboratory
TRI Environmental, Inc

Effective January 1, 2012, the Contractor shall supply independent test results from the National Transportation Product Evaluation Program (NTPEP).

Table 4 Tackifier Test Requirements

Properties	Test Method	Requirements
Heavy Metals Solvents Acute Toxicity	Test at manufacturer's recommended application rate	See Table in Section 9-14.4(2)
Performance in Protecting Slopes from Rainfall-Induced Erosion	Modified ASTM D 6459 on 3(H):1(V) slope with 2 inches of rainfall evenly distributed over a period of 100 minutes. Test in one soil type. Soil tested shall be	C Factor = 0.15 maximum using Revised Universal Soil Loss Equation (RUSLE)

	sandy loam as defined by the National Resources Conservation Service (NRCS) Soil Texture Triangle	

9-14.4(7)A Organic Tackifier

Organic tackifier shall be derived from natural plant sources and shall have an MSDS that demonstrates to the satisfaction of the Engineer that the product is not harmful to plants, animals, and aquatic life.

9-14.4(7)B Synthetic Tackifier

Synthetic tackifier shall have an MSDS that demonstrates to the satisfaction of the Engineer that the product is not harmful to plants, animals, and aquatic life.

9-14.4(8) Compost

Compost products shall be the result of the biological degradation and transformation of plant-derived materials under controlled conditions designed to promote aerobic decomposition. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation. Compost shall be mature with regard to its suitability for serving as a soil amendment or an erosion control BMP as defined below. The compost shall have a moisture content that has no visible free water or dust produced when handling the material.

Compost production and quality shall comply with Chapter 173-350 WAC.

Compost products shall meet the following physical criteria:

1. Compost material shall be tested in accordance with U.S. Composting Council Testing Methods for the Examination of Compost and Composting (TMECC) 02.02-B, "Sample Sieving for Aggregate Size Classification".

Fine compost shall meet the following gradation:

Sieve Size	Percent Passing	
	Minimum	Maximum
2"	100	
1"	95	100
5/8"	90	100
1/4"	75	100

Maximum particle length of 6 inches.

Medium compost shall meet the following gradation:

Sieve Size	Percent Passing	
	Minimum	Maximum
2"	100	
1"	95	100
5/8"	90	100
1/4"	75	85

Maximum particle length of 6 inches.

Medium compost shall have a carbon to nitrogen ratio (C:N) between 18:1 and 30:1. The carbon to nitrogen ratio shall be calculated using the dry weight of "Organic Carbon" using TMECC 04.01A divided by the dry weight of "Total N" using TMECC 04.02D.

Coarse compost shall meet the following gradation:

Sieve Size	Percent Passing	
	Minimum	Maximum
3"	100	
1"	90	100
3/4"	70	100
1/4"	40	60

Maximum particle length of 6 inches.

- The pH shall be between 6.0 and 8.5 when tested in accordance with U.S. Composting Council TMECC 04.11-A, "1:5 Slurry pH".
- Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0 percent by weight as determined by U.S. Composting Council TMECC 03.08-A "Classification of Inerts by Sieve Size".
- Minimum organic matter shall be 40 percent by dry weight basis as determined by U.S. Composting Council TMECC 05.07A "Loss-On-Ignition Organic Matter Method (LOI)".
- Soluble salt contents shall be less than 4.0 mmhos/cm when tested in accordance with U.S. Composting Council TMECC 04.10 "Electrical Conductivity".
- Maturity shall be greater than 80 percent in accordance with U.S. Composting Council TMECC 05.05-A, "Germination and Root Elongation".
- Stability shall be 7 mg CO₂-C/g OM/day or below in accordance with U.S. Composting Council TMECC 05.08-B "Carbon Dioxide Evolution Rate".
- The compost product shall originate a minimum of 65 percent by volume from recycled plant waste as defined in WAC 173-350 as "Type 1 Feedstocks." A maximum of 35 percent by volume of "Type 2 Feedstocks," source-separated food waste, and/or biosolids may be substituted for recycled plant waste. The Contractor shall provide a list of feedstock sources by percentage in the final compost product.
- The Engineer may evaluate compost for maturity using U.S. Composting Council TMECC 05.08-E "Solvita® Maturity Index". Fine compost shall score a number 6 or above on the Solvita® Compost Maturity Test. Coarse compost shall score a 5 or above on the Solvita® Compost Maturity Test.

9-14.4(8)A Compost Submittal Requirements

The Contractor shall submit the following information to the Engineer for approval:

- The Qualified Products List printed page or a Request for Approval of Material(DOT Form 350-071EF).

2. A copy of the Solid Waste Handling Permit issued to the manufacturer by the Jurisdictional Health Department in accordance with WAC 173-350 (Minimum Functional Standards for Solid Waste Handling).
3. The Contractor shall verify in writing, and provide lab analyses, that the material complies with the processes, testing, and standards specified in WAC 173-350 and these Specifications. An independent Seal of Testing Assurance (STA) Program certified laboratory shall perform the analysis.
4. A copy of the manufacturer's Seal of Testing Assurance (STA) certification as issued by the U.S. Composting Council.

9-14.4(8)B Compost Acceptance

Fourteen days prior to application, the Contractor shall submit a sample of the compost approved for use, and a STA test report dated within 90 calendar days of the application, and the list of feed stocks by volume for each compost type to the Engineer for review.

The Contractor shall use only compost that has been tested within 90 calendar days of application and meets the requirements in Section 9-14.4(8). Compost not conforming to the above requirements or taken from a source other than those tested and accepted shall not be used.

9-14.4(9) Vacant

9-14.4(10) Vacant

9-14.5 Erosion Control Devices

9-14.5(1) Polyacrylamide (PAM)

Polyacrylamide (PAM) products shall meet ANSI/NSF Standard 60 for drinking water treatment with an AMD content not to exceed 0.05 percent. PAM shall be anionic, linear, and not cross-linked. The minimum average molecular weight shall be greater than 5 mg/mole and minimum 30 percent charge density. The product shall contain at least 80 percent active ingredients and have a moisture content not exceeding 10 percent by weight. PAM shall be delivered in a dry granular or powder form.

9-14.5(2) Erosion Control Blanket

Temporary erosion control blanket shall be made of natural plant fibers. The Contractor shall supply independent test results from the National Transportation Product Evaluation Program (NTPEP) meeting the requirements in the following table:

Properties	ASTM Test Method	Requirements
Protecting Slopes from Rainfall-Induced Erosion	D 6459 - Test in one soil type. Soil tested shall be sandy loam as defined by the NRCS Soil Texture Triangle	Maximum C factor of 0.15 using Revised Universal Soil Loss Equation (RUSLE)
Dry Weight per Unit Area	D 6475	0.36 lb/sq. yd. minimum
Performance in	D 6460 Test in one soil	1.0 lb/sq. ft.

Protecting Earthen Channels from Stormwater-Induced Erosion	type. Soil tested shall be loam as defined by the NRCS Soil Texture Triangle	minimum
Seed Germination Enhancement	D 7322	200 percent minimum

Netting, if present, shall be biodegradable with a life span not to exceed one year.

Permanent erosion control blanket shall meet the following requirements:

Properties	ASTM Test Method	Requirements
UV Stability	D 4355	Minimum 80 percent strength retained after 500 hours in a xenon arc device
Protecting Slopes from Rainfall-Induced Erosion	D 6459 with 0.12 inch average raindrop size.* Test in one soil type. Soil tested shall be loam as defined by the NRCS Soil Texture Triangle **	Maximum C factor of 0.15 using Revised Universal Soil Loss Equation (RUSLE)
Dry Weight per Unit Area	D 6475	0.50 lb/sq. yd. minimum
Performance in Protecting Earthen Channels from Stormwater-Induced Erosion	D 6460 Test in one soil type. Soil tested shall be loam as defined by the NRCS Soil Texture Triangle**	2.0 lb/sq. ft. minimum
Seed Germination Enhancement	D 7322	200 percent minimum

9-14.5(2)A Erosion Control Blanket Approval

The Contractor shall select erosion control blanket products that bear the Quality and Data Oversight and Review (QDOR) seal from the Erosion Control and Technology Council (ECTC). All materials selected shall be currently listed on the QDOR products list available at www.ectc.org/qdor

9-14.5(3) Clear Plastic Covering

Clear plastic covering shall meet the requirements of ASTM D 4397 for polyethylene sheeting having a minimum thickness of 6 mils.

9-14.5(4) Geotextile-Encased Check Dam

The geotextile-encased check dam shall be a urethane foam core encased in geotextile material. The minimum length of the unit shall be 7 feet.

The foam core shall be a minimum of 8 inches in height, and have a minimum base width of 16 inches. The geotextile material shall overhang the foam by at least 6 inches at each end, and shall have apron type flaps that extend a minimum of 24 inches on

each side of the check dam. The geotextile material shall meet the requirements in Section 9-33.

9-14.5(5) Wattles

Wattles shall consist of cylinders of biodegradable plant material such as weed-free straw, coir, compost, wood chips, excelsior, or wood fiber or shavings encased within biodegradable netting. Wattles shall be a minimum of 5 inches in diameter. Netting material shall be clean, evenly woven, and free of encrusted concrete or other contaminating materials such as preservatives. Netting material shall be free from cuts, tears, or weak places and shall have a minimum lifespan of 6 months.

Compost filler shall be coarse compost and shall meet the material requirements as specified in Section 9-14.4(8). If wood chips are used they shall meet the material requirements as specified in Section 9-14.4(3). If wood shavings are used, 80 percent of the fibers shall have a minimum length of 6 inches between 0.030 and 0.50 inches wide, and between 0.017 and 0.13 inches thick.

Wood stakes for wattles shall be made from untreated Douglas fir, hemlock, or pine species. Wood stakes shall be 2 inch by 2 inch nominal dimension and 36 inches in length.

9-14.5(6) Compost Socks

Compost socks shall consist of extra heavy weight biodegradable fabric, with a minimum strand thickness of 5 mils. The fabric shall be filled with Coarse Compost. Compost socks shall be at least 8 inches in diameter. The fabric shall be clean, evenly woven, and free of encrusted concrete or other contaminating materials and shall be free from cuts, tears, broken or missing yarns, and be free of thin, open, or weak areas and shall be free of any type of preservative.

Coarse compost filler shall meet the material requirements as specified in Section 9-14.4(8).

Wood stakes for compost socks shall be made from untreated Douglas fir, hemlock, or pine species. Wood stakes shall be 2 inch by 2 inch nominal dimension and 36 inches in length,

9-14.5(7) Coir Log

Coir logs shall be made of 100 percent durable coconut (coir) fiber uniformly compacted within woven netting made of bristle coir twine with minimum strength of 80 lbs tensile strength. The netting shall have nominal 2 inch by 2 inch openings. Log segments shall have a maximum length of 20 feet, with a minimum diameter as shown in the Plans. Logs shall have a minimum density of 7 lbs/cf.

Stakes shall be untreated Douglas fir, hemlock, or pine species. Wood stakes shall have a notch to secure the rope ties. Rope ties shall be of 1/4 inch diameter commercially available hemp rope.

9-14.5(8) High Visibility Fencing

High visibility fence shall be UV stabilized, orange, high-density polyethylene or polypropylene mesh, and shall be at least 4-feet in height.

Support posts shall be wood or steel in accordance with Standard Plan I-10.10-00. The posts shall have sufficient strength and durability to support the fence through the life of the project.

9-14.6 Plant Materials

9-14.6(1) Description

Bareroot plants are grown in the ground and harvested without soil or growing medium around their roots.

Container plants are grown in pots or flats that prevent root growth beyond the sides and bottom of the container.

Balled and burlapped plants are grown in the ground and harvested with soil around a core of undisturbed roots. This rootball is wrapped in burlap and tied or placed in a wire basket or other supportive structure.

Cuttings are live plant material without a previously developed root system. Source plants for cuttings shall be dormant when cuttings are taken and all cuts shall be made with a sharp instrument. Cuttings may be collected. If cuttings are collected, the requirement to be nursery grown or held in nursery conditions does not apply. Written permission shall be obtained from property owners and provided to the Engineer before cuttings are collected. The Contractor shall collect cuttings in accordance with applicable sensitive area ordinances. Cuttings shall meet the following requirements:

- A. Live branch cuttings shall have flexible top growth with terminal buds and may have side branches. The rooting end shall be cut at an approximate 45 degree angle.
- B. Live stake cuttings shall have a straight top cut immediately above a bud. The lower, rooting end shall be cut at an approximate 45 degree angle. Live stakes are cut from one to two year old wood. Live stake cuttings shall be cut and installed with the bark intact with no branches or stems attached, and be ½ to 1½ inch in diameter.
- C. Live pole cuttings shall have a minimum 2 inch diameter and no more than three branches which shall be pruned back to the first bud from the main stem.

Rhizomes shall be a prostrate or subterranean stem, usually rooting at the nodes and becoming erect at the apex. Rhizomes shall have a minimum of two growth points. Tubers shall be a thickened and short subterranean branch having numerous buds or eyes.

9-14.6(2) Quality

At the time of delivery all plant material furnished shall meet the grades established by the latest edition of the American Standard for Nursery Stock, (ASNS) ANSI Z60.1 and shall conform to the size and acceptable conditions as listed in the Contract, and shall be free of all foreign plant material.

All plant material shall comply with State and Federal laws with respect to inspection for plant diseases and insect infestation.

1 All plant material shall be purchased from a nursery licensed to sell plants in
2 Washington State.

3
4 Live woody or herbaceous plant material, except cuttings, rhizomes, and tubers, shall
5 be vigorous, well formed, with well developed fibrous root systems, free from dead
6 branches, and from damage caused by an absence or an excess of heat or moisture,
7 insects, disease, mechanical or other causes detrimental to good plant development.
8 Evergreen plants shall be well foliated and of good color. Deciduous trees that have
9 solitary leaders shall have only the lateral branches thinned by pruning. All conifer trees
10 shall have only one leader (growing apex) and one terminal bud, and shall not be
11 sheared or shaped. Trees having a damaged or missing leader, multiple leaders, or Y-
12 crotches shall be rejected.

13
14 Root balls of plant materials shall be solidly held together by a fibrous root system and
15 shall be composed only of the soil in which the plant has been actually growing. Balled
16 and burlapped rootballs shall be securely wrapped with jute burlap or other packing
17 material not injurious to the plant life. Root balls shall be free of weed or foreign plant
18 growth.

19
20 Plant materials shall be nursery grown stock. Plant material, with the exception of
21 cuttings, gathered from native stands shall be held under nursery conditions for a
22 minimum of one full growing season, shall be free of all foreign plant material, and meet
23 all of the requirements of these Specifications, the Plans, and the Special Provisions.

24
25 Container grown plants shall be plants transplanted into a container and grown in that
26 container sufficiently long for new fibrous roots to have developed so that the root mass
27 will retain its shape and hold together when removed from the container, without having
28 roots that circle the pot. Plant material which is root bound, as determined by the
29 Engineer, shall be rejected. Container plants shall be free of weed or foreign plant
30 growth.

31
32 Container sizes for plant material of a larger grade than provided for in the container
33 grown Specifications of the ASNS shall be determined by the volume of the root ball
34 specified in the ASNS for the same size plant material.

35
36 All bare root plant materials shall have a heavy fibrous root system and be dormant at
37 the time of planting.

38
39 Average height to spread proportions and branching shall be in accordance with the
40 applicable sections, illustrations, and accompanying notes of the ASNS.

41
42 Plants specified or identified as "Street Tree Grade" shall be trees with straight trunks,
43 full and symmetrical branching, central leader, and be developed, grown, and
44 propagated with a full branching crown. A "Street Tree Grade" designation requires the
45 highest grade of nursery shade or ornamental tree production which shall be supplied.

46
47 Street trees with improperly pruned, broken, or damaged branches, trunk, or root
48 structure shall be rejected. In all cases, whether supplied balled and burlapped or in a
49 container, the root crown (top of root structure) of the tree shall be at the top of the finish
50 soil level. Trees supplied and delivered in a nursery fabric bag will not be accepted.

Plants which have been determined by the Engineer to have suffered damage for the following reasons will be rejected:

1. Girdling of the roots, stem, or a major branch.
2. Deformities of the stem or major branches.
3. Lack of symmetry.
4. Dead or defoliated tops or branches.
5. Defects, injury, and condition which renders the plant unsuitable for its intended use.

Plants that are grafted shall have roots of the same genus as the specified plant.

9-14.6(3) Handling and Shipping

Handling and shipping shall be done in a manner that is not detrimental to the plants.

The nursery shall furnish a notice of shipment in triplicate at the time of shipment of each truck load or other lot of plant material. The original copy shall be delivered to the Project Engineer, the duplicate to the consignee and the triplicate shall accompany the shipment to be furnished to the Inspector at the job site. The notice shall contain the following information:

1. Name of shipper.
2. Date of shipment.
3. Name of commodity. (Including all names as specified in the Contract.)
4. Consignee and delivery point.
5. State Contract number.
6. Point from which shipped.
7. Quantity contained.
8. Size. (Height, runner length, caliper, etc. as required.)
9. Signature of shipper by authorized representative.

To acclimate plant materials to Northwest conditions, all plant materials used on a project shall be grown continuously outdoors north of the 42nd Latitude (Oregon-California border) from not later than August 1 of the year prior to the time of planting.

All container grown plants shall be handled by the container.

All balled and burlapped plants shall be handled by the ball.

Plant material shall be packed for shipment in accordance with prevailing practice for the type of plant being shipped, and shall be protected at all times against drying, sun,

1 wind, heat, freezing, and similar detrimental conditions both during shipment and during
2 related handling. Where necessary, plant material shall be temporarily heeled in. When
3 transported in closed vehicles, plants shall receive adequate ventilation to prevent
4 sweating. When transported in open vehicles, plants shall be protected by tarpaulins or
5 other suitable cover material.
6

7 **9-14.6(4) Tagging**

8 Plants delivered as a single unit of 25 or less of the same size, species, and variety,
9 shall be clearly marked and tagged. Plants delivered in large quantities of more than 25
10 shall be segregated as to variety, grade, and size; and one plant in each 25, or fraction
11 thereof, of each variety, grade, and size shall be tagged.
12

13 **9-14.6(5) Inspection**

14 The Contracting Agency will make an inspection of plant material at the source when
15 requested by the Engineer. However, such preliminary approval shall not be considered
16 as final acceptance for payment. Final inspection and approval (or rejection) will only
17 occur when the plant material has been delivered to the Project site. The Contractor
18 shall notify the Engineer, not less than 48 hours in advance, of plant material delivery to
19 the project.
20

21 **9-14.6(6) Substitution of Plants**

22 No substitution of plant material, species or variety, will be permitted unless evidence is
23 submitted in writing to the Engineer that a specified plant cannot be obtained and has
24 been unobtainable since the Award of the Contract. If substitution is permitted, it can be
25 made only with written approval by the Engineer. The nearest variety, size, and grade,
26 as approved by the Engineer, shall then be furnished.
27

28 Container or balled and burlapped plant material may be substituted for bare root plant
29 material. Container grown plant material may be substituted for balled and burlapped
30 plant materials. When substitution is allowed, use current ASNS standards to determine
31 the correct rootball volume (container or balled and burlapped) of the substituted
32 material that corresponds to that of the specified material. These substitutions shall be
33 approved by the Engineer and be at no cost to the Contracting Agency.
34

35 **9-14.6(7) Temporary Storage**

36 Plants stored under temporary conditions prior to installation shall be the responsibility
37 of the Contractor.
38

39 Plants stored on the project shall be protected at all times from extreme weather
40 conditions by insulating the roots, root balls, or containers with sawdust, soil, compost,
41 bark or wood chips, or other approved material and shall be kept moist at all times prior
42 to planting.
43

44 Cuttings shall continually be shaded and protected from wind. Cuttings shall be
45 protected from drying at all times and shall be heeled into moist soil or other insulating
46 material or placed in water if not installed within eight hours of cutting. Cuttings to be
47 stored for later installation shall be bundled, laid horizontally, and completely buried
48 under 6 inches of water, moist soil or placed in cold storage at a temperature of 34°F
49 and 90 percent humidity. Cuttings that are not planted within 24 hours of cutting shall be
50 soaked in water for 24 hours prior to planting. Cuttings taken when the temperature is
51 higher than 50°F shall not be stored for later use. Cuttings that already have developed
52 roots shall not be used.

1
2 **9-14.6(8) Sod**

3 The available grass mixtures on the current market shall be submitted to the Engineer
4 for selection and approval.
5

6 The sod shall be field grown one calendar year or older, have a well developed root
7 structure, and be free of all weeds, disease, and insect damage.
8

9 Prior to cutting, the sod shall be green, in an active and vigorous state of growth, and
10 mowed to a height not exceeding 1 inch.
11

12 The sod shall be cut with a minimum of 1 inch of soil adhering.
13

14 **9-14.7 Stakes, Guys, and Wrapping**

15 Stakes shall be installed as shown in the Plans.
16

17 Commercial plant ties may be used in lieu of hose and wire guying upon approval of the
18 Engineer. The minimum size of wire used for guying shall be 12 gauge, soft drawn.
19

20 Hose for guying shall be nylon, rubber, or reinforced plastic and shall have an inside
21 diameter of at least 1 inch.
22

23 Tree wrap shall be a crinkled waterproof paper weighing not less than 4.0 pounds per
24 100 square feet and shall be made up of two sheets cemented together with asphalt.
25

26 **SECTION 9-15, IRRIGATION SYSTEM**
27 **January 4, 2010**

28 The first paragraph is supplemented with the following:
29

30 When the water supply for the irrigation system is from a non-potable source, irrigation
31 components shall have lavender indicators supplied by the equipment manufacturer.
32

33 **9-15.3 Automatic Controllers**

34 This section is revised to read:
35

36 The automatic controller shall be an electronic timing device for automatically opening
37 and closing control valves for predetermined periods of time. The automatic controller
38 shall be enclosed in a weatherproof, painted, metal housing fabricated from 16 gauge
39 sheet aluminum alloy 6061-T6 or 16 gauge sheet steel or unpainted, non-rusting
40 industrial grade stainless steel. The pedestal shall have a completely removable locking
41 faceplate to allow easy access to wiring.
42

43 The automatic controller housing shall have hasp and lock or locking device. All locks or
44 locking devices shall be master keyed and three sets of keys provided to the Engineer.
45 The controller shall be compatible with and capable of operating the irrigation system as
46 designed and constructed and shall include the following operating features:
47

- 48 1. Each controller station shall be adjustable for setting to remain open for any
49 desired period of time, from five minutes or less to at least 99 minutes.
50 2. Adjustments shall be provided whereby any number of days may be omitted
51 and whereby any one or more positions on the controller can be skipped.

- 1 When adjustments are made, they shall continue automatically within a 14-day
2 cycle until the operator desires to make new adjustments.
- 3 3. Controls shall allow any position to be operated manually, both on or off,
4 whenever desired, without disrupting the 14 day cycle.
- 5 4. Controls shall provide for resetting the start of the irrigation cycle at any time
6 and advancing from one position to another.
- 7 5. Controllers shall contain a power on-off switch and fuse assembly.
- 8 6. Output shall be 24 volt AC with battery back up for memory retention of the 14
9 day cycle.
- 10 7. Both normally-open or normally-closed rain sensor compatibility.

12 **9-15.4 Irrigation Heads**

13 This section is supplemented with the following new paragraph:

14
15 All instructions, special wrenches, clamps, tools, and equipment supplied by the
16 manufacturer necessary for the installation and maintenance of the irrigation heads
17 shall be turned over to the Engineer upon completion and acceptance of the project.

19 **9-15.5 Valve Boxes and Protective Sleeves**

20 This section including title is revised to read:

22 **9-15.5 Valve Boxes**

23 Valve boxes shall conform to the Plans and be extendible to obtain the depth required.
24 All manual drain valves and manual control valves shall be installed in valve box with a
25 vandal resistant lid as shown in the Plans.

27 **9-15.7(1) Manual Control Valves**

28 The third and fourth sentences are revised to read:

29
30 The Contractor shall furnish three suitable operating keys. Valves shall have removable
31 bonnet and stem assemblies with adjustable packing glands and shall house long acme
32 threaded stems to ensure full opening and closing.

34 **9-15.7(2) Automatic Control Valves**

35 In the second paragraph, the first and second sentences are revised to read:

36
37 Valves shall be of a normally closed design and shall be operated by an electronic
38 solenoid having a maximum rating of 6.5 watts utilizing 24 volt AC power. Electronic
39 solenoids shall have a stainless steel plunger and be directly attached to the valve
40 bonnets or body with all control parts fully encapsulated.

41
42 In the fifth sentence of the second paragraph, "electric" is revised to read "electrical".

44 **9-15.7(3) Automatic Control Valves With Pressure Regulator**

45 This section is revised to read:

46
47 Automatic control valves with pressure regulators shall be similar to automatic
48 control valves described in Section 9-15.7(2) and shall reduce the inlet pressure to
49 a constant pressure regardless of supply fluctuations. The regulator must be fully
50 adjustable.

51

9-15.8 Quick Coupling Equipment

In the first paragraph, the first and second sentences are revised to read:

Quick coupler valves shall have a service rating of not less than 125-psi for non-shock cold water. The body of the valves shall be of cast Copper Alloy No. C84400 Leaded Semi-Red Brass conforming to ASTM B 584.

In the fifth sentence of the first paragraph, "will" is revised to read "shall".

9-15.9 Drain Valves

This section is revised to read:

Drain valves may be a ½-inch or ¾-inch PVC or metal gate valve manufactured for irrigation systems. Valves shall be designed for underground installation with suitable cross wheel for operation with a standard key, and shall have a service rating of not less than 150-psi non-shock cold water. The Contractor shall furnish three standard operating keys per Contract. Drain valves shall be installed in a valve box with a vandal resistant lid as shown in the Plans.

Drain valves on potable water systems shall only be allowed on the downstream side of approved cross connection control devices.

9-15.10 Hose Bibs

The first sentence is revised to read:

Hose bibs shall be angle type, constructed of bronze or brass, threaded to accommodate a ¾-inch hose connection, and shall be key operated.

9-15.11 Cross Connection Control Devices

This section is revised to read:

Atmospheric vacuum breaker assemblies (AVBAs), pressure vacuum breaker assemblies (PVBAs), double check valve assemblies (DCVAs), and reduced pressure backflow devices (RPBDs), shall be of a manufacturer and product model approved for use by the Washington State Department of Health, Olympia, Washington or a Department of Health certified agency.

9-15.12 Check Valves

The last sentence is revised to read:

Valves shall have angled seats, Buna-N seals and threaded connections, and shall be installed in 8-inch round plastic valve boxes with vandal resistant lids.

9-15.14 Three-Way Valves

The last sentence is revised to read:

When handles are included as an integral part of the valves, the Contractor shall remove the handles and give them to the Engineer for ultimate distribution to the Maintenance Division.

1 **9-15.15 Flow Control Valves**

2 The third sentence is revised to read:

3

4 Valves shall be factory set to the flows as shown in the Plans.

5

6 **9-15.17 Electrical Wire and Splices**

7 This section is revised to read:

8

9 Electrical wire used between the automatic controller and automatic control valves shall
10 be solid or stranded copper, minimum size AWG 14. Insulation shall be Type USE
11 Chemically Cross Linked Polyethylene or Type UF, and shall be listed by a National
12 recognized Testing Laboratory. Each conductor shall be color coded and marked at
13 each end and at all splices with zone or station number identification.

14

15 Low voltage splices shall be made with a direct bury splice kit using a twist-on wire
16 connector and inserted in a waterproof polypropylene tube filled with a silicone electrical
17 insulating gel, or heat shrinkable insulating tubing. Heat shrinking insulating tubing shall
18 consist of a mastic lined heavy wall polyolefin cable sleeve.

19

20 **9-15.18 Detectable Marking Tape**

21 The first paragraph is revised to read:

22 Detectable marking tape shall consist of inert polyethylene plastic that is impervious to
23 all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the
24 soil, with a metallic foil core to provide for the most positive detection and pipeline
25 location.

26

27 In the second paragraph, the first and second sentences are revised to read:

28

29 The tape shall be color coded and shall be imprinted continuously over its entire length
30 in permanent black ink indicating the type of line buried below and shall also have the
31 word "Caution" prominently shown.

32

33 The last paragraph is revised to read:

34

35 The width of the tape shall be as recommended by the manufacturer based on depth of
36 installation.

37

38 **SECTION 9-16, FENCE AND GUARDRAIL**

39 **August 2, 2010**

40 **9-16.3(2) Posts and Blocks**

41 This section in its entirety is revised to read:

42

43 Posts and blocks may be of creosote, pentachlorophenol, waterborne chromate copper
44 arsenate (CCA), ammoniacal copper arsenate (ACA), or ammoniacal copper zinc
45 arsenate (ACZA), treated timber or galvanized steel (galvanized steel posts only –no
46 blocks). Blocks made from alternate materials that meet the NCHRP Report 350 or
47 MASH criteria may be used in accordance with the manufacturer's recommendations.
48 Wood posts and blocks may be surface four sides (S4S) or rough sawn.

49

50 Posts and blocks shall be of the size, length and type as shown in the Plans and meet
51 the requirements of the below Specifications.

Timber posts and blocks shall conform to the grade specified in Section 9-09.2. Timber posts and blocks shall be fabricated as specified in the Plans before being treated. Timber posts and blocks shall be treated by the empty cell process to provide a minimum retention, depending on the treatment used, according to the following:

Creosote oil	10.0	lbs. pcf
Pentachlorophenol	0.50	lbs. pcf
ACA	0.50	lbs. pcf
ACZA	0.50	lbs. pcf
CCA	0.50	lbs pcf

Treatment shall be in accordance with Section 9-09.3.

Galvanized steel posts, and base plates, where used, shall conform to either ASTM A36 or ASTM A992, and shall be galvanized in accordance with AASHTO M 111. Welding shall conform to Section 6-03.3(25). All fabrication shall be completed prior to galvanizing.

Steel posts for weathering steel beam guardrail shall be in accordance with one of the following two methods:

- 1 Galvanized Powder Coated Steel Posts: These posts shall conform to ASTM A36 or ASTM A992 and galvanized in accordance with AASHTO M 111. Powder Coating Galvanized Surfaces done in accordance with Sections: 6-07.3(11)B, 9-08.2. and 9-08.1(8). Only the top thirty inches on any post length shall be powder coated.
- 2 Galvanized Weathering Steel Posts: These posts shall conform to ASTM A588 steel and be galvanized in accordance with AASHTO M 111. Thirty inches, on any post length, shall not be galvanized for exposure above ground.

SECTION 9-22, MONUMENT CASES

January 4, 2010

9-22.1 Monument Cases, Covers, and Risers

In the first sentence, "Class 30B" is revised to read "Class 35B".

SECTION 9-23, CONCRETE CURING MATERIALS AND ADMIXTURES

August 2, 2010

9-23.1 Sheet Materials for Curing Concrete

In the first paragraph, "AASHTO M 171" is revised to read "ASTM C 171".

9-23.2 Liquid Membrane Forming Concrete Curing Compounds

The first paragraph is revised to read:

Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C 309 Type 1 or 2, Class A or B, except that the water retention when tested in accordance with WSDOT Test Method 814 shall be 2.50 grams for all applications.

1 **SECTION 9-29, ILLUMINATION, SIGNAL, ELECTRICAL**
2 **August 2, 2010**

3 In this division, all references to "hot-dipped" are revised to read "hot-dip".

4
5 **9-29.1(2)A Expansion Fittings, Deflection Fittings, and Combination**
6 **Expansion/Deflection Fittings**

7 The following new paragraph is inserted after the first paragraph:

8
9 Expansion fittings for use with PVC shall allow for 4-inches of movement minimum (2-
10 inches in each direction). Expansion fittings for PVC conduit shall be PVC and have
11 threaded terminal adaptor or coupling end and shall meet the requirements listed in
12 Section 9-29.1(4)A.

13
14 **9-29.4 Messenger Cable, Fittings**

15 This section is supplemented with the following:

16
17 Messenger cable shall be ¾-inch, 7-wire strand messenger cables conforming to ASTM
18 A 475, extra-high-strength grade, 15,400 pounds minimum breaking strength, Class A
19 galvanized.

20
21 Strain insulators shall be wet process, porcelain, conforming to EEI-NEMA Class 54-2
22 standards for 12,000 pound ultimate strength.

23
24 Down guy assembly shall consist of an eight-way steel expanding anchor, having a
25 minimum area of 300 square inches, made of pressed steel, coated with asphalt or
26 similar preservative, and fitted with a ¾-inch minimum guy eye anchor rod 8-feet long.
27 As an alternate to expanding anchors, screw type anchors with two 8-inch helix, 3½-
28 inch-pitch, 1-inch by 7 foot guy anchor rod, and rated for 7,000 pound maximum torque
29 may be installed.

30
31 All pole hardware, bolts, plate rods, hangers, clips, wire guards, and pole bands shall be
32 hot-dipped galvanized in conformance with the requirements of AASHTO M 232.

33
34 **9-29.6(5) Foundation Hardware**

35 The first paragraph is revised to read:

36
37 Anchor bolts for Type PPB, PS, I, FB, and RM signal standards shall conform to the
38 requirements of ASTM F1554, grade 55. Nuts shall meet the requirements of AASHTO
39 M 291, grade A. Washers shall meet the requirements of ASTM F 844 or ASTM F 436.

40
41 **9-29.7 Luminaire Fusing and Electrical Connections at Light Standard Bases,**
42 **Cantilever Bases and Sign Bridge Bases**

43 The content of this section is revised and moved to the following new sub-sections:

44
45 **9-29.7(1) Unfused Quick-Disconnect**

46 Unfused quick-disconnect connector kits shall conform to the following requirements:

- 47
48 1. The copper pin and copper receptacle shall be a crimped type of connection or
49 a stainless steel set screw and lug connection to the cable. The receptacle
50 shall establish contact pressure with the pin through the use of a tinned copper

or copper beryllium sleeve spring and shall be equipped with a disposable mounting pin. The receptacle shall be fully annealed. Both the copper pin and receptacle shall have a centrally located recessed locking area adapted to be complementarily filled and retained by the rubber housing.

2. The plug and receptacle housing shall be made of water resistant synthetic rubber which is capable of burial in the ground or installation in sunlight. Each housing shall provide a section to form a water-seal around the cable, have an interior arrangement to suitably and complementarily receive and retain the copper pin or receptacle, and a section to provide a water-seal between the two housings at the point of disconnection.
3. The kit shall provide waterproof in-line connector protection with three cutoff sections on both the line and load side to accommodate various wire sizes. All connections shall be as described in item "1" above. Upon disconnect, the connector shall remain in the load side of the kit.

9-29.7(2) Fused Quick-Disconnect

Fused quick-disconnect kits shall provide waterproof in-line fuse protection. The kit shall provide three cutoff sections on both lines and load side to accommodate various wire sizes. All connections shall be as described in item "1" above. Upon disconnect, the fuse shall remain in the load side of the kit.

Fuses furnished for all lighting circuits shall be capable of handling the operating voltage of the circuit involved and shall have the following characteristics:

1. Fuses shall be capable of indefinitely supporting 110 percent of the rated load.
2. Fuses shall be capable of supporting 135 percent of the rated load for approximately 1 hour.
3. A load of 200 percent of rated load shall effectively cause instantaneous blowing of the fuse.
4. Fuses shall be rated as listed below and shall be sized to fit the fuse containers furnished on this project, according to the manufacturer's recommendations therefore.
5. Fuses shall be listed by a nationally recognized testing laboratory.

Luminaire Size	Service Voltage		
	480V	240V	120V
1,000W	10A	15A	30A
750W	5A	10A	20A
700W	5A	10A	20A
400W	5A	10A	15A
310W	5A	5A	10A
250W	5A	5A	10A
200W	4A	5A	10A
175W	4A	5A	10A
150W	3A	4A	5A

100W	2A	3A	4A
70W	2A	2A	2A
50W	2A	2A	2A

9-29.9 Ballast, Transformers

This sections content is deleted and replaced with:

Heat-generating components shall be mounted to use the portion of the luminaire upon which they are mounted as a heat sink. Capacitors shall be located as far as practicable from heat-generating components or shall be thermally shielded to limit the fixture temperature to 160°F.

Transformers and inductors shall be resin-impregnated for protection against moisture. Capacitors, except those in starting aids, shall be metal cased and hermetically sealed.

No capacitor, transformer, or other device shall employ the class of compounds identified as polychlorinated biphenyls (PCB) as dielectric, coolants, or for any other purpose.

This section is supplemented with the following new sub-sections:

9-29.9(1) Ballast

Each ballast shall have a name plate attached permanently to the case listing all electrical data.

A Manufacturer's Certificate of Compliance in accordance with Section 1-06.3 meeting the manufacturers and these Specification requirements, shall be submitted by the Contractor with each type of luminaire ballast.

Ballasts shall be designed for continuous operation at ambient air temperatures from 20°F without reduction in ballast life. Ballasts shall have a design life of not less than 100,000 hours. Ballasts shall be designed to operate for at least 180 cycles of 12 hours on and 12 hours off, with the lamp circuit in an open or short-circuited condition and without measurable reduction in the operating requirements. All ballasts shall be high power factor (90%).

Ballasts shall be tested in accordance with the requirements of current ANSI C 82.6, Methods of Measurement of High-Intensity-Discharge Lamp Ballasts. Starting aids for ballasts of a given lamp wattage shall be interchangeable between ballasts of the same wattage and manufacturer without adjustment.

Ballast assemblies shall consist of separate components, each of which shall be capable of being easily replaced. A starting aid will be considered as a single component. Each component shall be provided with screw terminals, NEMA tab connectors or a single multi-circuit connector. All conductor terminals shall be identified as to the component terminal to which they connect.

Ballasts for high-pressure sodium lamps shall have a ballast characteristic curve which will intersect both of the lamp-voltage limit lines between the wattage limit lines and remain between the wattage limit lines throughout the full range of lamp voltage. This requirement shall be met not only at the rated input voltage of the ballast, but also the

lowest and highest input voltage for which the ballast is rated. Throughout the lifetime of the lamp, the ballast curve shall fall within the specified limits of lamp voltage and wattage.

All luminaires ballasts shall be located within the luminaire housing. The only exception shall be ballasts to be mounted on lowering assemblies and shall be external to, and attached to the fixture assembly.

Ballast Characteristics for High Pressure Sodium (HPS) and Metal Halide (MH) Sources shall be:

Source	Line Volt.	Lamp Wattage	Ballast Type	Input Voltage Variation	Lamp Wattage Variation
HPS	any	70 400	Mag. Reg. Lag	10%	18%
HPS	any	750 1000	Auto Reg. Lead CWA	10%	30%
MH	any	175 400	Mag. Reg. Lag	10%	18%
MH	any	1000	Auto Reg. Lead CWA	10%	30%

9-29.9(2) Transformers

The transformers to be furnished shall be indoor/outdoor dry type transformers rated as shown in the Plans. The transformer coils, buss bar, and all connections shall be copper. Transformers, 7.5 KVA and larger shall be supplied with two full capacity taps, one at 5% and one at 10% below the normal full capacity.

9-29.10 Luminaires

This section is revised to read:

All luminaires shall have their components secured to the luminaire frame with ANSI, 300 series chrome-nickel grade stainless steel, zinc dichromate coated steel or ceramic coated steel hardware. The luminaire slip-fitter bolts shall be either stainless steel, hot-dip galvanized steel, zinc dichromate coated steel, or ceramic coated steel. All internal luminaire assemblies shall be assembled on or fabricated from either stainless steel or galvanized steel. The housing, complete with integral ballast, shall be weathertight.

The temperature rating of all wiring internal to the luminaire housing, excluding the pole and bracket cable, shall equal or exceed 200°F .

All luminaires shall be provided with markers for positive identification of light source type and wattage. Markers shall be 3-inches square with Gothic bold, black 2-inch legend on colored background. Background color shall be gold for high pressure sodium, and red for metal halide light sources. Legends shall be sealed with transparent film resistant to dust, weather, and ultraviolet exposure.

Legends shall correspond to the following code:

Lamp	Wattage Legend
70	7
100	10
150	15
175	17
200	20
250	25
310	31
400	40
700	70
750	75
1,000	XI

9-29.10(1) Cobra Head Luminaires

This sections content including title is revised to read:

9-29.10(1) Conventional Roadway Luminaires

- A. Conventional highway luminaires shall be IES Type III medium distribution cut off cobra head configuration with horizontal lamp, rated at 24,000 hours minimum.
 - B. The ballast shall be mounted on a separate exterior door, which shall be hinged to the luminaire and secured in the closed position to the luminaire housing by means of an automatic type of latch (a combination hex/slot stainless steel screw fastener may supplement the automatic type latch).
 - C. The reflector of all luminaires shall be of a snap-in design or be secured with screws. The reflector shall be manufactured of polished aluminum or molded from prismatically formed borosilicate glass. The refractor or lens shall be mounted in a doorframe assembly which shall be hinged to the luminaire and secured in the closed position to the luminaire by means of automatic latch. The refractor or lens and doorframe assembly, when closed, shall exert pressure against a gasket seat. The refractor lens shall not allow any light output above 90 degrees nadir. Gaskets shall be composed of material capable of withstanding temperatures involved and shall be securely held in place.
 - D. Each housing shall be provided with a four bolt slipfitter capable of mounting on a 2-inch pipe tenon and capable of being adjusted within 5 degrees from the axis of the tenon. The clamping bracket(s) and the cap screws of the slipfitter shall not bottom out on the housing bosses when adjusted within the ± 5 degree range.
- No part of the slipfitter mounting brackets on the luminaires shall develop a permanent set in excess of 0.2-inch when the cap screws used for mounting are tightened to a torque of 32 pounds feet.
- E. Refractors shall be formed from heat resistant, high impact, molded borosilicate glass. Flat lens shall be formed from heat resistant, high impact borosilicate or tempered glass.
 - F. High pressure sodium conventional roadway luminaires shall be capable of accepting a 150, 200, 250, 310, or 400 watt lamp complete with ballast.

- 1
2 G. Housings shall be fabricated from aluminum. Painted housings shall be painted flat
3 gray, Federal Standard 595 color chip No. 26280. Housings that are painted shall
4 withstand a 1,000-hour salt spray test as specified in ASTM B 117.
5
6 H. All luminaires to be mounted on horizontal mast arms, shall be capable of
7 withstanding cyclic loading in:
8
9 1. A vertical plane at a minimum peak acceleration level of 3.0 g's peak-to-peak
10 sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed, for
11 a minimum of 2 million cycles without failure of any luminaire parts, and;
12
13 2. A horizontal plane perpendicular to the direction of the mast arm at a minimum
14 peak acceleration level of 1.5 g's peak to peak sinusoidal loading (same as
15 0.75 g's peak) with the internal ballast installed, for a minimum of 2 million
16 cycles without failure of any luminaire parts.
17
18 I. All luminaires shall have leveling reference points for both transverse and
19 longitudinal adjustment. Luminaires shall have slip-fitters capable of adjusting
20 through a 5-degree axis for the required leveling procedure.
21

22 **9-29.10(2) Decorative Luminaires**

23 In the first paragraph, "150 - 400" is revised to read "50 - 400".
24

25 In the second paragraph, "box shaped" is deleted.
26

27 In the third paragraph, the first sentence is deleted. The second sentence is revised to read:
28

29 The ballast housing shall be adequately constructed to contain ballasts for 50 - 400 watt
30 alternate high intensity discharge sources.
31

32 The fourth paragraph is revised to read:
33

34 Each housing shall consist of an integral reflector, containing a mogul based high
35 intensity discharge lamp, and a one piece heat and shock resistant, clear tempered lens
36 mounted in a gasketed, hinged frame. The reflector shall be a snap-in design or secured
37 with screws. The reflector assembly shall have a lamp vibration damper. The reflector
38 shall be manufactured of polished aluminum or molded from prismatically formed
39 borosilicate glass. The housing shall have a heat resistant finish. The lens frame shall
40 be secured to the housing with ANSI, 300 series chrome-nickel grade stainless steel,
41 zinc dichromate coated steel or ceramic coated steel hardware.
42

43 The last sentence in the fifth paragraph is deleted.
44

45 The sixth paragraph is deleted.
46

47 The seventh paragraph is revised to read:
48

49 The finish shall meet the requirements of ASTM B 117 with the exception that the finish
50 shall be salt spray resistant after 300 hours exposure .
51

52 The first sentence in the eight paragraph is deleted.

1
2 **9-29.10(3) High Mast Luminaires and Post Top Luminaires**

3 This sections content including title is deleted and replaced with:
4

5 **9-29.10(3) Vacant**
6

7 **9-29.10(5) Sign Lighting Luminaires**

8 This section is revised to read:
9

10 Sign lighting luminaires shall be the Induction Bulb type.
11

12 **9-29.10(5)A Sign Lighting Luminaires - Mercury Vapor**

13 This section including title is revised to read:
14

15 **9-29.10(5)A Sign Lighting Luminaires – Isolation Switch**

16 The isolation switch shall be installed in a terminal cabinet in accordance with Section 9-
17 29.25 with the exception that the cabinet shall be NEMA 3R and stainless steel. The
18 terminal cabinet shall be installed in accordance to the Standard Plans. The switch shall
19 be either single pole, single throw, or double pole single throw as necessary to open all
20 conductors to the luminaires other than neutral and ground conductors. The switch shall
21 contain 600 volt alternating current (VAC) terminal strips on the load side with solderless
22 lugs as required for each load carrying conductor plus four spare lugs per strip.
23

24 **9-29.10(5)B Sign Lighting Fixtures - Induction**

25 The first sentence is revised to read:
26

27 Sign lighting luminaires shall have a cast aluminum housing and door assembly with a
28 polyester paint finish.
29

30 In the second sentence of the sixth paragraph, "87" is revised to read "85".
31

32 In the last sentence of the sixth paragraph, "Class a" is revised to read "Class A".
33

34 The first sentence of the last paragraph is revised to read:
35

36 A Manufacturer's Certificate of Compliance, conforming to Section 1-06.3
37 "Manufacturer's Certificates of Compliance" and a copy of the high frequency generator
38 test methods and results shall be submitted by the manufacturer with each lot of sign
39 lighting fixtures.
40

41 **9-29.12 Electrical Splice Materials**

42 This section is revised to read:
43

44 Circuit splicing materials shall meet the following specifications.
45

46 **9-29.12(1) Illumination Circuit Splices**

47 This section is revised to read:
48

49 Illumination circuit splices shall be split bolt vice type connectors or solderless crimped
50 connections to securely join the wires both mechanically and electrically as defined in
51 Section 8-20.3(8).

This section is supplemented with the following new sub-sections:

9-29.12(1)A Heat Shrink Splice Enclosure

Heat shrink insulating materials shall be the moisture blocking mastic type meeting Mil Spec I 230053

9-29.12(1)B Molded Splice Enclosure

Epoxy resin cast type insulation shall employ a clear rigid plastic mold or a clear mylar sheet bonded to butyrate webbing forming a flexible mold. The material used shall be compatible with the insulation material of the insulated conductor or cable. The component materials of the resin insulation shall be packaged ready for convenient mixing without removing from the package.

9-29.12(2) Traffic Signal Splice Material

This section is revised to read:

Induction loop splices and magnetometer splices shall include an uninsulated barrel type crimped connector capable of being soldered. The insulating material shall be a heat shrink type meeting requirements of Section 9-29.12(1)A, an epoxy resin cast type with clear rigid plastic mold meeting the requirements of Section 9-29.12(1)B, or a re-enterable type with silicone type filling compound that remains flexible and enclosed in a re-enterable rigid mold that snaps together.

9-29.15 Flashing Beacon Control

In the first paragraph, the first word "Flashers" is revised to read "Line voltage flashers".

9-29.16 Vehicular Signal Heads

This sections title is revised to read:

9-29.16 Vehicular Signal Heads, Displays and Housing

The first sentence is revised to read:

Each signal head shall be of the adjustable, vertical type with the number and type of displays detailed in the Contract; shall provide an indication in one direction only; shall be adjustable through 360 degrees about a vertical axis; and shall be mounted at the location and in the manner shown in the Plans.

This following new paragraph is inserted after the first paragraph:

Back plates shall be constructed of 5-inch wide .050-inch thick corrosion resistant flat black finish, louvered aluminum or polycarbonate attached with stainless steel hardware. A 1-inch wide strip of yellow retro reflective, type IV prismatic sheeting, in accordance with Section 9-28.12, shall be applied around the perimeter of each backplate.

9-29.16(1) Optically Programmed, Adjustable Face, 12-inch Traffic Signal

This section including title is revised to read:

1 **9-29.16(1) Optically Programmed Adjustable Face, and Programmable,**
2 **Array 12-inch Traffic Signal**

3 The signal shall permit the visibility zone of the indication to be determined optically and
4 require no hoods or louvers. The projected indication may be selectively visible or veiled
5 anywhere within the optical axis. No indication shall result from external illumination, nor
6 shall one light unit illuminate a second. The display shall operate from 85 VAC to 130
7 VAC.

8
9 **9-29.16(1)A Optical Systems**

10 The following new title is inserted above the first paragraph:

11
12 **9-29.16(1)A1 Conventional Optical System**

13
14 This section is supplemented with the following new sub-section:

15
16 **9-29.16(1)A2 LED Programmable Array**

- 17 1. LED array with programmable visibility from a portable hand held device from
18 ground level,
19
20 2. Lens shall be clear, unless color lenses specified.

21
22 The LED array shall be 22 watt maximum and shall operate directly from 120 volt AC.

23
24 The LED array shall provide an accessible imaging surface at focus on the optical axis
25 for objects 900 to 1,200-feet distant, and permit an effective veiling mask to be variously
26 applied as determined by the desired visibility zone.

27
28 The optical system shall accommodate projection of diverse, selected indicia to
29 separate portions of the roadway such that only one indication will be simultaneously
30 apparent to any viewer after optically limiting procedures have been accomplished. The
31 projected indication shall conform to ITE transmittance and chromaticity standards.

32
33 **9-29.16(1)B Construction**

34 The title for this section is revised to read:

35
36 **9-29.16(1)B Housing Construction**

37
38 The fourth paragraph is deleted.

39
40 **9-29.16(1)D Electrical**

41 The title for this section is revised to read:

42
43 **9-29.16(1)D Housing Electrical**

44
45 The following new title is inserted above the first paragraph:

46
47 **9-29.16(1)D1 Electrical Conventional**

48
49 This section is supplemented with the following new sub-section:

1 **9-29.16(1)D2 Electrical LED**

2 The LED array shall be accessible from the front of the housing. Each multi section
3 assembly shall include a terminal block for clip or screw attachment of lead wires.
4

5 **9-29.16(1)E Photo Controls**

6 The following new title is inserted above the first paragraph:
7

8 **9-29.16(1)E1 Conventional Photo Controls**

9
10 This section is supplemented with the following new sub-section:
11

12 **9-29.16(1)E2 LED Photo Controls**

13 Each signal section shall include integral means for automatically regulating the display
14 intensity for day and night operation.
15

16 **9-29.16(2)A Optical Units**

17 This section is revised to read as follows:
18

19 Light Emitting Diode (LED) light sources are required for all displays. The Contractor
20 shall provide test results from a Nationally Recognized Testing Laboratory documenting
21 that the LED display conforms to the current ITE Specification for; Vehicle Traffic Control
22 Signal Heads, Light Emitting Diode Circular Signal Supplement VTCSH ST-052 or
23 Vehicle Traffic Signal Heads, Light Emitting Diode Vehicle Arrow Traffic Signal
24 Supplement ITE VTSCS ST-054, and the following requirements:
25

- 26 1. The LED traffic signal module shall be operationally compatible with controllers
27 and conflict monitors on this project and the LED lamp unit shall contain a
28 disconnect that will show an open switch to the conflict monitor when less than
29 60% of the LEDs in the unit are operational.
30
- 31 2. LED shall have a 50 degree min. viewing angle and the following:
32
- 33 3. Wattage (Maximum): 12-inch red, yellow and green ball displays - 25 W 12-
34 inch red, yellow and green arrow displays - 15W 8-inch red, yellow and green
35 ball displays - 15W
36
- 37 4. Voltage: The operation voltages shall be between 85 VAC and 130VAC.
38
- 39 5. The LED display shall be a module type and shall replace the lens, socket,
40 bail, reflector and be directly connected to the terminal strip in the signal head.
41
- 42 6. Label: Each optical unit shall be listed by and bear the label of a nationally
43 recognized testing laboratory. In addition, the manufacturer's name,
44 trademark, serial number and other necessary identification shall be
45 permanently marked on the backside of the LED signal module and the
46 installation date shall be indicated on a separate label with an indelible ink
47 marker.
48

49 **9-29.16(2)B Signal Housing**

50 The first sentence in the first paragraph is revised to read:
51

1 The signal head housing, or case, shall consist of an assembly of separate sections,
2 expandable type for vertical mounting, substantially secured together in a weathertight
3 manner.
4

5 In the third paragraph "may" is revised to read "shall".
6

7 **9-29.16(2)D Back Plates**

8 This section's content including title is deleted and replaced with:
9

10 **9-29.16(2)D Vacant**
11

12 **9-29.16(2)E Painting Signal Heads**

13 In the first sentence "Federal Standard 595B" is revised to read "Federal Standard 595-
14 14056".
15

16 **9-29.16(3) Polycarbonate Traffic Signal Heads**

17 This section is supplemented with the following paragraph:
18

19 Polycarbonate employed in traffic signal fabrication shall tolerate an elongation prior to
20 break in excess of 90 percent. The green color shall be molded throughout the head
21 assembly. The optical system shall be Light Emitting Diodes as defined in 9-29.16(2)A.
22 The entire optical system shall be sealed by a single neoprene gasket. The signal head
23 shall be formed to be used with standard signal head mounting accessories as shown in
24 9-29.17. All hinge pins, latch assemblies and reflector assemblies shall conform to 9-
25 29.16(2)B.
26

27 **9-29.16(3)A 8-inch Polycarbonate Traffic Signal Heads**

28 This section and title are deleted.
29

30 **9-29.16(3)B 12-inch Polycarbonate Traffic Signal Heads**

31 This section and title are deleted.
32

33 Section 9-29.16 is supplemented with the following new sub-section:
34

35 **9-29.16(4) Traffic Signal Cover**

36 The covers shall be manufactured from a durable fabric material, black in color with a
37 mesh front and designed to fit the signal head configuration properly. The covers shall
38 have an attachment method that will hold the cover securely to the signal in heavy wind.
39 The covers shall be provided with a drain to expel any accumulated water.
40

41 **9-29.18 Vehicle Detector**

42 The first paragraph is revised to read:
43

44 Induction loop detectors and magnetometer detectors shall comply with current NEMA
45 Specifications when installed with NEMA control assemblies and shall comply with the
46 current California Department of Transportation document entitled "Transportation
47 Electrical Equipment Specifications," specified in Section 9-29.13(7) when installed with
48 Type 170, Type 2070 or NEMA control assemblies.
49

50 **9-29.19 Pedestrian Push Buttons**

51 This section is revised to read:

Where noted in the Contract, pedestrian push buttons of tamper-resistant construction shall be furnished and installed. They shall consist of a 2-inch nominal diameter plunger. The switch shall be a three bladed beryllium copper spring rated at 10 amperes, 125 volts.

The pedestrian push-button assembly shall be constructed and mounted as detailed in the Contract.

9-29.25 Amplifier, Transformer, and Terminal Cabinets

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

Amplifier and terminal cabinets shall conform to NEMA 4 requirements. Transformer cabinets shall be NEMA 3R.

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

3. Cabinet doors shall have a stainless steel piano hinge or shall meet the requirements for the alternate hinge detailed for type B modified service cabinets. Doors less than 3 feet in height shall have two hinges. Doors from 3 feet to 4 feet 8 inches in height shall have 3 hinges. Spacing of hinges for doors greater than 4 feet 8 inches in height shall not exceed 14 inches center to center. The door shall also be provided with a three point latch and a spring loaded construction core lock capable of accepting a Best six pin CX series core. The locking mechanism shall provide a tapered bolt. The Contractor shall supply construction cores with two master keys. The keys shall be delivered to the Engineer. Three point latches are not required for terminal cabinets.

SECTION 9-30, WATER DISTRIBUTION MATERIALS

January 4, 2010

9-30.1(1) Ductile Iron Pipe

In the first paragraph, number 1. and 2. are revised to read:

1. Ductile iron pipe shall meet the requirements of AWWA C151. Ductile iron pipe shall have a cement mortar lining, and a 1 mil thick seal coat meeting the requirements of AWWA C104. Ductile iron pipe to be joined using bolted flanged joints shall be Special Thickness Class 53. All other ductile iron pipe shall be Special Thickness Class 50, minimum Pressure Class 350, or the class indicated on the Plans or in the Special Provisions.
2. Nonrestrained joints shall be either rubber gasket type, push on type, or mechanical type meeting the requirements of AWWA C111.

9-30.1(2) Polyethylene Encasement

This section is revised to read:

Polyethylene encasement shall be tube-form, high density cross-laminated polyethylene film, or linear low density polyethylene film, meeting the requirements of ANSI/AWWA C105. Color shall be natural or black.

SECTION 9-33, CONSTRUCTION GEOSYNTHETIC

April 5, 2010

9-33.4(3) Acceptance Samples

The third paragraph is revised to read:

Samples from the geosynthetic roll will be taken to confirm the material meets the property values specified. Samples will be randomly taken at the job site by the Contractor in accordance with WSDOT T 914 in the presence of the Project Engineer.

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

For each geosynthetic roll that is tested and fails the Project Engineer will select two additional rolls from the same lot for sampling and retesting. The Contractor shall sample the rolls in accordance with WSDOT T 914 in the presence of the Project Engineer.

SECTION 9-35, TEMPORARY TRAFFIC CONTROL MATERIALS

January 4, 2010

9-35.0 General Requirements

In the first paragraph, the item "Truck Mounted Attenuator" is revised to read "Transportable Attenuator".

In the second paragraph, the third sentence is revised to read:

Unless otherwise noted, Requests for Approval of Material (RAM) and Qualified Products List (QPL) submittals are not required.

9-35.12 Truck-Mounted Attenuator

This section including title is revised to read:

9-35.12 Transportable Attenuator

Transportable attenuators are Truck-Mounted Attenuators (TMA) or Trailer-Mounted Attenuators (TMA-trailer). The transportable attenuator shall be mounted on, or attached to a host vehicle with a minimum weight of 15,000 pounds and a maximum weight in accordance with the manufacturer's recommendations. Ballast used to obtain the minimum weight requirement, or any other object that is placed on the vehicle shall be securely anchored such that it will be retained on the vehicle during an impact. The Contractor shall provide certification that the transportable attenuator complies with NCHRP 350 Test level 3 requirements. Lighter host vehicles proposed by the Contractor are subject to the approval of the Engineer. The Contractor shall provide the Engineer with roll-ahead distance calculations and crash test reports illustrating that the proposed host vehicle is appropriate for the attenuator and the site conditions.

The transportable attenuator shall have a chevron pattern on the rear of the unit. The standard chevron pattern shall consist of 4-inch yellow stripes, alternating non-reflective black and retro-reflective yellow sheeting, slanted at 45 degrees in an inverted "V" with the "V" at the center of the unit.

This section is supplemented with the following new sub-sections:

1 **9-35.12(1) Truck-Mounted Attenuator**

2 The TMA may be selected from the approved units listed on the QPL or submitted using
3 a RAM.

4
5 The TMA shall have an adjustable height so that it can be placed at the correct elevation
6 during usage and to a safe height for transporting. If needed, the Contractor shall install
7 additional lights to provide fully visible brake lights at all times.
8

9 **9-35.12(2) Trailer-Mounted Attenuator**

10 The TMA-trailer may be selected from the approved units listed on the QPL or submitted
11 using a RAM.
12

13 If needed, the Contractor shall install additional lights to provide fully visible brake lights
14 at all times.
15

16 **9-35.12(3) Submittal Requirements**

17 For transportable attenuators listed on the QPL, the Contractor shall submit the QPL
18 printed page or a QPL Acceptance Code entered on the RAM (WSDOT Form 350-
19 071EF) for the product proposed for use to the Engineer for approval. The Contractor
20 shall submit a RAM for transportable attenuators not listed on the QPL.
21
22

SPECIAL PROVISIONS

The following Special Provisions are made a part of this contract and supersede any conflicting provisions of the 2010 Standard Specifications for Road, Bridge and Municipal Construction, and the foregoing Amendments to the Standard Specifications.

Several types of Special Provisions are included in this contract; General, Region, Bridges and Structures, and Project Specific. Special Provisions types are differentiated as follows:

(date)	General Special Provision
(*****)	Notes a revision to a General Special Provision and also notes a Project Specific Special Provision.
(Regions ¹ date)	Region Special Provision
(BSP date)	Bridges and Structures Special Provision

General Special Provisions are similar to Standard Specifications in that they typically apply to many projects, usually in more than one Region. Usually, the only difference from one project to another is the inclusion of variable project data, inserted as a "fill-in".

Region Special Provisions are commonly applicable within the designated Region. Region designations are as follows:

<u>Regions¹</u>	
ER	Eastern Region
NCR	North Central Region
NWR	Northwest Region
OR	Olympic Region
SCR	South Central Region
SWR	Southwest Region
WSF	Washington State Ferries Division

Bridges and Structures Special Provisions are similar to Standard Specifications in that they typically apply to many projects, usually in more than one Region. Usually, the only difference from one project to another is the inclusion of variable project data, inserted as a "fill-in".

Project Specific Special Provisions normally appear only in the contract for which they were developed.

DIVISION 1 GENERAL REQUIREMENTS

DESCRIPTION OF WORK

(March 13, 1995)

This contract provides for the improvement of *** 0.46 miles of US 12, MP 46.37 to MP 46.83 and 8.64 miles of Interstate 5, MP 87.42 to MP 97.09, in Thurston County, Grand Mound to Maytown Stage Two - Replace Interchange, by clearing and grubbing, grading, drainage, surfacing, paving with HMA, replacing Bridge No. 12/117 and 12/118, constructing retaining walls, illumination system, temporary signal, and intelligent transportation system (ITS) ***

1 and other work, all in accordance with the attached Contract Plans, these Contract
2 Provisions, and the Standard Specifications.

3 4 **BID PROCEDURES AND CONDITIONS**

5
6 **(March 13, 1995)**

7 **Examination Of Plans, Specifications And Site Of Work**

8 Section 1-02.4 is supplemented with the following:

9
10 The soils information used for study and design of this project is available for review by
11 the bidder at the following address:

12
13 ***

14 Marylou Nebergall, Project Engineer
15 821 Airport Court SE
16 Tumwater, WA 98501
17 (360) 570-6750 ***
18

19 **Preparation Of Proposal**

20
21 Section 1-02.6 is supplemented with the following:

22
23 (August 7, 2006)

24 A minimum bid of *** \$25,000 *** lump sum has been established for the item "Type ***
25 B *** Progress Schedule." The Contractor's bid shall equal or exceed that amount. If
26 the Contractor's bid is less than the minimum specified amount, the Contracting Agency
27 will unilaterally revise the bid amount to the minimum specified amount and recalculate
28 the Contractor's total bid amount. The corrected total bid amount will be used by the
29 Contracting Agency for award purposes and to fix the amount of the contract bond.
30

31 **(October 12, 2009)**

32 **Public Opening Of Proposal**

33 Section 1-02.12 is supplemented with the following:

34 35 ***Date Of Opening Bids***

36 Sealed bids are to be received at one of the following locations prior to the time
37 Specified:

- 38
39 1. At Post Office Box 47360, Olympia, Washington 98504-7360 until 11:00:59
40 A.M. of the bid opening date. The Department of Transportation will consider
41 notification of bid receipt by the Post Office as the actual receipt of the bid.
42
- 43 2. In the Department of Transportation Bid Room (SA19), located at the
44 Transportation Building, 310 Maple Park Avenue SE, Room SA19, Olympia
45 WA 98501-2361, until 11:00:59 A.M. of the bid opening date. Bids delivered in
46 person will be received only in the Bid Room SA19 on the bid opening date.
47
- 48 3. Electronically via Expedite software and BidX.com, until 11:00:59 am Pacific
49 time. Bids delivered in person or electronically via Expedite software and
50 BidX.com will be received only in the Bid Room on the bid opening date.
51

The bid opening date for this project is Wednesday, September 29, 2010.
Bids received will be publicly opened and read after 11:00:59 A. M. on this date.

CONTROL OF WORK

(August 2, 2004)

Plans And Working Drawings

Section 1-05.3 is supplemented with the following:

When submittals require review by the railroad, the Engineer will require up to 60 calendar days from the date the submittals are received until they are returned to the Contractor. If a submittal is returned unapproved and then resubmitted, then an additional review time of up to 60 calendar days will be required.

If more than 60 calendar days are required for the Engineer's review of any individual submittal or resubmittal, an extension of time will be considered in accordance with Section 1-08.8.

(***)**

60 days in advance of the US-12 closure event the contractor shall supply to the engineer a plan for the US-12 closure event.

At a minimum the plan shall include the following:

1. A comprehensive list of operational and back-up equipment to ensure the work will be completed within the specified window as well as how the work will be staged. The plan shall demonstrate that backup asphalt paving equipment is available to be used on site within one hour of any breakdown of the primary equipment.
2. An approved alternate asphalt source with approved materials and asphalt mix designs. The alternate asphalt source shall be available to produce asphalt within one hour in the event the primary source becomes unavailable during the work.
3. Detailed Construction Schedule of work activities. The schedule shall detail the work in one hour increments for entire duration of the US-12 closure event.
4. A Job Site Access Plan which will show the lane or ramp closures, haul routes and site access.
5. An Emergency Access Plan which will clearly identify how emergency vehicles will be routed through the work area.

Conformity With And Deviations From Plans And Stakes

Section 1-05.4 is supplemented with the following:

(***)**

Contractor Surveying - Structure

Copies of the Contracting Agency provided primary survey control data are available for the bidder's inspection at the office of the Project Engineer.

1
2 The Contractor shall be responsible for setting, maintaining, and resetting all alignment
3 stakes, slope stakes, and grades necessary for the construction of bridges, noise walls,
4 and retaining walls. Except for the survey control data to be furnished by the
5 Contracting Agency, calculations, surveying, and measuring required for setting and
6 maintaining the necessary lines and grades shall be the Contractor's responsibility.
7

8 Detailed survey records shall be maintained, including a description of the work
9 performed on each shift, the methods utilized, and the control points used. The record
10 shall be adequate to allow the survey to be reproduced. A copy of each day's record
11 shall be provided to the Engineer within three working days after the end of the shift.
12

13 The meaning of words and terms used in this provision shall be as listed in "Definitions
14 of Surveying and Associated Terms" current edition, published by the American
15 Congress on Surveying and Mapping and the American Society of Civil Engineers.
16

17 The survey work by the Contractor shall include but not be limited to the following:
18

- 19 1. Verify the primary horizontal and vertical control furnished by the Contracting
20 Agency, and expand into secondary control by adding stakes and hubs as well
21 as additional survey control needed for the project. Provide descriptions of
22 secondary control to the Contracting Agency. The description shall include
23 coordinates and elevations of all secondary control points.
24
- 25 2. Establish, by placing hubs and/or marked stakes, the location with offsets of
26 foundation shafts and piles.
27
- 28 3. Establish offsets to footing centerline of bearing for structure excavation.
29
- 30 4. Establish offsets to footing centerline of bearing for footing forms.
31
- 32 5. Establish wing wall, retaining wall, and noise wall horizontal alignment.
33
- 34 6. Establish retaining wall top of wall profile grade.
35
- 36 7. Establish elevation benchmarks for all substructure formwork.
37
- 38 8. Check elevations at top of footing concrete line inside footing formwork
39 immediately prior to concrete placement.
40
- 41 9. Check column location and pier centerline of bearing at top of footing
42 immediately prior to concrete placement.
43
- 44 10. Establish location and plumbness of column forms, and monitor column
45 plumbness during concrete placement.
46
- 47 11. Establish pier cap and crossbeam top and bottom elevations and centerline of
48 bearing.
49
- 50 12. Check pier cap and crossbeam top and bottom elevations and centerline of
51 bearing prior to and during concrete placement.
52

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- 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.

To facilitate the establishment of these lines and elevations, the Contracting Agency will provide the Contractor with the following primary survey and control information:

- 1. Descriptions of two primary control points used for the horizontal and vertical control. Primary control points will be described by reference to the project alignment and the coordinate system and elevation datum utilized by the project. In addition, the Contracting Agency will supply horizontal coordinates for the beginning and ending points and for each Point of Intersection (PI) on each alignment included in the project.
- 2. Horizontal coordinates for the centerline of each bridge pier.
- 3. Computed elevations at top of bridge roadway decks at one-tenth points along centerline of each girder web. All form grades and other working grades shall be calculated by the Contractor.

The Contractor shall give the Contracting Agency three weeks notification to allow adequate time to provide the data outlined in Items 2 and 3 above.

The Contractor shall ensure a surveying accuracy for the placement for Br. No. 12/118 Repl. Pier No. 2 footing, columns, and crossbeam within the following tolerances:

	<u>Vertical</u>	<u>Horizontal</u>
1. Stationing on structures		±0.01 feet
2. Alignment on structures		±0.01 feet
3. Substructure	±0.01 feet variation from Plan grades.	

For all other structural elements, The Contractor shall ensure a surveying accuracy within the following tolerances:

	<u>Vertical</u>	<u>Horizontal</u>
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 perform selective quality control (QA) checking of the Contractor's surveying. This Contracting Agency QA will not change the requirements for survey quality control (QC) 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 in accordance with Section 1-04.1 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.

Guarantees

Section 1-05.10 is supplemented with the following:

1 (*****)

2 **Signal, Illumination, and Intelligent Transportation System Equipment**

3 All manufacturer warranties for equipment installed by the Contractor shall be valid
4 upon completion of the contract.

5
6 **(March 13, 1995)**

7 **Cooperation With Other Contractors**

8 Section 1-05.14 is supplemented with the following:

9
10 **Other Contracts Or Other Work**

11 It is anticipated that the following work adjacent to or within the limits of this project will
12 be performed by others during the course of this project and will require coordination of
13 the work:

14
15 ***

16 I-5 Grand Mound to Maytown Stage 1 – Add Lanes

17 MP 86.93 to MP 96.21

18 Widening project.

19 Contact : WSDOT Tumwater Project Office

20 Attn: Marylou Nebergall, Project Engineer

21 (360) 570-6750

22
23 I-5 Blakeslee Junction to Grand Mound

24 MP 83.66 to MP 87.56

25 Widening project.

26 Contact : WSDOT Chehalis Engineering Office

27 Attn: Colin Newell, Area Engineer

28 (360) 740-8600

29
30 US-12 Elma Vic to Old Highway 9 SW – Paving and Centerline Rumble Strips

31 MP 21.56 to MP 44.62

32 Contact : WSDOT Aberdeen Project Office

33 Attn: Scott Ireland, Project Engineer

34 (360) 533-9352 ***

35
36 **LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC**

37
38 **State Taxes**

39 Section 1-07.2 is supplemented with the following:

40
41 (March 13, 1995)

42 The work on this contract is to be performed upon lands whose ownership obligates the
43 Contractor to pay State sales tax on portions of the project work and obligates the
44 Contractor to collect State sales tax from the Contracting Agency on other portions of
45 the project as follows:

- 46
47 1. The provisions of Section 1-07.2(1) apply to the following listed portions of the
48 project:

49
50 ***

51 I1 Line Station 7+28.40 to I1 Line station 20+00.00

52 J1 Line Station 0+00.00 to J1 Line Station 7+54.00 ***

- 1
2 2. The provisions of Section 1-07.2(2) apply to all of the remaining portions of the
3 project.
4

5 For bidding purposes the Contracting Agency has segregated the plan quantities which
6 are affected by Section 1-07.2(1) from those quantities affected by Section 1-07.2(2).
7 These approximate quantities are shown on the Summary of Quantities sheets;
8 however, any tax payments shall be based on actual quantities used.
9

10 **Environmental Regulations**

11
12 Section 1-07.5 is supplemented with the following:
13

14 **(August 3, 2009)**

15 **Environmental Commitments**

16 The following Provisions summarize the requirements, in addition to those required
17 elsewhere in the Contract, imposed upon the Contracting Agency by the various
18 documents referenced in the Special Provision PERMITS AND LICENSES. Throughout
19 the work, the Contractor shall comply with the following requirements:
20

21 **General**

22 The Contractor shall ensure that the Project Manager representing the Prime
23 Contractor and all Subcontractors has read and understands this Special Provision.
24 Prior to commencing any work on site, the Contractor shall provide the Engineer
25 with a signed statement from the Project Manager stating that the Project Manager
26 has read, understands and will abide by the conditions of this Special Provision.
27

28 **Wetlands and Water Quality**

29 The following restrictions and requirements pertain to work throughout the project
30 limits:
31

32 **(August 3, 2009)**

33 A copy of the WSDOT/DOE Implementing Agreement on Surface Water
34 Quality Standards must be kept on site at all times.
35

36 **(August 3, 2009)**

37 All forms used for concrete shall be completely sealed to prevent the possibility
38 of fresh concrete from entering waters of the state. All concrete shall be cured
39 a minimum of seven days before contact with waters of the State, including
40 wetlands. Any water that comes into contact with concrete within the first
41 seven days of cure shall be contained and discharged to land with no possible
42 entry to waters of the state, including wetlands. Where land is not available for
43 treatment, other methods of water treatment shall be utilized as approved by
44 the Engineer.
45

46 **(August 3, 2009)**

47 Debris accumulation on bridges, road surfaces and within bridge drains shall
48 be collected and properly disposed of off site.
49

50 **(August 3, 2009)**

51 Temporary BMPs shall be used to allow turbid water to settle before discharge
52 to the stream. Settling time shall be sufficient to meet water quality standards.

1 The flow rate of turbid water into the stream shall not exceed one tenth of the
2 natural flow rate of the stream at the time of discharge. Before discharging to
3 the stream, the Contractor shall request the Engineer to sample the water to
4 ensure the water is in compliance with water quality standards.

5
6 (August 3, 2009)

7 Areas set aside for wash out of concrete delivery trucks, pumping equipment,
8 and tools shall be approved by the Engineer. This area shall not have any
9 possibility of draining to waters of the State including wetlands.

10
11 (August 3, 2009)

12 All paved surfaces shall be dry cleaned of debris accumulations prior to fresh
13 water flushing. Flush water shall be clean, without detergents or other
14 cleaning agents.

15
16 (August 3, 2009)

17 During any operation involving saw cutting of concrete, all water generated by
18 the cutting operation shall be controlled and contained, to be disposed of on
19 land with no possibility of entry to waters of the State, including wetlands.

20
21 (August 3, 2009)

22 All treated lumber shall be completely cured before use in or within *** 300 ***
23 feet of any waters of the State, including wetlands.

24
25 (August 3, 2009)

26 The Contractor shall notify the Engineer a minimum of *** 15 *** calendar days
27 prior to commencing any work in environmentally sensitive areas, mitigation
28 areas, and wetland buffers. Installation of construction fencing is excluded
29 from this notice requirement. At the time of notification, the Contractor shall
30 submit a work plan for review and approval detailing how the work will be
31 performed. Plan detail must be sufficient to verify that work is in conformance
32 with all contract provisions.

33
34 (August 3, 2009)

35 The intentional bypass of stormwater from all or any portion of a stormwater
36 treatment system is prohibited without the approval of the Engineer.

37
38 (August 3, 2009)

39 No Contractor staging areas will be allowed within *** 300 *** feet of any
40 waters of the State including wetlands.

41
42 (August 3, 2009)

43 **Payment**

44 All costs to comply with this special provision for the environmental commitments
45 and requirements are incidental to the contract and are the responsibility of the
46 Contractor. The Contractor shall include all related costs in the associated bid
47 prices of the contract.

48
49 **Permits And Licenses**

50 Section 1-07.6 is supplemented with the following:

51
52 (March 13, 1995)

No hydraulic permits are required for this project unless the Contractor's operations use, divert, obstruct, or change the natural flow or bed of any river or stream, or utilize any of the waters of the State or materials from gravel or sand bars, or from stream beds.

(August 3, 2009)

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. All contacts with the permitting agency concerning the below-listed permit(s) shall be through the Engineer. 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 PERMIT	PERMITTING AGENCY	PERMIT REFERENCE NO.
Department of the Army Section 404 Individual Permit	Corps of Engineers Seattle District	NWS-2007-284-SOD
Section 401 Water Quality Certification	Department of Ecology	#4281
Coastal Zone Manage- ment Consistency Certification	Department of Ecology	#4281
NPDES Industrial Stormwater Permit for Construction Activities	Department of Ecology	WAR-009709
Water Quality Implementing Agreement	Department of Ecology	FEB 1998
Compliance Implementing Agreement (2004)	Department of Ecology	NOV 2004

Load Limits

Section 1-07.7 is supplemented with the following:

(March 13, 1995)

If the sources of materials provided by the Contractor necessitates hauling over roads other than State Highways, the Contractor shall, at the Contractor's expense, make all arrangements for the use of the haul routes.

Requirements For Nondiscrimination

Section 1-07.11 is supplemented with the following:

(August 4, 2008)

Minority And Women's Business Enterprise (M/WBE) Participation

General Statement

In accordance with the legislative findings and policies set forth in Chapter 39.19 RCW the State of Washington encourages participation in all of its contracts by M/WBE firms certified by the office of Minority and Women's Business Enterprises (OMWBE). Participation may be either on a direct basis in response to a solicitation/invitation or as a subcontractor to a Bidder/Proposer. No preference will be included in the evaluation of bids/proposals, no minimum level of M/WBE

1 participation shall be required as a condition for receiving an award and
2 bids/proposals will not be rejected or considered non-responsive on that basis.
3

4 **Voluntary M/WBE Goals**

5 Voluntary numerical M/WBE participation goals shall be established for all
6 solicitation/invitations where applicable. These goals are voluntary, but
7 achievement of the goals is encouraged. No preference will be included in the
8 evaluation of bids/proposals, no minimum level of M/WBE participation shall be
9 required as a condition of award or completion of the contract work, and
10 bids/proposals will not be rejected or considered non-responsive on that basis.
11 Bidders may contact OMWBE at 360-753-9693 to obtain information on certified
12 firms.
13

14 **Required M/WBE Participation Plan**

15 Prime Contractors shall submit an M/WBE Participation Plan as part of
16 responsibility, before work begins. Although the goals contained within each
17 Contract are voluntary, that is, award of the contract is not conditioned upon
18 attainment of the voluntary M/WBE goals, the outreach efforts to provide M/WBEs
19 maximum practicable opportunities are not. For M/WBE Participation Plan Drafting
20 Guidelines, please visit: www.wsdot.wa.gov/equalopportunity.
21

22 **Non-discrimination**

23 Contractors, Bidders, and Proposers shall not create barriers to open and fair
24 opportunities for all businesses including M/WBEs to participate in all State
25 contracts and to obtain or compete for contracts and subcontracts as sources of
26 supplies, equipment, construction and services. In considering offers from and
27 doing business with subcontractors and suppliers, the Contractor shall not
28 discriminate on the basis of race, color, creed, religion, national origin, sex, age,
29 nationality, marital status, or the presence of any mental or physical disability in an
30 otherwise qualified disabled person.
31

32 The Contractor shall make the M/WBE Participation General Statement cited
33 previously in this Special Provision a part of all subcontracts and agreements
34 entered into as a result of this contract.
35

36 **Definitions**

37 When referred to in this contract, the terms Minority, Minority Business Enterprise
38 (MBE), and Women's Business Enterprise (WBE) will be construed to have the
39 following meanings:
40

41 Minority means a person who is a citizen or lawful permanent resident of the
42 United States and who is:
43

- 44 (a) Black: having origins in any of the black racial groups of Africa;
- 45
- 46 (b) Hispanic: of Mexican, Puerto Rican, Cuban, Central or South
47 American, or other Spanish or Portuguese culture or origin,
48 regardless of race;
- 49
- 50 (c) Asian American: having origins in any of the original peoples of the
51 Far East, Southeast Asia, the Indian subcontinent, or the Pacific
52 Islands; or

(d) American Indian or Alaskan Native: having origins in any of the original peoples of North America.

Minority Business Enterprise, Minority-owned Business Enterprise, or MBE means a business organized for profit, performing a commercially useful function, which is owned and controlled by one or more minority individuals or minority business enterprises. Owned and controlled means a business in which one or more minorities or MBE's own at least fifty-one percent (51%), or in the case of a corporation at least fifty-one percent (51%) of the voting stock, and control at least fifty-one percent (51%) of the management and daily business operations of the business.

M/WBE means a minority owned business enterprise, a women-owned business enterprise, and/or a combination minority and women's business enterprise certified by the Office of Minority and Women's Business Enterprises (OMWBE) of the State of Washington.

Women's Business Enterprise, Women-owned Business Enterprise, or WBE means a business organized for profit, performing a commercially useful function, which is owned and controlled by one or more women or women's business enterprises. Owned and controlled means a business in which one or more women or WBE's own at least fifty-one percent (51%) or in the case of a corporation at least fifty-one percent (51%) of the voting stock, and control at least fifty-one percent (51%) of the management and daily business operations of the business. The women owners must be United States citizens or lawful permanent residents.

Minority/Women's Business Enterprise means a minority owned business enterprise, a women-owned business enterprise; and/or a combination minority and women's business enterprise certified by the OMWBE of the State of Washington.

MBE/WBE Status

A consolidated list of firms accepted as certified by OMWBE is available via the WSDOT Home Page, (WWW.WSDOT.WA.GOV) and a hard copy is available at nominal cost from the OMWBE.

MBE/WBE Goals

The Contracting Agency has established a voluntary goal in the amount of:

*** Sixteen percent (16.0%) of the contract total for combined MWBE goals ***

Further Information

If further information is desired concerning Minority Business Enterprise/Women's Business Enterprise participation, inquiry may be directed to:

External Civil Rights Branch
Office of Equal Opportunity
Washington State Department of Transportation
Transportation Bldg., PO Box 47314
Olympia, WA 98504-7314

1 or telephone - (360) 705-7085

2 Fax (360) 705-6801

3
4 **Temporary Water Pollution/Erosion Control**

5
6 ***Spill Prevention, Control and Countermeasures Plan***

7 Section 1-07.15(1) is supplemented with the following:

8
9 (August 3, 2009)

10 The Contractor shall address the following items in the SPCC Plan in addition to
11 the requirements of Section 1-07.15(1):

12
13 **Mixing, Transfers, & Storage**

- 14 1. All oil, fuel or chemical storage tanks or containers shall be diked and
15 located on impervious surfaces so as to prevent spill from escaping.
16
17 2. All liquid products shall be stored and mixed on impervious surfaces in a
18 secure water tight environment and provide containment to handle the
19 maximum volume of liquid products on site at any given time.
20
21 3. Proper security shall be maintained to prevent vandalism.
22
23 4. Drip pans or other protective devices shall be required for all transfer
24 operations.

25
26 **Spills**

27 Paint and solvent spills shall be treated as oil spills and shall be prevented
28 from reaching storm drains or other discharges. No cleaning solvents or
29 chemicals used for tool or equipment cleaning may be discharged to the
30 ground or water.

31
32 **Maintenance of Equipment**

33 Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc, shall be
34 checked regularly for drips or leaks and shall be maintained and stored
35 properly to prevent spills into State waters.

36
37 **Disposal**

38 Spilled waste, chemicals or petroleum products shall be transported off site for
39 disposal at a facility approved by the Department of Ecology. The materials
40 shall not be discharged to any sanitary sewer without approval of the local
41 sewer authority.

42
43 **Reporting and Cleanup**

44 The Contractor's designated person for managing and implementing the SPCC
45 Plan shall report hazardous material spills as follows:

46
47 Spills into State water (including ponds, ditches, seasonally dry streams,
48 and wetlands) – Immediately call all of the following:

49
50 National Response Center 1-800-424-8802
51 WA State Div. of Emergency Management (24 hr) 1-800-258-5990
52 Ecology *** Southwest *** Regional Office *** 360-407-6300 ***

1
2 Spill to Soil (Including encounters of pre-existing contamination):
3

4 Ecology *** Southwest *** Regional Office *** 360-407-6300 ***
5 Report immediately if threatening to health or environment (i.e.,
6 explosive, flammable, toxic vapors, shallow groundwater, nearby
7 creek), otherwise within 90 days
8

9 Underground Storage Tank (confirmed release of material)
10

11 Ecology *** Southwest *** Regional Office *** 360-407-6300 ***
12 Report within 24 hours
13

14 (OR February 22, 2010)

15 Containment and cleanup efforts shall begin immediately and be completed as
16 soon as possible, taking precedence over normal work. Cleanup shall include
17 proper disposal of any spilled material and used cleanup materials. No emulsifiers
18 or dispersants are to be used in waters of the State without written approval from
19 the Department of Ecology. Concentrated waste or spilled chemicals shall be
20 transported off the site for disposal at a facility approved by the Department of
21 Ecology or local County Health Department.
22

23 **(April 2, 2007)**

24 **Utilities and Similar Facilities**

25 Section 1-07.17 is supplemented with the following:
26

27 Locations and dimensions shown in the Plans for existing facilities are in accordance
28 with available information obtained without uncovering, measuring, or other verification.
29

30 The following addresses and telephone numbers of utility companies known or
31 suspected of having facilities within the project limits are supplied for the Contractor's
32 convenience:
33

34 ***

35 Puget Sound Energy
36 LV-SVC
37 2711 Pacific Ave SE.
38 Olympia, WA 98501
39 Attn: Justin Shahan
40 Phone: (360) 570-6803
41

42 Qwest Communications
43 711 Capitol Way S. Room 307
44 Olympia, WA 98501
45 Attn: Wayde Holmquist
46 Phone: (360) 754-5912
47

48 Comcast of Washington, Inc.
49 440 Yaeger Way SW
50 Olympia, WA 98502
51 Attn: Mark Torres
52 Phone: (360) 357-1230

Thurston Co. Water and Waste Management
929 Lakeridge Drive SW
Building No. 4, Room 100
Olympia, WA 98502
Attn: Jack King
Phone: (360) 754-3355 ***

(*****)

Public and private utilities, or their Contractors, will furnish all work necessary to adjust, relocate, replace, or construct their facilities unless otherwise provided for in the Plans or these Special Provisions. Such adjustment, relocation, replacement, or construction will be done during the prosecution of the work for this project. It is anticipated that utility adjustment, relocation, replacement or construction within the project limits will be completed as follows:

Puget Sound Energy will relocate three utility poles located at currently located at Stations:

I1 19+11.09 (51.15 LT)

I1 17+23.97 (49.01)

I1 12+90.69 (44.36 LT)

The relocation work will be completed by April 30, 2011.

The Contractor shall attend a mandatory utility preconstruction meeting with the Engineer, all affected subcontractors, and all utility owners and their contractors prior to beginning onsite work.

The following addresses and telephone numbers of utility companies or their Contractors that will be adjusting, relocating, replacing or constructing utilities within the project limits are supplied for the Contractor's use:

Puget Sound Energy
LV-SVC
2711 Pacific Ave SE.
Olympia, WA 98501
Attn: Justin Shahan
Phone: (360) 570-6803

This utility relocation must be completed prior to the construction of sidewalk and illumination on the I1 line between stations I1 12+50 to I1 19+50 (LT)

(*****)

Underground Utility Exploration (Pot Holing)

Description

The Contractor shall perform underground utility exploration (pot holing). This work shall begin after the Contractor has called the utilities for field locations and the utilities have identified and located their respective facilities.

Pot holing shall be used to determine whether or not conflicts will be encountered in the installation of underground structures. Locations to be pot holed will either be

1 where contract excavation indicates close proximity to existing utilities or where the
2 utility's field-locate marks indicate utilities may be present. Pot hole locations will
3 be as directed by the Engineer upon notification by the Contractor of a potential
4 conflict between construction and utilities.
5

6 The information obtained by pot holing will be used to notify the affected utility and
7 the Engineer so that underground work delays will be minimized.
8

9 **Construction Requirements**

10 The Contractor shall as a minimum, and with prior approval from the Engineer,
11 perform pot holing one week prior to beginning construction in the area of the field
12 locates of the utility's facilities.
13

14 The Contractor shall use a vacuum excavator or other means as ordered by the
15 Engineer. The vacuum excavator operator shall be competent and experienced in
16 operation of the equipment.
17

18 Pot holing shall expose utilities or other conflicts within the depth and width to be
19 excavated for future structures.
20

21 The Contractor shall notify the utility and the Engineer of all objects exposed and
22 found in conflict.
23

24 The Contractor shall ensure observations and accurate measurements are
25 recorded before backfilling.
26

27 Pot holes shall be backfilled or safely covered if left unattended at any time.
28

29 **Payment**

30 Payment will be made in accordance with Section 1-04.1, for the following bid
31 items:
32

33 "Force Account – Potholing," by force account as provided in Section 1-09.6.
34

35 To provide a common proposal for all bidders, the Contracting Agency has
36 entered an amount in the proposal to become a part of the Contractor's total
37 bid.
38

39 The second paragraph of Section 1-07.17 is supplemented with the following:
40

41 (OR October 15, 2004)

42 The Contractor shall contact the WSDOT Olympic Region Signal Superintendent, Don
43 Anders, to obtain the locations of all Contracting Agency-owned utilities within the
44 project limits. To request utility locates, call 360-357-2616 during normal business hours
45 (7:30AM to 4:00PM) or 360-704-3228 (available 7 days per week by voicemail).
46

47 **Public Liability And Property Damage Insurance**

48
49 Section 1-07.18 is supplemented with the following:
50

1 (*****)

2 **Relations With Railroad**

3 Railroad Company, as used in the following specifications, shall be the railroad
4 company or companies, or railway company or companies specified in these Special
5 Provisions. The following provisions, though referring to a single Railroad Company,
6 shall be applicable to each of the following railroad companies or railway companies:
7

8 Tacoma Rail
9

10 **Protection of Railroad Property**

11 The Contractor shall exercise care in all operations and shall, at the Contractor's
12 expense, protect the property of the Railroad Company and the Company's
13 appurtenances, property in its custody, or persons lawfully upon its right of way,
14 from damage, destruction, interference or injury caused by the Contractor's
15 operations. The Contractor shall prosecute the work to not interfere with the
16 Railroad Company or its appurtenances, or any of the Railroad Company's trains or
17 facilities, and shall complete the work to a condition that shall not interfere with or
18 menace the integrity or safe and successful operations of the Railroad Company or
19 its appurtenances, or any of the Railroad Company's trains or facilities.
20

21 The Contractor shall not transport equipment, machinery, or materials across the
22 Railroad Company's tracks, except at a public crossing, without the written consent
23 of the Railroad Company.
24

25 The Contractor shall keep the right of way and ditches of the Railroad Company
26 open and clean from any deposits or debris resulting from its operations. The
27 Contractor shall be responsible for the cost to clean and restore ballast of the
28 Railroad Company which is disturbed or becomes fouled with dirt or materials when
29 such deposits or damage result from the Contractor's operations, except as
30 provided elsewhere.
31

32 The Contractor's work shall be conducted in such a manner that there will be a
33 minimum of interference with the operation of railroad traffic. The Railroad
34 Company will specify what periods will be allowed the Contractor for executing any
35 part of the work in which the Railroad Company's tracks will be obstructed or made
36 unsafe for operation of railroad traffic.
37

38 In the event that an emergency occurs in connection with the work specified, the
39 Railroad Company reserves the right to do any and all work that may be necessary
40 to maintain railroad traffic. If the emergency is caused by the Contractor, the
41 Contractor shall pay the Railroad Company for the cost of such emergency work.
42

43 Protective services to protect the Railroad Company's facilities, property, and
44 movement of its trains or engines, including railroad flagging and other devices,
45 may be required by the Railroad Company as a result of the Contractor's
46 operations.
47

48 The nature and extent of protective services, personnel and other measures
49 required will in all cases be determined by the Railroad Company. Nothing in these
50 specifications will limit the Railroad Company's right to determine and assign the
51 number of personnel, the classes of personnel for protective services, nor other
52 protective measures it deems necessary.

1
2 When, in the opinion of the Railroad Company, the services of flaggers or security
3 personnel are necessary for the protection of the Railroad Company's facilities by
4 reason of the Contractor's operations, the Railroad Company will furnish such
5 flaggers or security personnel as may be required. The Contractor shall notify the
6 Railroad Company a minimum of 30 calendar days in advance of whenever the
7 Contractor is about to perform work adjacent to the tracks to enable the Railroad
8 Company to provide flagging or other protective service.
9

10 The Railroad Company's contact is:

11
12 Alan Matheson
13 Tacoma Rail
14 1171 Taylor Way
15 Tacoma, WA 98421
16 (253) 779-7065
17

18 No act of the Railroad Company in supervising or approving any work shall reduce
19 or in any way affect the liability of the Contractor for damages, expense, or cost
20 which may result to the Railroad Company from the construction of this Contract.
21

22 Unless otherwise provided, all personnel assigned by the Railroad Company, other
23 than those engaged in performing work by the Railroad Company as listed under
24 Construction Work by Railroad Company, will be considered protective personnel.
25

26 In general, the Railroad Company will furnish protective services:

- 27
28 a. For any excavation below the elevation of the track subgrade, if in the
29 opinion of the Railroad Company's representative, the track or other
30 railroad facilities may be subject to settlement or movement.
31

32 For all work over or adjacent to the track if, in the opinion of the Railroad
33 Company's representative, said work represents a hazard to the Railroad
34 Company.
35

- 36 b. During any clearing, grubbing, grading, or blasting in proximity to the
37 facilities, which in the opinion of the Railroad Company's representative,
38 may endanger or interfere with railroad facilities or operations.
39

- 40 c. When any of the Contractor's operations take place within or near railroad
41 right of way and, in the opinion of the Railroad Company's representative,
42 could endanger railroad facilities or create a hazard to railroad operations.
43 Communications Linemen or Signalmen may be used to protect
44 communications and signal facilities, if deemed necessary by the Railroad
45 Company.
46

47 There will be no cost to the Contractor for the railroad protective services
48 unless such services result from the Contractor's failure to comply with the
49 terms and conditions of its contract with the Contracting Agency or with its
50 Contractor's Right of Entry Agreements with the Railroad Companies.
51

1 **Construction Work by Railroad Company**

2 The work by the Railroad Company as described below will be performed by the
3 Railroad Company with its own forces at no cost to the Contractor:
4

5 *Flagging will be provided by the Railroad Company (as specified above).
6

7 All work which is performed by the Railroad Company at the Contractor's request
8 and which is for the Contractor's benefit or convenience shall be at the Contractor's
9 expense and the Contractor shall reimburse the Railroad Company for all costs for
10 such work.
11

12 The Contractor shall cooperate with the Railroad Company and so conduct
13 operations that the necessary reconstruction of its facilities and the removal of
14 existing facilities can be accomplished without interruption of service.
15

16 **Contractor's Right of Entry Agreement**

17 No work shall be commenced within Railroad right of way until the Contractor has
18 executed, delivered, and received in return the fully executed Contractor's Right-of-
19 Entry Agreement from Railroad, and has obtained all of the insurance required by the
20 Railroad. All work within Railroad right of way shall be in accordance with Railroad's
21 Contractor Requirements and the Contractor's Right of Entry Agreement (See
22 Appendix).
23

24 The Contractor, its subcontractors or agents, shall at its own expense, obtain and
25 maintain in force all insurance required by Railroad until the completion date of the
26 contract as described in Section 1-08.5 except as stated herein.
27

28 When all the work involving construction activities within or immediately adjacent to the
29 railroad right of way is completed, the Contractor may make a written request to the
30 Engineer to be relieved of the responsibility to continue the insurance specified above.
31 If the Engineer deems the portion of the work in that area is complete, the Engineer may
32 approve the Contractor's request. However, if for any reason the Contractor resumes or
33 starts any new work in that area (including being ordered to do so by the Engineer), the
34 insurance shall be reinstated by the Contractor before the work is started. If the
35 insurance must be reinstated because of negligence or acts by the Contractor or failure
36 of the Contractor to perform all the contract requirements, the costs shall be the
37 responsibility of the Contractor. If the insurance must be reinstated because of changes
38 to the contract, the costs will be considered in accordance with Section 1-04.4.
39

40 **(December 6, 2004)**

41 **Owners and Contractors Protective Insurance**

42 Item No. 1 of the first paragraph of Section 1-07.18 is revised to read:
43

- 44 1. Owners and Contractors Protective Insurance providing bodily injury and
45 property damage liability with limits of *** \$5 million *** per occurrence and in
46 the aggregate for each policy period, written on Insurance Services Office
47 (ISO) form CG0009 together with Washington State Department of
48 Transportation Amendatory Endorsement No. CG 29 08, specifying the State
49 of Washington as a named insured.
50

51 The Contractor may choose to terminate this insurance after the date of
52 Substantial Completion as determined by the Engineer or, should Substantial

Completion not be achieved, after the date of Physical Completion as determined by the Engineer. In the event the Contractor elects to terminate this coverage, prior to acceptance of the contract, the Contractor shall first obtain an endorsement to the Commercial General Liability Insurance described below that establishes the Contracting Agency on that policy as an additional insured.

Public Convenience And Safety

Construction Under Traffic

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

(*****)

There shall be no restrictions or interruptions to traffic on the day prior to a holiday or holiday weekend through the last day of the holiday or holiday weekend.

Lane restrictions shall be held to a minimum time and length needed for each operation. If the Engineer determines that the lane restrictions are causing congestion, the Contractor will be required to open all lanes to traffic until the congestion is eliminated.

Access to work areas at locations other than what is shown in the plans that require vehicles 10,000 GVW or greater shall be required to use lane restriction and associated work hours to enter or exit the work area. Traffic control vehicles are excluded from the gross vehicle weight requirement.

Lane, Ramp, and Roadway Closures

Work requiring lane restrictions shall be permitted during the following hours:

Interstate 5 Northbound Double Lane closures

Where there are three lanes available. Or Single Lane closure where there are two lanes available.

Sun	10:00 pm	to	Mon	5:00 am
Mon	8:00 pm	to	Tues	5:00 am
Tues	8:00 pm	to	Wed	5:00 am
Wed	8:00 pm	to	Thurs	5:00 am
Thurs	9:00 pm	to	Fri	5:00 am
Fri	10:00 pm	to	Sat	7:00 am
Sat	10:00 pm	to	Sun	8:00 am

Interstate 5 Southbound Double Lane closures

Where there are three lanes available. Or Single Lane closure where there are two lanes available.

Sun	10:00 pm	to	Mon	6:00 am
Mon	8:00 pm	to	Tues	6:00 am
Tues	8:00 pm	to	Wed	6:00 am
Wed	8:00 pm	to	Thurs	6:00 am
Thurs	9:00 pm	to	Fri	6:00 am
Fri	10:00 pm	to	Sat	7:00 am
Sat	10:00 pm	to	Sun	8:00 am

Interstate 5 Northbound On or Off Ramp Closures

Sun	11:00 pm	to	Mon	5:00 am
Mon	11:00 pm	to	Tues	5:00 am
Tues	11:00 pm	to	Wed	5:00 am
Wed	11:00 pm	to	Thurs	5:00 am
Thurs	11:00 pm	to	Fri	5:00 am
Fri	11:00 pm	to	Sat	7:00 am
Sat	11:00 pm	to	Sun	8:00 am

Interstate 5 Southbound On or Off Ramp Closures

Sun	11:00 pm	to	Mon	6:00 am
Mon	11:00 pm	to	Tues	6:00 am
Tues	11:00 pm	to	Wed	6:00 am
Wed	11:00 pm	to	Thurs	6:00 am
Thurs	11:00 pm	to	Fri	6:00 am
Fri	11:00 pm	to	Sat	7:00 am
Sat	11:00 pm	to	Sun	8:00 am

Ramp Closures shall be restricted to the following number of occurrences.

- Southbound On-Ramp 3
- Southbound Off-Ramp 4
- Northbound Loop Off-Ramp 1 prior to complete closure
- Northbound On-Ramp 4
- Northbound Off-Ramp 2

Interstate 5 Closure for Girder Setting and Demolition of Existing Structure. Using TC33 –TC39

Mon	12:01 am	to	Mon	4:00 am
Tues	12:01 am	to	Tues	4:00 am
Wed	12:01 am	to	Wed	4:00 am
Thurs	12:01 am	to	Thurs	4:00 am
Fri	12:01 am	to	Fri	4:00 am

Interstate 5 Northbound and Southbound Rolling Slowdown for Aerial Crossings

Mon	12:01 am	to	Mon	4:00 am
Tues	12:01 am	to	Tues	4:00 am
Wed	12:01 am	to	Wed	4:00 am
Thurs	12:01 am	to	Thurs	4:00 am

A and A1 Line Eastbound or Westbound Alternating One-Way Traffic Control

Sun	9:00 pm	to	Mon	5:00 am
Mon	9:00 pm	to	Tues	5:00 am
Tues	9:00 pm	to	Wed	5:00 am
Wed	9:00 pm	to	Thurs	5:00 am
Thurs	9:00 pm	to	Fri	5:00 am
Fri	11:00 pm	to	Sat	8:00 am
Sat	10:00 pm	to	Sun	9:00 am

A1 Line Eastbound Single Lane Closure

Where there are two lanes in each direction.

Sun	7:00 pm	to	Mon	6:00 am
Mon	6:00 pm	to	Tues	6:00 am
Tues	6:00 pm	to	Wed	6:00 am
Wed	6:00 pm	to	Thurs	6:00 am
Thurs	7:00 pm	to	Fri	6:00 am
Fri	9:00 pm	to	Sat	10:00 am
Sat	7:00 pm	to	Sun	11:00 am

A1 Line Westbound Single Lane Closure

Where there are two lanes in each direction.

Sun	6:00 pm	to	Mon	7:00 am
Mon	7:00 pm	to	Tues	7:00 am
Tues	7:00 pm	to	Wed	7:00 am
Wed	7:00 pm	to	Thurs	7:00 am
Thurs	7:00 pm	to	Fri	7:00 am
Fri	8:00 pm	to	Sat	11:00 am
Sat	7:00 pm	to	Sun	12:01 pm

A and A1 Line Short Term Traffic Stops for Truck Ingress and Egress.

Daytime

Mon	9:00 am	to	Mon	3:00 pm
Tues	9:00 am	to	Tues	3:00 pm
Wed	9:00 am	to	Wed	3:00 pm
Thurs	9:00 am	to	Thurs	3:00 pm
Fri	9:00 am	to	Fri	3:00 pm

Stops shall be one minute or less. Traffic shall be allowed to clear between stops.

Nighttime

Sun	6:00 pm	to	Mon	6:00 am
Mon	6:00 pm	to	Tues	6:00 am
Tues	6:00 pm	to	Wed	6:00 am
Wed	6:00 pm	to	Thurs	6:00 am
Thurs	6:00 pm	to	Fri	6:00 am

Stops shall be one minute or less. Traffic shall be allowed to clear between stops.

Old Highway 99 and Elderberry Alternating One-Way

Sun	9:00 pm	to	Mon	4:00 am
Mon	9:00 pm	to	Tues	4:00 am
Tues	9:00 pm	to	Wed	4:00 am
Wed	9:00 pm	to	Thurs	4:00 am
Thurs	9:00 pm	to	Fri	4:00 am
Fri	9:00 pm	to	Sat	7:00 am
Sat	10:00 pm	to	Sun	8:00 am

A Line Closure Event – Stage 5A and 5B

Sat	2:00 am	to	Sun	10:00 am

This event is limited to one time occurrence.

Only the following roadways can be closed:

During Stage 5A

- A Line between I-5 NB and SB Ramps. See TC14 - TC18

During Stage 5B

- US 12 to I-5 SB On Ramp. See TC20

During the A Line Closure Event the contractor shall complete roadway construction on the A1 line, F line, G line, C line, and B line as shown in the plans prior to re-opening the roadway to traffic including the following:

- Placement of 0.45' of HMA paving
- Temporary Striping as shown on TC14 thru TC20
- Temporary Signal Modifications as shown on TC46
- Permanent Signal Turn on as shown on TC45
- Roadway Signing consisting of all regulatory, warning and guide signs that have a route shield for US 12 and all ramps.

The Contractor shall provide written notification 30 days in advance of the A Line closure event. The A Line closure event will not be allowed without the advance notification to the Engineer. The notification shall also provide an alternate weekend for the scheduled work in the event of a suspension of work due to unsuitable weather conditions.

All costs necessary to prepare and submit any advance notification to the Engineer as described, shall be included in the unit bid prices for the various items in the contract.

GENERAL RESTRICTIONS

The Contractor shall notify the Engineer three weeks prior to a ramp closure or implementing any construction operation or traffic switch that requires lane closures or rolling slowdowns. In addition, the Contractor shall install advance notification signs two weeks in advance of the start of work requiring these traffic restrictions.

No two consecutive on-ramps shall be closed at the same time, and no two consecutive off-ramps shall be closed at the same time except when specifically described in the Plans or if approved by the Engineer.

All rechannelizing (temporary pavement marking) for a following stage or phase that can be done within the work areas of the current stage or phase shall be completed to minimize the duration of the closures needed during tie ins.

Should high volume hours differ from those specified, as determined by the Engineer, the Contractor will be required to adjust the hours of work accordingly. Exceptions to these restrictions may be considered by the Engineer on a case by case basis following a written request by the Contractor.

Special events that generate increased traffic volumes through the work area may occur during the life of this project. Lane restrictions may be denied if severe traffic congestion is expected.

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

(April 2, 2007)

Work Zone Clear Zone

The Work Zone Clear Zone (WZCZ) applies during working and nonworking hours. The WZCZ applies only to temporary roadside objects introduced by the Contractor's operations and does not apply to preexisting conditions or permanent Work. Those work operations that are actively in progress shall be in accordance with adopted and approved Traffic Control Plans, and other contract requirements.

During nonworking hours equipment or materials shall not be within the WZCZ unless they are protected by permanent guardrail or temporary concrete barrier. The use of temporary concrete barrier shall be permitted only if the Engineer approves the installation and location.

During actual hours of work, unless protected as described above, only materials absolutely necessary to construction shall be within the WZCZ and only construction vehicles absolutely necessary to construction shall be allowed within the WZCZ or allowed to stop or park on the shoulder of the roadway.

The Contractor's nonessential vehicles and employees private vehicles shall not be permitted to park within the WZCZ at any time unless protected as described above.

Deviation from the above requirements shall not occur unless the Contractor has requested the deviation in writing and the Engineer has provided written approval.

Minimum WZCZ distances are measured from the edge of traveled way and will be determined as follows:

Posted Speed	Distance From Traveled Way (Feet)
35 mph or less	10 *
40 mph	15
45 to 55 mph	20
60 mph or greater	30

* or 2-feet beyond the outside edge of sidewalk

Minimum Work Zone Clear Zone Distance

Construction and Maintenance of Detours

(December 1, 2008)

Section 1-07.23(2) is supplemented with the following:

Pedestrian Control and Protection

If no alternative is proposed within the contract plans, all existing pedestrian routes and access points within the project limits, including sidewalks and crosswalks, shall remain open and clear at all times. The Contractor may propose Traffic Control Plans (TCP's) that comply with the MUTCD, ADA requirements, and these Specifications. Contractor proposed TCP's detailing the alternative accessible pedestrian route shall be approved by the Engineer prior to implementation. The plans will either be returned for correction, approved as noted, or approved for use by the end of a 10-day review period. Each time the plan is returned for correction, an additional 10-day review period may be necessary.

When the Engineer allows work areas to encroach upon a sidewalk or crosswalk area, and minimum clear width of 48-inches cannot be maintained for pedestrian use, an alternative accessible pedestrian route shall be provided. Separation of pedestrians from the work area and vehicular traffic is required.

Protective barricades, fencing, and bridges, together with warning and guidance devices and signs, shall be utilized so that the passageway for pedestrians is safe, well defined and accessible. Whenever pedestrian walkways are provided across excavations, they shall be provided with suitable handrails. Foot bridges shall be safe, strong, and free of bounce and sway, have a slip resistant coating, and be free of cracks, holes and irregularities that could cause tripping. Ramps, with a maximum slope of 8.3%, shall be provided at the entrance and exit of all raised footbridges. The maximum cross slope shall be 2.0%. When the existing facility is illuminated or TCP's requires illumination, illumination shall be provided during the hours of darkness. Retroreflective delineation shall be provided during hours of darkness.

Where accessible pedestrian routes are allowed to be closed by the Engineer during construction, an alternate accessible pedestrian route shall be provided that complies with the MUTCD, ADA requirements and these Specifications. The alternate accessible pedestrian route shall not have abrupt changes in grade or terrain. Barriers and channelizing devices shall be detectable to pedestrians who have visual disabilities. Where it is necessary to divert pedestrians into the roadway, barricading or channelizing devices shall be provided to separate the pedestrian route from the adjacent vehicular traffic lane. Barricading or channelizing devices used to separate pedestrian and vehicular traffic shall be crashworthy and, when struck by vehicles, present a minimum threat to pedestrians, workers, and occupants of impacting vehicles. At no time shall pedestrians be diverted into a portion of the street used concurrently by moving vehicular traffic.

In addition the Traffic Control Plan shall address the following:

- All pedestrians, including persons with disabilities, shall be provided with a safe and accessible route.
- The width of the existing pedestrian facility shall be maintained if possible. When it is not possible to maintain a minimum width of 60-inches throughout the entire length of the pedestrian route, a minimum

width of 48-inches shall be provided with 60-inch x 60-inch passing zones spaced at maximum intervals of 200-feet to allow individuals in wheelchairs to pass.

- Traffic control devices and other construction materials and features shall not intrude into the usable width of the sidewalk, alternate accessible pedestrian route, or other pedestrian facility.
- Signs and other devices mounted lower than 84-inches above the temporary accessible pedestrian route shall not project more than 4-inches into the accessible pedestrian route.
- A smooth, continuous hard surface shall be provided throughout the entire length and width of the pedestrian route throughout construction. There shall be no curbs or vertical elevation changes greater than ½-inch in grade or terrain that could cause tripping or be a barrier to wheelchair use. Vertical elevation differences between ¼-inch and ½-inch shall be beveled at a maximum 2:1 slope.
- When channelization is used to delineate a pedestrian pathway, a continuous detectable edging shall be provided throughout the length of the facility such that pedestrians using a cane can follow it. Edging shall protrude at least 6-inches above the surface of the sidewalk or pathway with the bottom of the edging a maximum of 2-1/2 inches above the surface.
- Temporary ramps shall be provided when an alternate accessible pedestrian route crosses a curb and no permanent curb ramps are in place. The width of the curb ramp shall be a minimum of 48-inches and the maximum slope of the ramp shall be 8.3%. The maximum cross slope shall be 2.0%. The bottom of the curb ramp shall be flush with the Roadway. Temporary detectable warning mats shall be installed at street crossings.
- When possible, an alternate accessible pedestrian route shall be provided on the same side of the street as the disrupted route. When it is not possible, the alternate route shall be clearly identified at the nearest intersection crossing prior to the closure area.
- Information regarding closed pedestrian routes, alternate crossings, and sign and signal information shall be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a cane or who have low vision.
- It is desirable that pedestrians cross to the opposite side of the roadway at intersections rather than mid-block. Appropriate signing shall be placed at the intersections prior to any pedestrian route closure.
- If not otherwise stated in the contract provisions, access to transit stops shall be provided and maintained at all times. Transit stops may be

temporarily relocated with approval of the transit agency and the Project Engineer.

- At locations where adjacent alternate walkways cannot be provided, appropriate signs shall be posted at the limits of construction and in advance of the closure at the nearest crosswalk or intersection, to divert pedestrians across the street. Physical barricades shall be installed to prevent visually impaired people from inadvertently entering a closed area.

Measurement

No specific unit of measurement will apply to the lump sum item for pedestrian control and protection.

Payment

Payment will be made in accordance with Section 1-04.1 for the following Bid item included in the Proposal:

"Pedestrian Control and Protection", lump sum.

The lump sum contract payment shall be full compensation for all costs incurred by the Contractor for construction, maintenance, and removal of all protective barricades, fencing, and bridges, together with warning and guidance devices detailed in the Plans or any alternative accessible pedestrian routes proposed by the Contractor.

(July 1, 2009)

Apprentice Utilization

Section 1-07 is supplemented with the following:

This Contract includes an Apprentice Utilization Requirement as defined in this specification. No less than 15.0% of project Labor Hours shall be performed by Apprentices.

Definitions

For the purposes of this specification the following definitions apply:

- Apprentice Utilization Requirement is expressed as a percentage of the project Labor Hours performed by Apprentices.
- Labor Hours are the total hours performed by all workers receiving an hourly wage who are directly employed on the project site including hours performed by workers employed by the prime Contractor and all Subcontractors. Labor Hours do not include hours performed by foremen, superintendents, owners, and workers who are not subject to prevailing wage requirements.
- Apprentice is a person enrolled in a State-approved Apprenticeship Training Program.
- State-approved Apprenticeship Training Program is an apprenticeship training program approved by the Washington State Apprenticeship Council.

- 1 5. Good Faith Effort is a demonstration that the Contractor has strived to meet
2 the Apprentice Utilization Requirement including but not necessarily limited to
3 the specific steps as described elsewhere in this specification.
4

5 **Plan**

6 The Contractor shall submit an "Apprentice Utilization Plan" (DOT form 422-115 EF)
7 within 30 days of execution, demonstrating how and when they intend to achieve the
8 Apprentice Utilization Requirement. The plan shall be updated and resubmitted as
9 appropriate as the Work progresses. The intent is to provide the Project Engineer with
10 enough information to track progress in meeting the utilization requirements.
11

12 **Reporting**

13 The Contractor shall submit a "Statement of Apprentice /Journeyman Participation"
14 (DOT form 422-110 EF) on a monthly basis. The report shall be submitted to the Project
15 Engineer by the last working day of the subsequent month, until the Physical
16 Completion Date. The data reported shall be cumulative to date and consolidated to
17 include the Contractor and all Subcontractors. At the Contractor's request, the Project
18 Engineer may suspend this reporting requirement during periods of minimal or no
19 applicable work activities on the project. The Contractor shall submit documentation of
20 their Good Faith Effort if; (1) they are unable to provide a plan demonstrating how they
21 intend to meet the Apprentice Utilization Requirement; or, (2) the project has been
22 completed without meeting the Apprentice Utilization Requirement.
23

24 **Contacts**

25 The Contractor may obtain information on State-approved Apprenticeship Training
26 Programs by contacting the Department of Labor and Industries at:

27
28 Specialty Compliance Services Division, Apprenticeship Section, P.O. Box 44530,
29 Olympia, WA 98504-4530 or by phone at (360) 902-5320.
30

31 **Compliance**

32 In the event that the Contractor is unable to accomplish the Apprentice Utilization
33 Requirement, the Contractor shall demonstrate that a Good Faith Effort has been made
34 as described elsewhere in this specification. Failure to comply with the requirements as
35 specified may result in reduction or revocation of prequalification as allowed by WAC
36 468-16-190.
37

38 **Good Faith Efforts**

39 In fulfilling the Good Faith Effort, the Contractor shall perform and, when appropriate,
40 require its Subcontractors to perform the following steps:
41

- 42 1. Solicit Apprentice(s) from State-approved Apprenticeship Training Program(s)
43
44 2. Document the solicitation and, in the event Apprentice(s) are not available,
45 obtain supporting documentation from the solicited program(s).
46
47 3. Demonstrate that the plan was updated as required elsewhere in this
48 specification.
49
50 4. Provide documentation demonstrating what efforts the Contractor has taken to
51 require Subcontractors to solicit and employ Apprentice(s).
52

1 In the event that the preceding steps have been followed, the Contractor may also
2 supplement the Good Faith Efforts documentation with the following documentation:

- 3
4 5. Submit documentation demonstrating successful Apprentice utilization on
5 previous contracts.
6
7 6. Submit documentation indicating company wide Apprentice utilization efforts
8 and percentages of attainment.
9

10 **Payment**

11 Compensation for all costs involved with complying with the conditions of this specification is
12 included in payment for the associated Contract items of work.
13

14 **PROSECUTION AND PROGRESS**

15
16 **Progress Schedule**

17
18 Section 1-08.3 is supplemented with the following:

19
20 (OR October 7, 2003)

21 ***Weekly Meeting***

22 The Contractor shall attend weekly meetings with the Project Engineer's office, at a
23 mutually agreed upon time and location, to discuss changes in the proposed order of
24 work, construction delays, or conditions that may affect the progress of work.
25

26 The attendees shall include but not be limited to Project Manager(s),
27 Superintendents(s), key personnel, and when necessary, subcontractor personnel.
28

29 **Prosecution Of Work**

30
31 Section 1-08.4 is supplemented with the following:

32
33
34 (*****)

35 **Order of Work**

36 Unless otherwise approved by the Engineer, the Contractor shall complete the work in
37 accordance with the Construction Staging Plans, the Special Provision
38 **CONSTRUCTION UNDER TRAFFIC**, and the following:
39

40 The first order of work on this project shall be the installation of fencing to delineate
41 all wetland and sensitive areas in accordance with Standard Specification 1-08.4.
42

43 Pond 5 shall be constructed in its entirety, through final planting, prior to
44 constructing any drainage feature associated with drainage structure codes DR2/2,
45 DR2/3, DR6/1 through DR6/13 and DR8/1 through DR8/9
46

47 Upon placement of girders on Bridge 12/118, the channelization on I-5 shall be
48 implemented per sheets TC13A thru 13F
49

50 The demolition of the existing bridge 12/118 shall be completed prior to
51 constructing the final HMA overlay on I-5.
52

(*****)

There are overhead power lines in conflict with illumination and sidewalk as shown in the plans. The three power poles, located at Station I1 19+11.09 (51.15 LT), I1 17+23.97 (49.01) and I1 12+90.69 (44.36 LT) will be relocated by the utility owner, Puget Sound Energy, by April 30, 2011.

(*****)

Work Cancellation

For The A line Closure Event, a determination to cancel due to weather conditions will be made by 3:00 pm on the Thursday preceding the scheduled closure event. This decision will be made jointly by the engineer and the contractor.

Weather forecasting information used to determine if scheduled work is to be suspended shall be from the following source or as approved by the Engineer.

<http://www.wrh.noaa.gov>

Time For Completion

(March 13, 1995)

Section 1-08.5 is supplemented with the following:

This project shall be physically completed within *** 198 *** working days.

Liquidated Damages

Section 1-08.9 is supplemented with the following:

(*****)

Lane, intersection, and bridge closures will result in user impacts. These include delays to the traveling public, increase fuel consumption and vehicle operating cost, pollution, and other inconveniences.

Accordingly, the Contractor agrees to authorize the Engineer to deduct from any money due or coming due to the Contractor the following interim liquidated damages for failure to have the traveled way open as specified under the Special Provision titled **Time for Completion and Construction Under Traffic**:

Interstate 5 Northbound or Southbound is restricted to a single lane

\$1,000 liquidated damages per fifteen minutes per direction for each fifteen-minute period (prorated to the nearest 5 minutes) that all lanes of Interstate 5 are not open by the specified opening time following a two lane closure (one lane open per direction).

Interstate 5 Closure for Girder Setting and Demolition of Existing Structure \$800

liquidated damages per fifteen minutes per direction for each fifteen-minute period (prorated to the nearest 5 minutes) that all lanes of Interstate 5 are not open by the specified opening time following full closure

A and A1 Line Eastbound or Westbound Alternating One-Way

\$2,000 liquidated damages per fifteen minutes for each fifteen-minute period (prorated to the nearest 5 minutes) that all lanes of SR 12 are not open by the specified opening time following a lane closure that requires alternating one-way traffic.

1
2 **Interstate 5 Northbound and Southbound Ramp closures**

3 \$300 liquidated damages per fifteen minutes per ramp for each fifteen-minute period
4 (prorated to the nearest 5 minutes) that a ramp is not open by the specified opening
5 time following full closure.
6

7 **A Line Closure Event**

8 \$1,000 liquidated damages per fifteen minutes for each fifteen-minute period (prorated
9 to the nearest 5 minutes) that all lanes of SR 12 on the Interstate 5 bridge between the
10 northbound and southbound ramps (Stage 5A closure) are not open by the specified
11 opening time.
12

13 **MEASUREMENT AND PAYMENT**

14
15 **(November 9, 2009)**

16 **Scope of Payment**

17 Section 1-09.3 is supplemented with the following:
18

19 ***Fuel Cost Adjustment***

20 **General**

21 The Contracting Agency will make a fuel cost adjustment, either a credit or a
22 payment, for qualifying changes in the index price of on-highway diesel fuel. The
23 adjustment will be applied to partial payments made according to Section 1-09.9.
24

25 The adjustment is not a guarantee of full compensation for fuel price changes. Any
26 adjustment provided by this provision shall not obligate the Contracting Agency for
27 any costs due solely to changes in fuel costs beyond the amount adjusted by this
28 provision. The Contracting Agency does not guarantee that fuel will be available at
29 the base fuel cost or monthly fuel cost. No additional adjustment will be made for
30 rates of fuel consumption or actual fuel types that differ from those specified for the
31 purpose of determining the adjustment.
32

33 For the purpose of determining the adjustment, the Base Fuel Cost shall be the
34 Weekly U.S. On-Highway Diesel Fuel Price for West Coast No. 2 Diesel Retail
35 Sales by All Sellers (Cents per Gallon) dated on the nearest Monday occurring
36 three weeks prior to the date that bids are opened, published by the Energy
37 Information Administration (Department of Energy), available at:
38 <http://tonto.eia.doe.gov/oog/ftp/area/wogirs/xls/psw18vwall.xls>. The Base Fuel Cost
39 is fixed for the duration of the contract and will be used for determining all
40 adjustments.
41

42 The Monthly Fuel Cost shall be the most recent Monthly U.S. On-Highway Diesel
43 Fuel Price for West Coast No. 2 Diesel Retail Sales by All Sellers (Cents per
44 Gallon), published by the Energy Information Administration (Department of
45 Energy). If the specified index ceases to be available for any reason, the
46 Contracting Agency at its discretion will select and begin using a substitute price
47 source or index to establish the Monthly Fuel Cost.
48

49 **Measurement**

50 No adjustment will be made if the Monthly Fuel Cost is within 10 percent of the
51 Base Fuel Cost. No adjustment will be made for work performed after the
52 authorized Time for Completion.

If the Monthly Fuel Cost is greater than or equal to 110% of the Base Fuel Cost, then:

$$\text{Adjustment} = \frac{(\text{Monthly Fuel Cost} - (1.1 \times \text{Base Fuel Cost})) \times Q}{100}$$

If the Monthly Fuel Cost is less than or equal to 90% of the Base Fuel Cost, then:

$$\text{Adjustment} = \frac{(\text{Monthly Fuel Cost} - (0.90 \times \text{Base Fuel Cost})) \times Q}{100}$$

Where Q = Σ ((Fuel Usage Factor for each Eligible Bid Item) x (Quantity paid in the current months progress estimate for each Eligible Bid Item)) for all Eligible Bid Items listed below:

<u>Eligible Bid Item</u>	<u>Fuel Usage Factor</u>

Excavation Incl. Haul	0.29 gal/cy
Gravel Borrow Incl. Haul	0.17 gal/cy
Structure Excavation Class _ Incl. Haul	0.25 gal/cy
Shoring or Extra Excavation Class A	0.04 gal/dollar
Crushed Surfacing Base Course	0.70 gal/ton
HMA Cl. ½ In. PG64-22	2.90 gal/ton
Concrete Class 4000	1.00 gal/cy
Superstructure	0.02 gal/dollar ***

Payment

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

"Fuel Cost Adjustment", by calculation.

To provide a common proposal for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the Contractor's total bid.

(August 3, 2009)

Payment For Material On Hand

The last paragraph of Section 1-09.8 is revised to read:

The Contracting Agency will not pay for material on hand when the invoice cost is less than \$2,000. As materials are used in the work, credits equaling the partial payments for them will be taken on future estimates. Each month, no later than the estimate due date, the Contractor shall submit a letter to the Project Engineer that clearly states: 1) the amount originally paid on the invoice (or other record of production cost) for the items on hand, 2) the dollar amount of the material incorporated into each of the various work items for the month, and 3) the amount that should be retained in material on hand items. If work is performed on the items and the Contractor does not submit a letter, all of the previous material on hand payment will be deducted on the estimate. Partial payment for materials on hand shall not constitute acceptance. Any material will be rejected if found to be faulty even if partial payment for it has been made.

1 **(March 13, 1995)**

2 **Payments**

3 Section 1-09.9 is supplemented with the following:

4
5 The quantity of the following items to be paid for on this project shall be the quantity
6 shown in the Proposal, unless changes are made in accordance with Section 1-04.4
7 which affect this quantity. The quantity shown in the Proposal will be adjusted by the
8 amount of the change and will be paid for as specified in Section 1-04.4.

9 ***

10 "St. Reinf. Bar For Bridge"

11 "Conc. Class 4000 For Bridge"

12 "Precast Column"

13 "Precast Crossbeam" ***

14
15
16 The quantities in the Proposal are listed only for the convenience of the Contractor in
17 determining the volume of work involved and are not guaranteed to be accurate. The
18 prospective bidders shall verify these quantities before submitting a bid. No
19 adjustments other than for approved changes will be made in the quantity even though
20 the actual quantities required may deviate from those listed.

21
22 The unit contract price for these items shall be full pay to construct and complete this
23 portion of the work.

24
25 **TEMPORARY TRAFFIC CONTROL**

26
27 **General**

28
29 Section 1-10.1(2) is supplemented with the following:

30
31 (August 2, 2004)

32 The Contracting Agency will provide the following labor, equipment and/or materials
33 resources to the Contractor for use on the project. The Contractor will notify the
34 Engineer when each resource is to be utilized and will provide adequate notice that will
35 allow any necessary arrangements to be made.

36
37 ***

38 WSP for Signal Turn On – Flagging

39 WSP for Girder Setting and Bridge Demo – Flagging ***

40
41 (August 2, 2004)

42 The Contracting Agency has arranged for uniformed law enforcement personnel to
43 participate in the Contractor's traffic control activities. As stated in the last paragraph of
44 Section 1-10.1(2), the responsibility for all traffic control shall remain with the Contractor.
45 Uniformed law enforcement personnel may be utilized to perform the following traffic
46 control tasks:

47
48 ***

49 20hrs for Signal Turn On – Maximum 4 hours per signal for each traffic control plan.
50 See TC44 thru TC48.

64hrs for Girder Setting and Bridge Demo – Maximum of 16 nights of 4 hours each night. See TC33 thru TC39C. ***

This resource is provided at no additional cost to the Contractor. The value of this resource is assumed to be reflected in the Contractor's bid for Traffic Control. Additional agreement or price adjustment between the Contractor and the Contracting Agency for this resource shall not be necessary.

Traffic Control Management

General

(December 1, 2008)

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

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
401 Pontius Ave. N.
Seattle, WA 98109
1-800-521-0778 or
(206) 382-4090

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

Traffic Control Labor, Procedures and Devices

Traffic Control Procedures

One-Way Traffic Control

Section 1-10.3(2)A is supplemented with the following:

(*****)

The total delay for any vehicle due to flagging operations shall be fifteen minutes or less through the work area. The total delay for short term traffic stops for truck ingress/egress shall be one minute or less.

Measurement

Item Bids With Lump Sum for Incidentals

Section 1-10.4(2) is supplemented with the following:

(August 2, 2004)

The bid proposal does not contain the item "Project Temporary Traffic Control," lump sum. The provisions of Section 1-10.4(2) shall apply.

DIVISION 2 EARTHWORK

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Description

Section 2-02.1 is supplemented with the following:

(March 13, 1995)

This work shall consist of removing miscellaneous traffic items.

Construction Requirements

Section 2-02.3 is supplemented with the following:

(March 13, 1995)

Removing Miscellaneous Traffic Items

The following miscellaneous traffic items shall be removed and disposed of:

17,110 LF of Paint Line

3,440 LF of Plastic Line

6 plastic Traffic Marking

1250 SF of Plastic Crosswalk Line

2.20 Hundred Raised Pavement Markers ***

(***)**

Removing Wire Fence

Wire fence designated for removal shall be removed completely and disposed of off the project site.

Voids resulting from post removal shall be immediately backfilled and compacted.

There shall be no breaks in the fence at the end a work shift. The Contractor shall schedule the removal work to coincide with the installation of new fence, or furnish and install temporary fence to close breaks.

(***)**

Removing Drainage Structure

Existing drainage structures designated to be removed shall be completely removed and disposed of by the Contractor off the project site. Connecting pipes shall be removed within excavation limits. Pipe ends shall be plugged in accordance with Section 7-08.3(4).

(***)**

Removing Drainage Pipe

Existing drainage pipes designated to be removed shall be removed per limits shown in the plans and disposed of by the Contractor off the project site.

1
2 **Removal of Bridges, Box Culverts, and other Drainage Structures**

3 Section 2-02.3(2) is supplemented with the following:
4

5 (June 26, 2000)

6 The Contractor shall remove existing Bridge *** No. 12/118 *** after routing traffic
7 onto *** the new US 12 alignment (A1 Line) ***.
8

9 (June 26, 2000)

10 The Contractor shall remove existing Bridge *** No. 12/117*** in stages as shown
11 in the Plans.
12

13 (June 26, 2000)

14 Plans of the existing bridge(s) are available at the Project Engineer's Office for the
15 prospective bidder's inspection.
16

17 (June 26, 2000)

18 **Bridge Demolition Plan**

19 The Contractor shall submit a bridge demolition plan with working drawings and
20 calculations to the Engineer for approval in accordance with Section 6-01.9,
21 showing the method of removing the existing bridge(s), or portions of bridges, as
22 specified.
23

24 The bridge demolition plan shall show support bents, bracing, guys, lifting devices,
25 lifting attachments, the sequence of demolition and removal, the type of equipment
26 to be used in all demolition and removal operations, the location of cranes and
27 barges, the location of support or lifting points, and the weights of structure parts
28 being removed. The plan shall include a crane stability analysis and crane load
29 calculations based on the controlling crane picks of the Contractor's plan. The plan
30 shall detail the containment, collection, and disposal of all debris. The plan shall
31 show all stages of demolition.
32

33 The Contractor shall not begin removal operations until receiving the Engineer's
34 approval of the bridge demolition plan.
35

36 **Use of Explosives**

37
38 (June 26, 2000)

39 Explosives shall not be used in the demolition.
40

41 **Measurement**

42 Section 2-02.4 is supplemented with the following:
43

44 (September 8, 1997)

45 Pavement removal will be measured by the square yard.
46

47 (*****)

48 The removal of wire fence will be measured by the linear foot along the ground line of
49 the removed fence.
50

1 (*****)
2 The removal of drainage structures outside of the limits of a roadway or structure
3 excavation area will be measured per each for each structure removed.
4
5 (*****)
6 The removal of drainage pipes outside of the limits of a roadway or structure excavation
7 area will be measured by the linear foot for the length of pipe removed.
8

9 **Payment**

10
11 Section 2-02.5 is supplemented with the following:

12
13 (September 30, 1996)
14 "Removing Miscellaneous Traffic Item", lump sum.

15
16 (June 26, 2000)
17 "Removing Existing Bridge _____", lump sum.

18
19 (September 30, 1996)
20 "Removing *** Asphalt Concrete *** Pavement", per square yard.

21
22 (*****)
23 "Removing Wire Fence", per linear foot.

24
25 The unit contract price per linear foot for "Removing Wire Fence" shall include all costs
26 associated with furnishing and installing temporary fence to close breaks in the fence at
27 the end of a work shift.

28
29 (*****)
30 "Removing Drainage Structure", per each.

31
32 (*****)
33 "Removing Drainage Pipe", per linear foot.
34

35 **ROADWAY EXCAVATION AND EMBANKMENT**

36 37 **Construction Requirements**

38
39 Section 2-03.3 is supplemented with the following:

40
41 (*****)
42 ***Earthwork Design Assumptions***

43 The following are the Contracting Agency's roadway excavation and embankment
44 design assumptions:

45
46 Roadway excavation material is not considered suitable for construction of roadway
47 embankments. During Stage 6 of the project 6,130 cy of material may be wasted
48 on the project; on the slope of the A1 Line between stations 201+71 RT to 204+00
49 RT. The wasted material shall be placed as shown on Sheets CN4 and CN6.

50
51 Pond Excavation materials from Pond 5 is considered suitable for construction of
52 roadway embankments.

(*****)

Pond Excavations

Ponds shall be excavated to the lines and grades detailed in the Plans. Except for Pond Excavation materials from Pond 5, all other Pond Excavation material shall not be used for embankment construction and shall be disposed of in accordance with Section 2-03.3(7)C.

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 pond excavation, 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.

Copies of the ground cross-section notes will be available for the bidder's inspection, before the opening of bids, at the Project Engineer's office and at the Region office.

Upon award of the contract, copies of the original ground cross-sections will be furnished to the successful bidder on request to the Project Engineer.

Payment

Section 2-03.5 is supplemented with the following:

(*****)

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

The unit contract price per cubic yard for "Pond Excavation Incl. Haul" shall be full compensation incurred for excavating, dewatering, loading, and disposing of the material offsite.

STRUCTURE EXCAVATION

Construction Requirements

Shoring And Cofferdams

Section 2-09.3(3)D is supplemented with the following:

(March 13, 1995)

The Contractor shall protect the existing pavement from damage due to the Contractor's operations and shall shore all excavation adjacent to the existing pavement.

(*****)

Shoring at Pier 1 of US 12 Over TRMD RR Br. No. 12/117

The Contractor shall protect the existing track and facilities of the Railroad Company from damage due to the Contractor's operations, and shall shore all excavation adjacent to the existing railroad track, including Pier 1 of US 12 Over TRMD RR Br. No. 12/117.

Shoring at Pier 1 of US 12 Over TRMD RR Br. No. 12/117 shall be designed in accordance with the current AREMA Manual For Railway Engineering to support the soil load and a Cooper E-80 live load surcharge.

The Contractor is advised that the shoring details shown in the Plans have received conceptual approval from the Railroad companies, but that submittal of the Contractor's specific details for this system will be required for approval under the requirements of Section 6-02.3(16). The Contractor is advised that submittal of design calculations and details for shoring systems different from that shown in the Plans will require significantly longer review time prior to approval under the requirements of Section 6-02.3(16), than for a submittal based on the shoring system shown in the Plans.

The Contractor shall drive or push the shoring in advance of all excavation, and shall not excavate below the bottom of the shoring at any time.

After completing the footing construction of Pier 1 of US 12 Over TRMD RR Br. No. 12/117, and prior to extracting the shoring, the Contractor shall fill the excavation with either native backfill or common borrow material compacted in accordance with Section 2-03.3(14)C, except that the backfill shall be compacted to 80 percent of the maximum density as specified. After completing the backfilling and compacting operation to the level of the existing groundline, the Contractor shall extract and remove the shoring.

Damage to the railroad track or railroad facilities, due to the Contractor's operations, will be repaired by the Railroad at the Contractor's expense.

(March 13, 1995)

Because of the nearness of the work to the existing *** Tacoma Rail Mountain Division (TRMD) tracks, *** the Contractor shall protect the *** Tacoma Rail Mountain Division (TRMD) tracks *** during the *** construction of Br. No. 12/117 Repl. and the removal of existing Br. No. 12/117 ***.

**DIVISION 4
BASES**

Description

Section 4-04.1 is supplemented with the following:

(OR March 30, 2010)

This work also includes shoulder finishing by furnishing and placing bituminous pavement planings or crushed surfacing base course along roadway shoulders as detailed in the Plans.

Materials

Section 4-04.2 is supplemented with the following:

(OR February 20, 2004)

Crushed surfacing base course used in shoulder finishing will be accepted by the Engineer based upon satisfactory performance of the material for its intended use. The material may be tested at the discretion of the Engineer. Bituminous pavement planings may be used in lieu of crushed surfacing base course.

Construction Requirements

Section 4-04.3 is supplemented with the following:

(OR February 20, 2004)

After paving the top lift of HMA, crushed surfacing base course or planings shall be placed against the vertical edge of the pavement. Materials shall be graded into place and compacted by approved compaction equipment with a minimum of two passes. For compaction, water shall be applied as determined by the Engineer.

Following the construction of shoulder finishing, the paved shoulders shall be cleaned of all dirt and debris to the satisfaction of the Engineer.

Measurement

Section 4-04.4 is supplemented with the following:

(OR February 6, 2001)

Shoulder finishing will be measured to the nearest 0.01 mile along each shoulder finished.

Payment

Section 4-04.5 is supplemented with the following:

(OR December 19, 2005)

"Shoulder Finishing", per mile.

The unit contract price per mile for "Shoulder Finishing" shall include all costs to furnish and place the material as specified.

**DIVISION 5
SURFACE TREATMENTS AND PAVEMENTS**

HOT MIX ASPHALT

Description

Section 5-04.1 is supplemented with the following:

(*****)

This work shall include rubblizing the existing asphalt concrete pavement, and incorporating the material into the new roadway embankment.

Materials

Section 5-04.2 is supplement with the following:

1 (*****)

2 **Rubblized Asphalt Concrete Pavement**

3 Existing asphalt concrete pavement on site shall be rubblized by a method that limits
4 damage or dislodging of the material below the pavement. The rubblized material shall
5 conform to the following gradation:
6

7 Sieve Size	Percent Passing
8 U.S. Standard	by Dry Weight

10 6-inch	100

12 3/4-inch	40 max.

13
14 Acceptance of the gradation will be based on visual inspection.
15

16 **Construction Requirements**

17
18 Section 5-04.3 is supplemented with the following:
19

20 (*****)

21 **Rubblizing Existing Pavement**

22 Rubblized Materials shall be compacted using a 10-ton compression roller or a vibratory
23 roller having a dynamic force of at least 30,000-pounds impact per vibrations and at least
24 1,000-vibrations per minute. In either case, the roller shall make four passes of full
25 coverage. Rollers must exert reasonably even pressure over the area covered. The
26 Contractor shall limit the speed of the compression rollers to no more than 4 miles per
27 hour, and the speed of the vibratory rollers to no more than 1.5 miles per hour.
28

29 **General**

30 In Section 5-04.3(10)A, the second sentence of the third paragraph is revised to
31 read as follows:
32

33 (OR December 11, 2008)

34 An exception shall be that pneumatic tired rollers shall be used between
35 September 1st of any year and April 1st of the following year.
36

37 **Joints**

38 Section 5-04.3(12) is supplemented with the following:
39

40 (OR November 30, 2004)

41 **HMA Longitudinal Paper Joint at Intersections**

42 At intersections or where traffic may cross over the vertical edge, the Contractor
43 shall construct and maintain a temporary HMA wedge across the entire length of
44 the intersection. The wedge shall be constructed as shown in the Plans and shall
45 be constructed before opening to traffic. When paving operations resume, the
46 paper joint shall be removed. The HMA material that is cut away shall be wasted
47 and a new mix shall be laid against the fresh cut.
48

49 (OR May 27, 2004)

50 **HMA Step Wedge Joint**

51 A continuous HMA step wedge joint shall be constructed along the longitudinal joint
52 between driving lanes. The HMA step wedge joint shall consist of a vertical step

not less than ¾-inch or more than one-half the compacted lift thickness. The remaining depth below the vertical step shall be tapered at a slope not steeper than 4:1. The sloped portion of the HMA step wedge joint shall be uniformly compacted.

Planing Bituminous Pavement

Section 5-04.3(14) is supplemented with the following:

(January 5, 2004)

The Contractor shall perform the planing operations no more than *** 3 *** calendar days ahead of the time the planed area is to be paved with HMA, unless otherwise allowed by the Engineer in writing.

Measurement

Section 5-04.4 is supplemented with the following:

(September 5, 2006)

No specific unit of measurement will apply to the calculated item of asphalt cost price adjustment.

(*****)

Rubblization of asphalt conc. pavement will be measured by the square yard.

Payment

Section 5-04.5 is supplemented with the following:

(September 8, 2008)

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 the asphalt binder reference cost twice each month and post the information on the Agency website at:

<http://www.wsdot.wa.gov/biz/construction/AsphaltIndex.cfm>

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.

The base cost established for this contract is the reference cost posted on the Agency website for the period immediately preceding the bid opening date.

Adjustments will be based on the most current reference cost for Western Washington or Eastern Washington as posted on the Agency website, depending on where the work is performed. 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. The adjustment will be calculated as follows:

No adjustment will be made if the reference cost is within 5% of the base cost.

If the reference cost is greater than or equal to 105% of the base cost, then
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
Adjustment = (Current Reference Cost – (0.95 x Base Cost)) x (Q x 0.056).

Where 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.

(OR November 30, 2004)

All costs to incorporate the HMA longitudinal paper joint at intersections into the paving shall be included in the unit contract price for "HMA CL. ____ PG ____", per ton.

(OR November 30, 2004)

All costs to incorporate the HMA step wedge joint into the paving shall be included in the unit contract price for "HMA CL. ____ PG ____", per ton.

(*****)

"Rubblization of Asphalt Conc. Pavement," per square yard

The unit contract price per square yard for "Rubblization of Asphalt Conc. Pavement" shall be full compensation for all labor, tools and equipment to complete the work as specified including compaction of the rubblized pavement.

DIVISION 6 STRUCTURES

GENERAL REQUIREMENTS FOR STRUCTURES

Foundation Data

Section 6-01.2 is supplemented with the following:

(June 26, 2000)

1 The attached log of test boring pages are reproductions of the original Log of Test
2 Boring for the test holes shown in the Plans.

3
4 The Contractor should review the geotechnical recommendations report prepared for
5 this project. Copies of the geotechnical recommendations report are available for
6 review by prospective bidders at the location specified in Section 1-02.4 as
7 supplemented in these Special Provisions.

8
9 (August 6, 2001)

10 The Contractor should also review the Summary of Geotechnical Conditions in the
11 Appendix to the Special Provisions.

12 13 **CONCRETE STRUCTURES**

14 15 **Materials**

16 Section 6-02.2 is supplemented with the following:

17
18 *(April 7, 2008)*

19 ***Resin Bonded Anchors***

20 The resin bonded anchor system shall include the nut, washer, and threaded anchor rod
21 which is installed into hardened concrete with a resin bonding material. The resin
22 bonded anchor system shall conform to the following requirements:

23 24 1. Threaded Anchor Rod and Nuts

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

29
30 Nuts shall conform to AASHTO M 291, Grade DH, except as otherwise noted.
31 Nuts for stainless steel resin bonded anchor systems shall conform to ASTM F
32 594 and shall be Type 304 unless otherwise specified.

33
34 Washers shall conform to AASHTO M 293, except as otherwise noted.
35 Washers for stainless steel resin bonded anchor systems shall conform to
36 ASTM A 240 and the geometric requirements of ANSI B18.22.1 and shall be
37 Type 304 Stainless Steel unless otherwise specified.

38
39 Nuts and threaded anchor rods, except those manufactured of stainless steel,
40 shall be galvanized in accordance with AASHTO M 232. Galvanized threaded
41 anchor rods shall be tested for embrittlement after galvanizing, in accordance
42 with Section 9-06.5(4).

43
44 Threaded anchor rods used with resin capsules shall have the tip of the rod
45 chiseled in accordance with the resin capsule manufacturer's
46 recommendations. Galvanized threaded rods shall have the tip chiseled prior
47 to galvanizing.

48 49 2. Resin Bonding Material

50 Resin bonding material shall be one of the following:

51
52 a. Vinylester resin.

- b. Polyester resin.
- c. Methacrylate resin.
- d. A two component epoxy 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

(April 7, 2008)

Block Finish

The block finish shall be accomplished by the use of either a form liner selected from the approved products listed in the WSDOT Qualified Products List (QPL), latest edition, or a form liner approved by the Engineer as an equal product. For approval of form liners not listed in the current WSDOT QPL, the Contractor shall submit four copies of the request, along with catalogue cuts and other descriptive supporting information, as follows:

1. Two sets to the Project Engineer
2. Two sets, accompanied by a 2 foot square physical sample of the form liner, to the State Bridge and Structures Architect, addressed as follows:

If sent via US Postal Service:

Washington State Department of Transportation
State Bridge and Structures Architect
P. O. Box 47340
Olympia, WA 98504-7340

If sent via FedEx:

Washington State Department of Transportation
State Bridge and Structures Architect
7345 Linderson Way SW
Tumwater, WA 98501-6504

1 The height of the form liner shall be equal to or greater than the height of the formed
2 surface. Only elastomeric form liners are allowed to have horizontal splices.

3
4 **(April 7, 2008)**

5 ***Split Face Finish***

6 The split face finish shall be accomplished by the use of either a form liner selected
7 from the approved products listed in the WSDOT Qualified Products List (QPL), latest
8 edition, or a form liner approved by the Engineer as an equal product. For approval of
9 form liners not listed in the current WSDOT QPL, the Contractor shall submit four copies
10 of the request, along with catalogue cuts and other descriptive supporting information,
11 as follows:

- 12
13 1. Two sets to the Project Engineer
14
15 2. Two sets, accompanied by a 2 foot square physical sample of the form liner, to
16 the State Bridge and Structures Architect, addressed as follows:

17 If sent via US Postal Service:

18
19
20 Washington State Department of Transportation
21 State Bridge and Structures Architect
22 P. O. Box 47340
23 Olympia, WA 98504-7340
24

25 If sent via FedEx:

26
27 Washington State Department of Transportation
28 State Bridge and Structures Architect
29 7345 Linderson Way SW
30 Tumwater, WA 98501-6504
31

32 The height of the form liner shall be equal to or greater than the height of the formed
33 surface. Only elastomeric form liners are allowed to have horizontal splices.

34
35 **(BSP August 4, 2003)**

36 **Prestressed Concrete Girders**

37 ***Aggregates and Proportioning***

38 The second paragraph of Section 9-19.1 is revised to read as follows:

39
40 The Contractor shall submit a Contractor-Provided mix design for each design
41 strength of prestressed girder to the Engineer for approval in accordance with
42 Section 6-02.3(2)A, including a Contractor-Provided mix design of high strength
43 concrete for the prestressed girders of *** Bridge Nos. 12/117 Repl. and 12/118
44 Repl.***.

45
46 Approval of the mix design will not preclude any requirements for the concrete
47 placed in the girders.

48
49 The Contractor-Provided mix design for high strength concrete shall conform to the
50 following:

51 Minimum Compressive
52 Strength in psi at 56 days

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	in accordance with AASHTO T 22
Bridge	

Br. No. 12/117 Repl.	9,800
Br. No. 12/118 Repl.	9,400

The Contractor may substitute testing for minimum compressive strength at 28 days, provided that the 28 day compressive strength is equal to or greater than 95 percent of the specified 56 day compressive strength.

The Contractor shall test a minimum of three specimens for each of the tests specified. The test specimens for the compressive strength tests shall be four inch by eight inch cylinders cast in molds supplied by the Contractor in accordance with Section 6-02.3(5)D. The Contractor shall include the results of all tests in the high strength concrete mix design submittal to the Engineer.

Construction Requirements

Bridge Decks and Bridge Approach Slabs

Bridge Approach Slab Orientation and Anchors

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

(August 4, 2008)

The pavement end of the bridge approach slab shall be constructed normal to the roadway center line.

(August 4, 2008)

The compression seal shall be a 2-1/2 inch wide gland selected from the approved products listed in the WSDOT Qualified Products List, latest edition.

Finishing Concrete Surfaces

Section 6-02.3(14) is supplemented with the following:

(June 26, 2000)

General Requirements for Concrete Surface Finishes Produced by Form Liners

Horizontal and vertical joints shall be spliced in accordance with the manufacturer's printed instructions. A copy of these printed instructions shall be submitted to the Engineer prior to placement of the form liners. The Contractor shall not place concrete against the form liners until receiving the Engineer's approval of the forms and splices.

Horizontal splicing of ABS and plastic form liners to achieve the required height is not permitted and there shall be no horizontal joints. The concrete formed with ABS and plastic form liners shall be given a light sandblast to remove the glossy finish.

Side forms, traffic barrier forms, and pedestrian barrier forms using these form liners may be removed after 24 hours provided a water reducing admixture

1 approved by the Engineer is used in the concrete, and the concrete reaches 1,400
2 psi minimum compressive strength before form removal. Concrete in load
3 supporting forms utilizing these form liners shall be cured in accordance with
4 Section 6-02.3(17)N. Once the forms are removed, the Contractor shall treat the
5 joint areas by patching or light sandblasting as required by the Engineer to ensure
6 that the joints are not visible.

7
8 Form liners shall be cleaned, reconditioned, and repaired before each use. Form
9 liners with repairs, patches, or defects which, in the opinion of the Engineer, would
10 result in adverse effects to the concrete finish shall not be used.

11
12 Care shall be taken to ensure uniformity of color throughout the textured surface. A
13 change in form release agent will not be allowed.

14
15 All surfaces formed by the form liner shall also receive a Class 2 surface finish.
16 Form ties shall be a type that leaves a clean hole when removed. All spalls and
17 form tie holes shall be filled as specified for a Class 2 surface finish.

18
19 **(August 6, 2007)**

20 **Block Finish**

21 Form liners shall be placed with the faux mortar joints and formliner joints normal to
22 grade for barrier applications and vertical (or as shown in the Plans) for other
23 applications. Horizontal joints in the elastomeric form liners are permitted on
24 surfaces greater than 8 feet in height provided that the minimum form liner panel
25 dimension is 8 feet.

26
27 **(April 7, 2008)**

28 **Split Face Finish**

29 Form liners shall be placed with the joints normal to grade for barrier applications
30 and vertical (or as shown in the Plans) for other applications. Horizontal joints in
31 the elastomeric form liners are permitted on surfaces greater than 8 feet in height
32 provided that the minimum form liner panel height and width dimensions are 8 feet
33 by 6 feet, respectively.

34
35 **Pigmented Sealer for Concrete Surfaces**

36 Section 6-02.3(14)C is supplemented with the following:

37
38 **(April 6, 2009)**

39 The color of the pigmented sealer shall be Washington Gray.

40
41 ***Falsework and Formwork***

42
43 **Falsework and Formwork at Special Locations**

44 Section 6-02.3(17)C is supplemented with the following:

45
46 **(June 26, 2000)**

47 The Contractor shall obtain permission from the Railroad Company and the
48 Washington Utilities and Transportation Commission for the Contractor's
49 falsework openings over railroad tracks. The Contractor shall notify the
50 Railroad Company at least 10 working days prior to erecting falsework over a
51 track, and shall include the dimensions of the opening and the duration of the
52 restricted clearance in the submittal.

1
2 **(August 5, 2002)**

3 **Placing Anchor Bolts**

4 Section 6-02.3(18) is supplemented with the following:
5

6 **Resin Bonded Anchors**

7 The Contractor shall submit item 1 and 2 to the Engineer for all resin bonded
8 anchor systems. If the resin bonded anchor system and anchor diameter are not
9 listed in the current WSDOT Qualified Products List, the Contractor shall also
10 submit item 3 to the Engineer.
11

- 12 1. The resin manufacturer's written installation procedure for the anchors.
13 Resin bonding material used in overhead and horizontal application shall
14 be specifically recommended by the resin manufacturer for those
15 applications.
16
- 17 2. The manufacturer's certificate of compliance for the threaded anchor rod
18 certifying that the anchor rod meets the requirements of this Special
19 Provision.
20
- 21 3. Test results by an independent laboratory certifying that the threaded
22 anchor rod system meets the ultimate anchor tensile load capacity
23 specified in Section 6-02.2 as supplemented in these Special Provisions.
24 The tests shall be performed in accordance with ASTM E 488.
25

26 The embedment depth of the anchors shall be as specified in the Plans. If the
27 embedment depth of the anchor is not specified in the Plans then the embedment
28 depth shall be as specified in the table of minimum and maximum torque below.
29

30 The anchors shall be installed in accordance with the resin manufacturer's written
31 procedure.
32

33 Holes shall be drilled as specified in the Plans. Holes may be drilled with a rotary
34 hammer drill when core drilling is not specified in the Plans. If holes are core
35 drilled, the sides of the holes shall be roughened with a rotary hammer drill after
36 core drilling.
37

38 Holes shall be prepared in accordance with the resin manufacturer's
39 recommendations and shall meet the minimum requirements as specified herein.
40 Holes drilled into concrete shall be thoroughly cleaned of debris, dust, and laitance
41 prior to installing the threaded rod and resin bonding material. Holes shall not have
42 any standing liquid at the time of installation of the threaded anchor rod.
43

44 Threaded anchors shall not be installed in submerged liquid environments unless
45 specifically recommended by the resin manufacturer. The Contractor shall submit
46 tests performed by an independent laboratory which certifies that anchors installed
47 in a submerged environment meet the strength requirements specified in Section 6-
48 02.2 as supplemented in these Special Provisions.
49

50 The anchor nuts shall be tightened to the following torques when the embedment
51 equals or exceeds the minimum embedment specified.
52

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.

Grout for Anchor Bolts and Bridge Bearings

Section 6-02.3(20) is supplemented with the following:

(June 26, 2000)

Grout placed at the following locations shall conform to the requirements of this section.

*** Bearing pad grout pads at the end piers or as shown in the Plans. ***

Prestressed Concrete Girders

Section 6-02.3(25) is supplemented with the following:

(*****)

The precast crossbeam of Bridge No. 12/118 Repl. shall be constructed in accordance with this Section.

Casting

(BSP August 4, 2003)

The second paragraph of Section 6-02.3(25)B is revised to read as follows:

The Contractor shall fabricate all prestressed concrete girders using the Contractor-Provided mix design appropriate for the design strength specified for each girder in accordance with Sections 6-02.3(2)A and 9-19.1 as supplemented in these Special Provisions, and as approved by the Engineer. The temperature of the concrete when placed shall be between 50F and 90F.

(*****)

The use of air entrainment shall be required in the concrete placed into precast crossbeams.

Contractors Control Strength

Section 6-02.3(25)E is supplemented with the following:

1 (BSP August 4, 2003)

2 For the prestressed girders of *** Bridge Nos. 12/117 Repl. and 12/118 Repl.
3 ***, the Contractor may substitute compressive strength testing at 28 days
4 provided that the 28 day compressive strength is equal to or greater than 95
5 percent of the required 56 day compressive strength.
6

7 **Shipping**

8
9 (BSP August 4, 2003)

10 The first paragraph of Section 6-02.3(25)M is revised to read as follows:

11
12 After the girder has reached its 28-day design strength, or 95 percent of the 56
13 day design strength for the girders of *** Bridge Nos. 12/117 Repl. and 12/118
14 Repl. ***, and the fabricator believes it to comply with the specification, the
15 girder and a completed Certification of Compliance, signed by a
16 Precast/Prestressed Concrete Institute Technician or a professional engineer,
17 acceptable to the Contracting Agency, shall be submitted to the Engineer for
18 inspection. If the Engineer finds the certification and the girder to be
19 acceptable, the Engineer will stamp the girder "Approved for Shipment".
20

21 (BSP August 4, 2003)

22 The third paragraph of Section 6-02.3(25)M is supplemented with the following:

23
24 The Contractor is advised that, because of the higher compressive design
25 strengths required for the production prestressed concrete girders of *** Bridge
26 Nos. 12/117 Repl. and 12/118 Repl. ***, it will take longer than the usual time
27 for these girders to reach sufficient strength for shipping. The Contractor shall
28 take this into account when preparing schedules for this portion of the work.
29

30 **Precast Concrete Panels**

31 Section 6-02.3(28) is supplemented with the following:

32
33 (*****)

34 The precast columns and crossbeam end panels of Bridge No. 12/118 Repl. shall
35 be constructed in accordance with this Section.
36

37 **Shop Drawings**

38 The third paragraph of Section 6-02.3(28)A is supplemented with the following:

39
40 (*****)

41 Contractor shall submit a grouting operation Plan to the Engineer for approval in
42 accordance with Section 6-02.3(26)H except duct leak tightness testing will not be
43 required.
44

45 **Casting**

46 Section 6-02.3(28)B is supplemented with the following:

47
48 (*****)

49 The precast columns shall be fabricated by the same fabricator as the precast
50 crossbeams.
51

52 The precast column segments shall be match-marked.

The precast crossbeam end panels shall be cast using a template from the precast crossbeams.

Ducts shall be semi-rigid, corrugated, galvanized, ferrous metal. The minimum duct thickness shall be 31-gauge.

Erection

Section 6-02.3(28)I is supplemented with the following:

(*****)

Grout placed between column segments and column to crossbeam connection shall be pumpable and conform to Section 9-20.3(2) and the following:

Property	Value	
Mechanical	Age	Compressive Strength (psi)
Compressive Strength	1 Day	2,500
(ASTM C-109, 2" cubes)	3 Days	4,000
	7 Days	5,000
	28 Days	Maximum [6,000, 1.25f _c cap + 500)]
Compatibility		
Expansion Requirements (ASTM C-827 & C-1090)	Grade B or C	
Modulus of Elasticity (ASTM C-469)	2.8-5.0x10 ⁶ psi	
Coefficient of Thermal Expansion (ASTM C-531)	3.0 – 10.0x10 ⁻⁶ /deg F	
Constructability		
Flowability (ASTM C-969; CRD-C 611 Flow Cone)	Fluid consistency Efflux time : 20 – 30 seconds	
Set Time (ASTM C-191)		
Initial	2.5 – 5.0 hrs	
Final	4.0 – 8.0 hrs	
Durability		
Freeze Thaw (ASTM C-666)	300 cycles, RDF 90%	
Sulfate Resistance (ASTM C-1012)	Expansion at 26 weeks < 0.1%	

The ducts between column segments shall be air flushed prior to grouting.

Shims for aligning column segments column to crossbeam connection shall be one of the following or an approved equal:

Korolath Shim Strips
Korolath of New England, Inc.
498 River Road

1 Hudson, MA 01749
2 (978)562-7366
3
4 Vers-A-Shim High Impact Plastic Shims
5 Deslauriers, Inc
6 1245 Barnsdale Road
7 LaGrange Park, IL 60526
8 (800)743-4106
9 <http://www.deslinc.com/index-home.cfm>
10
11 Tilt Up Shims
12 Greenstreak
13 3400 Tree court Industrial Blvd.
14 St. Louis, Mo 63133-6614
15 (800)325-9504
16 <http://www.greenstreak.com/index.asp>
17
18 Shimmers
19 JVI
20 7131 North Ridgeway
21 Lincolnwood, IL 60712
22 (800)742-8127
23 <http://www.jvi-inc.com/contact.shtml>
24

25 Measurement

26 Section 6-02.4 is supplemented with the following:

27
28 (June 26, 2000)

29 *** Superstructure – Br. No. 12/117 Repl and Br. No. 12/118 Repl. *** contains the
30 following approximate quantities of materials and work:

31
32 ***

33 Superstructure – Br. No. 12/117 Repl

34 Epoxy-Coated St. Reinf. Bar	23,475	LBS.
35 St. Reinf. Bar	8,400	LBS.
36 Conc. Class 4000D	146	C.Y.
37 Conc. Class 4000	71	C.Y.
38 Elastomeric Bearing Pads	36	Each
39 Elastomeric Transverse Stop Pads	72	Each

41 Superstructure – Br. No. 12/118 Repl

42 Epoxy-Coated St. Reinf. Bar	85,000	LBS.
43 St. Reinf. Bar	17,150	LBS.
44 Conc. Class 4000D	335	C.Y.
45 Conc. Class 4000	175	C.Y.
46 Elastomeric Bearing Pads	30	Each
47 Elastomeric Transverse Stop Pads	60	Each

48 ***

49
50 The quantities are listed only for the convenience of the Contractor in determining the
51 volume of work involved and are not guaranteed to be accurate. The prospective
52 bidders shall verify these quantities before submitting a bid. No adjustments other than

1 for approved changes will be made in the lump sum contract price for *** Superstructure
2 – Br. No. 12/117 Repl and Br. No. 12/118 Repl *** even though the actual quantities
3 required may deviate from those listed.
4

5 (BSP December 5, 2005)

6 Prestressed concrete girder will be measured by the linear foot of girder specified in the
7 Proposal, including adjustments to the Plan quantity made in accordance with Section
8 1-04.4.
9

10 (*****)

11 Precast columns will be measured by the linear foot as installed along its longitudinal
12 completed line and slope.
13

14 Precast crossbeam will be measured by the linear foot as installed along its longitudinal
15 completed line and slope.
16

17 **Payment**

18
19 The first bid item under Section 6-02.5 is supplemented with the following:
20

21 (June 26, 2000)

22 All costs in connection with producing *** split face and block *** finish on concrete
23 surfaces as specified shall be included in the unit contract price per cubic yard for
24 "Conc. Class ____". If the concrete is to be paid for other than by class of concrete
25 then the costs shall be included in the applicable adjacent item of work.
26

27 The third bid item under Section 6-02.5 is supplemented with the following:
28

29 (June 26, 2000)

30 All costs in connection with *** elastomeric bearing pads and transverse elastomeric
31 girder stop pads, *** shall be included in the lump sum contract price for "Superstructure
32 - ____".
33

34 Section 6-02.5 is supplemented with the following:
35

36 (BSP November 5, 2006)

37 "Prestressed Conc. Girder ____", per linear foot.

38 The unit contract price per linear foot for "Prestressed Conc. Girder ____" shall be full
39 pay for performing the work as specified, including shop drawing submittals, fabrication,
40 storage, handling, shipping, erection (including all site preparation and restoration
41 activities necessary for erection equipment access and support), furnishing and
42 removing oak block wedges, furnishing and removing temporary bracing, and furnishing
43 and cutting temporary strands. For deck bulb tee girders and PCPS members, all work
44 related to equalizing girder camber, connecting weld-ties, and grouting keyways, shall
45 also be included. For spliced prestressed concrete girders, all work related to cast-in-
46 place concrete closures and post-tensioning shall be included. Payment will be made
47 based on the quantity specified in the Proposal, unless changes are made to this
48 quantity in accordance with Section 1-04.4, in which case the quantity specified in the
49 Proposal will be adjusted by the amount of the change and will be paid for in
50 accordance with Section 1-04.4.
51

1 (*****)

2 "Precast Columns", per linear foot.

3
4 "Precast Crossbeam", per linear foot.

5 The unit cost per linear foot of the "Precast Crossbeam" shall be full pay for performing
6 the work as specified, including fabricating and erecting the precast end panels.

7
8 **(June 26, 2000)**

9 ***Bridge and Structures Minor Items***

10 For the purpose of payment, such bridge and structures items as *** pre-molded joint
11 filler, neoprene pad, butyl rubber sheeting and assembly, adhesives, oak blocks, grout,
12 anchor bolt, flexible sealant, polystyrene foam, and plastic shims *** etc., for which there
13 is no pay item included in the proposal, are considered as bridge and structures minor
14 items. All costs in connection with furnishing and installing these bridge and structures
15 minor items as shown and noted in the Plans and as outlined in these specifications and
16 in the Standard Specifications shall be included in the *** applicable adjacent items of
17 work ***

18
19 **BRIDGE RAILINGS**

20
21 **Materials**

22 Section 6-06.2 is supplemented with the following:

23
24 ***(BSP August 3, 2009)***

25 ***Bridge Railing Type Snow Fence and Bridge Railing Type Wire Fabric***
26 ***Fence***

27 Wire fabric shall be 6 gage diameter, 2 inch space, intermediate crimp, intermediate
28 weave, low carbon steel, basic bright, galvanized.

29
30 HSS tubes shall conform to ASTM A 500, Grade B.

31
32 Steel bars, plates, and shapes shall conform to either ASTM A 36 or ASTM A 992.

33
34 HSS tube caps shall conform to ASTM A 53 Grade B Type E or S, or may be fabricated
35 from material conforming to ASTM A 36.

36
37 HSS tubes, HSS tube caps, and steel bars, plates, and shapes, shall be galvanized
38 after fabrication in accordance with AASHTO M 111.

39
40 Bolts, anchor bolts, threaded welded studs, nuts, and washers shall conform to Section
41 9-06.5(3), and shall be galvanized after fabrication in accordance with AASHTO M 232.

42
43 Carriage bolts shall conform to ASTM F 593, Type 304. Carriage bolt nuts shall conform
44 to ASTM F 594, Type 304. Carriage bolt washers shall conform to ASTM A 240 Type
45 304 stainless steel and the geometric requirements of ANSI B18.22.1.

46
47 Resin bonded anchors shall conform to Section 6-02.2 as supplemented in these
48 Special Provisions.

49
50 All tubes, pipes, bars, plates, shapes, wire fabric, and hardware, shall be shop painted
51 or powder coated after galvanizing in accordance with Section 6-07.3(11). The color of

1 the finish coat, when dry, shall match the color *** Federal Standard 595 Color Number
2 20045 ***.

3 4 **Construction Requirements**

5 6 **Metal Railings**

7 Section 6-06.3(2) is supplemented with the following:

8
9 **(BSP August 3, 2009)**

10 **Bridge Railing Type Snow Fence and Bridge Railing Type Wire Fabric Fence**

11 The railing shall be fabricated and installed in accordance with the shop drawings
12 approved by the Engineer. The railing panels shall be installed level, and the railing
13 posts shall be installed plumb.

14
15 The Contractor shall install anchor bolts for each post anchorage as shown in the
16 Plans. Alternatively, the Contractor may install resin bonded anchors at each post
17 anchorage, in accordance with Section 6-02.3(18) as supplemented in these
18 Special Provisions.

19
20 After completing erection, the Contractor shall repair all metal surfaces with
21 damaged paint or powder coatings and exposed metal with a field repair coating in
22 accordance with Section 6-07.3(9)I and Section 6-07.3(11)A (for paint) or Section 6-
23 07.3(11)B (for powder coating). The color of the finish coat of the field repair
24 coating, when dry, shall match the color *** Federal Standard 595 Color Number
25 20045 ***.

26
27 **(*****)**

28 **STEEL PEDESTRIAN RAILING**

29 **Description**

30 This work shall consist of fabricating and installing a galvanized and painted or powder
31 coated steel pedestrian railing.

32 33 **Materials**

34 Material shall meet the requirements of the following sections of the Standard Specifications:

35		
36	Epoxy Resin	9-26.1
37	Paint or Powder Coating Systems	9-08.1 and 9.08.2
38		

39 All steel components shall be in accordance with ASTM A 53 Grade B. Galvanizing shall be
40 in accordance with ASTM M 111.

41 42 **Construction Requirements**

43 The steel sleeves for the pedestrian railing shall be securely placed in the hole or form prior
44 to pouring the concrete. Precast concrete fascia panels for Geosynthetic Retaining Wall W1
45 shall include steel sleeves as shown in the Plans to receive the vertical posts. The steel
46 sleeves shall be placed in the concrete wall fascia during manufacturing.

47
48 Drilling of holes to accept steel sleeves after placement of concrete will not be allowed.
49 When installing the railing, temporary blocking may be required to provide the required
50 height until the epoxy resin has set.

1 Railing with a radius of less than one hundred feet shall be bent by the fabricator prior to
2 delivery on the job site. Bending shall be smooth and uniform with no visible kinking. All steel
3 pedestrian railing components shall be primed and painted with the final exposed finish
4 being Federal Standard 595 color 34097. Railings shall be painted or powder coated in
5 accordance with Section 6-07.3(11) and may be painted on site after installation. Painting
6 activities shall be performed in a manner to protect adjacent areas from paint overspray. All
7 damage to pre-painted surfaces as a result of the Contractor's operations, including
8 handling, shipping and installation, shall be repaired in accordance with Section 1-07.13.

9
10 An alternative manufactured metal railing may be substituted for the railing shown in the
11 Plans, subject to the approval of the Engineer. The alternative manufactured metal railing, if
12 proposed, shall be the height shown in the Plans, and shall be material of the same
13 diameter.

14 15 **Measurement**

16 Steel Pedestrian Railing will be measured by the linear foot measured along its complete
17 line. This measurement will be from the beginning vertical post to the ending vertical post at
18 their respective bases measured horizontally. The concrete bases will not be included in this
19 measurement.

20 21 **Payment**

22 Payment will be made in accordance with Section 1-04.1 of the Standard Specifications for
23 the following bid item in the proposal:

24
25 "Steel Pedestrian Railing", per linear foot.

26
27 The unit contract price per linear foot for "Steel Pedestrian Railing" shall be full pay for
28 furnishing and installing as specified including forming of steel sleeves in precast
29 concrete fascia panel, sleeves, epoxy resin, bracing, galvanizing, painting and all other
30 work necessary for construction.

31 32 **CONCRETE BARRIER**

33 34 **Construction Requirements**

35 36 ***Temporary Concrete Barrier***

37 Section 6-10.3(5) is supplemented with the following:

38
39 (March 13, 1995)

40 Delineators shall be placed on the traffic face of the barrier 6 inches from the top
41 and spaced a maximum of 40 feet on tangents and 20 feet through curves.

42
43 Reflector color shall be white on the right of traffic and yellow on the left of traffic.

44
45 The Contractor shall maintain, replace, and clean the delineators when ordered by
46 the Engineer.

47 48 ***Placing Concrete Barrier***

49 Section 6-10.3(6) is supplemented with the following:

50
51 (March 13, 1995)

1 Precast barrier intended for permanent placement may be used at temporary
2 locations and will be considered temporary barrier until installed at a permanent
3 location.

4
5 Barrier damaged while being used at a temporary location shall not be reused at a
6 permanent location even though it has been repaired, and when no longer required
7 at a temporary location, shall become the property of the Contractor and removed
8 from the project.
9

10 **Measurement**

11 Section 6-10.4 is supplemented with the following:

12
13 **(*****)**

14 Removing and resetting existing concrete HP barrier will be measured by the linear foot
15 and will be measured one time only for removing, storage, and resetting. No measure
16 will be made for barrier that has been removed and reset for the convenience of the
17 Contractor.
18

19 **Payment**

20 Section 6-10.5 is supplemented with the following:

21
22 **(*****)**

23 "Removing and Resetting Existing Concrete HP Barrier," per linear foot.
24

25 The unit contract price per linear foot for "removing and resetting existing concrete HP
26 barrier" shall be full pay for planing, commercial HMA and all other materials, tools,
27 equipment, supplies, and labor necessary to complete the work as specified in the
28 contract plans and details.
29

30 (April 28, 1997)

31 The following paragraph is added immediately following the bid item, "Temporary Conc.
32 Barrier":
33

34 The unit contract price per linear foot for "Temporary Conc. Barrier" shall include all
35 costs for furnishing, placing, maintaining, replacing, and cleaning barrier
36 delineation.
37

38 **GEOSYNTHETIC RETAINING WALLS**

39 **Materials**

40
41
42 Section 6-14.2 is supplemented with the following:

43
44 **(*****)**

45 Gravel Borrow 9-03.14(1)
46

47 **Measurement**

48
49 Section 6-14.4 is supplemented with the Following:

50
51 **(*****)**

52 Gravel Borrow will be measured as specified in section 2-03.4

Payment

Section 6-14.5 is supplemented with the following:

(*****)

"Gravel Borrow Incl. Haul", per ton.

All costs in connection with furnishing and placing backfill material for temporary geosynthetic retaining walls as specified shall be included in the unit Contract price per ton for "Gravel Borrow Incl. Haul"

DIVISION 7

**DRAINAGE STRUCTURES, STORM SEWERS, SANITARY
SEWERS, WATER MAINS, AND CONDUITS**

DRAINS

Description

Section 7-01.1 is supplemented with the following:

(*****)

This work shall consist of constructing media filter drains and placing compost.

Materials

Section 7-01.2 is supplemented with the following:

(*****)

Medium Compost

9-14.4(8)

Geotextile for Underground Drainage (Moderate Survivability)

9-33

Media Filter Drain

Media Filter Drain Mix

Media filter drain mix shall be mixed in the following proportions: 3 cubic yards of aggregate, 1 cubic yard of Horticultural Grade Perlite, 10 pounds of Agricultural Grade Dolomite Lime, and 1.5 pounds of Agricultural Grade Gypsum. Media filter drain mix shall be premixed prior to placement. The soil amendments and aggregate shall meet the following requirements prior to mixing:

Aggregate for Media Filter Drain Mix

Aggregate for Media Filter Drain Mix shall be manufactured from ledge rock, talus, or gravel, in accordance with Section 3-01 and shall meet the following test requirements for quality. The use of recycled material is not permitted.

Los Angeles Wear, 500 Revolutions

35% max.

Degradation Factor

30 min.

Aggregate for Media Filter Drain Mix shall meet the following requirement for grading and quality:

Sieve Size

Percent Passing (by weight)

1/2"

100

3/8"	90-100
No. 4	30-56
No. 10	0-10
No. 200	0-1.5
% fracture, by weight, min.	75

The fracture requirement shall be at least two fractured faces and will apply to material retained on the No. 4 sieve.

Aggregate for Media Filter Drain Mix shall be substantially free from adherent coatings. The presence of a thin, firmly adhering film of weathered rock shall not be considered as coating unless it exists on more than 50% of the surface area of any size between successive laboratory sieves.

Horticultural Grade Perlite shall meet the following grading requirements, and not contain any toxic material:

Sieve Size	% Passing
No. 18	0% - 30%
No. 30	0% - 10%

Agricultural Grade Dolomite Lime shall meet the following grading requirements, and not contain any toxic material.

Sieve Size	% Passing
No. 8	100%
No. 16	0%

Agricultural Grade Gypsum shall meet the following grading requirements, and not contain any toxic material:

Sieve Size	% Passing
No. 8	100%
No. 16	0%

The acceptance of the aggregate shall be based on a satisfactory test report for every 1000 tons. Testing of aggregate shall occur prior to mixing with the soil amendments. Horticultural grade perlite, Agricultural Grade Dolomite lime and Gypsum will be accepted by catalog cut or bag label.

The finished product shall be clean, uniformly mixed, and free from wood, bark, roots, and other deleterious materials.

Construction Requirements

Section 7-01.3 is supplemented with the following:

(*****)

Media Filter Drain

The Contractor shall construct the media filter drain in accordance with the details in the Plans.

1 The Contractor shall conduct the installation of the media filter drain such that the
2 different sections of the media filter drain are not contaminated by other materials during
3 installation.
4

5 Once installed, the Contractor will not be allowed to drive equipment over the area of
6 the media filter drain.
7

8 Media filter drain Excavation shall conform to Section 2-09.3(4). Excavated material
9 suitable for use in embankment may be used the discretion of the Engineer. Otherwise,
10 the material excavated shall become property of the Contractor.
11

12 **Medium Compost**

13 After the initial planting area weed control, soil placement, and grading are completed,
14 the grass strip area of the media filter drain shall be covered with medium compost.
15

16 The Contractor shall notify the Engineer a minimum of five working days prior to the
17 start of medium compost work.
18

19 Medium compost shall be uniformly and evenly placed in all designated grass strip
20 areas at the rate of 408 cubic yards per acre
21

22 **Measurement**

23 Section 7-01.4 is supplemented with the following:
24

25 (*****)

26 Medium compost will be measured by the square yard to the neat line limits as shown in
27 the plans.
28

29 Media filter drain will be measured by the square yard by ground slope measurement.
30

31 **Payment**

32 Section 7-01.5 is supplemented with the following:
33

34 (*****)

35 "Medium Compost", per square yard.

36 The unit price per square yard for "Medium Compost" shall be full pay for furnishing,
37 and spreading the compost along the grass strip.
38

39 "Media Filter Drain", per square yard.

40 The unit contract price per square yard for "Media Filter Drain mix" shall be full pay to
41 furnish all labor, equipment and materials to construct and install the mix in locations
42 detailed in the Plans including all excavation and disposal of excavated material, Media
43 Filter Drain Mix, underdrain pipe, drain pipe, gravel backfill for drains, and geotextile for
44 underground drainage.
45

46 **DIVISION 8**

47 **MISCELLANEOUS CONSTRUCTION**

48 **EROSION CONTROL AND WATER POLLUTION CONTROL**

49 **Geomembrane Lining System**

50 Section 8-01.1 is supplemented with the following:
51
52

(*****)

This work shall consist of constructing a textured Light Low Density Polyethylene (LLDPE) geomembrane lining system for Wetland cell and forebay of Constructed Stormwater Treatment Wetlands 1, 2-B and 5. The intent of this specification is to provide a watertight liner at the completion of the work.

Definitions:

Boot

Watertight collar fabricated from geomembrane sheet for sealing geomembrane to pipe or drainage structure that penetrates geomembrane.

Geomembrane Lining System

Textured LLDPE geomembrane, sealed pipe penetrations, sealed connections to walls or structures, anchor trenches, sand, concrete and all other components necessary for providing a watertight lining.

Panel

Piece of geomembrane composed of two or more sheets factory seamed together.

Sheet

Seamless piece of geomembrane

Watertight

Geomembrane installation free of flaws and defects that will prevent passage of water under anticipated service conditions.

Materials

Section 8-01.2 is supplemented with the following:

(*****)

Backfill for Sand Drains

9-03.13

The Textured LLDPE Geomembrane shall meet the following requirements:

<u>Property</u>	<u>Required Value</u>	<u>Test Method</u>
Tensile Stress at Break	60 lbs/inch	ASTM 6693
Tensile Elongation at Break	250% minimum	ASTM 6693
Puncture Resistance	44 lbs minimum	ASTM D4833
Tear Resistance	22 lbs minimum	ASTM D1004
Bonded Seam Peel Strength	50 lbs/inch 44 lbs/inch	ASTM 6392 Hot Wedge Extrusion (@2 in/min)
Bonded Seam Shear Strength	60 lbs/inch	ASTM D6392 (@2 in/min)

1	Minimum Thickness	38 mils	ASTM D 5994
2			
3	Resin Density	0.91 – 0.93 g/cc	ASTM D1505/
4			ASTM 792
5	Notes:		
6	1. All geomembrane properties are minimum average roll values (i.e., the test		
7	result for any sample roll in a lot shall meet or exceed the values shown in the		
8	table).		
9			
10	2. All other material components, such as extrudate, pipe boots, sealant caulking,		
11	stainless steel clamps, butyl mastic tape, neoprene rubber pads, and all other		
12	components needed to provide a complete LLDPE Geomembrane Lining		
13	System shall be in accordance with manufacturer's recommendation.		
14			

LLDPE Geomembrane Manufacturers and Fabricators

The following manufacturers have produced a product complying with these specifications:

- A. GSE Lining Technology, Inc. Houston, TX
- B. Poly-America Inc., Grand Prairie, TX
- C. Agru America, Fernly, NV
- D. Approved Equal

Construction Requirements

General

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

(***)**

Geomembrane Lining System

Submittals

Prior to beginning construction on the geomembrane lining system, the Contractor shall submit the following documentation for review and approval by the engineer:

- A. Manufacturer's specifications, and literature for geomembrane furnished, and all products used to complete the installation.
- B. Shop Drawings: Geomembrane Panel/sheet layout with proposed size, number, position, sequence of geomembrane placement, location of field seams, and locations of pipe penetrations.
- C. Samples: The Contractor shall submit a sample of 2 square yards of the material from each shipment for verification and testing.
- D. Quality Control Submittals: Prior to beginning construction of the geomembrane lining system, the Contractor shall submit the following for review and approval by the Engineer:

1
2 Factory test results and Manufacturer's Certification of Compliance for each
3 geomembrane roll. Test results and certifications shall be provided for each
4 geomembrane property shown in the materials section of this specification with
5 the exception of bonded seam shear and bonded seam peel strength results.
6 Lot and roll numbers shown on the Manufacturer's Certification of Compliance
7 shall be clearly marked on each roll delivered to the project site.
8

9 Quality Assurance Program (QAP): Written description of geomembrane
10 manufacturer's and installer's formal programs for fabricating, handling,
11 installing, storing, sealing pipe penetrations and connections to walls or
12 structures, seaming, testing, and repairing geomembrane, resulting in a
13 complete, watertight installation.
14

15 **General**

16 **Coordination Meetings**

17 Prior to the installation of the geomembrane lining system, the Contractor shall
18 hold a meeting with the The Engineer and geomembrane installer, to review
19 the approved QAP and associated roles and responsibilities.
20

21 **Delivery, Storage, and Handling**

22 A. The Contractor shall protect each sheet of geomembrane from damage
23 during shipment, mark each package with the identification of material
24 type, size and weight, and Keep roll stack height to that which will not
25 deform or damage rolls in accordance with manufacturer's
26 recommendations.
27

28 B. Each roll with insufficient marking to clearly correlate each roll to test
29 results and certifications will be subject to rejection by the project
30 engineer.
31

32 **Subgrade Preparation**

33 The Contractor shall incorporate the following procedures:
34

35 Smooth-drum roll the bottom and side slopes to form a firm, stable base.
36 Surface shall be smoothed to remove depressions, high points, and
37 surface irregularities. The surface shall not have holes, depressions more
38 than 1 inch, nor protrusions extending above the surface more than 0.5
39 inch.
40

41 **Geomembrane Installation**

42 A. The geomembrane lining system shall be installed in accordance with the
43 approved QAP and as shown in the Contract Plans.
44

45 B. The Engineer will visually inspect geomembrane sheets, seams, anchors,
46 seals, and repairs for rips, tears, and holes as installation progresses and
47 again on completion. Areas with defects such as rips, tears, and holes
48 shall be repaired in accordance with the manufacturer's recommendations
49 to the Engineer's satisfaction. Any area showing damage due to scuffing,
50 penetration by foreign objects or distress from rough subsurface shall be
51 replaced or covered with an additional layer of geomembrane material.
52

- 1 C. Geomembrane installation shall proceed between ambient temperatures
2 of 32° F and 104° F. Placement can precede below 32° F only after it has
3 been verified by the Engineer that the material can be seamed according
4 to the specification. Geomembrane placement shall not be done during
5 any precipitation, in the presence of excessive moisture (e.g., fog, rain,
6 dew) or in the presence of excessive winds, as determined by the
7 installation supervisor.

8
9 **Field Seam Testing**

- 10 A. Testing shall be completed in accordance with the approved QAP and
11 manufacturer's recommendations.
12
13 B. Initial Testing: At the beginning of the initial seaming session the
14 Contractor will produce a test seam in the presence of the engineer, made
15 from geomembrane samples taken from an approved roll. A test seam will
16 be provided by each piece of seaming equipment used in production
17 seaming. The Contractor shall have the seams tested for bonded seam
18 shear strength and bonded seam peel strength by an independent GAI-
19 LAP certified independent lab. Independent test results will be used to
20 verify the Contractors test data. After providing the test seams the
21 Contractor may begin production work.

22
23 The following lab is GAI-LAP certified:

24
25 Precision Geosynthetic Laboratories
26 1160 North Gilbert Street, Anaheim, CA. 92801
27

- 28 C. Non-Destructive Seam Testing: The installer shall non-destructively test all
29 field seams over their full length.
30

31 **Vacuum Box Testing**

32 Equipment for testing extrusion seams shall be comprised of the following:

- 33
34 1. A vacuum box assembly consisting of a rigid housing, a
35 transparent viewing window, a soft rubber gasket attached to the
36 bottom, port hole or valve assembly, and a vacuum gauge.
37
38 2. Soapy solution comprised of 1 cup of dishwashing liquid
39 detergent per 1 gallon of water in a plastic bucket with a mop.
40

41 The following procedures shall be followed by the installer:

- 42
43 1. Excess sheet overlap shall be trimmed away.
44
45 2. Wet a strip of geomembrane approximately 12 inches wide by
46 the length of box with the soapy solution.
47
48 3. Place the box over the wetted area and compress.
49
50 4. Create a vacuum of 3 - 5 psi.
51
52 5. Ensure that a leak tight seal is created.

6. For a period of approximately 10 seconds, examine the geomembrane through the viewing window for the presence of animated or expanding soap bubbles.
7. If no animated or expanding bubbles appear after 10 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
8. All areas where animated or expanding soap bubbles appear shall be marked, repaired and then retested.

Air Pressure Testing (For Double Fusion Seams Only)

Equipment for testing double fusion seams shall be comprised of the following:

1. An air pump equipped with pressure gauge capable of generating and sustaining a pressure between 25 and 30 psi.
2. A pressure gauge equipped with a sharp hollow needle.

The following procedures shall be followed by the installer:

1. Seal one end of the seam to be tested.
2. Insert needle or other approved pressure feed device through the sealed end of the channel created by the double wedge fusion weld.
3. Energize the air pump to verify the unobstructed passage of air through the channel.
4. Seal the other end of the channel.
5. Energize the air pump to a pressure between 25 and 30 psi, close valve, allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for approximately 5 minutes.
6. If loss of pressure exceeds 4 psi, or pressure does not stabilize, locate faulty area, repair and retest.
7. If pressure does not drop below the acceptable value after five minutes, cut the air channel open at the opposite end from the pressure gauge. The air channel should deflate immediately indicating that the entire length of the seam has been tested.

D. Destructive Seam Testing

The engineer reserves the right to require one destructive test sample per 500 feet of seam length from a location specified by the engineer for destructive seam testing if seam quality appears inadequate.

Destructive seam testing will be minimized to preserve the integrity of the liner. If requested by the Engineer the Contractor shall have the seams tested for bonded seam shear strength and bonded seam peel strength by an independent GAI-LAP certified independent lab.

E. Defects and Repairs

All seams and non-seam areas of the geomembrane shall be inspected by the Engineer for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection.

Each suspect location in seam and non-seam areas shall be non-destructively tested as appropriate in the presence of the Engineer. Each location that fails the non-destructive testing shall be marked by the Engineer, and repaired accordingly.

F. Repair Procedures

1. Defective seams shall be cap stripped or replaced.
2. Small holes shall be repaired by extrusion welding a bead of extrudate over the hole. If the hole is larger than 1/4 inch, it shall be patched.
3. Tears shall be repaired by patching. If the tear is on a slope or an area susceptible to stress and has a sharp end it must be rounded prior to patching.
4. Blisters, large cuts and undispersed raw materials shall be repaired by patches.
5. Patches shall be completed by extrusion welding. The weld area shall be ground no more than 10 minutes prior to welding. No more than 10% of the thickness shall be removed by grinding. Welding shall commence where the grinding started and must overlap the previous seam by at least 2 inches. Reseaming over an existing seam without regrinding shall not be permitted. The welding shall restart by grinding the existing seam and rewelding a new seam.

Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects.

G. Verification of Repairs

Each repair shall be non-destructively tested. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

The Engineer shall keep daily documentation of all non-destructive and destructive testing. This documentation shall identify all seams that initially

1 failed the test and include evidence that these seams were repaired and
2 successfully retested.

3
4 **Placing Backfill Over Geomembrane Lining System**

5 A. Use track-mounted equipment with low ground pressure treads having a
6 ground pressure of 4.4 psi or less, for spreading materials over the
7 geomembrane. In no case shall tracked equipment be allowed to operate
8 on less than 12 inches of cover over the geomembrane.

9
10 B. The Contractor shall use great care in placing backfill materials so that the
11 geomembrane lining system is not damaged. If the Engineer determines
12 that the backfilling activities are damaging the geomembrane lining
13 system the Contractor, at the Engineer's discretion, shall be required to
14 remove materials by hand for a visual inspection of the liner. Removal,
15 replacement, and repair of materials shall be completed at the expense of
16 the Contractor.

17
18 **Submittals**

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

20
21 (*****)

22 A temporary erosion and sediment control (TESC) narrative is included in the
23 Appendix of these provisions and is made part of the contract. The Contractor
24 shall either adopt the narrative portion of the TESC plan, or initiate revisions to
25 the narrative to reflect work methods and field conditions and then prepare a
26 TESC plan based on these revised conditions. Proposed revisions shall be
27 submitted to the Engineer for review and approval.

28
29 **Seeding, Fertilizing and Mulching**

30
31 **Seeding and Fertilizing**

32 Section 8-01.3(2)B is supplemented with the following:

33
34 (*****)

35 Seed, of the following composition, proportion, and quality shall be applied at
36 the rate of 100 pounds of Pure Live Seed (PLS) per acre in the Seed Mix #1
37 areas as shown on the Landscape Plan Sheets:

38

<u>Kind and Variety of Seed in Mixture</u>	<u>% By Weight</u>	<u>Minimum % Purity</u>	<u>Minimum % Germination</u>
Common blue camas <i>Camassia quamash</i>	12	90	85
California oatgrass <i>Danthonia californica</i>	43	90	85
Blue wildrye <i>Elymus glaucus</i>	19	90	85
Roemer's fescue <i>Festuca idahoensis ssp. Roemerii</i>	16	90	85

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Total 90

The remaining 10% by weight shall be any combination of at least 3 of the following species. Each species shall be not more than 33% by weight of the total, shall have a minimum purity of 90%, and shall have a germination rate of at least 85%. Species include:

- Sitka brome (*Bromus sitchensis*)
- California brome (*Bromus carinatus*)
- Long stoloned sedge (*Carex pennsylvanica*)
- Wild broadpetal strawberry (*Fragaria virginiana* v. *platypetala*)
- June grass (*Koeleria macrantha*)
- Spring gold (*Lomatium utriculatum*)
- Field woodrush (*Luzula multiflora*)
- Panic grass (*Panicum occidentale*)
- Prairie violet (*Viola adunca*)

Seed of the following composition, proportion, and quality shall be applied at the rate of 100 pounds of Pure Live Seed (PLS) per acre in the Seed Mix #2 areas as shown on the Landscape Plan Sheets:

<u>Kind and Variety of Seed in Mixture</u>	<u>% By Weight</u>	<u>Minimum % Purity</u>	<u>Minimum % Germination</u>
Spike bentgrass <i>Agrostis exarata</i>	0.2	90	85
Greater camas <i>Camassia leichtlinei</i>	11	90	85
Tufted hairgrass <i>Deschampsia caespitosa</i>	2.8	90	85
Western manna grass <i>Glyceria occidentalis</i>	3	90	85
Meadow barley <i>Hordeum brachyantherum</i>	73	90	85
Total	90		

The remaining 10% by weight shall be any combination of at least 3 of the following species. Each species shall be not more than 33% by weight of the

total, shall have a minimum purity of 90%, and shall have a germination rate of at least 85%. Species include:

Canada reed (*Calamagrostis canadensis*)

Northern cluster sedge (*Carex arcta*)

Slenderbeak sedge (*Carex athrostachya*)

One-sided sedge (*Carex unilateralis*)

Creeping spike-rush (*Eliocharis palustris*)

Seed of the following composition, proportion, and quality shall be applied at the rate of 100 pounds of Pure Live Seed (PLS) per acre in the Seed Mix #3 areas as shown on the Landscape Plan Sheets:

<u>Kind and Variety of Seed in Mixture</u>	<u>% By Weight</u>	<u>Minimum % Purity</u>	<u>Minimum % Germination</u>
Spike bentgrass <i>Agrostis exarata</i>	6	90	85
Slough sedge <i>Carex obnupta</i>	31	90	85
Tufted hairgrass <i>Deschampsia caespitosa</i>	17	90	85
Spike rush <i>Eliocharis palustris</i>	21	90	85
Western manna grass <i>Glyceria occidentalis</i>	15	90	85
Total	90		

The remaining 10% by weight shall be any combination of at least 3 of the following species. Each species shall be not more than 33% by weight of the total, shall have a minimum purity of 90%, and shall have a germination rate of at least 85%. Species include:

Canada reed (*Calamagrostis canadensis*)

Northern cluster sedge (*Carex arcta*)

Slenderbeak sedge (*Carex athrostachya*)

One-sided sedge (*Carex unilateralis*)

Seed, of the following composition, proportion, and quality shall be applied at the rate of 100 pounds of Pure Live Seed (PLS) per acre in the Seed Mix #4 areas as shown on the Landscape Plan Sheets:

<u>Kind and Variety of Seed in Mixture</u>	<u>% By Weight</u>	<u>Minimum % Purity</u>	<u>Minimum % Germination</u>
California oatgrass <i>Danthonia californica</i>	38	90	85
Blue wildrye <i>Elymus glaucus</i>	26	90	85
Roemer's fescue <i>Festuca idahoensis ssp. Roemeri</i>	26	90	85
Total	90		

The remaining 10% by weight shall be any combination of at least 3 of the following species. Each species shall be not more than 33% by weight of the total, shall have a minimum purity of 90%, and shall have a germination rate of at least 85%. Species include:

- Sitka brome (*Bromus sitchensis*)
- California brome (*Bromus carinatus*)
- Long stoloned sedge (*Carex pennsylvanica*)
- June grass (*Koeleria macrantha*)
- Field woodrush (*Luzula multiflora*)
- Panic grass (*Panicum occidentale*)

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

Seed mixes must be submitted for approval by Landscape Architect prior to application.

(January 3, 2006)

Sufficient quantities of fertilizer shall be applied to supply the following amounts of nutrients:

Total Nitrogen as N - *** 135 *** pounds per acre.

Available Phosphoric Acid as P_2O_5 - *** 60 *** pounds per acre.

Soluble Potash as K_2O - *** 60 *** pounds per acre.

1 *** 90 *** pounds of nitrogen applied per acre shall be derived from
2 isobutylidene diurea (IBDU), cyclo-di-urea (CDU), or a time release,
3 polyurethane coated source with a minimum release time of 6 months. The
4 remainder may be derived from any source.

5
6 The fertilizer formulation and application rate shall be approved by the
7 Engineer before use.

8 9 **Mulching**

10 Section 8-01.3(2)D is supplemented with the following:

11
12 (January 3, 2006)

13 *** Wood Fiber *** mulch shall be applied at a rate of *** 2000 *** pounds per
14 acre.

15 16 **Measurement**

17 Section 8-01.4 is supplemented with the following:

18
19 (*****)

20 LLDPE Geomembrane Lining System shall be measured per square yard of material
21 placed along the surface of the installed geomembrane lining; excluding the anchor
22 trench.

23 24 **Payment**

25 Section 8-01.5 is supplemented with the following:

26
27 (*****)

28 "LLDPE Geomembrane Lining System," per square yard.

29
30 The unit contract price per square yard for "LLDPE Geomembrane Lining System" shall
31 be full compensation for all labor, tools, concrete, sand, topsoil and other materials, and
32 equipment necessary to furnish, install, inspect, and test the geomembrane and seams
33 as shown in the Plans.

34 35 **ROADSIDE RESTORATION**

36 37 **Description**

38 Section 8-02.1 is supplemented with the following:

39
40 (*****)

41 ***Bioretention Treatment Soil Mix***

42 This work consists of providing a bioretention treatment soil mixture of a compost and
43 aggregate component.

44 45 **Materials**

46 Section 8-02.2 is supplemented with the following:

47
48 (*****)

49 ***Compost Component***

50 Compost for bioretention treatment soil mix shall be Fine Compost in accordance with
51 9-14.4(8).
52

Aggregate Component

Aggregate for Bioretention Treatment Soil Mix shall be naturally occurring water rounded aggregate. Aggregate from quarries, ledge rock, and talus slopes are not acceptable for this application. The use of recycled materials is not permitted.

Aggregate for Bioretention Treatment Soil Mix shall meet the follow test requirements for quality:

Aggregate Property	Test Method	Requirement
Degradation Factor	WSDOT T 112	15 min.
Los Angeles Wear, 500 Rev.	AASHTO T 96	35% max.

Aggregate for Bioretention Treatment Soil Mix shall meet the following requirement for grading prior to mixing with the compost component:

Sieve Size	Percent Passing
3/8"	100
No. 4	95 – 100
No. 10	75 – 90
No. 40	25 – 40
No. 100	4 – 10
No. 200	2.0 – 5.0

Aggregate for Bioretention Treatment Soil Mix shall be classified as well-graded sand and shall have a Coefficient of Uniformity of ≥ 6 and a Coefficient of Curve of between 1 and 3 as determined in accordance with ASTM D 2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

Bioretention Treatment Soil Mix

The Bioretention Treatment Soil Mix shall be 50% compost and 50% aggregate by volume and meet the following specification requirements:

Property	Test Method	Requirement
Cation Exchange Capacity (CEC)	U.S. EPA Method 9081	≥ 5 milliequivalents CEC/100g dry soil
Hydraulic Conductivity @ 85% of relative density	ASTM D 2434	0.5" Per hour minimum 12" per hour maximum

Bioretention Treatment Soil Mix Submittal Requirements

At least 30 days prior to placement the Contractor shall submit to the Engineer the test information and results for the compost component, aggregate component, and the Bioretention Treatment Soil Mix

1. Quality analysis results for the compost compound performed in accordance with Seal of Testing Assurance (STA) standards, as specified in Section 9-14.4(8)
2. Aggregate Source Approval (ASA) report demonstrating the aggregate source satisfies the specification requirements for Degradation Factor and Los Angeles Wear.

3. Grain size analysis results of the aggregate performed in accordance with ASTM D 422 satisfying the grading requirements for the aggregate in Bioretention Treatment Soil Mix.
4. Cumulative Particle-Size Plot along with the calculations demonstrating conformance to the Coefficient of Uniformity of ≥ 6 and Coefficient of Curve of $1 \leq 3$ as determined in accordance with ASTM D 2487 for the aggregate in Bioretention Treatment Soil Mix.
5. Test results for the Organic Content from the Bioretention Treatment Soil Mix demonstrating conformance to these specification requirements determined in accordance with TMECC 05.07A.
6. Test results for Cation Exchange Capacity (CEC) for the Bioretention Treatment Soil Mix demonstrating conformance to these specification requirements determined in accordance with U.S. EPA Method 9081.
7. Test results for Hydraulic Conductivity for the Bioretention Treatment Soil Mix demonstrating conformance to these specification requirements determined in accordance with ASTM D 2434 at 85 percent of modified maximum dry unit weight as determined in accordance with ASTM D 1557.
8. Provide the following information about the testing laboratory(ies):
 - a. Name of laboratory(ies) including contact person(s),
 - b. Address(es)
 - c. Phone contact(s)
 - d. E-mail address(es)
 - e. Qualifications of laboratory and personnel including date of current accreditation by STA, ASTM, AASHTO, or approved equal.

Construction Requirements

Section 8-02.3 is supplemented with the following:

(*****)

Bioretention treatment soil mix shall be thoroughly blended by either continuous flow or batch – type mixers using revolving blades or rotary-drum mixers.

The subgrade shall be approved by the Engineer prior to the placement of the Bioretention treatment soil mix.

Excavation within 6-inches of final native soil grade shall not be permitted if Project Site soil is saturated (3% above optimum moisture content).

The Contractor shall not start bioretention construction until the Project Site draining to the bioretention area has been stabilized and authorization is given by Engineer. Prior to placement of bioretention treatment soil mix in each swale or bioretention area, the Contractor shall notify the Engineer to inspect the swale. If any sediment laden runoff has entered the swale or rain garden, the sediment deposition shall be removed by overexcavating the swale by a 3-inch minimum. An additional 3-inches of bioretention treatment soil mix shall be imported at the Contractor's expense.

Scarify the subgrade soil a minimum of 2 inches deep prior to placing bioretention treatment soil mix. Mixing or placing bioretention treatment soil mix shall not be allowed if the area receiving bioretention treatment soil mix is saturated. The Engineer will have final authority to determine if saturated conditions exist. Place bioretention treatment soil

1 mix loosely. Final grade shall be measured at 3 inches above the grade specified on the
2 plans.

3
4 **Planting Area Preparation**

5 Section 8-02.3(5) is supplemented with the following:

6
7 (*****)

8 After the initial planting area weed control, soil placement, and grading are
9 completed, and prior to the installation of irrigation lines and planting, all designated
10 planting areas shall be covered with fine compost.

11
12 Prior to placement and incorporation of fine compost, the application and
13 incorporation methods shall be approved by the Engineer.

14
15 Fine compost shall not be placed when a condition exists, such as frozen or water
16 saturated soil, which may be detrimental to successful application, incorporation, or
17 soil structure.

18
19 The Contractor shall notify the Engineer a minimum of five working days prior to the
20 start of fine compost work.

21
22 Fine compost shall be uniformly and evenly placed in all designated areas at the
23 rate of 277 cubic yards per acre in seeding areas, and 400 cubic yards per acre in
24 shrub planting areas.

25
26 After placement of the fine compost, the Contractor shall incorporate the layer
27 uniformly into the existing soil to a depth of 6 inches in seeding areas, and 12
28 inches in shrub planting areas.

29
30 **Measurement**

31 Section 8-02.4 is supplemented with the following:

32
33 (*****)

34 Bioretention Treatment Soil Mix will be measured by the square yard by the neat line.

35
36 **Payment**

37 Section 8-02.5 is supplemented with the following:

38
39 (August 7, 2006)

40 "___ Compost", per cubic yard.

41 The unit contract price per cubic yard for "___ Compost" shall be full pay for furnishing,
42 spreading, and incorporating the compost into the soil.

43
44 (*****)

45 "Bioretention Treatment Soil Mix", per cubic yard.

46 The contract price for "Bioretention Treatment of Soil Mix" per square yard shall be full
47 pay for all labor, tools, equipment, and materials utilized to perform the work specified
48 including mixing, transporting, preparing the subgrade, placing, grading, and finishing
49 the soil mix.

GUIDE POSTS

Materials

Section 8-10.2 is supplemented with the following:

(OR April 7, 2009)

Ground mounted guide posts with metal anchors will not be allowed.

CHAIN LINK FENCE AND WIRE FENCE

Materials

Section 8-12.2 is supplemented with the following:

(August 3, 2009)

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 Federal Standard 595 color number *** 20045 ***, or be as approved by the Engineer.

Samples of the coated fencing materials shall be approved by the Engineer 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:

(April 1, 2002)

"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, PullPost 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.

RIPRAP

Measurement

(February 5, 2001)

1 The last paragraph in Section 8-15.4 is deleted.

2 3 **Payment**

4
5 (March 13, 1995)

6 The first sentence of the second paragraph of Section 8-15.5 is revised to read as follows:

7
8 The unit contract price per ton or cubic yard for the class or kind of riprap specified shall
9 be full pay for furnishing all labor, tools, equipment, and materials required to construct
10 the riprap, including excavation.

11 12 **ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL**

13 14 **Description**

15 Section 8-20.1 is supplemented with the following:

16
17 (*****)

18 ***Temporary Illumination system***

19 This work consists of furnishing, installing, maintaining, and removing all materials and
20 equipment necessary to construct the temporary illumination system.

21
22 (*****)

23 ***Temporary Traffic Signal System***

24 This work consist of furnishing, installing, maintaining, and removing all materials and
25 equipment necessary to construct the temporary signal system.

26 27 **Materials**

28 Section 8-20.2 is supplemented with the following:

29
30 (*****)

31 ***Temporary Illumination Equipment and Materials***

32 With the exception of lamps and wiring, the equipment and materials used in the
33 temporary illumination system does not have to be new. Equipment and materials shall
34 be of the type and grade specified within the Plans, these Special Provisions, and the
35 Standard Specifications.

36
37 Timber pole locations shall be staked in the field by the Engineer as shown in the plans.
38 Timber light standards may be relocated up to four feet from the location shown in the
39 plans at the discretion of the Engineer. Timber poles without light standards may be
40 located as needed provided no aerial conductor span exceeds 300 feet.

41
42 The luminaries shall be equipped with 180 degree house side shield as designated in
43 the Plans to minimize spill light.

44
45 (*****)

46 ***Temporary Signal Equipment and Materials***

47 With the exception of lamps and wiring, the equipment and materials used in the
48 temporary signal system does not have to be new. Equipment and materials shall be of
49 the type and grade specified within the Plans, these Special Provisions, and the
50 Standard Specifications.

1 Timber poles locations shall be staked in the field by the Engineer as shown in the
2 plans. Minimal adjustment of pole locations may be made at the discretion of the
3 Engineer, provided no signal span exceeds 150 feet in length.

4
5 (*****)

6 **Variable Message Sign**

7 The variable message sign shall be supplied as a unit including the sign, mounting
8 hardware, VMS sign beacons, VMS Controller and VMS Control Software, VMS ground-
9 mounted cabinet, and warranty.

10
11 Equipment Model Numbers:

12
13 AF0-2S2A8-2204V (Front Access)

14
15 Manufacturer Information:

16
17 ADDCO, LLC dba IMAGO North America
18 ATTN: Brian Nicholson
19 240 Arlington Avenue East
20 Saint Paul, MN 55117
21 Telephone: 800-616-4408
22 www.imagoscreens.com

23
24 (*****)

25 **CCTV Camera Assembly**

26 Television cameras shall be supplied as a unit including camera with integrated lens,
27 camera controller, pressurized environmental enclosure, pan and tilt mechanism and
28 rain/sun shade. The camera assembly shall be a 3960 series I-view system,
29 manufactured by Cohu.

30
31 Equipment Model Numbers:

32
33 I-View Camera system with integrated positioner:

34
35 Top pole mount Model 3965-5100/PEDD

36
37 Manufacturer Information:

38
39 Cohu Inc., Electronics Division
40 PO Box 85623
41 San Diego, CA 92186-5623
42 Telephone: (858) 277-6700
43 www.cohu-cameras.com
44 info@cohu.com

45
46 **CCTV System Cabling**

47 Cable connections between the camera system (Model 3965) and the control cabinet
48 shall be as shown in the Plans. The cable ends shall be factory terminated. Cable
49 installation shall only require installing the connector shell at the camera end, and
50 modifying the power cable at the cabinet end. The cable used between the CCTV
51 camera and the camera control cabinet shall be manufactured by Cohu.
52

Equipment Model Numbers:

Cable Assembly, 3965 control CA297F

CCTV Encoder and Decoder

Encoders and decoders shall be:

Equipment Model Numbers:

Indigo Vision 9000 Transmitter 719118

Rack Card Transmitter/Receiver

Indigo Vision 4 Space Rack 980193

Indigo Vision 9000 Receiver Card 729107

Rack Card Receiver

Manufacturer Information:

Indigo Vision Inc.

108 Egel Avenue

Middlesex, NJ 08846

Telephone: (908) 315-0786

www.indigovision.com

(*****)

Roadway Weather Information System (RWIS)

Each RWIS component shall be supplied and manufactured by Vaisala Inc. The RWIS system shall include the following components:

1. Equipment Model Numbers:

RPU

Wind Speed & Direction Sensor

Air temperature & Relative Humidity Sensor

Weather Identifier & Visibility Sensor

Road Surface State Sensor

Sensor Adapter for DCS111

RoSA DMF133

DM32WMS301

HMP45

PWD12

DSC111

DRA411

2. Manufacturer Information:

Vaisala Inc.

194 South Taylor Ave.

Louisville, CO 80027

Telephone: 1-800-408-9457

www.vaisala.com

(*****)

Induction Loop Sealant

Induction loop sealant shall be installed per the manufacturer's recommendations and shall be one of the following:

1. 3M - Detector Loop Sealant 5000. Color Black.
2. Crafc0, Inc - Loop Detector Sealant 271.
3. **QCM Industrial - EAS-14 Epoxy Adhesive System** Loop Detector Sealant
Type 1 - High Viscosity.
4. Thoroc, Degussa Building Systems - Gold Label Flex 1P (one part sealant).
5. Henry – HE760 Duraflex Detector Loop Sealant.

(*****)

Equipment Manuals and Documentation

Documentation for each system element shall consist of the manufacturer's name, equipment model number, serial number (when available), materials, operating specifications, wiring schematic, parts list, owner's manuals, factory service manuals, and procedures for factory testing and system acceptance testing as specified in this Contract.

The contractor shall submit three copies of the documentation specified above prior to the installation of cable or components described in the submittal. In addition, the Contractor shall submit three copies of an overall system wiring schematic and termination chart for the installed ITS elements. The Contractor shall submit two copies of operation and maintenance manuals for each of the following upon completion of the contract: Type 170 Controllers, Type 2070 Controllers, Cohu CCTV equipment, SESA VMS Equipment, and RWIS Equipment.

All documentation for each individual element shall be neatly bound together with the remainder of the documents such that all pages are completely legible without removing pages from the binding. This documentation shall be in addition to any other data, shop drawings, or other documentation required to be submitted by these Special Provisions or the Standard Specifications.

Light And Signal Standards

(August 2, 2010)

Light Standards with Type 1 Luminaire Arms

Lighting standards shall be fabricated in conformance with the methods and materials specified on the pre-approved Plans listed below, provided the following requirements have been satisfied:

- (a) Light source to pole base distance (H1) shall be as noted in the Plans. Verification of H1 distances by the Engineer, prior to fabrication, is not required. Fabrication tolerance shall be ± 6 inches.
- (b) All other requirements of the Special Provisions have been satisfied.

Pre-Approved Plan

Fabricator

Mounting Hgt.

Drawing No. DB00654 Rev. D
Sheets 1, 2, 3 & 4

Valmont Ind. Inc.

30', 35', 40' & 50'

1	Drawing No. W3721-1	Ameron Pole	40' & 50'
2	Rev. H & W3721-2	Prod. Div.	
3	Rev. C		
4			
5	Drawing No. NWS 3510 Rev.	Northwest Signal	25', 30', 35',
6	1 or NWS 3510B	Supply, Inc.	40', 45' & 50'
7	Rev. 1		
8			
9	Drawing WS-SL-01	American Pole	25', 30', 35',
10	Revision 5	Structures, Inc.	40', 45', 50'
11			
12	Drawing 71035-B39 Rev. R9	Union Metal Corp	40'
13	Sheets 1 & 2 of 2, and		
14	B100-B335 Rev. R1		
15			
16	Drawing 71035-B50 Rev. R2	Union Metal Corp.	50'
17	Sheets 1, 2 & 3 and		
18	B100-B335 Rev. R1		
19			
20	Drawing No. 71035-B47,	Union Metal Corp	40', 50'
21	Rev R3, Sheet 1 of 1		
22	Elbow Mounting Detail		
23			
24	Drawing No. WSDOT-LP-01	West Coast	25', 30', 35', 40',
25	Rev. 4, Sheets 1 and 2 or	Engineering	45', and 50'
26	WSDOT - LP-01-BE Rev 3	Group	
27	Sheets 1 and 2 or		
28	WSDOT - LP-01-C8B Rev 2		
29			
30	Drawing No. 10-31-RWP-1	KW Industries	25, 30, 35, 40, 45, 50
31	Rev. 4 Sheets 1, 2 & 3		
32			
33	Drawing No. 10-31-RWP-3	KW Industries	
34	Rev. 1		
35	(Bridge Mount Details)		
36			

(August 2, 2010)

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.

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 AASHTO M 164 connecting bolts tightening shall comply with Section 6-03.3(33).

Traffic signal standard types and applicable characteristics 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:

<u>Fabricator</u>	<u>Drawing No.</u>
Northwest Signal Supply Inc.	NWS 3540 Rev. 1 and NWS 3540B Rev. 1
Valmont Ind. Inc.	DB00655 Rev. G Sht. 1 & 2
Ameron Pole Prod. Div.	M3723 Rev. G
Union Metal Corp.	TA-10035 Rev. R3
West Coast Engineering Group	WSDOT-PP-01 Rev. 1
KW Industries	10-200-PED-1 Rev. 5, Sheets 1 and 2

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

<u>Fabricator</u>	<u>Drawing No.</u>
Northwest Signal Supply Inc.	NWS 3540 Rev. 1 and NWS 3540B Rev. 1
Valmont Ind. Inc.	DB00655 Rev.G Sht. 1 & 2
Ameron Pole Prod. Div.	M3723 Rev. G or W3539 Rev. B
Union Metal Corp.	TA-10025 Rev. R14
West Coast Engineering Group	WSDOT-PP-02 Rev. 1
American Pole Structures, Inc.	WS-PP-03 Rev. 1C
KW Industries	10-200-PED-1 Rev. 5, Sheets 1 and 2

Type I Type I vehicle signal standards shall conform to Standard Plan J-21.15 or to one of the following pre-approved plans:

<u>Fabricator</u>	<u>Drawing No.</u>
Northwest Signal Supply Inc.	NWS 3540 Rev. 1 and NWS 3540B Rev. 1

1		Valmont Ind. Inc.	DB00655 Rev. G
2			Sht. 1 & 2
3			
4		Ameron Pole	M3723 Rev. G or W3539 Rev. B
5		Prod. Div	
6			
7		Union Metal Corp.	TA-10025 Rev. R14
8			
9			
10		West Coast	
11		Engineering Group	WSDOT-PP-02 Rev. 1
12			
13		American Pole	WS-PP-03 Rev. 1C
14		Structures, Inc.	
15			
16		KW Industries	10-200-PED-1
17			Rev. 5, Sheets 1 and 2
18			
19	Type FB	Type FB flashing beacon standard shall conform to Standard	
20		Plan J-21.16 or the following pre-approved plan:	
21			
22		<u>Fabricator</u>	<u>Drawing No.</u>
23		Union Metal Corp	50200-B58 Rev. R4
24			
25		Valmont Ind. Inc.	DB00655 Rev.G
26			Sht. 1 & 2
27			
28		Ameron Pole	W3539 Rev. B
29		Prod. Div.	
30			
31		Northwest Signal	NWS 3540 Rev. 1 and
32		Supply, Inc.	NWS 3540B Rev. 1
33			
34		KW Industries	10-200-PED-1
35			Rev. 5, Sheets 1 and 2
36			
37	Type RM	Type RM ramp meter standard shall conform to Standard Plan J-	
38		22.15 or the following pre-approved plan:	
39			
40		<u>Fabricator</u>	<u>Drawing No.</u>
41		Union Metal Corp	50200-B58 Rev. R4
42			
43		Valmont Ind. Inc.	DB00655 Rev. G
44			Sht. 1 & 2
45			
46		Ameron Pole	W3539 Rev. B
47		Prod. Div.	
48			
49		Northwest Signal	NWS 3540 Rev. 1 and
50		Supply, Inc.	NWS 3540B Rev. 1
51			
52		KW Industries	10-200-PED-1

Type CCTV Type CCTV camera pole standards shall conform to one of the following pre-approved Plans:

<u>Fabricator</u>	<u>Drawing No.</u>
Valmont Industries, Inc.	DB 00759 Rev. L
Ameron Pole Product Div.	W6CCTV1 Rev D
West Coast Engineering Group	AP-WSDOT-CP-01-Rev. 3
American Pole Structures, LLC	WS-CP-01 Rev. 1C Sht. 1 & 2
Union Metal Corporation	Drawing No P33-B317, Rev R3, Sheets 1, 2 of 2
Union Metal Corporation	Drawing No. P33-B318, Rev. R6 Sheets 1, 2 of 2
Northwest Signal Supply, Inc.	Drawing No. NWS 3545 (For Type CCTV)
KW Industries	Drawing No. 10-200-CAM-1 Rev. 6, Sheets 1 and 2

Type II Characteristics:

Luminaire mounting height	N.A.
Luminaire arms	N.A.
Luminaire arm length	N.A.
Signal arms	One Only

Type II 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.

<u>Signal Arm Length (max)</u>	<u>Fabricator-(x) (y) (z)</u>	<u>Drawing No.</u>
65 ft.	Valmont Ind. Inc.-(2894)	DB00625-Rev.N, Shts. 1, 2 & 3
65 ft.	Union Metal Corp. (2900)	71026-B86 Rev. R7 Shts. 1, 2, & 3
65 ft.	Ameron Pole-(2900) Prod. Div.	W3724-1 Rev. I & W3724-2 Rev. F
65 ft.	Northwest Signal-(2802) Supply Inc.	NWS 3500 Rev. 3 or NWS 3500B Rev. 3
45 ft.	American Pole(1875) Structures, Inc.	WS-T2-L Rev. 6
65 ft.	American Pole (2913)	WS-T2-H Rev. 6

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	Structures, Inc.		
65 ft.	KW Industries		10-200-TSP-4 Rev. 4, Sheets 1, 2, and 3
65 ft	West Coast Engineering Group		WSDOT-TS-01 Rev. 3 Sheets 1, 2, and 3
65 ft.	Maico Industries (2894)		WSDOTMA Rev. 3 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.		
	<u>Signal Arm Length (max)</u>	<u>Fabricator-(x) (y) (z)</u>	<u>Drawing No.</u>
65 ft.	Valmont Ind. Inc.-(2947)		DB00625-Rev.N, Shts. 1, 2 & 3 and "J" luminaire arm
65 ft.	Union Metal Corp. (2900)		71026-B87 Rev. R8 Shts. 1, 2 & 3
65 ft.	Ameron Pole-(2900) Prod. Div.		W3724-1 Rev. I & W3724-2 Rev. F and "J" luminaire arm
65 ft.	Northwest Signal-(2802) Supply Inc.		NWS 3500 Rev. 3 or NWS 3500B Rev. 3
45 ft.	American Pole (1875) Structures, Inc.		WS-T3J-L, Sht. 1 of 2 Rev. 9, and Sht. 2 of 2 Rev. 4
65 ft.	American Pole (2913) Structures, Inc.		WS-T3J-H, Sht. 1 of 2 Rev. 8, and Sht. 2 of 2 Rev. 4

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-2 Rev. 4, Sheets 1, 2, and 3
65 ft.	KW Industries	10-200-TSP-3 Rev. 4, Sheets 1, 2, and 3
Type IV	Type IV strain pole standards shall be consistent with details in the plans and Standard Plan J-7c or one of the following pre-approved plans:	
	<u>Fabricator</u>	<u>Drawing No.</u>
	Northwest Signal Supply Inc.	NWS 3520 Rev. 1 or NWS 3520B Rev. 1,
	Valmont Ind. Inc.	5000-4
	Ameron Pole Prod. Div.	M3650 Rev. D
	Union Metal Corp.	EA-10224 Rev. R8
	American Pole Structures, Inc.	9000-12-037 Rev. A
	Maico Industries	WA-SP-4 Rev.2, Sheets 1 and 2 of 2
	KW Industries	10-200-SP-1 Rev. 4, Sheets 1 and 2
	KW Industries	10-200-SP-2 Rev. 5, Sheets 1 and 2
Type V	Type V combination strain pole and lighting standards shall be consistent with details in the plans and Standard Plan J-7c or one of the following pre-approved plans:	
	<u>Fabricator</u>	<u>Drawing No.</u>
	Northwest Signal Supply Inc.	NWS 3520 Rev. 1 or NWS 3520B Rev. 1
	Valmont Ind. Inc.	5000-4
	Ameron Pole Prod. Div.	M3650 Rev. D

1		Union Metal Corp.	EA-10225, Rev. R8
2			Shts. 1 & 2
3			
4		American Pole	9020-12-007 Rev. B
5		Structures, Inc.	
6			
7		Maico Industries	WA-SP-5 Rev. 2 , Sheets 1, 2 & 3
8			and "J" luminaire arm
9			
10		The luminaire arm shall be Type 1, 16 foot maximum and the	
11		luminaire mounting height shall be 40 feet or 50 feet as noted in	
12		the plans.	
13			
14	Type SD	Type SD standards require special design. All special design	
15		shall be based on the latest AASHTO Standard Specifications for	
16		Structural Supports for Highway Signs, Luminaires and Traffic	
17		Signals and pre-approved plans and as follows:	
18			
19		1. A 90 mph wind loading shall be used.	
20			
21		2. The Design Life and Recurrence Interval shall be 50	
22		years for luminaire support structures.	
23			
24		3. Fatigue design shall conform to AASHTO Section 11,	
25		Table 11-1 using fatigue category III.	
26			
27		Complete calculations for structural design, including anchor bolt	
28		details, shall be prepared by a Professional Engineer, licensed	
29		under Title 18 RCW, State of Washington, in the branch of Civil	
30		or Structural Engineering or by an individual holding valid	
31		registration in another state as a civil or structural Engineer.	
32			
33		All shop drawings and the cover page of all calculation submittals	
34		shall carry the Professional Engineer's original signature, date of	
35		signature, original seal, registration number, and date of	
36		expiration. The cover page shall include the contract number,	
37		contract title, and sequential index to calculation page numbers.	
38		Two copies of the associated design calculations shall be	
39		submitted for approval along with shop drawings.	
40			
41		Details for handholes and luminaire arm connections are	
42		available from the Bridges and Structures Office.	
43			
44		Foundations for various types of standards shall be as follows:	
45			
46	Type PPB	As noted on Standard Plan J-20.10.	
47	Type PS	As noted on Standard Plan J-21.10.	
48	Type I	As noted on Standard Plan J-21.10.	
49	Type FB	As noted on Standard Plan J-21.10.	
50	Type RM	As noted on Standard Plan J-21.10.	
51	Type CCTV	As noted in the Plans.	
52	Type II	As noted in the Plans.	

Type III	As noted in the Plans.
Type IV	As noted in the Plans and Standard Plan J-7c.
Type V	As noted in the Plans and Standard Plan J-7c.
Type SD	As noted in the Plans.

Equipment List And Drawings

Section 8-20.2(1) is supplemented with the following:

(March 13, 1995)

Pole base to light source distances (H1) for lighting standards with pre-approved plans shall be as noted in the Plans.

Pole base to light source distances (H1) for lighting standards without pre-approved plans will be furnished by the Engineer as part of the final approved shop drawings, prior to fabrication.

(March 13, 1995)

If traffic signal standards, strain pole standards, or combination traffic signal and lighting standards are required, final verified dimensions including pole base to signal mast arm connection point, pole base to light source distances (H1), mast arm length, offset distances to mast arm mounted appurtenances, and orientations of pole mounted appurtenances will be furnished by the Engineer as part of the final approved shop drawings prior to fabrication.

Construction Requirements

Section 8-20.3 is supplemented with the following:

(*****)

Temporary Illumination System

The temporary illumination system shall be operational prior to opening any temporary connection, detour to traffic, or disconnecting any existing illumination. Where required, the Contractor shall perform necessary excavation and embankment around the pole shafts without disturbing them.

The Contractor shall be responsible for the installation, operation, and maintenance of the temporary illumination system. This includes relamping and keeping the temporary illumination system in operation throughout the period of time that operation is required. The Contractor shall perform relamping in the event of outages within one day following notification by the Engineer.

The temporary illumination system when no longer required, as determined by the Engineer, shall be removed and will become the property of the Contractor. Removal shall include timber light standards, luminaries, and cables. When poles or foundations are removed, they shall be backfilled and compacted in accordance with 8-02.3(2) to the level of the surrounding surface.

(*****)

Temporary Signal System

Temporary timber signal standards, span wires, and conductors shall be installed and connected as shown in the plans. Attach back guys, aerial junction boxes and other hardware required to complete the temporary signal system as shown in the plans.

1
2 The Contractor is responsible for identifying the exact locations and methods for
3 installing and anchoring the temporary signal standards.
4

5 All temporary signal standards and hardware shall be removed upon completion of the
6 permanent signal systems or when otherwise specified in the Plans.
7

8 When no longer required, the controller cabinets, all equipment contained within the
9 controller cabinets, and all video detectors and their associated equipment shall remain
10 the property of the Contracting Agency. The Contractor shall deliver this equipment to
11 the Olympic Region Signal Shop, 5720 Capitol Blvd., Tumwater, WA during normal
12 business hours.
13

14 All other existing electrical equipment and materials designated to be removed shall
15 become the property of the Contractor and be removed from the project.
16

17 **(*****)**

18 ***Closed Circuit Television (CCTV) System***
19

20 **Camera Pole**

21 CCTV Camera standards shall be installed in accordance with Section 8-20.3(14)E
22 of the Standard Specifications.
23

24 **Camera Install**

25 The camera and pan/tilt shall not be installed until power is supplied to the camera
26 cabinet. All cables shall be connected when the camera is installed to allow the
27 camera heater to keep moisture out of the camera enclosure.
28

29 **CCTV System Setup**

30 The Contractor shall set the horizontal panning stops so that the 5-degree limit of
31 horizontal panning, known as the dead spot, is oriented as shown in the Plans.
32 The Contractor shall set the vertical tilting up limit stop to prohibit the camera from
33 tilting above the highest point on the horizon when at full zoom. The Contractor
34 shall set the vertical tilting down limit stop so that the camera movement does not
35 interfere with the PTZ cable.
36

37 **Test**

38 The Contractor shall test the CCTV system using a Contractor-supplied NTSC-
39 compatible video monitor and a Contractor-supplied camera control device. The
40 control device may be an IBM-compatible laptop computer with a suitable EIA-422
41 converter using current Cohu supplied software. The control device and monitor
42 shall remain the property of the Contractor. All test cables and connections shall be
43 the responsibility of the Contractor.
44

45 During each testing phase, the Contractor shall repair, replace, or reconfigure the
46 CCTV camera installation as necessary, at no additional cost to the Contracting
47 Agency.
48

49 **Bench Test**

50 The Contractor shall perform a bench test on the camera, pan and tilt unit, and
51 camera controller prior to installation. The bench test shall be performed at a

location proposed by the Contractor and approved by the Engineer. The bench test shall consist of the following:

1. Display camera video on Contractor-provided monitor
2. Program I.D. generator (to be tested using two different text sets)
3. Pan and tilt camera
4. Zoom and focus camera in both fast and slow modes
5. Turn camera off and on and change iris between auto and manual
6. Color balance adjustment

Local Test

At the camera control cabinet the Contractor shall connect the video monitor to the coaxial video cable and connect the camera control device to Cohu MPC camera controller. The Contractor shall demonstrate to the Engineer the following features of the camera installation:

1. Camera displays video on the Contractor-provided monitor.
2. Program the I.D. generator to display the State Route on line 1 and the CCTV camera number on line 2.
3. Pan and tilt the camera.
4. Zoom and focus the camera in both fast and slow modes.
5. Turn the camera off and on; change the iris to auto and manual.
6. Color balance.

TMC Test

At the Olympic Region Traffic Management Center, the Contractor shall witness the TMC CCTV Testing as performed by the Contracting Agency. The Contracting Agency will attempt to perform all of the Local CCTV Test features through an existing TMS control console at the TMC.

Warranty

The Closed Circuit Television System and all components shall be provided with a one-year, on-site parts and labor warranty from the manufacture that begins the date that the system successfully completed the TMC CCTV test. This quality assurance shall cover each piece of equipment and shall be provided by the manufacturer or agent of said equipment.

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Fiber Optic Cable and Conduit

General

The Contractor shall make a physical survey of the project site for the purpose of establishing the exact cable routing and cutting lengths prior to the commencement of any fiber optic work or committing any fiber optic materials. The Contractor shall submit a cable routing plan that shows the locations of all splices. Splice locations other than those shown in the plans shall not be allowed, unless approved by the engineer. If approved, all additional splices shall be sealed in an approved fiber optic splice enclosure and shall be located in a cabinet, pull box or cable vault. All work for additional splices shall be at the contractor's expense.

1
2 **Warning Tape and Location Wire**

3 Detectable underground warning tape shall be installed in continuous sections
4 above all conduit that contains fiber optic cable, placed approximately 12 inches
5 below the surface of pavement or existing grade. A minimum of 6 feet of the
6 metallic portion of the warning tape shall extend into each cable vault, pull box, or
7 cabinet.
8

9 **Location Wire**

10 Location 14 AWG stranded orange USE insulated wire shall be placed in
11 continuous lengths inside all conduits containing fiber optic cable. Location wire in
12 innerduct may be installed in the same duct as the fiber optic cable. Location wire
13 is required in spare fiber-optic conduits, unless in shared trench with detectable
14 conduit or conduit with a location wire. Location wire shall extend 8 feet into all pull
15 boxes and cable vaults. Location wire shall be attached to the "C" channel or the
16 cover hinge bracket of pull boxes and cable vaults with stainless steel bolts and
17 straps.
18

19 **Submittals**

20 The Contractor shall submit to the Engineer the following items, 1 week prior to
21 anticipated construction.
22

- 23 1. Manufacturer's complete specifications for all fiber optic system cables.
- 24
- 25 2. Manufacturer's complete specifications for optical fiber splice enclosures.
- 26
- 27 3. Factory test data sheets for each reel of cable delivered.
- 28

29 **Cable Installation**

30 The Contractor shall make a physical survey of the project site for the purpose of
31 establishing the exact cable routing and cutting lengths prior to the commencement
32 of any fiber optic work or committing any fiber optic materials. The Contractor shall
33 submit a cable routing plan that shows the locations of all splices. All splice
34 locations other than those shown in the Plans must be approved by the Engineer.
35

36 Fiber optic cables shall be installed in continuous lengths without intermediate
37 splices throughout the project, except at the locations specified in the Plans.
38

39 The Contractor shall comply with the cable manufacturer's specifications and
40 recommended procedures including, but not limited to the following:
41

- 42 1. Installation.
- 43 2. Proper attachment to the cable strength elements for pulling during
44 installation.
- 45 3. Bi-directional pulling.
- 46 4. Cable tensile limitations and the tension monitoring procedure.
- 47 5. Cable bending radius limitations.
- 48

49 The Contractor shall protect the loops from tangling or kinking. At no time during
50 the length of the project shall the cable's minimum bending radius specification be
51 violated.
52

To accommodate long, continuous installation lengths, bi-directional pulling of the fiber optic cable shall be permitted.

In all cable vaults and at all splice locations; 100 feet of cable slack shall be left by the Contractor. In all pullboxes 50 foot length of slack shall be left by the Contractor. Slack fiber optic cable shall be coiled and secured with tie wraps to racking hardware. No slack in the cable is required when pulling through NEMA junction boxes.

The pulling eye/sheath termination hardware on the fiber optic cables shall not be pulled over any sheave blocks.

When power equipment is used to install fiber optic cabling, the pulling speed shall not exceed 100 feet per minute. The manufactures pulling tension limitation for fiber optic cables shall not be exceeded under any circumstances.

Large diameter wheels, pulling sheaves, and cable guides shall be used to maintain the appropriate bending radius. Tension monitoring shall be accomplished using commercial dynamometers or load-cell instruments.

Cable Splicing

This section describes minimum requirements for splicing and connecting of the specified fiber optic cables.

Field splices for fusion-spliced pigtails terminating in patch panels shall be located as shown in the Plans. No additional splices will be allowed without the approval of the Engineer.

The Contractor shall provide all required brackets and other racking hardware required for the fiber optic cable racking operations as specified.

All fusion splicing equipment shall be in good working order, properly calibrated, and meet all industry standards and safety regulations. Cable preparation, closure installation and splicing shall be accomplished in accordance with EIA-TIA Fiber Optic Standards, NEC Article 770, and all other applicable approved industry standards.

Upon completion of the splicing operation, all waste material shall be deposited in suitable containers for fiber optic disposal, removed from the job site, and disposed of in an environmentally acceptable manner.

The Contractor shall use the fusion method with local injection and detection for all fiber optic splicing.

The average splice loss of each fiber shall be 0.15 dB or less per splice. The average splice loss is defined as the summation of the attenuation as measured in both directions through the fusion splice, divided in half.

No individual splice loss measured in a single direction shall exceed 0.2 dB.

1 The Contractor shall seal all cables where the cable jacket is removed. The cable
2 shall be sealed per the cable manufacturer's recommendation with an approved
3 blocking material.
4

5 All below ground splices shall be contained in waterproof splice enclosures. Splice
6 enclosures shall be reusable and designed for use on fiber optic cables in an
7 underground environment.
8

9 All splices shall be contained in splice trays utilizing strain relief, such as heat
10 shrink-wraps, as recommended by the splice tray manufacturer.
11

12 **Cable Labeling**

13 Permanent cable labels shall be used to identify fibers and patch cords at each
14 termination point. The cable labels shall consist of white colored heat shrink-wraps
15 with identification based on the schematic shown on the ITS detail sheets.
16

17 **Cable Testing**

18 The installed optical fiber cable shall be tested for compliance with the transmission
19 requirements of this specification, the cable and hardware manufacturer's
20 specifications, and prescribed industry standards and practices.
21

22 **Types of Testing**

23 The types of acceptance testing for optical fiber cable system certification are:
24

- 25 1. Attenuation testing
- 26 2. Optical Time Domain Reflectometer (OTDR) testing
27

28 **Attenuation Testing**

29 Insertion loss testing shall be used to measure end-to-end attenuation on each
30 new fiber installed between a field device and the patch panel in the
31 communications cabinet as well as on all optical fiber prior to installation.
32 Insertion loss testing shall be performed at the 1310 nanometer wavelength.
33

34 Prior to commencing testing, the Contractor shall submit the manufacturer and
35 model number of the test equipment along with certification that it has been
36 calibrated within 6 months of the proposed test dates.
37

38 The following information shall be documented for each fiber test
39 measurement:
40

- 41 • Wavelength
- 42 • Fiber type
- 43 • Cable, tube and fiber IDs
- 44 • Near end and far end test locations
- 45 • End-to-end attenuation
- 46 • Date, time, and operator
47

48 **Optical Time Domain Reflectometer (OTDR) Testing**

49 An optical time domain reflectometer (OTDR) with recording capability shall be
50 utilized to test the end-to-end transmission quality of each optical fiber. Quality
51 tests shall consider both attenuation and discontinuities. The OTDR shall be
52 equipped with 1310 nanometer and 1550 nanometer light sources for single

mode optical fibers. The OTDR shall be capable of providing electronic and hard copy records of each test measurement.

The OTDR shall be equipped with sufficient internal masking to allow the entire cable section to be tested. This may be achieved by using an optical fiber pigtail of sufficient length to display the required cable section, or by using an OTDR with sufficient normalization to display the required cable section.

Prior to commencing testing, the Contractor shall submit the manufacturer and model number of the OTDR test unit along with certification that it has been calibrated within 6 months of the proposed test dates.

Each new lateral fiber shall be tested in both directions at the 1310 and 1550 nanometer wavelengths.

The following information shall be documented for each fiber test measurement:

- X-Y plot scaled for fiber length
- Wavelength
- Refraction index
- Fiber type
- Averaging time
- Pulse width
- Cable and fiber IDs
- Near end and far end test locations
- Date, time, and operator
- Event table that includes: event ID, type, location, loss, and reflection.

Testing Documentation

The Contractor shall submit one hard copy and one electronic copy of the fiber test results to the Engineer for approval. The Contractor shall take corrective actions on portions of the fiber installation determined to be out of compliance with these specifications.

Upon acceptance of the cable installation and test results, the Contractor shall submit three hard copies and one electronic copy of the fiber test results to the Engineer.

Hard copy submittals shall be bound in 3-ring binders. The electronic submittal shall be on 3.5" floppy disks or a compact disk and include one licensed copy of the applicable OTDR reader program.

The following information shall be included in each test result submittal:

1. Contract number, contract name, contractor name and address.
2. Dates of cable manufacture, installation, and testing.
3. Cable specifications
4. Location of all splices
5. OTDR test results
6. Attenuation test results

1 Within 30 days of submitting the test results, the Contractor, in the presence of
2 the Engineer, shall re-test a minimum of 5% of the previously tested locations
3 to validate the test results. A 5% sample will be selected randomly from the
4 terminal device locations.

5
6 (*****)

7 **Variable Message Sign (VMS)**

8
9 **General**

10 The variable message sign shall be installed as per manufacturer's specifications.

11
12 **VMS System Testing**

13 Testing of the VMS hardware and software furnished and installed for this Contract
14 shall be the responsibility of the Contractor. All variable message signs, VMS
15 control software, VMS control equipment, and cabinets shall be inspected and
16 tested prior to shipment from the factory and after installation in the field. These
17 tests shall demonstrate that each component is fully functional and conforms with
18 these specifications. At a minimum, the tests shall show that all pixels are
19 operational and that the control software provides LED brightness, housing
20 ventilation, message and beacon control. All components that fail a test shall be
21 replaced and re-tested.

22
23 The Contractor shall provide a copy of all Factory Test reports to the Contracting
24 Agency at the time of shipment. The Contractor shall provide the Contracting
25 Agency with a copy of the Field Test reports for each VMS, once the VMS
26 equipment is found to be fully functional. The test reports required by this
27 specification shall include:

- 28
29 1. a list of all equipment used to perform the tests
30 2. a record of each test step, who performed the tests, who witnessed the
31 tests, and the test results
32 3. a record of test failures, corrective action taken, and results of the retest
33

34 The Contracting Agency reserves the right to perform any independent inspections
35 or tests, which are deemed necessary to ensure that the VMS equipment and
36 software complies with the requirements of the Contract Specifications.

37
38 **NTCIP Testing**

39 VMS sign controllers will be tested by the Contracting Agency using the NTCIP
40 Exerciser in place of the Central Computer. The NTCIP test will use the circuit
41 created to connect the sign controller to the central computer, the modem
42 furnished for this Contract, and the Ordering Agencies copy of the Exerciser.
43 The Exerciser shall prove that VMS sign controller fully complies with the
44 NTCIP requirements of this specification. The Contracting Agency shall decide
45 any differences in the interpretation of NTCIP Standards. The Contractor shall
46 be responsible for ensuring that the VMS equipment fully complies with NTCIP
47 standards specified herein. The Contractor shall allow 14 days for NTCIP
48 testing. The System Acceptance Test will begin upon completion of the NTCIP
49 test.
50

Acceptance Testing

The VMS sign shall be tested in order to check the operation of the sign. A representative from the manufacturer shall be present during testing of the VMS. A VMS operation manual shall be provided to the Contracting Agency at the time of the test.

During the 20 day test, the Contractor shall replace all failed components that were supplied as part of the contract. If a failed component is identified by either the Contractor or Contracting Agency at any point during the 20 day test, the 20 day test period shall be suspended until the replacement component has been replaced and the system returned to full operation. The 20 day test period will then start over. The intention is for the VMS system to complete the 20 day test period with no component failures.

The Contractor shall verify remote control of the sign from the Ordering Agencies Traffic Management Center before scheduling any testing. The Contractor shall demonstrate to the satisfaction of the Contracting Agency that the sign, as a minimum can display diagnostic messages originating from the Contracting Agencies Traffic Management Center control consoles. Messages shall incorporate the use of the beacons. Testing shall not begin until the sign's basic features have been demonstrated to the satisfaction of the Contracting Agency. The test shall be conducted immediately following the complete installation of the new VMS. The Contractor shall demonstrate that all functions of the signs and local controllers are operational. This test shall be conducted in the presence of the Contracting Agency.

The Contractor shall be available on-site during final termination of communication and electrical systems, and final VMS system component installations that are necessary for full VMS system operation. The purpose of the Contractor will be to troubleshoot and provide technical assistance to the Contracting Agency.

Upon satisfaction of the Contracting Agency that all functions of the system are operational, a 20-day test period of continuous operation shall begin. The test period shall be shown in the Contractor's CPM schedule. The following shall be observed during the test period:

1. All equipment shall be in working order at the beginning of the test. Any adjustment or replacement of components shall be considered a malfunction and cause for termination of the test period.
2. The system shall operate for 20 consecutive days without malfunction.
3. The VMS shall be communicating with the central computer during the entire 20-day test. Any loss of communication between the VMS and the central computer shall be considered a malfunction.
4. Although it is not necessary for the Contractor to provide personnel to be in attendance during the 20-day testing period, upon being informed of a malfunction, the Contractor shall respond within 48 hours with a representative who is thoroughly familiar with the operation of all parts of the system.

- 1 5. Upon detection of a malfunction, the test and test time shall be
2 stopped and the malfunction corrected. Test time will be reset and a
3 new 20-day test period shall begin.
4

5 **Product Testing**

6 The VMS manufacturer shall provide documentation indicating that the VMS
7 product has been tested to the following standards. It shall be acceptable for
8 the testing to be performed on scale-sized versions of the actual VMS provided
9 that the test unit is functionally and structurally equivalent to the full size VMS.
10

11 Failure to conform to these testing requirements shall be grounds for rejection.
12 Rejected equipment may be offered for test or retest provided all non-
13 compliant items have been corrected and tested or retested by the VMS
14 manufacturer. Any corrections deemed necessary by the Contracting Agency
15 shall be made by the VMS manufacturer, at no additional cost to the
16 Contracting Agency.
17

18 **Third Party Testing**

19 Third party test reports shall be submitted for the following testing:
20

21 NEMA Standards Publication TS 4, Hardware Standards for Dynamic
22 Message Signs (DMS), with NTCIP Requirements – Section 2,
23 Environmental Requirements. Test report shall detail results of mechanical
24 vibration and shock, electrical noise and immunity, temperature, and
25 humidity.
26

27 Underwriters Laboratories (UL), UL 48 Standard for Electric Signs, UL 50
28 Enclosures for Electrical Equipment, and UL 1433 Standard for Control
29 Centers for Changing Message Type Electric Signs. The UL report
30 number(s) for all VMS and control equipment manufactured by the VMS
31 manufacturer shall be submitted and the products shall bear the UL mark.
32 The supplier shall provide a record of each test performed including the
33 results of each test. The report shall include a record of the 3rd party test
34 laboratory and the test lab's representative that witnessed the tests,
35 including the signature of the lab's representative. The test reports shall be
36 provided to the Contracting Agency for review as part of the technical
37 submittal. The Contracting Agency reserves the right to conduct additional
38 NTCIP testing after delivery of the VMS and control equipment to the
39 Contracting Agency prior to final acceptance.
40

41 **Self Certification**

42 The VMS manufacturer shall provide self-certification, including a statement of
43 conformance and copies of test reports, indicating that the following tests have
44 been performed and passed.
45

46 Third party test reports shall be submitted for testing of the following National
47 Transportation Communication for ITS Protocol (NTCIP) standards:
48

49 NTCIP 1101: Simple Transportation Management Framework (STMF),
50 Conformance Level 1 (Simple Network Management Protocol
51 (SNMP))
52

 NTCIP 1201: NTCIP Global Object Definitions

1 NTCIP 1203: Object Definitions for Dynamic Message Signs
2 NTCIP 2001: Class B Profile. All serial ports on the device shall support
3 communications according to these standards.
4 NTCIP 2101: SP-PMPP/RS232 Point-to-Multi-Point Protocol (PMPP)
5 NTCIP 2102: SP – PMPP/ FSK
6 NTCIP 2103: SP – PPP/ RS 232
7 NTCIP 2104: SP – Ethernet
8 NTCIP 2201: NTCIP TP-Null Transport Profile Null (TP-NULL)
9 NTCIP 2202: Internet (TCP/IP and UDP/IP)

10
11 The NTCIP testing shall have been completed using industry accepted test
12 tools such as the NTCIP Exerciser, Trevilon's NTester, Intelligent Devices'
13 Device Tester, and/or Frontline's FTS for NTCIP. The NTCIP test report(s) shall
14 include testing of sub-network communications functionality, all mandatory
15 objects in all mandatory conformance groups, and a subset of the remaining
16 objects.

17
18 **VMS Warranty**

19 Section 1-05.10 shall be supplemented with the following:

20
21 The Contractor shall procure from ADDCO, LLC dba IMAGO North America for the
22 benefit of the Contracting Agency, a ten (10) year manufacturer's warranty for the
23 major components of the VMS system listed as follows:

24
25 Sign Display
26 VMS Sign Beacon
27 Sign Housing
28 Sign Mounting Hardware
29 VMS Field Cabinet
30 Control System
31 Circuit Boards
32 Display LEDs
33 LED Modules
34 LED Output Control
35 LED Intensity Control System
36 LED Display Driver Circuit Boards
37 Power Supplies
38 Transient Current Protection
39 VMS Controller
40 Sign Controller Software
41 Control Software

42
43 The warranty shall be written by the manufacturer or authorized repair agent
44 (warrantor) of the above components in favor of the Contracting Agency
45 (warranty) as ultimate owner and user of the VMS system. The warranty shall
46 provide that:

- 47
48 (1) The components are fit and sufficient for the purpose intended;
49 (2) components are merchantable, of good quality and free from defects,
50 whether patent or latent in material or workmanship under normal use and
51 service; and

(3) components conform to the standards required in the Contract between the Contractor and Ordering Agency. Any component that fails to comply with the warranty shall be replaced on site with new parts by the warrantor free of all charges, including all labor costs incurred in removing defective components, installing new replacement parts, and restoring the system to full operation.

All incidental charges incurred by the Contracting Agency, including but not limited to Contracting Agency provided traffic control, equipment, materials and labor necessary to restore operation; shall be reimbursed to the Contracting Agency in the form of an agreed upon warranty extension equal to the charges incurred by the Contracting Agency.

The warrantor shall provide software upgrades during the warranty period and for the service life of the VMS at no cost to the warrantee.

The warrantee shall notify the warrantor in writing, within a reasonable time after the discovery of any component failure, defect or damage covered by the warranty. Within 2 days of the notification, the warrantor shall inspect the component(s) and commence the work required to restore the system to full operation. Warrantor shall make arrangements with the warrantee's representative listed below to provide onsite access to the VMS system and any necessary traffic control.

If the warrantor fails to restore the system to full operation within the 5 days timeframe or within another timeframe mutually agreed to by the parties, the warrantee shall have the right to replace, repair or otherwise remedy the failure, defect or damage at warrantor expense. If requested by the warrantee, the warrantor shall provide the installation instructions required to correct any mechanical problems with the VMS system.

The warrantor shall indemnify and hold the warrantee, its agents, employees and officers harmless from and shall process and defend at its own expense all claims, suits or actions brought for damages or loss attributable to death, bodily injury and/or destruction of property, arising out of, in connection with or incident to the warrantor, its agents or employees own negligent acts or omissions while performing warranty work or related services on the warrantee's right of way; provided, however, that if such claims are caused by or result from the concurrent negligence of (a) the warrantor and (b) the warrantee, this indemnity and defense provision shall be valid and enforceable only to the extent of the negligence or omissions of the warrantor and provided, further, that nothing herein shall require the warrantor to hold harmless or defend the warrantee from any claims arising from the sole negligence of the warrantee.

Any warrant work to the component(s) will have a ten (10) year warranty from the date the replaced component(s) is/are installed into the VMS system.

The warranty shall exclude coverage for damage or defects caused by abuse, insufficient maintenance, improper operation, modification, accidents, acts of God, or normal wear and tear from use.

The warranty shall further indicate that in the event any legal action or proceedings are instituted to enforce any right or obligations under the warranty, the action shall

1 be initiated in the State of Washington and that all questions be resolved by the
2 application of Washington State law.

3
4 The warranty period with the warrantor of the components shall begin upon
5 acceptance of the VMS system. Acceptance of the system is defined as starting on
6 the physical completion date of the Contract, or if relief of responsibility is to be
7 granted in accordance with Section 1-07.13(2) of WSDOTs Standard Specifications
8 for Road, Bridge and Municipal Construction, M41-10, on the date the Contracting
9 Agency relieves the Contractor from responsibility for the completed VMS system.

10
11 The Contracting Agency shall be provided with a written copy of the warranty. Any
12 other warranty or guarantee applying to any component listed above that is typically
13 furnished as a customary trade practice in connection with the purchase of that
14 component shall be provided. All warranties shall be executed in writing for the
15 benefit of the Contracting Agency. Any warranty document shall denote that the
16 warranty period begins upon acceptance of the VMS system and not on product
17 delivery.

18
19 The rights and remedies of the Contracting Agency provided in this warranty
20 section are in addition to and do not limit any rights afforded to the Contracting
21 Agency by any other section of the Contract.

22 **VMS System Training**

23 **General Information**

24 The Vendor shall provide training for the Contracting Agency personnel on the
25 operation and maintenance of the variable message signs, field controllers,
26 control equipment cabinets, and Central Software. The Vendor shall utilize
27 qualified instructor(s) provided by the variable message signs manufacturer.
28 At least thirty (30) calendar days prior to commencement of the training, the
29 Vendor shall submit detailed course curriculums, draft manuals, handouts and
30 resumes of all instructors. The Contracting Agency will review the proposed
31 training materials and reserves the right to request modifications to the training
32 program and materials as appropriate.

33
34
35 Training shall not last for more than eight (8) hours of any given day (i.e.,
36 twenty-four (24) hours of training would be conducted over at least a three (3)
37 day period). Training shall be a mixture of formal classroom and hands-on
38 training, and at least half of the training shall be hands-on. Training shall be
39 conducted at a facility designated by the Contracting Agency and shall be
40 completed within sixty days after installation and approval of the final VMS.

41
42 Training material shall consist of manuals and other handouts for each
43 attendee. Training material shall serve not only as training course guidance,
44 but also as a quick reference guide for future use by the attendee. A copy of
45 all training material, in reproducible form, shall be delivered to the Contracting
46 Agency after training is complete.

47
48 The Vendor shall provide VHS/DVD training tape(s), which have been
49 produced utilizing a planned narrative. Tape(s) shall include a step-by-step
50 guide on the complete operation and maintenance of all VMS equipment and
51 software. The tape(s) shall be on VHS/DVD format, and Five (5) sets of tapes
52 shall be provided. All materials and video tapes will become the property of

the Contracting Agency and may be reproduced for internal use without violating any copyright laws.

Training

Personnel attending this training shall be thoroughly instructed to use all features and functions of the VMS equipment and software, including diagnosis of system functions from a Central Control computer. Training shall include an overview of how each component operates and how the system is interconnected and communicates. In addition, training shall focus on removal and replacement of sign components and manufacturers standard troubleshooting procedures.

Training shall be held for a minimum of fifteen (15) hours for Contracting Agency personnel taught by a manufacturer certified instructor. This shall include classroom instruction at a Contracting Agency facility as well as at the VMS location. A minimum of 7.5 hours shall be devoted to maintenance, and a minimum of 7.5 hours shall be devoted to system operation. The maximum number of training attendees will be twenty (20).

Operation and Maintenance Manuals

At the time of delivery, Contract shall provide two (2) copies (and up to five (5) upon request) at no additional charge of the Operation and Maintenance Manuals for each Variable Message Sign (VMS) delivered. The manuals shall contain sufficient information to operate and maintain the equipment, including:

- Schematics
- Wiring And Interconnection Diagrams
- A complete parts list and a list of recommended spares
- A set of Management Information Bases (MIB's) as described in these Specifications.

Buy American

A certification of materials origin will be required for any items comprised of, or containing, steel or iron construction materials prior to such items being incorporated into the permanent work. The certification shall be on DOT Form 350-109EF provided by the Purchaser, or such other form the Contractor chooses, provided it contains the same information as DOT Form 350-109EF. American-made material is defined as material having all manufacturing processes occurring domestically. To further define the coverage, a domestic product is a manufactured steel material that was produced in one of the 50 States, the District of Columbia, Puerto Rico, or in the territories and possessions of the United States.

If domestically produced steel billets or iron ingots are exported outside of the area of coverage, as defined above, for any manufacturing process then the resulting product does not conform to the Buy America requirements. Additionally, products manufactured domestically from foreign source steel billets or iron ingots do not conform to the Buy America requirements because the initial melting and mixing of alloys to create the material occurred in a foreign country.

Manufacturing begins with the initial melting and mixing, and continues through the coating stage. Any process which modifies the chemical content, the physical size or shape, or the final finish is considered a manufacturing process. The processes include rolling, extruding, machining, bending, grinding, drilling, welding, and

1 coating. The 27 action of applying a coating to steel or iron is deemed a
2 manufacturing process. Coating includes epoxy coating, powder coating,
3 galvanizing, aluminizing, painting, and any other coating that protects or enhances
4 the value of steel or iron. Any process from the original reduction from ore to the
5 finished product constitutes a manufacturing process for iron.

6
7 Due to a nationwide waiver, Buy America does not apply to raw materials (iron ore
8 and alloys), scrap (recycled steel or iron), and pig iron or processed, pelletized, and
9 reduced iron ore.

10
11 The following are considered to be steel manufacturing processes:

12
13 1. Production of steel by any of the following processes:

- 14 a. Open hearth furnace.
15 b. Basic oxygen.
16 c. Electric furnace.
17 d. Direct reduction.

18
19 2. Rolling, heat treating, and any other similar processing.

20
21 3. Fabrication of the products.

- 22 a. Spinning wire into cable or strand.
23 b. Corrugating and rolling into culverts.
24 c. Shop fabrication.

25
26 **(*****)**

27 **Roadway Weather Information System (RWIS)**

28 The RWIS components shall be installed as per manufacturer's specifications.

29
30 **RWIS components Test**

31 The RWIS components and cables shall be tested in accordance to the
32 manufacturer's specification after installation. All acceptance tests shall be
33 performed by the Contractor in the presence of the Engineer for each component.
34 The RWIS components serial number and location shall be recorded with the test
35 results on the manufactures form provided with the components. A hard copy of the
36 test results shall be provided by the Contractor to the Contracting Agency.

37
38 If the tests are not within the manufacture's tolerances the Contractor shall replace
39 the sensor at no additional costs to the Contracting Agency.

40
41 **General**

42 Section 8-20.3(1) is supplemented with the following:

43
44 **(*****)**

45 **Approval of Contractor or Subcontractor**

46 The Contractor or subcontractor performing the work described in the Special
47 Provision **INTELLIGENT TRANSPORTATION SYSTEM (ITS)** shall provide
48 references and resumes of staff that shall meet the following requirements:

- 49
50 1. A list of all fiber optic based communications systems and related projects,
51 which have been completed in the past three (3) years. Include the
52 following information for each project:

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- A. Title and description of work including:
 - (1) Types of communications systems or related projects supplied, installed, and tested.
 - (2) Length of fiber optic cable installed above ground and in underground conduit support structures.
 - (3) Experience in performing fiber optic splices and field installation of patch panels and connectors for singlemode and multi-mode fibers.
 - B. Bidders responsibility on the project (such as prime contractor or subcontractor).
 - C. Percent of work performed by the bidder.
 - D. Original and final contract value of the work.
 - E. Project start, original completion, and actual completion dates of the communications systems related work.
 - F. Name, address, telephone, and fax number of project owner and owner's representative.
2. List the key field and home office personnel and the position to which they may be assigned on a fiber optic based communications systems project.
- Personnel should include key people such as Project Manager, Electronic Communications Engineer, Contract Administrator, Engineering Specialist, Superintendent for Field Management and Principal-in-Charge, Chief Engineer, and Division Manager for home office management.
- The applicant shall submit resumes, which include the following information concerning each listed individual:
- A. Present position or capacity and length of employment.
 - B. Years of construction experience and prior employer(s).
 - C. Years of fiber optic based communications system or related electronic experience.
 - D. Type of position and capacity held for fiber optic based communications systems or related electronic experience.
 - E. Education and Professional Registration.
3. In addition, the Contractor shall provide evidence to show that the following full-time personnel are on staff and available to support such a project:

- 1
2 A. Project Manager with at least two (2) years experience coordinating
3 the installation, splicing, and testing of fiber optic cables.
4
5 B. Electronic Communications Engineer with at least three (3) years
6 experience in the engineering, installation, and testing of fiber optic
7 based communications systems consisting of analog or digital voice,
8 data, and video transmission systems.
9

10 The Contracting Agency reserves the right to reject any Contractor or subcontractor
11 that does not meet these minimum experience and staffing requirements.
12

13 If the Contractor or subcontractor is currently prequalified in Work Class 42 -
14 Electronics - Fiber Optic Based Communications Systems, the above listed
15 information for items 1 & 2 will not be required. The information for item 3 shall still
16 be submitted.
17

18 If the Contractor or subcontractor is not so prequalified, all the above information
19 shall be submitted to the Contracting Agency for approval. The Contractor or
20 subcontractor shall anticipate a minimum of 30 working days for approval or
21 disapproval of the submittal. Work shall not start on any fiber optic or electronics
22 related work until the Contracting Agency has approved the Contractor's or
23 subcontractor's qualifications.
24

25 (*****)

26 **Contractor Supplied Materials**

27 The Contractor shall supply the Contracting Agency with the following additional
28 materials:
29

30 4 each - Digi TS DB-25M Modem Adapter	Model # 76000700
31 4 each - Digi TS DB-9M Modem Adapter	Model # 76001742
32 1 each - Digi Port Server TS 16	Model # 76001742
33 1 each - Vicon V1400X-IDL RS-422 Distribution Line	
34 1 each - Indigovision 10 Space Rack 980096	
35 2 each - Kramer VM1055 Video Distribution Amplifier	
36 6 each - Indigovision 9000 Receiver Card 729107	

37

38 The Contractor shall coordinate with the OR ITS supervisor 48 hours prior to
39 delivering equipment at the Olympic Region Facility. OR Facility is located 5720
40 Capitol Blvd., Tumwater, WA 98501. The OR ITS contact during normal business
41 hours (7:00 AM to 3:30 PM) is:
42

43 Tim Brenneis: (360) 357-2702 or (360) 239-1579
44

45 (*****)

46 **Olympic Region (OR) ITS Work Coordination**

47 The Contractor shall coordinate with the OR ITS Maintenance Supervisor 48 hours
48 prior to needing access to existing ITS control cabinets and all ITS testing. OR ITS
49 supervisor or his appointee will be present when access to existing control cabinets
50 is required and during all ITS testing. The OR ITS Maintenance contact during
51 normal working hours (7:00 AM to 3:30 PM) is:
52

Tim Brenneis: (360) 357-2702 or (360) 239-1579

(*****)

Traffic Management Center Work Coordination

The Contractor shall coordinate with the Traffic Management Center (TMC) Electronic Maintenance Technician 48 hours prior to any interruption of any equipment communications to TMC. This includes cutting any existing fiber optic cable, before performing any splices, or before disconnecting any existing equipment. The TMC Electronic Maintenance contact during normal business hours (7:30AM to 4:00PM) is:

Dwight Walker: (253) 548-2433 or (253) 377-0001

(*****)

Removed Equipment

The existing signal controller cabinets to be removed shall remain the property of WSDOT. The contractor shall deliver this equipment to the Olympic Region Signal Shop, 5720 Tumwater Blvd SE, Tumwater, WA, during normal business hours. Contact Olympic Region Signal Superintendent, Don Anders (360)-357-2616.

All other existing electrical equipment and materials designated to be removed shall become the property of the Contractor and be removed from the project.

Foundations

Section 8-20.3(4) is supplemented with the following:

Foundations

Section 8-20.3(4) is supplemented with the following:

(*****)

Shafts For CCTV Pole Foundations

Shaft foundations for the CCTV Pole at the following location(s) shall be constructed in accordance with the following requirements, except that temporary casing is not required by the Contracting Agency but is instead a Contractor option:

I-5 Sta. 753+73 Rt.

I-5 Sta. 645+10 Rt.

Submittals

Contractor Project Reference and Personnel Experience Submittal

Prior to the start of shaft construction, the Contractor shall electronically submit a project reference list to the Engineer for approval verifying the successful completion by the Contractor of at least three separate shaft foundation projects within the past five years with drilled shafts of diameters and depths similar to or larger than those shown in the Plans, and ground conditions similar to those identified in the Contract. A brief description of each listed project shall be provided along with the name and current phone number of the project owner or the owner's Contractor.

Prior to the start of shaft construction, the Contractor shall electronically submit a list identifying the on-site supervisors, and drill rig operators potentially assigned to the project to the Engineer for approval. On-site

1 supervisors shall have a minimum two years experience in supervising
2 construction of shaft foundations, and drill rig operators shall have a
3 minimum one year experience in construction of shaft foundations. The list
4 shall contain a brief description of each individual's experience.
5

6 The Engineer will approve or reject the Contractor's qualifications and field
7 personnel within 10 working days after receipt of the submission. Work
8 shall not be started on any drilled shaft until the Contractor's qualifications
9 and field personnel are approved by the Engineer. The Engineer may
10 suspend the shaft construction if the Contractor substitutes unapproved
11 personnel. The Contractor shall be fully liable for the additional costs
12 resulting from the suspension of work and no adjustments in contract time
13 resulting from the suspension of work will be allowed.
14

15 **Shaft Installation Narrative Submittal**

16 The Contractor shall electronically submit a shaft installation narrative for
17 approval by the Engineer. The narrative shall reference available
18 subsurface data provided in the contract test hole boring logs, and the
19 geotechnical report(s) prepared for this project. This narrative shall
20 provide the following information in a single complete submittal:
21

- 22 1. Proposed overall construction operation sequence.
- 23
- 24 2. Description, size and capacities of specific equipment that will be
25 available on site, including but not limited to cranes, drills, auger,
26 bailing buckets, final cleaning equipment and drilling unit. The
27 narrative shall describe why the equipment was selected, and
28 describe equipment suitability to the anticipated site conditions
29 and work methods. The narrative shall include a project history
30 of the drilling equipment demonstrating the successful use of the
31 equipment on shafts of equal or greater size in similar soil/rock
32 conditions. The narrative shall also include details of shaft
33 excavation and cleanout methods.
34
- 35 3. Details of the method(s) to be used to ensure shaft stability (i.e.,
36 prevention of caving, bottom heave, etc. using casing, slurry, or
37 other means) during excavation (including pauses and stops
38 during excavation) and concrete placement. Casing dimensions
39 and detailed procedures for permanent casing installation, and
40 methods of advancing permanent casing with the excavation in
41 accordance with this Special Provision, shall be provided.
42
- 43 4. Description and details of the storage and disposal plan for
44 excavated material and slurry (if applicable).
45
- 46 5. Description of the method used to fill or eliminate all voids below
47 the top of shaft between the permanent shaft casing and
48 surrounding soil.
49
- 50 6. Reinforcing steel shop drawings, details of reinforcement
51 placement, including bracing, centering, and lifting methods, and

1 the method to assure the reinforcing cage position is maintained
2 during construction.

3
4 7. Details of concrete placement, including operational procedures
5 for pumping methods.

6
7 8. Description of the material (either CDF or granular material) used
8 to temporarily backfill a shaft excavation during a stoppage of the
9 excavation operation, as well as the method used to place and
10 remove the material.

11
12 The Engineer will evaluate the shaft installation narrative for conformance
13 with the Plans, Specifications and Special Provisions within the review
14 time specified in Section 6-01.9.

15
16 The project reference and personnel experience submittal and the shaft
17 installation narrative submittal shall be in electronic pdf format, and all
18 documents in each pdf shall be legible. All submittals shall be prepared jointly
19 by the Contractor and any subcontractors that will be performing the work.

20
21 Work shall not begin until all the required submittals have been approved in
22 writing by the Engineer. All procedural approvals given by the Engineer will be
23 subject to trial in the field and shall not relieve the Contractor of the
24 responsibility to satisfactorily complete the work.

25
26 **Quality Assurance**

27 Shafts shall be constructed so that the center at the top of the shaft is within
28 four inches of the Plan location. Shafts shall be within 1.5 percent of plumb.
29 Shaft steel reinforcing bar placement tolerances shall conform to Section 6-
30 02.3(24)C.

31
32 A shaft preconstruction conference shall be held at least five working days
33 prior to the Contractor beginning any shaft construction work at the site to
34 discuss construction procedures, personnel, and equipment to be used, and
35 other elements of the approved shaft installation plan as specified elsewhere in
36 this Special Provision. Those attending shall include:

- 37
38 1. (representing the Contractor) The superintendent, on site
39 supervisors, and all foremen in charge of excavating the shaft,
40 placing the casing and slurry as applicable, placing the steel
41 reinforcing bars, and placing the concrete.
- 42
43 2. (representing the Contracting Agency) The Project Engineer, key
44 inspection personnel, and representatives from the WSDOT State
45 Construction Office and Materials Laboratory Geotechnical Division.

46
47 If the Contractor proposes a significant revision of the approved shaft
48 installation plan, as determined by the Engineer, the Engineer may require an
49 additional conference be held before any additional shaft construction
50 operations are performed.

Shaft Excavation

Shafts shall be excavated to the required depth as shown in the Plans. Shaft excavation operations shall conform to this Special Provision and the shaft installation narrative as approved by the Engineer. Once the excavation operation has been started, the excavation shall be conducted in a continuous operation until the excavation of the shaft is completed, except for pauses and stops as noted, using approved equipment capable of excavating through the type of material expected.

Pauses, defined as momentary interruptions of the excavation operation, will be allowed only for casing splicing, tooling changes, slurry maintenance, and removal of obstructions. Shaft excavation operation interruptions not conforming to this definition shall be considered stops.

During stops, the Contractor shall stabilize the shaft excavation to prevent bottom heave, caving, head loss, and loss of ground, in accordance with item 3 of the shaft installation narrative. For stops exceeding 65 hours, the Contractor shall stabilize the excavation by backfilling in accordance with item 8 of the shaft installation narrative. The Contractor shall backfill the hole to a minimum of five feet above the bottom of casing. Backfilling of shafts with casing fully seated into rock, as determined by the Engineer, will not be required.

If slurry is present in the shaft excavation, the Contractor shall conform to the requirements in the **Slurry** subsection of this Special Provision regarding the maintenance of the slurry and the minimum level of drilling slurry throughout the stop, and shall recondition the slurry to the required slurry properties prior to recommencing shaft excavation operations.

Permanent casing advanced during excavation operations is required full depth for all traffic signal standard shaft foundation locations specified at the beginning of this Special Provision. Excavation in advance of the casing tip shall not exceed three feet. In no case shall shaft excavation and casing placement extend below the bottom of shaft excavation as shown in the Plans.

The Contractor shall conduct casing installation operations and shaft excavation operations such that the adjacent soil outside the casing and shaft excavation for the full height of the shaft is not disturbed. Disturbed soil is defined as soil whose geotechnical properties have been changed from those of the original in-situ soil, and whose altered condition adversely affects the structural integrity of the shaft foundation.

The Contractor shall use appropriate means such as a cleanout bucket or air lift to clean the bottom of the excavation of all shafts. No more than two inches of loose or disturbed material shall be present at the bottom of the shaft just prior to placing concrete.

The excavated shaft shall be inspected and approved by the Engineer prior to proceeding with construction. The bottom of the excavated shaft shall be sounded with an airlift pipe, a tape with a heavy weight attached to the end of the tape, or other means acceptable to the Engineer to determine that the shaft bottom meets the requirements in the Contract.

When obstructions are encountered, the Contractor shall notify the Engineer promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and man made objects) encountered during the shaft excavation operation which prevents or hinders the advance of the shaft excavation. When efforts to advance past the obstruction to the design shaft tip elevation result in the rate of advance of the shaft drilling equipment being significantly reduced relative to the rate of advance for the portion of the shaft excavation in the geological unit that contains the obstruction, then the Contractor shall remove, break-up, or push aside, the obstruction under the provisions of Section 8-20.5 as supplemented in these Special Provisions. The method of dealing with such obstructions, and the continuation of excavation shall be as proposed by the Contractor and approved by the Engineer.

Excavation shall conform to the specified outside diameter of the shaft. After the casing has been filled with concrete, all void space occurring between the casing and shaft excavation shall be filled with a material which approximates the geotechnical properties of the in-situ soils, in accordance with item 5 of the shaft installation narrative as approved by the Engineer.

Slurry

If the Contractor uses slurry in shafts installed below groundwater the slurry level in the excavation shall be maintained above the groundwater level the greater of the following dimensions, except as otherwise noted for the special requirements for all stops in shaft excavation operations:

1. Not less than ten feet,
2. Dimension as required to provide and maintain a stable hole.

The Contractor shall provide casing, or other means, as necessary to meet these requirements.

The slurry level shall be maintained above all unstable zones a sufficient distance to prevent bottom heave, caving or sloughing of those zones.

Throughout all stops in shaft excavation operations as defined in the **Shaft Excavation** subsection of this Special Provision, the Contractor shall monitor and maintain the slurry level in the excavation the greater of the following elevations:

1. No lower than the water level elevation outside the shaft.
2. Elevation as required to provide and maintain a stable hole.

The Contractor shall demonstrate to the satisfaction of the Engineer that stable conditions are being maintained. If the Engineer determines that stable conditions are not being maintained, the Contractor shall immediately take action to stabilize the shaft. The Contractor shall submit a revised shaft installation narrative which addresses the problem and prevents future instability. The Contractor shall not continue with shaft construction until the

1 damage which has already occurred is repaired in accordance with the
2 specifications, and until receiving the Engineer's approval of the revised shaft
3 installation narrative.

4
5 The Contractor shall dispose of the slurry as specified in the shaft installation
6 narrative as approved by the Engineer, and in accordance with the following
7 requirements:

- 8
9
- 10 1. Water slurry may be infiltrated to uplands within the confines of the
11 Contracting Agency Right Of Way for the project, provided that the
12 groundline at the disposal site is at least five feet above the current
13 water table, and that disposal operations conform to the temporary
14 erosion and sedimentation control (TESC) requirements established
15 for this project. For the purposes of water slurry disposal, upland is
16 defined as an area that has no chance of discharging directly to
17 waters of the State, including wetlands or conveyances that indirectly
18 lead to wetlands or waters of the State.
 - 19 2. Synthetic slurries shall be contained and disposed of at a waste water
20 treatment facility or into a sanitary sewer in accordance with the
21 Contractor's permit requirements.
- 22

23 **Assembly And Placement Of Steel Reinforcing Bars**

24 The steel reinforcing bar cage shall be rigidly braced to retain its configuration
25 during handling and construction. Individual or loose bars will not be
26 permitted. The Contractor shall show bracing and any extra reinforcing steel
27 required for fabrication of the cage in the shop drawings.

28
29 The reinforcement shall be carefully positioned and securely fastened to
30 provide the minimum clearances listed below, and to ensure that no
31 displacement of the steel reinforcing bars occurs during placement of the
32 concrete. The Contractor shall submit details of the steel reinforcing bar cage
33 centralizers along with the shop drawings required by item 6 of the shaft
34 installation narrative. The reinforcing steel centralizers shall be placed at least
35 at the quarter points around the circumference of the steel reinforcing bar
36 cage, and located vertically at least at the 1/4 and 3/4 points of the shaft length
37 below the shaft cap.

38
39 The Contractor shall place bars as shown in the Plans with minimum concrete
40 cover of three inches for shafts with diameters of three feet or less, and four
41 inches for shafts with diameters greater than three feet.

42 **Placing Concrete**

43 Shaft concrete shall be Class 4000P. Concrete placement shall commence
44 immediately after completion of excavation by the Contractor and inspection by
45 the Engineer. If slurry is used, testing immediately prior to commencing
46 concrete placement shall show a maximum sand content of 1.0 percent, in
47 accordance with API 13B-1 Section 5. Concrete placement shall continue in
48 one operation to the top of the shaft, or as shown in the Plans.

49
50 During concrete placement, the Contractor shall monitor, and minimize, the
51 difference in the level of concrete inside and outside of the steel reinforcing bar
52

1 cage. The Contractor shall conduct concrete placement operations to maintain
2 the differential concrete head as 1'-0" maximum.
3

4 When placing concrete in the dry, only the top five feet of concrete shall be
5 vibrated. The amount and extent of vibration shall be sufficient to assure
6 concrete flow to the outside of the shaft with full consolidation without causing
7 segregation to occur. Vibration of the top five feet of concrete does not affect
8 the maximum slump allowed for the concrete class specified.
9

10 If water is not present, the concrete shall be deposited through the center of
11 the reinforcement cage by a method which prevents segregation of aggregates
12 and splashing of concrete on the reinforcement cage. The concrete shall be
13 placed such that the free-fall is vertical down the center of the shaft without
14 hitting the sides, the steel reinforcing bars, or the steel reinforcing bar cage
15 bracing.
16

17 When placing concrete underwater, including when water in a shaft excavation
18 exceeds three inches in depth with an infiltration rate of 12 inches of depth or
19 more in one hour, the Contractor shall place the concrete by pressure feed
20 using a concrete pump with a watertight tube having a minimum diameter of
21 four inches. The discharge end of the tube on the concrete pump shall include
22 a device to seal out water while the tube is first filled with concrete. Concrete
23 placement by gravity feed is not allowed.
24

25 Throughout the underwater concrete placement operation, the discharge end
26 of the tube shall remain submerged in the concrete at least five feet and the
27 tube shall always contain enough concrete to prevent water from entering.
28 The concrete placement shall be continuous until the work is completed,
29 resulting in a seamless, uniform shaft.
30

31 Before placing any fresh concrete against concrete deposited in water or
32 slurry, the Contractor shall remove all scum, laitance, loose gravel and
33 sediment on the upper surface of the concrete deposited in water or slurry and
34 chip off any high spots on the upper surface of the existing concrete that would
35 prevent the steel reinforcing bar cage from being placed in the position
36 required by the Plans.
37

38 The Contractor's construction operation in the vicinity of a drilled shaft
39 excavation with freshly placed concrete and curing concrete shall conform to
40 Section 6-02.3(6)D.
41

42 **Casing Removal**

43 Tops of permanent casings for the shafts shall be removed to at least six
44 inches beneath finish groundline, unless otherwise specified by the Engineer.
45

46 **CCTV Pole Foundation Shaft Casing**

47
48 All permanent casing shall be a smooth wall non corrugated structure of steel base
49 metal. All permanent casing shall be of ample strength to resist damage and
50 deformation from transportation and handling, installation stresses, and all
51 pressures and forces acting on the casing. The casing shall be clean prior to
52 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.

(*****)

The Contractor shall verify that cabinet base dimensions are compatible with the cabinet foundation dimensions as shown in Standard Plans J-3b and J-6c prior to construction of each foundation.

(*****)

All existing light standard and signal standard foundations to be removed shall be removed to two feet below subgrade if within the roadway prism or two feet below finished grade elsewhere, whichever is greater. The remaining hole shall be backfilled with granular material and compacted in accordance with Section 8-20.3(2).

All cabinet foundations to be removed shall be removed in their entirety.

Conduit

Section 8-20.3(5) is supplemented with the following:

(*****)

Rigid galvanized steel conduit shall be used for the following installations (PVC conduit shall not be used):

1. Traffic signal systems (with the exception of interconnects)
2. Structures (such as walls and bridges)
3. Vehicle crossings (includes roadways, roadbeds, driveways, and road approaches)
4. Surface mounts
5. Light Standard, Signal Standard, and Cabinet foundations

At other locations, the Contractor may elect to use PVC conduit. If PVC conduit is used, it shall meet the following requirements:

1. Minimum diameter of 1 ¼ inches.
2. Schedule 80 conduit.
3. Installed per Standard Specifications and Standard Plans.

All spare conduits shall be prepared per Standard Specification 8-20.3(5) and shall include end bells or bushings as required and a pull string rated for 200 lbs. or greater. All spare conduits shall be capped per Standard Specification 8-20.3(5). All trenches that contain only empty spare PVC conduit shall have a 14 AWG stranded orange USE locate wire installed with the PVC conduit as described in this section for non-metallic conduits for fiber-optic cable.

Junction Boxes, Cable Vaults, and Pull Boxes

The first paragraph of section 8-20.3(6) is revised to read as follows:

(*****)

Standard junction boxes, pull boxes, and cable boxes shall be installed as close to the location specified in the plans as possible. Locations can be field adjusted to match grade, curb or sidewalk edges, or to avoid obstructions, with the approval of the Engineer. The Contractor may install, at no expense to the Contracting Agency, such additional boxes as may be desired to facilitate the Work or to accommodate the requirements of the material used by the Contractor. Junction box installation shall conform to the details in the Standard Plans.

Item No. 2 in the second paragraph of Section 8-20.3(6) is revised to read as follows:

(*****)

2. Cable vaults and pull boxes shall be installed on six-inches of gravel backfill for drains material, per Section 9-03.12(4), placed on a compacted or undisturbed level foundation.

All cable vaults shall include a removable galvanized steel ladder mounted in accordance with the vault manufacturer's specifications. In cable vaults meeting H-20 requirements, the ladder shall be located on the wall opposite the cable racking.

Section 8-20.3(6) is supplemented with the following:

(*****)

Junction boxes, pull boxes, and cable vaults placed adjacent to curb or sidewalk shall be installed flush with the curb or sidewalk. Prior to construction of finished grade, newly installed or adjusted junction boxes may have pre-molded joint filler placed around their perimeters. The joint filler shall be removed prior to adjustment to finished grade. Joint filler shall remain where junction boxes are placed against sidewalk edges.

Junction boxes, pull boxes, and cable vaults which are adjusted as part of the Contract, which do not have a six-inch gravel pad beneath them, shall have a six-inch gravel pad installed per item two of the second paragraph of this specification.

Wiring

Section 8-20.3(8) is supplemented with the following:

(March 13, 1995)

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

1	Spare	614	624	634	644	654	664	674	684	694
2	Spare	615	625	635	645	655	665	675	685	695
3	AC-	616	626	636	646	656	666	676	686	696
4	Red Auxiliary	617	627	637	647	657	667	677	687	697
5	Yellow Auxiliary	618	628	638	648	658	668	678	688	698
6	Green Auxiliary	619	629	639	649	659	669	679	689	699
7	Pedestrian Heads & Dets.									
8	Hand	711	721	731	741	751	761	771	781	791
9	Man	712	722	732	742	752	762	772	782	792
10	AC-	713	723	733	743	753	763	773	783	793
11	Detection	714	724	734	744	754	764	774	784	794
12	Common-Detection	715	725	735	745	755	765	775	785	795
13	Spare	716	726	736	746	756	766	776	786	796
14	Spare	717	727	737	747	757	767	777	787	797
15	Spare	718	728	738	748	758	768	778	788	798
16	Spare	719	729	739	749	759	769	779	789	799
17	Detection									
18	AC+	811	821	831	841	851	861	871	881	891
19	AC-	812	822	832	842	852	862	872	882	892
20	Common-Detection	813	823	833	843	853	863	873	883	893
21	Detection A	814	824	834	844	854	864	874	884	894
22	Detection B	815	825	835	845	855	865	875	885	895
23	Loop 1 Out	816	826	836	846	856	866	876	886	896
24	Loop 1 In	817	827	837	847	857	867	877	887	897
25	Loop 2 Out	818	828	838	848	858	868	878	888	898
26	Loop 2 In	819	829	839	849	859	869	879	889	899
27	Supplemental Detection									
28	Loop 3 Out	911	921	931	941	951	961	971	981	991
29	Loop 3 In	912	922	932	942	952	962	972	982	992
30	Loop 4 Out	913	923	933	943	953	963	973	983	993
31	Loop 4 In	914	924	934	944	954	964	974	984	994
32	Loop 5 Out	915	925	935	945	955	965	975	985	995
33	Loop 5 In	916	926	936	946	956	966	976	986	996
34	Loop 6 Out	917	927	937	947	957	967	977	987	997
35	Loop 6 In	918	928	938	948	958	968	978	988	998
36	Spare	919	929	939	949	959	969	979	989	999

(*****)

Temporary Illumination and Signal Systems

Temporary Illumination and Signal System wiring shall conform to all of the requirements for permanent Illumination and Signal System wiring. Aerial triplex wire shall be Aluminum Cable Steel Reinforced per Standard Specification 9-29.3(2)C. Messenger cables shall conform to the requirements of Standard Specification 9-29.4.

Vertical clearance under any conductors, with the exception traffic signal spans with signal heads, shall be a minimum of 25 feet between the conductor and any ground or roadway.

1 (*****)

2 **Cabinet Wiring**

3 All wiring, cable, and cords within cabinets shall be neatly bundled and secured
4 with nylon ties. Wiring, cable, and cords shall be secured to rack frames or cable
5 trays as appropriate.
6

7 All work areas shall be clean and orderly at the completion of work and as required
8 by the Engineer during the progress of the work.
9

10 (*****)

11 **Labeling**

12 The eleventh paragraph is revised as follows:
13

14 All wiring, exclusive of the previously mentioned illumination circuits, shall be
15 labeled in all junction boxes, pull boxes, cable vaults, and cabinets. The label shall
16 be an approved tag and shall have the information required by the following list:
17

- 18 1. Individual conductors – the circuit number indicated in the Contract.
- 19
- 20 2. Multiconductor cable – the numbers of the signal heads and/or pedestrian
21 push buttons served.
22
- 23 3. Loop lead-in cable – the numbers of the loops served.
- 24
- 25 4. Magnetometer cable – the numbers of the magnetometers served.
- 26
- 27 5. Camera lead-in cable – the numbers of the phases the cameras served.
- 28
- 29 6. Communications cable – labeled as "COMM"
30

31 ***Services transformer, Intelligent Transportation System Cabinet***

32 The fifth paragraph of section 8-20.3(10) is deleted and replaced with the following:
33

34 The service, transformer, and ITS cabinets shall be marked with the service
35 agreement letters and numbers as noted in the Plans. Transformer and ITS
36 cabinets shall also be marked with the 10 character equipment identifier as shown
37 in the Plans. These markings shall be installed on the outside of the cabinet, on
38 the side most visible from the roadway.
39

40 All markings shall be capital letters and numbers. Letters and numbers shall be
41 Series C as defined in the Standard Highway Signs manual (FHWA) or larger.
42 Transformer and ITS cabinet markings shall be adhesive black vinyl. Service
43 cabinets shall be marked using stencils and black enamel alkylid gloss paint
44 conforming to Federal Specification TT-E-489F
45

46 ITS cabinets shall also have an engraved nameplate attached to the inside of the
47 cabinet door. The nameplate shall have white lettering on a red background. The
48 nameplate text shall be two lines. The first line shall read "Cabinet Power Source"
49 in ½ inch nominal letters. The second line shall read "SCA ####" or "005-TR-
50 #####", as appropriate, in 1 inch nominal letters, with the #'s replaced with the
51 appropriate source designation as shown in the Plans.
52

Testing

Section 8-20.3(11) is supplemented with the following:

(*****)

Testing and turn-on of electrical systems shall be performed during daytime hours. The time and date of the Turn-on date shall be coordinated with the Olympic Region Signal Shop. Prior to scheduling a Turn-On date, the Contractor shall verify with the Engineer that:

1. Field tests 1, 2, 3 and 4 as specified in Section 8-20.3(11) have been completed; and
2. Contractor supplied 48" x 48" W20-902 (NEW SIGNAL AHEAD) or W20-903 (SIGNAL REVISION AHEAD), as specified in the Plans, black legend on orange background signs and 4" x 6" wood posts shall be installed on all approaching intersection legs at locations staked by the Engineer. The signs shall be placed in accordance with Standard Plan K-80.10-00 or the approved Traffic Control Plan in the Contract Plans. The Contractor shall remove these sign assemblies two weeks after normal cycling operation has begun.

Prior to Turn-On, the Contractor shall perform Field Test 5 in the presence of Contracting Agency electronics technician and electrical inspector.

Field Test 5 shall proceed as follows:

1. Turn-On the signal system to its flash mode to verify proper flash indications;
2. Stop all traffic from entering the intersection; and,
3. Allow the signal system to cycle through no less than one full signal cycle to verify proper signal operation.

Based on the outcome of Field Test 5, the Contractor shall take one of the following actions as determined by the Engineer:

1. Turn-On the signal system to normal cycling operation:
2. Set the signal system to its flash mode for a period not exceeding five calendar days; or,
3. Turn-Off power to the signal system and cover all signal displays with black opaque material.

If action 3 is taken, the Contractor shall schedule a new Turn-On date with the Engineer following the procedures given herein.

Following Turn-On, all conflicting signs shall be removed as ordered by the Engineer.

Signal Systems

Signal Controllers

Section 8-20.3(14)A is supplemented with the following:

(August 2, 2010)

Testing

All signal control equipment shall be tested at the Washington State Department of Transportation Materials Laboratory located in Tumwater, Washington, prior to final delivery. The tests shall check the operation of each individual component as well as the overall operation of the system.

The Contractor shall designate a qualified representative for these tests. Notification of this representative shall be submitted for approval, in writing, to the State Materials Laboratory, 14 calendar days prior to any equipment deliveries. The Engineer shall also receive a copy of this notification, which includes the representative's name, address, and telephone number. All communications and actions regarding testing of all equipment submitted to the State Materials Laboratory shall be made through this representative. These communications and actions shall include, but not be limited to, the following:

All notifications of failure or rejection, demonstration of the equipment, and the return of rejected equipment.

The State Materials Laboratory testing process will consist of the following four separate stages:

- a. Delivery and Assembly
- b. Demonstration and Documentation
- c. Performance Test
- d. Operational Test

Testing will follow in the correct order with no time gaps between stages unless mutually agreed upon by the Contractor and State Materials Laboratory.

Stage 1 Delivery Assembly

All components for the complete traffic control systems, including the necessary test equipment, shall be assembled and ready for demonstration within ten working days of delivery to the Materials Laboratory. The systems shall simulate the operations as installed in the field.

Equipment and prerequisites necessary to complete this stage shall include:

- a. **Detection Simulator:**
The detection simulator shall provide at least one detector per phase and variable traffic volumes. One simulator shall be required for every two controllers tested.
- b. **Communications Network:**

Locations, specified for coordinating communications equipment and cable, shall be completely wired to provide an operational communications system between all local and master controllers.

The Contractor shall provide labor, equipment, and materials necessary to assemble all control equipment complete and ready for demonstration. Materials and equipment used for this stage that are not required for field installation shall remain the property of the Contractor. Failure to complete this stage within ten working days will result in rejection of the entire system.

Stage 2 Demonstration and Documentation

This stage shall be completed within seven working days following the completion of Stage 1. Failure to do so shall result in rejection of the entire shipment.

All documentation shall be furnished with the control equipment prior to the start of testing. If corrections to any document are deemed necessary by the State, the Contractor shall submit this updated version prior to the final approval by the State Materials Laboratory. The documents to be supplied shall consist of or provide the following:

- a. A Complete accounting of all the control and test equipment required.
- b. A complete set of documents which shall include:
 1. Serial numbers when applicable.
 2. Written certification that equipment of the same make and model has been tested according to NEMA Environmental Standards and Test Procedures, and has met or exceeded these standards. The certificate shall include equipment model number and where, when, and by whom the tests were conducted. This certificate shall accompany each shipment of controllers.
 3. Reproducible mylar wiring diagrams and two blue-tone prints for each controller and cabinet supplied. The sheet size shall be 24 inches by 36 inches.
 4. Wiring diagrams for all auxiliary equipment furnished. One set per cabinet.
 5. Complete operations and maintenance manuals including complete and correct software listing and flow charts. One set of operations and maintenance manuals per cabinet; at least four but no more than ten. Five sets of software listings and flow charts.
 6. Complete operations and maintenance manuals for all auxiliary equipment. One set per cabinet.

- c. A description of the functions and the capabilities of individual components and of the overall control system.
- d. A presentation on how to operate the system.
- e. A complete and thorough demonstration to show that all components of the control system are in good condition and operating properly, and proof that the controller and cabinet are functioning correctly.
- f. Detailed instructions for installing and operating the controller(s), including explanations on the use of all features of the controller(s).
- g. The operational and maintenance manuals for each traffic signal controller supplied including as a minimum, but not to be limited to the following:
 1. Detailed instructions for maintaining all hardware components, controller, and auxiliary equipment.
 2. A complete parts list detailing all manufacturer's identification codes.
 3. Detailed wiring diagrams and schematics indicating voltage levels and pictorial description, part name, and location for all hardware components, controller, and auxiliary equipment.

The demonstration shall include the following:

- a. Phasing per plans and all phase timing.
- b. Detection including any special detector functions.
- c. Conflict Monitor and Load Switches.
- d. Special Coordination including communication equipment.

This demonstration shall be performed by the Contractor in the presence of State Materials personnel. The Contractor shall supply any item not accounted for within five working days of the accounting. Controllers and cabinets that remain incomplete five working days after notification shall be rejected and returned freight collect to the Contractor.

Stage 3 Unit Performance Test

A minimum of ten working days shall be allowed for one or two cabinet assemblies and five working days for each additional assembly.

The unit performance test will be conducted by State Personnel to determine if each and every controller cabinet assembly complies with

1 NEMA Environmental Standards as stated in NEMA publication No. TS 1-
2 1976, Part 2.

3
4 Any unit submitted, whose failure has been corrected, shall be retested
5 from the beginning of this stage.
6

7 **Stage 4 Operational Test**

8 All control and auxiliary equipment shall operate without failure for a
9 minimum of ten consecutive days. If an isolated controller is specified, it
10 shall operate as an isolated controller. If a coordinated system is
11 specified, it shall operate as a total coordinated system with the master
12 and all local controllers operating in all coordinated modes.
13

14 If any failure occurs during this stage, all equipment for this stage shall be
15 restarted following completion of repairs.
16

17 **Equipment Failure Or Rejection**

18 Equipment failures shall be defined as set forth in NEMA Publication No.
19 TS 1-1976. Failure of load switches, detector amplifiers, and conflict
20 monitors shall not result in rejection of the controller or cabinet. However,
21 the Contractor shall stock, as replacements, approximately 30 percent
22 more than the total for these three items. All excess material shall remain
23 the property of the Contractor following completion of all tests.
24

25 If a failure occurs during Stages 3 or 4, repairs shall be made and
26 completed within ten working days following notification of the malfunction.
27 The Contractor shall have the option of making onsite repairs or repair
28 them at a site selected by the Contractor. Failure to complete repairs
29 within the allotted time shall result in rejection of the controller or cabinet
30 assembly under test.
31

32 A total of two failures will be allowed from the start of Stage 3 to the end of
33 Stage 4. If three failures occur during this time period, the equipment will
34 be rejected. New equipment of different serial numbers submitted as
35 replacement shall be received by the Materials Laboratory for testing
36 under Stage 3 within ten working days following notification of rejection.
37 Failure to meet this requirement within the allotted time will result in
38 rejection of the entire system. Software errors will be considered as
39 failures and, if not corrected within ten working days, the entire system will
40 be subject to rejection. Following rejection of any equipment, the
41 Contractor shall be responsible for all costs incurred. This shall include
42 but not be limited to all shipping costs.
43

44 When the traffic control program is supplied by the State, the Contractor
45 shall prove that any failures are, in fact, caused by that program and not
46 the hardware.
47

48 All component or system failures, except load switches and detector
49 amplifiers, shall be documented. This documentation shall be submitted
50 prior to commencing the test or stage in which the failure was found and
51 shall provide the following information:
52

- a. A detailed description of the failure.
- b. The steps undertaken to correct the failure.
- c. A list of parts that were replaced, if any.

Upon completion of the tests, the equipment will be visually inspected. If material changes are observed which adversely affect the life of the equipment, the cause and conditions shall be noted. The Contractor will immediately be given notice to correct these conditions. If not repaired within ten working days of notification, the equipment will be subject to rejection. A final accounting shall be made of all equipment prior to approval.

All failed or rejected equipment shall be removed from the Materials Laboratory within three working days following notification; otherwise, the failed or rejected equipment will be returned, freight collect, to the Contractor.

Following final approval by the State Materials Laboratory, all equipment shall be removed from the State Materials Laboratory and delivered to sites as designated elsewhere in this contract.

Guarantees

Guarantees and warranties shall be in accordance with Section 1-05.10.

Signal Heads

Section 8-20.3(14)B is supplemented with the following:

(*****)

Signal heads which have been installed but are not in operation shall be bagged in orange plastic. Each signal head shall be bagged such that only the mounting conduit is visible outside the bag. No lenses, visors, backplates, or any part of the housing shall be visible.

Induction Loop Vehicle Detectors

Section 8-20.3(14)C is supplemented with the following:

(*****)

The width of the saw cut for Section A-A in Standard Plan J-8a shall be at least 1/16 inch wider than the diameter of the loop wire, up to a maximum of 3/8 inch. The width of Section B-B in Standard Plan J-8a shall be at least 1/16 inch wider than twice the diameter of the loop wire, up to a maximum of 5/8 inch.

Damaged or substandard vehicle induction loops shall be replaced after planing, cracksealing, pavement repair operations, or any other Contract work resulting in their damage, and prior to paving the final lift of HMA.

The Contractor shall notify the WSDOT Olympic Region Signal Superintendent, Don Anders (360) 357-2616, a minimum of 3 days prior to planing or saw cutting of any roadway or paved shoulder and prior to disturbing any detection loops. The Olympic Region Signal Shop will coordinate any repair, temporary detection, and/or replacement of loops if

necessary and provide temporary signal timing as needed. The signal system shall remain functional during construction.

The Contractor shall replace removed/damaged vehicle induction loops and associated home runs within five (5) working days of removing the detectors as directed by the Engineer. All new loops shall be spliced in the junction box by the Contractor and tested by the WSDOT Olympic region Signal Shop to be verified as fully operational.

Replaced induction loop vehicle detectors shall be constructed in accordance with Standard Plan J-8a and tested in accordance with Section 8-20.3(14)D.

Round Loops

As an alternate to the 6' x 6' square Type 2 induction loop shown on Standard Plan J-8a, 6 feet diameter round loops may be constructed. Round loops shall be constructed in accordance with the requirements noted below and shall conform to Standard Plan J-8c as modified by the following:

1. Loop conductor and loop lead-in cable shall conform to Section 9-29.3.
2. Round saw cuts shall be 6 feet in diameter and shall be constructed using equipment designed for cutting round loops. The equipment shall utilize a concave, diamond-segmented blade. The saw-cuts shall be vertical and shall be a minimum of 1/4 inch wide. The saw cut shall be a minimum of 3 inches deep, measured at any point along the perimeter of the saw cut. Other methods of constructing the round saw-cut such as anchoring a router or flat blade saw will not be allowed.
3. The bottom of the saw cut shall be smooth. No edges created by differences in saw cut depths will be allowed.
4. All saw cut corners shall be rounded to a minimum 1.5 inches radius.
5. All saw cuts shall be cleaned with a high-pressure washer. Wash water and slurry shall be vacuumed out or blown dry with compressed air.
6. Loops shall be installed after all grinding and prior to paving the final lift of asphalt designated in the Plan.
7. The loop shall be constructed using 4 turns of conductor. The conductor shall be installed one turn on top of the previous turn. All turns shall be installed in a clockwise direction. The conductors shall be secured to prevent floating with 2 inches lengths of high temperature foam backer rod sized for a snug fit and spaced at 1 foot intervals around the perimeter of the saw cut and at the corners. If the conductors are not rated for high temperatures, 1/4 inch sealant rope shall run the continuous length
8. Loop sealant shall be installed as per manufacturer's recommendations.

"As-Built" Plans

Section 8-20.3(17) is supplemented with the following:

1 (*****)

2 **Intelligent Transportation System**

3 The Contractor Shall provide the Engineer with a cable routing diagram indicating
4 actual cable routes and "meter marks" for all intersections, directional change
5 points, and termination points. The Contractor shall record these locations during
6 cable installation. Cable system "as-built" drawings showing the exact cable route
7 and all ITS equipment locations shall be provided by the Contractor to the
8 Engineer. Information such as the location and amount of slack cable shall also be
9 included in the cable routing diagram.

10
11 **Measurement**

12 Section 8-20.4 is supplemented with the following:

13
14 (*****)

15 No specific unit of measurement will apply to the lump sum contract price for
16 "Temporary Illumination System _____" but measurement will be for the sum total of all
17 items for a complete system to be furnished and installed.

18
19 (*****)

20 No specific unit of measurement will apply to the lump sum contract price for
21 "Temporary Signal System No. _____" but measurement will be for the sum total of all
22 items for a complete system to be furnished and installed.

23
24 (*****)

25 No specific unit of measurement will apply to the lump sum contract price for "Variable
26 Message Sign System" but measurement will be for the sum total of all items for a
27 complete system to be furnished and installed.

28
29 (*****)

30 No specific unit of measurement will apply to the lump sum contract price for
31 "Contractor Supplied Materials", but measurement will be for the sum total of all items
32 listed under Contractor Supplied Materials to be furnished to the Olympic Region
33 Facility.

34
35 **Payment**

36 Section 8-20.5 is supplemented with the following:

37
38 (*****)

39 Removal of the existing illumination equipment, including the existing temporary
40 illumination system, powered from service SCA 527 shall be included in the lump sum
41 payment for "Illumination System SCA 527".

42
43 Removal of the existing illumination equipment powered from service SCA 528 shall be
44 included in the lump sum payment for "Temporary Illumination System SCA 528".

45
46 Removal of the existing temporary signal system equipment shall be included in the
47 lump sum payment for "Traffic Signal System – Temporary Signal System".

48
49 Removal of the existing illumination and traffic signal system at US 12 and Old Hwy 99 /
50 Elderberry ST shall be included in the lump sum payment for "Traffic Signal System No.
51 1 – US12 and Elderberry"

1 (*****)

2 All costs associated with the delivery of electrical equipment removed as part of
3 Illumination System SCA 527, to remain the property of WSDOT, to the State's Olympic
4 Region Signal Shop shall be included in the lump sum price for "Illumination System
5 SCA 527".
6

7 All costs associated with the delivery of electrical equipment removed as part of Traffic
8 Signal System No. 1 – US 12 and Elderberry, to remain the property of WSDOT, to the
9 State's Olympic Region Signal Shop shall be included in the lump sum price for "Traffic
10 Signal System No. 1 – US 12 and Elderberry".
11

12 All costs associated with the delivery of electrical equipment removed as part of
13 Temporary Traffic Signal System No. 1 – US 12 and SB I-5, to remain the property of
14 WSDOT, to the State's Olympic Region Signal Shop shall be included in the lump sum
15 price for "Temporary Traffic Signal System No. 1 – US 12 and SB I-5"
16

17 All costs associated with the delivery of electrical equipment removed as part of
18 Temporary Traffic Signal System No. 2 – US 12 and NB I-5, to remain the property of
19 WSDOT, to the State's Olympic Region Signal Shop shall be included in the lump sum
20 price for "Temporary Traffic Signal System No. 2 – US 12 and NB I-5"
21

22 (*****)

23 "Temporary Illumination System _____", lump sum.

24 The lump sum contract price for "Temporary Illumination System _____", shall be full pay
25 for all costs in furnishing all labor, materials, tools, and equipment necessary or
26 incidental to the construction, installation, maintenance and removal of the complete
27 and operable temporary illumination system.
28

29 (*****)

30 "Temporary Traffic Signal System No. _____", lump sum.

31 The lump sum contract price for "Temporary Traffic Signal System No. _____", shall be full
32 pay for installation or modification of the system as described, including removal.
33

34 (*****)

35 "Variable Message Sign System", lump sum.

36 The lump sum contract price for "Variable Message Sign System", shall be full pay for
37 the construction of the complete electrical system, as described above and shown in the
38 Plans, and herein specified, including excavation, backfilling, concrete foundations,
39 conduit, wiring, restoring facilities destroyed or damaged during construction, salvaging
40 existing materials, for making all required tests, and for providing the warranty described
41 herein. All additional materials and labor, not shown in the Plans or called for herein
42 and which are required to complete the electrical system, shall be included in the lump
43 sum Contract price. .
44

45 (*****)

46 "Contractor Supplied Materials", lump sum.

47 The lump sum contract price for "Contractor Supplied Materials", shall be full pay for all
48 labor, equipment, and materials associated with the furnishing and delivery of
49 Contractor Supplied Materials to the Olympic Region Facility..
50

51 (*****)

52 "Removing CCTV Pole Shaft Obstructions", estimated.

1 Payment for removing obstructions, as defined in Section 8-20.3(4) as supplemented in
2 these Special Provisions, will be made for the changes in shaft construction methods
3 necessary to remove the obstruction. The Contractor and the Engineer shall evaluate
4 the effort made and reach agreement on the equipment and employees utilized, and the
5 number of hours involved for each. Once these cost items and their duration have been
6 agreed upon, the payment amount will be determined using the rate and markup
7 methods specified in Section 1-09.6. For the purpose of providing a common proposal
8 for all bidders, the Contracting Agency has entered an amount for the item "Removing
9 CCTV Pole Shaft Obstructions" in the bid proposal to become a part of the total bid by
10 the Contractor.

11
12 If the shaft construction equipment is idled as a result of the obstruction removal work
13 and cannot be reasonably reassigned within the project, then standby payment for the
14 idled equipment will be added to the payment calculations. If labor is idled as a result of
15 the obstruction removal work and cannot be reasonably reassigned within the project,
16 then all labor costs resulting from Contractor labor agreements and established
17 Contractor policies will be added to the payment calculations.

18
19 The Contractor shall perform the amount of obstruction work estimated by the
20 Contracting Agency within the original time of the contract. The Engineer will consider a
21 time adjustment and additional compensation for costs related to the extended duration
22 of the shaft construction operations, provided:

- 23
24 1. the dollar amount estimated by the Contracting Agency has been exceeded,
25 and
26
27 2. the Contractor shows that the obstruction removal work represents a delay to
28 the completion of the project based on the current progress schedule provided
29 in accordance with Section 1-08.3.
30

31 **PERMANENT SIGNING**

32 **Materials**

33 ***Sign Support Structures***

34
35
36
37 Section 9-28.14 is supplemented with the following:

38
39 **(BSP April 5, 2010)**

40 **Sign Structure Foundation Shaft Casing And Slurry**

41 All temporary casing shall be a smooth wall non corrugated structure of steel base
42 metal. All temporary casing shall be of ample strength to resist damage and
43 deformation from transportation and handling, installation and extraction stresses,
44 and all pressures and forces acting on the casing. The temporary casing shall be
45 capable of being removed without deforming and causing damage to the completed
46 shaft, and without disturbing the surrounding soil.

47
48 The temporary casing shall be clean prior to placement in the excavation. The
49 temporary casing may be telescoped, but the outside diameter of the temporary
50 casing shall not be less than the specified diameter of the shaft.
51

Slurry for shaft foundations shall be either synthetic slurry or water slurry, conforming to the following requirements:

Synthetic Slurries

Synthetic slurries shall be used in conformance with the manufacturer's recommendations, and the quality control plan specified in Section 8-21.3(9)F as supplemented in these Special Provisions. The sand content of synthetic slurry prior to final cleaning and immediately prior to placing concrete shall be less than 2.0 percent, in accordance with API 13B-1, Section 5.

Water Slurry (with or without site soils)

Water with or without site soils may be used as slurry when casing is used for the entire length of the drilled hole. Use of water slurry without full length casing may only be used with the approval of the Engineer. Water slurry shall conform to the following requirements:

Property	Test	Requirement
Density (pcf)	Mud Weight (Density) API 13B-1, Section 1	65 max.
Sand Content (percent)	Sand API 13B-1, Section 5	1.0 max.

Slurry temperature shall be at least 40F when tested.

Steel Structures and Posts

Section 9-28.14(2) is supplemented with the following:

(BSP October 2, 2006)

Monotube Sign Structures

Structural steel, except for cover plates, anchor rod templates and as otherwise shown in the Plans, shall conform to either ASTM A 572 Grade 50, or ASTM A 588. Cover plates shall conform to ASTM A 36.

Handhole cover screws shall conform to ASTM F 593, Grade 1.

Sign bracket bolts, nuts, and washers shall conform to Section 9-06.5(1).

Monotube splice bolts, mounting beam rods, and associated nuts and washers, shall conform to the Section 9-06.5(3) requirements for AASHTO M 164.

Anchor rods shall conform to ASTM F 1554 Grade 105, including supplemental requirements S2, S3, and S5. Nuts shall conform to AASHTO M 291 Grade DH. Washers shall conform to AASHTO M 293. Anchor rods shall be galvanized a minimum of 1'-0" at the exposed end in accordance with AASHTO M 232. Nuts and washers shall be galvanized in accordance with AASHTO M 232.

Construction Requirements

1 **Location of Signs**

2 The last sentence of Section 8-21.3(1) is deleted and replaced with the following:

3
4 (*****)

5 Final lengths of 2.5" and 3" square steel posts will be determined or verified by the
6 Engineer at the request of the Contractor prior to fabrication. Final lengths of steel
7 W-beam post will be determined by the Engineer prior to fabrication.

8
9 **Sign Structures**

10
11 **Fabrication of Steel Structures**

12 Section 8-21.3(9)A is supplemented with the following:

13
14 **(BSP August 3, 2009)**

15 **Monotube Sign Structures**

16 **Bolted Connections**

17 All bolted connections shall be made using the direct tension indicator
18 method, except as otherwise specified.

19
20 The Contractor may use tension control bolts at all monotube splice
21 locations, subject to the following conditions:

- 22
- 23 1. The tension control bolts shall incorporate a design feature
24 intended to either indirectly indicate, or to automatically provide,
25 the bolt tension as specified in Table 3 of Section 6-03.3(33).
26
 - 27 2. The Contractor shall submit the tension control bolt system to the
28 Engineer for approval, including but not limited to bolt capacities,
29 type of bolt, nut, and washer lubricant, method of packaging and
30 protection of the lubricated bolt, installation equipment,
31 calibration equipment, and installation procedures.
32
 - 33 3. Verification testing of the tension control bolt system shall be
34 performed at the job site in a device capable of indicating the
35 actual bolt tension. A representative sample of not less than
36 three bolt and nut assemblies of each diameter, length, and
37 grade, used for structure assembly shall be tested. The test
38 assembly shall include the type of washers specified for the
39 structure, and the bolt, nut, and washers shall be arranged in the
40 device as specified in the Plans for the structure. The test
41 assembly shall use the lubricated bolts as supplied by the
42 manufacturer.
43
 - 44 4. The verification testing shall demonstrate that each bolt develops
45 a tension not less than the tension specified in Table 3 of Section
46 6-03.3(33).
47
 - 48 5. The tension control bolt manufacturer's installation procedure
49 shall be followed for installation of bolts in the verification testing
50 device, in all calibration devices, and in all structure connections.
51

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6. Upon receiving the Engineer's approval of the verification testing results, the Contractor shall assemble the bolts in the splice locations as follows:
 - a. All bolts, nuts, and washers shall be lubricated as supplied by the manufacturer and as tested during verification testing.
 - b. All bolts shall be initially tightened sufficiently to bring all plies of the splice joint into firm contact but without yielding or fracturing the tension control or tension indicator element of the bolts.
 - c. All bolts shall be tightened further, progressing systematically from the most rigid part of the connection to the free edges in a manner that will minimize relaxation of previously tightened bolts. In some cases, proper tensioning of the bolts may require more than one cycle of systematic partial tightening prior to final yield or fracture of the tension control or tension indicator element of each bolt.
 - d. If yield or fracture of the tension control or tension indicator element of a bolt occurs prior to the final tightening cycle, that bolt shall be replaced with a new one.
 7. Additional field verification testing shall be performed as requested by the Engineer.
 8. All bolts and connecting hardware shall be stored and handled in a manner to prevent corrosion and loss of lubricant. Bolts which are installed without the same lubricant coating as tested under the verification test will be rejected, shall be removed from the joint, and shall be replaced with new lubricated bolts at no additional cost to the Contracting Agency.

39 Shop Assembly

40 Prior to galvanizing, the Contractor shall shop assemble the completed
41 structure lying on its side in an undeflected position to ensure correct
42 alignment, accuracy of holes, fit of joints, smooth camber profile, and the
43 specified amount of camber. The joints shall be bolted with a sufficient
44 number of bolts tightened snug tight to close the joints as they would be in
45 the final field assembled position. The Contractor shall not disassemble
46 the sign structure for galvanizing as specified until receiving the Engineer's
47 approval of the shop assembled structure.

48 Zinc Coating and Painting

49 All galvanized surfaces exposed to view after erection shall be shop
50 painted or shop powder coated in accordance with Section 6-07.3(11),
51 except when the Plans or Special Provisions require field painting only in
52 accordance with Sections 6-07.3(9)I and 6-07.3(11)A. Contact surfaces of

1 the field bolted connections shall be left as galvanized without any
2 overcoat.

3
4 The color of the finish coat shall match *** Federal Standard 595 Color
5 Number 35327 *** when dry.

6
7 All galvanized surfaces specified to be painted or powder coated shall be
8 prepared for coating in accordance with the ASTM D 6386 and Section 6-
9 07.3(11). The method of preparation shall be as agreed upon by the paint
10 or powder coating manufacturer and the galvanizer. The Contractor shall
11 not begin painting or powder coating the sign structure until receiving the
12 Engineer's approval of the prepared galvanized surface.

13
14 After completing erection, the Contractor shall repair all metal surfaces
15 with damaged paint or powder coatings and exposed metal with a field
16 repair coating in accordance with Section 6-07.3(9) and Section 6-
17 07.3(11)A (for paint) or Section 6-07.3(11)B (for powder coating). The
18 color of the finish coat of the field repair coating, when dry, shall match the
19 color specified above.

20 21 **Field Assembling**

22 The Contractor shall furnish and install the vibration damper as shown in
23 the Plans. The damper shall be installed before the sign structure is
24 erected.

25 26 **Welding Inspector Qualification**

27 The fabricator shop will provide a Certified Welding Inspector. The
28 inspector shall be a AWS Certified Welding Inspector (CWI) qualified and
29 certified in accordance with the provisions of AWS QCI Standard for
30 Qualification and Certification.

31 32 **Welding Inspection**

33 Welds for monotube sign structures shall be inspected using the methods
34 described below.

35 36 1. Visual Inspection

37 All welds shall have 100 percent of their length visually
38 inspected.

39 40 2. Magnetic Particle Inspection

41 Fillet welds, and longitudinal butt joint welds in beams, shall have
42 30 percent of their length inspected using magnetic-particle
43 testing techniques. If rejectable flaws are found in any test
44 length of the weld, the full length of the weld or five feet on either
45 side of the test length, whichever is less, shall be tested.

46 47 3. Ultrasonic Inspection

48 Groove welds, except the post to beam connection weld and
49 longitudinal butt joint welds in beams, shall have 100 percent of
50 their length inspected using ultrasonic testing techniques. The
51 testing procedure and acceptance criteria for tubular members

shall conform to the latest edition of the AWS Structural Welding Code D1.1-Steel.

4. Dye-Penetrant or Magnetic Particle Inspection

The post to beam connection weld shall have 100 percent of its length inspected using dye-penetrant or magnetic-particle testing techniques. The inspection shall be performed after the root pass and after completion of the weld.

Bridge Mounted Sign Brackets

Section 8-21.3(9)E is supplemented with the following:

(BSP December 14, 2000)

Bridge Mounted Sign Bracket No(s). *** 1 *** include the following quantities of structural carbon steel:

Sign Bracket No. 1

Structural Steel

911 LBS.

For bridge mounted sign brackets mounted with resin bonded anchors, the Contractor shall install resin bonded anchors in accordance with Section 6-02.3(18) as supplemented in these Special Provisions. For this type of mounting, Bridge Mounted Sign Bracket No(s). *** 1 *** include the following quantities of drilled holes:

Sign Bracket No. 1

7 L.F.

Foundations

Section 8-21.3(9)F is supplemented with the following:

(BSP July 12, 2000)

The Contractor shall not construct grout pads at the base of the monotube sign structures.

(BSP April 5, 2010)

Shafts For Sign Structure Foundations

Shaft foundations for the sign structures at the following location(s) shall be constructed in accordance with the following requirements, except that temporary casing is not required by the Contracting Agency but is instead a Contractor option:

*** Cantilever Sign Structure No. 1 – Sta. 795+90 LT. ***

Shaft foundations for the sign structures at the following location(s) shall be constructed in accordance with the following requirements, including required use of temporary casing:

*** N/A ***

Submittals

Contractor Project Reference and Personnel Experience Submittal

Prior to the start of shaft construction, the Contractor shall electronically submit a project reference list to the Engineer for approval verifying the successful completion by the Contractor of at least three separate shaft foundation projects in the past five years with drilled shafts of diameters and depths similar to or larger than those shown in the Plans and ground conditions similar to those identified in the Contract. A brief description of each listed project shall be provided along with the name and current phone number of the project owner or the owner's Contractor.

Prior to the start of shaft construction, the Contractor shall electronically submit a list identifying the on-site supervisors, and drill rig operators potentially assigned to the project to the Engineer for approval. On-site supervisors shall have a minimum two years experience in supervising construction of shaft foundations, and drill rig operators shall have a minimum one year experience in construction of shaft foundations. The list shall contain a brief description of each individual's experience.

The Engineer will approve or reject the Contractor's qualifications and field personnel within 10 working days after receipt of the submission. Work shall not be started on any drilled shaft until the Contractor's qualifications and field personnel are approved by the Engineer. The Engineer may suspend the shaft construction if the Contractor substitutes unapproved personnel. The Contractor shall be fully liable for the additional costs resulting from the suspension of work and no adjustments in contract time resulting from the suspension of work will be allowed.

Shaft Installation Narrative Submittal

The Contractor shall electronically submit a shaft installation narrative for approval by the Engineer. The narrative shall reference available subsurface data provided in the contract test hole boring logs, and the geotechnical report(s) prepared for this project. This narrative shall provide the following information in a single complete submittal:

1. Proposed overall construction operation sequence.
2. Description, size, and capacities of specific equipment that will be available on site, including but not limited to cranes, drills, auger, bailing buckets, final cleaning equipment and drilling unit. The narrative shall describe why the equipment was selected, and describe equipment suitability to the anticipated site conditions and work methods. The narrative shall include a project history of the drilling equipment demonstrating the successful use of the equipment on shafts of equal or greater size in similar soil/rock conditions. The narrative shall also include details of shaft excavation and cleanout methods
3. Details of the method(s) to be used to ensure shaft stability (i.e., prevention of caving, bottom heave, etc. using temporary casing, slurry, and other means) during excavation (including pauses

and stops during excavation) and concrete placement. Temporary casing dimensions and detailed procedures for temporary casing installation and removal, and methods of advancing temporary casing with the excavation in accordance with this Special Provision, shall be provided.

4. Detailed procedures for mixing, using, and maintaining the slurry shall be provided. A detailed mix design (including all additives and their specific purpose in the slurry mix), and a discussion of its suitability to the anticipated subsurface conditions, shall also be provided for the proposed slurry.

The submittal shall include a detailed plan for quality control of the selected slurry, including tests to be performed, test methods to be used, and minimum and/or maximum property requirements which shall be met to ensure that the slurry functions as intended, considering the anticipated subsurface conditions and shaft construction methods, in accordance with the slurry manufacturer's recommendations and this Special Provision. As a minimum, the slurry quality control plan shall include the following tests:

Property	Test Method
Density	Mud Weight (Density), API 13B-1, Section 1
Viscosity	Marsh Funnel and Cup, API 13B-1, Section 2.2
PH	Glass Electrode, pH Meter, or pH Paper
Sand Content	Sand, API 13B-1, Section 5

5. Description of the method used to fill or eliminate all voids below the top of shaft between the plan shaft diameter and excavated shaft diameter.
6. Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods, and the method to assure the reinforcing cage position is maintained during construction.
7. Details of concrete placement, including operational procedures for pumping methods, and a sample uniform yield form to be used by the Contractor for plotting the approximate volume of concrete placed versus the depth of shaft for all shaft concrete placement (except concrete placement in the dry).

8. Description of the material (either CDF or granular material) used to temporarily backfill a shaft excavation during a stoppage of the excavation operation, as well as the method used to place and remove the material.
9. Storage and disposal plan for excavated material and drilling slurry (if applicable).

The Engineer will evaluate the shaft installation narrative for conformance with the Plans, Specifications and Special Provisions within the review time specified in Section 6-01.9.

Synthetic Slurry Technical Representative Submittal

If synthetic slurry is used to construct the shafts, the Contractor shall provide or arrange for technical assistance in the use of the synthetic slurry as specified in the **Slurry** subsection of this Special Provision. As part of the shaft installation narrative submittal, the Contractor shall electronically submit one of the following to the Engineer for approval:

1. The name and current phone number of the synthetic slurry manufacturer's technical representative assigned to the project.
2. The name(s) of the Contractor's personnel assigned to the project and trained by the synthetic slurry manufacturer in the proper use of the synthetic slurry. The submittal shall include a signed training certification letter from the synthetic slurry manufacturer for each trained Contractor's employee listed, including the date of the training.

All submittals shall be in electronic pdf format, and all documents in each pdf shall be legible. All submittals shall be prepared jointly by the Contractor and any subcontractors that will be performing the work.

Work shall not begin until all the required submittals have been approved in writing by the Engineer. All procedural approvals given by the Engineer will be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work.

Quality Assurance

Shafts shall be constructed so that the center at the top of the shaft is within four inches of the Plan location. Shafts shall be within 1.5 percent of plumb. Shaft steel reinforcing bar placement tolerances shall conform to Section 6-02.3(24)C.

A shaft preconstruction conference shall be held at least five working days prior to the Contractor beginning any shaft construction work at the site to discuss construction procedures, personnel, and equipment to be used, and other elements of the approved shaft installation plan as specified elsewhere in this Special Provision. Those attending shall include:

1. (representing the Contractor) The superintendent, on site supervisors, and all foremen in charge of excavating the shaft, placing the casing and slurry as applicable, placing the steel reinforcing bars, and placing the concrete. If synthetic slurry is used to construct the shafts, the synthetic slurry manufacturer's representative and/or approved Contractor's employees trained in the use of the synthetic slurry shall also attend.
2. (representing the Contracting Agency) The Project Engineer, key inspection personnel, and representatives from the WSDOT State Construction Office and Materials Laboratory Geotechnical Division.

If the Contractor proposes a significant revision of the approved shaft installation plan, as determined by the Engineer, the Engineer may require an additional conference be held before any additional shaft construction operations are performed.

Shaft Excavation

Shafts shall be excavated to the required depth as shown in the Plans. Shaft excavation operations shall conform to this Special Provision and the shaft installation narrative as approved by the Engineer. Once the excavation operation has been started, the excavation shall be conducted in a continuous operation until the excavation of the shaft is completed, except for pauses and stops as noted, using approved equipment capable of excavating through the type of material expected.

Pauses, defined as momentary interruptions of the excavation operation, will be allowed only for casing splicing, tooling changes, slurry maintenance, and removal of obstructions. Shaft excavation operation interruptions not conforming to this definition shall be considered stops. Stops for uncased or partial depth cased excavations shall not exceed 16 hours in duration. Stops for fully cased excavations shall not exceed 65 hours duration.

For stops exceeding the time durations specified above, the Contractor shall stabilize the excavation using one or both of the following methods:

1. Before the end of the work day, install casing in the hole to the depth of the excavation. The outside diameter of the casing shall not be smaller than six inches less than either the Plan diameter of the shaft or the actual excavated diameter of the hole, whichever is greater. Prior to removing the casing and resumption of shaft excavation, the annular space between the casing and the excavation shall be sounded. If the sounding operation indicates that caving has occurred, the casing shall not be removed and shaft excavation shall not resume until the Contractor has stabilized the excavation in accordance with item 3 of the shaft installation narrative as approved by the Engineer.

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2. Backfill the hole with CDF or granular material as specified by the Contractor and approved by the Engineer in accordance with item 8 of the shaft installation narrative. The Contractor shall backfill the hole to the ground surface if the excavation is not cased, or to a minimum of five feet above the bottom of casing if the excavation is cased. Backfilling of shafts with casing fully seated into rock, as determined by the Engineer, will not be required.

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During stops, the Contractor shall stabilize the shaft excavation to prevent bottom heave, caving, head loss, and loss of ground. The Contractor bears full responsibility for selection and execution of the method(s) of stabilizing and maintaining the shaft excavation, in accordance with Section 1-07.13. Shaft stabilization shall conform to item 3 of the shaft installation narrative.

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If slurry is present in the shaft excavation, the Contractor shall conform to the requirements in the **Slurry** subsection of this Special Provision regarding the maintenance of the slurry and the minimum level of drilling slurry throughout the stop, and shall recondition the slurry to the required slurry properties prior to recommencing shaft excavation operations.

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Temporary casing shall be advanced during excavation operations within the limits of temporary casing shown in the Plans for all sign structure shaft foundation locations specified at the beginning of this Special Provision as requiring temporary casing. Excavation in advance of the casing tip shall not exceed three feet, except that in no case shall shaft excavation and casing placement extend below the bottom of shaft excavation as shown in the Plans. Unless otherwise shown in the Plans, temporary casing shall be full depth of the sign bridge shaft.

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The Contractor shall conduct casing installation operations and shaft excavation operations such that the adjacent soil outside the casing and shaft excavation for the full height of the shaft is not disturbed. Disturbed soil is defined as soil whose geotechnical properties have been changed from those of the original in-situ soil, and whose altered condition adversely affects the structural integrity of the shaft foundation.

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The Contractor shall use appropriate means such as a cleanout bucket or air lift to clean the bottom of the excavation of all shafts. No more than two inches of loose or disturbed material shall be present at the bottom of the shaft just prior to placing concrete.

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The excavated shaft shall be inspected and approved by the Engineer prior to proceeding with construction. The bottom of the excavated shaft shall be sounded with an airlift pipe, a tape with a heavy weight attached to the end of the tape, or other means acceptable to the Engineer to determine that the shaft bottom meets the requirements in the Contract.

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When obstructions are encountered, the Contractor shall notify the Engineer promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and man made objects)

1 encountered during the shaft excavation operation which prevents or
2 hinders the advance of the shaft excavation. When efforts to advance
3 past the obstruction to the design shaft tip elevation result in the rate of
4 advance of the shaft drilling equipment being significantly reduced relative
5 to the rate of advance for the portion of the shaft excavation in the
6 geological unit that contains the obstruction, then the Contractor shall
7 remove, break-up, or push aside, the obstruction under the provisions of
8 Section 8-21.5 as supplemented in these Special Provisions. The method
9 of dealing with such obstructions, and the continuation of excavation shall
10 be as proposed by the Contractor and approved by the Engineer.

11
12 The Contractor shall use slurry, as specified in the **Slurry** subsection of
13 this Special Provision, to maintain a stable excavation during excavation
14 and concrete placement operations once water begins to enter the shaft
15 excavation and remain present.

16 **Slurry**

17 If synthetic slurry is used, either a manufacturer's representative or a
18 Contractor's employee trained in the use of the synthetic slurry, as
19 approved by the Engineer in accordance with the **Submittals** subsection
20 of this Special Provision, shall provide technical assistance for the use of
21 the synthetic slurry, shall be at the site prior to introduction of the synthetic
22 slurry into a drilled hole, and shall remain at the site during the
23 construction and completion of a minimum of one shaft to adjust the slurry
24 mix to the specific site conditions.

25
26
27 If the Contractor uses slurry in shafts installed below groundwater and in
28 caving or sloughing soils, the slurry level in the excavation shall be
29 maintained above the groundwater level the greater of the following
30 dimensions, except as otherwise noted for the special requirements for all
31 stops in shaft excavation operations:

- 32 1. Not less than ten feet,
- 33 2. Dimension as required to provide and maintain a stable hole.

34
35 The Contractor shall provide casing, or other means, as necessary to
36 meet these requirements.

37
38 The slurry level shall be maintained above all unstable zones a sufficient
39 distance to prevent bottom heave, caving or sloughing of those zones.

40
41 Throughout all stops in shaft excavation operations as defined in the **Shaft**
42 **Excavation** subsection of this Special Provision, the Contractor shall
43 monitor and maintain the slurry level in the excavation the greater of the
44 following elevations:

- 45 1. No lower than the water level elevation outside the shaft.
- 46 2. Elevation as required to provide and maintain a stable hole.

1 Synthetic slurry shall be mixed and thoroughly hydrated in slurry tanks,
2 ponds, or storage areas. The Contractor shall draw sample sets from the
3 slurry storage facility and test the samples for the conformance with the
4 appropriate specified material properties before beginning slurry
5 placement in the drilled hole. Synthetic slurry shall conform to the quality
6 control plan included in the shaft installation plan as approved by the
7 Engineer. A sample set shall be composed of samples taken at mid-height
8 and within two feet of the bottom of the storage area.
9

10 The Contractor shall sample and test all slurry in the presence of the
11 Engineer, unless otherwise directed. The date, time, names of the
12 persons sampling and testing the slurry, and the results of the tests shall
13 be recorded. A copy of the recorded slurry test results shall be submitted
14 to the Engineer at the completion of each shaft, and during construction of
15 each shaft when requested by the Engineer.
16

17 Sample sets of all slurry, composed of samples taken at mid-height and
18 within two feet of the bottom of the shaft, shall be taken and tested during
19 drilling as necessary to verify the control of the properties of the slurry. As
20 a minimum, sample sets of all slurry shall be taken and tested at least
21 once every two hours if the slurry is not recirculated in the drilled hole or if
22 the previous sample set did not have consistent specified properties. All
23 slurry shall be recirculated, or agitated with the drilling equipment, when
24 tests show that the sample sets do not have consistent specified
25 properties.
26

27 Sample sets of all slurry, as specified, shall be taken and tested prior to
28 final cleaning of the bottom of the hole and again just prior to placing
29 concrete. Cleaning of the bottom of the hole and placement of the
30 concrete shall not start until tests show that the samples taken at mid-
31 height and within two feet of the bottom of the hole have consistent
32 specified properties.
33

34 The Contractor shall clean, recirculate, de-sand, or replace the slurry to
35 maintain the required slurry properties.
36

37 The Contractor shall demonstrate to the satisfaction of the Engineer that
38 stable conditions are being maintained. If the Engineer determines that
39 stable conditions are not being maintained, the Contractor shall
40 immediately take action to stabilize the shaft. The Contractor shall submit
41 a revised shaft installation narrative which addresses the problem and
42 prevents future instability. The Contractor shall not continue with shaft
43 construction until the damage which has already occurred is repaired in
44 accordance with the specifications, and until receiving the Engineer's
45 approval of the revised shaft installation narrative.
46

47 The Contractor shall dispose of the slurry as specified in the shaft
48 installation plan as approved by the Engineer, and in accordance with the
49 following requirements:
50

- 51 1. Water slurry may be infiltrated to uplands within the confines of
52 the Contracting Agency Right Of Way for the project, provided

1 that the groundline at the disposal site is at least five feet above
2 the current water table, and that disposal operations conform to
3 the temporary erosion and sedimentation control (TESC)
4 requirements established for this project. For the purposes of
5 water slurry disposal, upland is defined as an area that has no
6 chance of discharging directly to waters of the State, including
7 wetlands or conveyances that indirectly lead to wetlands or
8 waters of the State.
9

- 10 2. Synthetic slurries shall be contained and disposed of at a waste
11 water treatment facility or into a sanitary sewer in accordance
12 with the Contractor's permit requirements.
13

14 **Assembly And Placement Of Steel Reinforcing Bars**

15 The steel reinforcing bar cage shall be rigidly braced to retain its
16 configuration during handling and construction. Individual or loose bars
17 will not be permitted. The Contractor shall show bracing and any extra
18 reinforcing steel required for fabrication of the cage in the shop drawings.
19

20 The reinforcement shall be carefully positioned and securely fastened to
21 provide the minimum clearances listed below, and to ensure that no
22 displacement of the steel reinforcing bars occurs during placement of the
23 concrete. The Contractor shall submit details of the proposed reinforcing
24 cage centralizers along with the shop drawings required by item 6 of the
25 shaft installation narrative. The reinforcing steel spacers shall be placed
26 at least at the quarter points around the circumference of the steel
27 reinforcing bar cage, , and located vertically at least at the 1/4 and 3/4
28 points of the shaft length below the shaft cap.
29

30 The Contractor shall place bars as shown in the Plans with minimum
31 concrete cover of three inches for shafts with diameters of three feet or
32 less, and four inches for shafts with diameters greater than three feet.
33

34 **Placing Concrete**

35 Shaft concrete shall be Class 4000P. Concrete placement shall
36 commence immediately after completion of excavation by the Contractor
37 and inspection by the Engineer. Immediately prior to commencing
38 concrete placement, the shaft excavation and the properties of the slurry
39 (if used) shall conform to the excavation and slurry requirements specified
40 elsewhere in this Special Provision. Concrete placement shall continue in
41 one operation to the construction joint at the top of the shaft, as shown in
42 the Plans.
43

44 During concrete placement, the Contractor shall monitor, and minimize,
45 the difference in the level of concrete inside and outside of the steel
46 reinforcing bar cage. The Contractor shall conduct concrete placement
47 operations to maintain the differential concrete head as 1'-0" maximum.
48

49 When placing concrete in the dry, only the top five feet of concrete shall be
50 vibrated. The amount and extent of vibration shall be sufficient to assure
51 concrete flow to the outside of the shaft with full consolidation without
52 causing segregation to occur. Temporary casing shall be removed before

1 vibration. This requirement may be waived if the temporary casing is
2 removed with a vibratory hammer during the concrete placement
3 operation. Vibration of the top five feet of concrete does not affect the
4 maximum slump allowed for the concrete class specified.
5

6 If water is not present, the concrete shall be deposited through the center
7 of the reinforcement cage by a method which prevents segregation of
8 aggregates and splashing of concrete on the reinforcement cage. The
9 concrete shall be placed such that the free-fall is vertical down the center
10 of the shaft without hitting the sides, the steel reinforcing bars, or the steel
11 reinforcing bar cage bracing.
12

13 When placing concrete underwater, including when water in a shaft
14 excavation exceeds three inches in depth with an infiltration rate of 12
15 inches of depth or more in one hour, the Contractor shall place the
16 concrete by pressure feed using a concrete pump with a watertight tube
17 having a minimum diameter of four inches. The discharge end of the tube
18 on the concrete pump shall include a device to seal out water while the
19 tube is first filled with concrete. Concrete placement by gravity feed is not
20 allowed.
21

22 Throughout the underwater concrete placement operation, the discharge
23 end of the tube shall remain submerged in the concrete at least five feet
24 and the tube shall always contain enough concrete to prevent water from
25 entering. The concrete placement shall be continuous until the work is
26 completed, resulting in a seamless, uniform shaft.
27

28 Before placing any fresh concrete against concrete deposited in water or
29 slurry, the Contractor shall remove all scum, laitance, loose gravel and
30 sediment on the upper surface of the concrete deposited in water or slurry
31 and chip off any high spots on the upper surface of the existing concrete
32 that would prevent the steel reinforcing bar cage from being placed in the
33 position required by the Plans.
34

35 The Contractor's construction operation in the vicinity of a drilled shaft
36 excavation with freshly placed concrete and curing concrete shall conform
37 to Section 6-02.3(6)D.
38

39 Except for shafts where the shaft concrete is placed in the dry, the
40 Contractor shall complete a uniform yield form, consistent with the sample
41 form submitted to the Engineer as part of the shaft installation plan, for
42 each shaft and shall submit the completed form to the Engineer within 24
43 hours of completing the concrete placement in the shaft.
44

45 **Casing Removal**

46 As the temporary casing is withdrawn, a minimum five foot head of
47 concrete shall be maintained to balance the foundation material and water
48 pressure at the bottom of the casing. The Contractor shall completely
49 remove all temporary casings.
50

51 **Measurement**

52 Section 8-21.4 is supplemented with the following:

(BSP July 12, 2000)

*** Cantilever Sign Structure No. ____ *** contain(s) the following approximate quantities of material and work:

Cantilever Sign Structure No. 1

Soil Excavation	11.2	C.Y.
St. Reinf. Bar	1,037	LBS
Conc. Class 4000 & 4000P	9.5	C.Y.
Structural Low Alloy Steel	9,565	LBS

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 approved changes will be made in the applicable sign structure lump sum contract price even though the actual quantities required may deviate from those listed.

Payment

Section 8-21.5 is supplemented with the following:

(BSP August 4, 2008)

"Removing Sign Structure Shaft Obstructions", estimated.

Payment for removing obstructions, as defined in Section 8-21.3(9)F as supplemented in these Special Provisions, will be made for the changes in shaft construction methods necessary to remove the obstruction. The Contractor and the Engineer shall evaluate the effort made and reach agreement on the equipment and employees utilized, and the number of hours involved for each. Once these cost items and their duration have been agreed upon, the payment amount will be determined using the rate and markup methods specified in Section 1-09.6. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount for the item "Removing Sign Structure Shaft Obstructions" in the bid proposal to become a part of the total bid by the Contractor.

If the shaft construction equipment is idled as a result of the obstruction removal work and cannot be reasonably reassigned within the project, then standby payment for the idled equipment will be added to the payment calculations. If labor is idled as a result of the obstruction removal work and cannot be reasonably reassigned within the project, then all labor costs resulting from Contractor labor agreements and established Contractor policies will be added to the payment calculations.

The Contractor shall perform the amount of obstruction work estimated by the Contracting Agency within the original time of the contract. The Engineer will consider a time adjustment and additional compensation for costs related to the extended duration of the shaft construction operations, provided:

1. the dollar amount estimated by the Contracting Agency has been exceeded, and

2. the Contractor shows that the obstruction removal work represents a delay to the completion of the project based on the current progress schedule provided in accordance with Section 1-08.3.

PAVEMENT MARKING

Description

Section 8-22.1 is supplemented with the following:

(*****)

Plastic Junction Box Markings are defined as a WHITE marking consisting of two 4 inch by 12 inch strips of plastic pavement marking material placed at the location of a junction box, pull box, or cable vault, one foot outside the pavement edge line. The strips shall be configured so that they overlap, forming an arrowhead with a 90 degree internal angle, pointing at the junction box, pull box, or cable vault.

Construction Requirements

Removal of Pavement Markings

Section 8-22.3(6) is supplemented with the following:

(*****)

Use of a grinder to remove painted markings shall not be allowed. For removing of plastic markings, grinding will be allowed down to the pavement surface then water blasting or shot blasting shall be required to remove the remainder of the marking.

Measurement

Section 8-22.4 is supplemented with the following:

(*****)

Plastic Junction Box Markings will be measured per each.

Payment

Section 8-22.5 is supplemented with the following:

(*****)

"Plastic Junction Box Marking", per each.

TEMPORARY PAVEMENT MARKINGS

Description

The second paragraph of Section 8-23.1 is deleted in its entirety.

Section 8-23.1 is supplemented with the following:

(*****)

Temporary pavement markings shall be installed in accordance with Section 8-22 of the Standard Specifications and Standard Plan M-20.10-01.

Temporary lane lines on Interstate 5 shall have temporary raised pavement markers (Type 2W) placed 6 inches after each 10 foot line.

1 Paint shall be used for temporary pavement markings on all planed surfaces opened to
2 traffic.
3

4 **Measurement**

5 The first paragraph of section 8-23.4 is supplemented with the following:
6

7 (*****)

8 "Temporary Painted Traffic Arrow" will be measured per each arrow installed. Type 1
9 through Type 6 traffic arrows will be measured as 1 unit each, regardless of the number
10 of arrow heads.
11

12 **Payment**

13 The first paragraph of section 8-23.5 is supplemented with the following:
14

15 (*****)

16 "Temporary Painted Traffic Arrow" per each.
17

18 The second paragraph is supplemented with the following:
19

20 (*****)

21 The unit contract price per each for "Temporary Painted Traffic Arrow" shall be full pay
22 for placing, maintaining and removing each arrow.
23

24 **DIVISION 9** 25 **MATERIALS** 26

27 **REINFORCING STEEL** 28

29 **Deformed Steel Bars**

30 Section 9-07.2 is supplemented with the following:
31

32 (*****)

33 Headed steel reinforcing bars shall conform to ASTM A 970 Class HA.
34

35 **AGGREGATES** 36

37 **Aggregates for Hot Mix Asphalt** 38

39 (*****)

40 **HMA Test Requirements**

41 Section 9-03.8(2) is supplemented with the following:
42

43 **ESAL's**

44 The number of ESAL's for the design and acceptance of the HMA on I-5 shall be 45
45 million.
46

47 The number of ESAL's for the design and acceptance of the HMA on all other
48 roadways shall be 12.3 million
49

50 **STRUCTURAL STEEL AND RELATED MATERIALS** 51

Roadside Sign Structures

Section 9-06.16 is supplemented with the following:

(August 2, 2004)

Perforated Steel Square Sign Post System

Where noted in the Plans, steel sign post systems shall be square, pre-punched galvanized steel tubing, that are NCHRP 350 Test Level 3 Certified and FHWA approved.

The steel sign post system shall include all anchor sleeves, and other hardware required for a complete sign installation.

System Acceptance

Systems listed in the current QPL will be accepted per the QPL approval code. Systems not listed in the QPL will be accepted based on a Supplier's Certificate of Compliance. The Supplier's Certificate of Compliance will be a contract specific letter from the supplier stating the system is NCHRP 350 Test Level 3 compliant. A Certificate of Material Origin (WSDOT Form 350-109) will be required for contracts containing the "Foreign Made Materials" clause and will include a dollar value for any foreign steel used in the system being supplied.

EROSION CONTROL AND ROADSIDE PLANTING

Soil

Topsoil Type A

Section 9-14.1(1) is supplemented with the following:

(***)**

Topsoil type A shall consist of a uniform blend composed by volume of 40% Topsoil Type C, 30% aggregate, and 30% fine compost. One hundred percent of this mixture shall pass through a 1 inch sieve.

Aggregate

Aggregate shall meet the material requirements for Backfill for Sand Drain, Section 9-03.13.

Mixing Requirements

The Contractor shall submit in writing, for the Engineer's approval, the proposed mixing method. No mixing shall take place without written approval from the Engineer.

Approval and Acceptance

The Contractor shall submit for approval a preliminary sample of the Topsoil Type A, a minimum of 30 working days prior to beginning placement. Placement shall not begin until approval has been received in writing.

Quality

Section 9-14.6(2) is supplemented with the following:

(*****)

All seeds and plants must have a genetic provenance from Washington State, west of the Cascade Mountains, below 1000 feet in elevation. The propagating nursery shall certify in writing that all seeds and plants grown from seeds or cuttings are collected in this geographic area. A copy of this certification shall be submitted to the Engineer for verification at least one month before seeding or planting may occur.

SIGNING MATERIALS AND FABRICATION

April 7, 2008

Sign Support Structures

Section 9-28.14 is supplemented with the following:

Manufacturers for Steel Sign Supports

The Standard Plans lists several steel sign support types. These supports are patented devices and many are sole-source. All of the sign support types listed below are acceptable when shown in the plans.

<u>Steel Sign Support Type</u>	<u>Manufacturer</u>
Type TP-A & TP-B	Transpo Industries, Inc.
Type PL, PL-T & PL-U	Northwest Pipe Co.
Type AS	Transpo Industries, Inc.
Type AP	Transpo Industries, Inc.
Type ST 1, ST 2, ST 3, & ST 4	Ultimate Highway Products, Allied Tube & Conduit, Inc., Northwest Pipe, Inc.
Type SB-1, SB-2, & SB-3	Ultimate Highway Products, Xcessories Squared Development and Manufacturing Incorporated,, Northwest Pipe, Inc.

Sign Support Structures

Steel Structures and Posts

Section 9-28.14(2) is supplemented with the following:

(*****)

Zinc plated nuts, bolts, and washers may be used for the installation of perforated square steel posts and slip bases as found in Standard Plans G-24.40 and G-24.50.

Zinc plate flanged shoulder bolts (part number G8FSB38-35-Z or 35120) shall be used in lieu of corner bolts for the connection of the SB-1 and SB-3 perforated square steel posts as found in Standard Plan G-24.40.

ILLUMINATION, SIGNALS, ELECTRICAL

Section 9-29 is supplemented with the following:

1 **(*****)**

2 **Intelligent Transportation System (ITS)**

3 Section 9-29 is supplemented to include ITS equipment as identified in the Plans and
4 these Special Provisions.

5 **(*****)**

6 **Type 334 Cabinet**

7 Each traffic data station controller cabinet furnished shall meet the requirements for
8 Model 334 Cabinets specified in Chapter 12 of the Type 170E Traffic Signal Control
9 Hardware Specification, FHWA IP-78-16.

10 **(*****)**

11 **Type 334 Dual CCTV/Data Station Cabinet (Pad Mount)**

12 The camera / data station control cabinet shall contain the equipment shown in the
13 Plans. The cabinet shall have the same external physical dimensions and appearance
14 of Model 334D cabinets and shall conform to the following:

- 15 1. The cabinet shall be fabricated of 0.125 inch sheet aluminum, 5052 alloy, with
16 mill finish, in accordance with Section 9-29.13(7)D, Item number 1. Painted or
17 anodized aluminum is not allowed.
- 18 2. Cabinet doors shall have a three-point latch and two-position stop assembly
19 with spring loaded construction core lock capable of accepting a Best Lock
20 Company 6-pin CX series core. The Contractor shall supply red or blue
21 construction cores. Upon contract completion, the Contractor shall deliver two
22 master keys to the Engineer.
- 23 3. The cabinet shall be equipped with an electric strip heater with a rating of 100
24 watts and 120 VAC and a ventilation fan meeting the requirements specified in
25 Chapter 12 of FHWA IP-78-16. The strip heater shall not be mounted directly
26 under the equipment and shall be shielded in a manner that prevents damage
27 to nearby electrical cables.
- 28 The fan and strip heater shall be controlled by a high-low adjustable
29 thermostat that can be set to ensure the cabinet interior temperature remains
30 between 60°F and 125°F. The heater strip shall be shielded.
- 31 4. Four shatterproof fluorescent interior cabinet lights with self-starting ballast
32 shall be furnished. Door switches shall automatically turn on the two lights on
33 the same side of the cabinet as the door.
- 34 5. The cabinet shall be equipped with a power distribution panel mounted on a
35 standard EIA 19 inches rack utilizing no more than five rack mounting spaces
36 (8.66 inches). The following devices shall be provided with the power
37 distribution panel:

- 38 a. Duplex 120 VAC power receptacle.
39 b. Main circuit breaker, 120 VAC, 50 amp.
40 c. Four load circuit breakers, 120 VAC, 1-30 amp, 1-20 amp, 2- 15 amp.
41 d. Neutral bus.
42 e. Ground bus.
43 f. Surge suppresser and filter unit, 120 VAC, 50 amp.

Power distribution panel components shall be mounted in or on the panel such that they are readily accessible, provide dead front safety, and all hazardous voltage points are covered to prevent inadvertent contact.

6. Two controller unit shelves, which attach to the front rails of the EIA rack, shall be provided in lieu of the two controller unit support angles. The shelves and mounting brackets shall be 12 inches deep and fabricated from aluminum. The shelves shall be installed such that they do not interfere with access to any terminal block. The shelves shall contain roll-out flip-top drawers for storage of wiring diagrams and manuals.
7. The Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet model D7430 WDM and Indigo Vision encoder VP800 for camera communications.
8. The Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet model D9130 WDM for Data Station communications.
9. The Contractor shall install a rack - mounted fiber optic patch panel in the control cabinet as specified in the Plans. The Contractor shall use an ST/UPC patch cord from the patch panel to the GE/IFS transceiver. Fiber optic cables entering into control cabinets shall have fusion spliced pigtails terminating in the interconnection sleeves.

(*****)

Type 334 Data Station / Ramp Meter Cabinet (Pad Mount)

The Data Station and Ramp Meter control cabinet shall contain the equipment shown in the Plans. The cabinet shall have the same external physical dimensions and appearance of Model 334 cabinets and shall conform to the following:

1. The cabinet shall be fabricated of 0.125 inch sheet aluminum, 5052 alloy, with mill finish, in accordance with Section 9-29.13(7)D, Item number 1. Painted or anodized aluminum is not allowed.
2. Cabinet doors shall have a three-point latch and two-position stop assembly with spring loaded construction core lock capable of accepting a Best Lock Company 6-pin CX series core. The Contractor shall supply red or blue construction cores. Upon contract completion, the Contractor shall deliver two master keys to the Engineer.
3. The cabinet shall be equipped with an electric strip heater with a rating of 100 watts and 120 VAC and a ventilation fan meeting the requirements specified in Chapter 12 of FHWA IP-78-16. The strip heater shall not be mounted directly under the equipment and shall be shielded in a manner that prevents damage to nearby electrical cables.

The fan and strip heater shall be controlled by a high-low adjustable thermostat that can be set to ensure the cabinet interior temperature remains between 60°F and 125°F. The heater strip shall be shielded.

4. Two shatterproof fluorescent interior cabinet lights with self-starting ballast shall be furnished, one fixture mounted on the rear rack near the top and the second mounted at the top of the front rack. Door switches shall automatically turn on both lights when either door is opened.
5. The cabinet shall be equipped with a power distribution panel mounted on a standard EIA 19 inches rack utilizing no more than five rack mounting spaces (8.66 inches). The following devices shall be provided with the power distribution panel:
 - a. Duplex 120 VAC power receptacle.
 - b. Main circuit breaker, 120 VAC, 50 amp.
 - c. Four load circuit breakers, 120 VAC, 1-30 amp, 1-20 amp, 2-15 amp
 - d. Neutral bus.
 - e. Ground bus.
 - f. Surge suppresser and filter unit, 120 VAC, 50 amp.

Power distribution panel components shall be mounted in or on the panel such that they are readily accessible, provide dead front safety, and all hazardous voltage points are covered to prevent inadvertent contact.

6. Two controller unit shelves, which attach to the front rails of the EIA rack, shall be provided in lieu of the two controller unit support angles. The shelves and mounting brackets shall be 12 inches deep and fabricated from aluminum. The shelves shall be installed such that they do not interfere with access to any terminal block. The shelves shall contain roll-out flip-top drawers for storage of wiring diagrams and manuals.
7. The Contractor shall install GE/IFS Fiber Optics transceiver in the control cabinet. Model D9130 WDM for Ramp Meter and Data Station.
8. The Contractor shall install a rack - mounted fiber optic patch panel in the control cabinet as specified in the Plans. The Contractor shall use an ST/UPC patch cord from the patch panel to the GE/IFS transceiver. Fiber optic cables entering into control cabinets shall have fusion spliced pigtailed terminating in the interconnection sleeves.

(*****)

Variable Message Sign System

The Variable Message Sign System includes the following components:

VMS Sign Display

The variable message signs provided shall be IMAGO Front Access 110x28 Pixel Matrix, AF0-2S1A8-2204V (15 degree horizontal X 15 degree vertical viewing angle). The VMS shall have 3 lines of text, 18 characters long, and 18 inch character heights and shall meet the standard and guidance requirements of the 2009 MUTCD (Manual on Uniform Traffic Control Devices) Section 2L.04 Design Characteristics of Changeable Message Signs.

VMS Sign Beacons

Three flashing beacons shall be installed on top of the sign housing in a manner that does not penetrate the shell of the cabinet. The beacons shall be 12 inch,

1 yellow, LED type, and shall meet the requirements of Sections 9-29.21 and 9-
2 29.16(2)A of the Standard Specifications. Beacon housings shall be aluminum,
3 meet the requirements of Section 9-29.16(2)B of the Standard Specifications, and
4 have Cadet style visors.

5
6 Controllers for the flashing beacons shall meet the requirements of Section 9-29.15
7 of the Standard Specifications, and the enclosure shall be aluminum. The beacons
8 shall be connected such that the center beacon flashes alternately to the two
9 outside beacons. The sign controller shall operate the beacons as commanded by
10 the NTCIP communications protocol.

11 12 **VMS Sign Mounting Hardware**

13 The sign housing shall be provided with all necessary hardware including sign
14 mounting beams, vertical and horizontal brackets, and all related hardware to install
15 the VMS. The VMS vendor shall supply the Contractor with shop drawings for the
16 sign mount. VMS mounting hardware shop drawings, and supporting design
17 calculations, shall be prepared in accordance with the AASHTO Standard
18 Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic
19 Signals, dated 2009, and current interims, using a 90 mph wind velocity, and shall
20 be submitted to the Engineer for approval in accordance with Section 6-01.9.

21 22 **VMS SIGN CONTROLLER**

23 Each VMS shall include an associated sign controller, which shall be installed in the
24 field cabinet. The sign controller hardware and software shall support all VMS
25 communication, control, and diagnostic features as listed herein.

26 27 **Memory**

28 Sign controllers shall have both permanent and semi-permanent memory.
29 Permanent memory shall be EE-PROM integrated circuits and shall contain
30 the executable sign controller software. Semi-permanent memory shall be
31 RAM integrated circuits with a battery backup that retains the data in memory
32 for a minimum of one year following a power failure. Semi-permanent memory
33 shall contain the library of messages, the message display schedule and
34 programmable operating parameters. Each message shall have the capability
35 to be defined and stored as a three-page message.

36 37 **Power Interruptions**

38 Contents of the sign controller's memory shall be preserved by battery backup
39 during AC power interruptions and the controller shall automatically resume
40 operation once AC power is restored. Upon recovering from a power
41 interruption, the sign controller shall display the message identified by the
42 Power Recovery Message parameter. The sign controller shall report to the
43 central computer that it has recovered from a power interruption.

44 45 **Sign Controller Software**

46 The sign controller shall cause the desired message to be displayed on the
47 VMS. The sign shall display alphanumeric character fonts. The sign controller
48 shall provide a default value for each NTCIP object supported.
49

Message Selection

The central computer or laptop computer shall cause the sign controller to implement a message selected from those stored in controller memory, or a new message entered via the communication port.

The sign controller shall incorporate cyclic redundancy checks (CRC) checks to verify MULTI strings. The sign shall not display a message unless the MessageActivationCode CRC matches the MessageCRC.

A message shall remain displayed on the sign until either a command to change the current message or a command to blank the display is received. A command to display a message shall not succeed if the activation priority is less than the run time priority of the message currently displayed.

Data Transmission Requirements

Each sign controller shall contain two communication ports. Each communication port shall be labeled ("Local" or "Central") and shall be set to 9600 baud at the factory. Each port shall operate independently at baud rates of 1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600, & 115200 bits per second. The user shall select the baud rate for each port via a DIP switch and through the control software per the Control Software requirements.

Communication

The sign controller hardware and software shall communicate with the central computer in a polled multi-drop operation. In the polled multi-drop operation, several sign controllers shall share the same communication channel, with each controller assigned a unique ID number. Controller ID numbers shall conform to the NTCIP requirements for address numbers. A sign controller shall only reply to messages labeled with its ID. In polled multi-drop mode, sign controllers never initiate communication, but merely transmit their responses to messages from the central computer.

A laptop computer connected to the sign controller's local communication ports in either the VMS Sign and Ground-Mounted Field Control Cabinet shall have the same control and diagnostic capabilities as the central computer. One Serial and one Ethernet Communication port, meeting the requirements as specified below, shall be installed inside the VMS sign and Ground-Mounted Field Control Cabinet for laptop access.

All remote communication ports shall be NTCIP-compatible as defined in the "NTCIP Requirements" section of these specifications.

All data transmission baud rates shall be selectable by dip switches or through the local and central control software.

Communication Modes

The VMS sign controller shall be able to receive instructions from and provide information to a computer containing VMS control software using the following communication modes:

Remotely via direct or dial-up communications with a remotely located computer. The system communications backbone, as well as all field

1 modems or signal converters, shall provide the VMS sign controller with
2 an RS232 signal.

3
4 Locally via direct connection with a laptop computer that is connected
5 directly to the sign controller using an RS232 null-modem or Ethernet
6 connection.

7
8 Locally via direct connection with a laptop computer that is connected
9 directly to the Ground-Mounted Field Controller Cabinet using an RS232
10 null-modem or Ethernet connection.

11 12 **Serial Communication Ports**

13 The VMS sign controller shall contain a minimum of three (3) NTCIP-
14 compatible RS232 communication ports. These ports shall support multiple
15 communication interfaces, including, but not limited to, direct null-modem (for
16 local laptop control), dial-up and leased-line modems, radio systems, cellular
17 modems, and fiber optic modems. The RS232 ports shall all have standard
18 DB9M connectors.

19
20 The baud rate, connection type, and NTCIP communication protocol shall be
21 configurable. Each port must support all typical serial baud rates ranging from
22 1200 to 115,200 baud. All three ports shall be capable of supporting either of
23 the following sub network profiles: NTCIP 2101 (PMPP) or NTCIP 2103 (PPP).
24 They shall also be capable of supporting either NTCIP 2201 (Null) or NTCIP
25 2202 (Internet) transport profiles. Only one each of the transport and sub
26 network profiles shall be active at any time on each port.

27 28 **Ethernet Port**

29 The VMS sign controller shall contain a minimum of one (1) 10/100Base-T
30 Ethernet communication port. This port shall be available for optional use for
31 communicating from the central control system to the VMS sign controller
32 when an Ethernet network is available. The Ethernet port shall have a standard
33 RJ45 connector.

34
35 Communications on the Ethernet port shall be NTCIP-compatible using the
36 NTCIP 2202 Internet transport profile and the NTCIP 2104 Ethernet sub
37 network profile. This shall permit the controller to be operated on any typical
38 Ethernet network using the TCP/IP and UDP/IP protocols.

39 40 **Dial-Up Modem Communication Port**

41 The VMS sign controller shall include one (1) built-in Hayes-compatible dial-up
42 modem. The modem port shall have a standard RJ11 connector.

43
44 This modem shall be configured to support either the NTCIP 2101 (PMPP) or
45 the NTCIP 2103 (PPP) sub network profile. At least one of the following
46 transport profiles shall also be available for configuration: NTCIP 2201 (Null) or
47 NTCIP 2202 (Internet). Only one each of the transport and sub network profiles
48 shall be active at any time on the port.

49
50 The modem shall be configurable to support both incoming and outgoing calls
51 as supported by NTCIP. The modem shall support a minimum communication
52 speed range from 1200 baud to 28800 baud. The modem shall support the

1 following protocols at a minimum: Hayes-compatible "AT" command set,
2 MNP5, MNP10, and V.42bis.

3 4 **Controller Addressing**

5 The VMS sign controller shall use whatever addressing scheme is appropriate
6 for the NTCIP network types used for communications. The controller
7 addressing shall be configurable through the front panel user interface.

8
9 NTCIP 2101 (PMPP) networks shall be configured with an address in the
10 range 1 to 255 with a default address of 1. NTCIP 2104 (Ethernet) networks
11 shall use a static IP address. Both the IP address and subnet shall be
12 configurable. NTCIP 2103 (PPP) networks shall not require network
13 addressing.

14 15 **NTCIP Requirements**

16 The sign controller software shall comply with the National Transportation
17 Communications for ITS Protocol (NTCIP) documents and all related errata
18 sheets published before July 1, 1999 and as referenced herein.

19
20 The sign controller software shall support the following standards:

- 21
22 1. NTCIP 1101, Simple Transportation Management Framework
23 (STMF), Conformance Level 1 (Simple Network Management
24 Protocol (SNMP))
- 25
26 2. NTCIP 2001, Class B Profile. All serial ports on the device shall
27 support communications according to these standards.
- 28
29 3. NTCIP 2101, SP-PMPP/RS232 Point-to-Multi-Point Protocol (PMPP)
30
31 NTCIP 2102 – SP – PMPP/ FSK
32
33 NTCIP 2103 – SP – PPP/ RS 232
34
35 NTCIP 2104 – SP – Ethernet
36
37 NTCIP 2201, NTCIP TP-Null Transport Profile Null (TP-NULL)
38
39 NTCIP 2202 – Internet (TCP/IP and UDP/IP)

40
41 The sign controller software shall implement all mandatory objects of all
42 mandatory conformance groups as defined in NTCIP 1201, Global Object
43 Definitions, and NTCIP 1203, Object Definitions for Dynamic Message Signs.
44 Software shall implement the following conformance groups:

45 46 **NTCIP 1203, Object Definitions for DMS**

- 47
48 1. VMS Sign Configuration
- 49 2. MULTI Configuration
- 50 3. Default Message Control
- 51 4. Pixel Service Control
- 52 5. MULTI Error Control

6. Sign Status
7. Status Error
8. Pixel Error Status
9. Lamp Error Status
10. Fan Error Status
11. Power Status
12. Temperature Status

NTCIP 1203, Object Definitions for DMS

1. dmsMessageBeacon
2. dmsMessagePixelService
3. dmsCommunicationsLossMessage
4. dmsPowerLossMessage
5. dmsTimeCommLoss
6. dmsMultiOtherErrorDescription
7. dmsStatDoorOpen
8. fanFailures
9. fanTestActivation
10. lineVolts
11. tempMaxSignHousing

Objects required by these specifications shall support all values within its standardized range. The standardized range is defined by a size, range, or enumerated listing indicated in the object's SYNTAX field and/or through descriptive text in the object's description field. The following list indicates the modified object requirements for these objects.

Object Name	Object ID	Minimum Requirements
Number of Fonts	numFonts	9
Maximum Characters per Font	maxFontCharacters	255
Default Background Color	defaultBackgroundColor	0
Default Foreground Color	defaultForegroundColor	9
Default Justification Line	defaultJustificationLine	2, 3, and 4
Default Justification Page	defaultJustificationPage	2, 3, and 4
Number of Permanent Msgs.	DmsNumPermanentMsg.	2
Maximum No. Changeable Msg.	DmsMaxChangeableMsg.	8
Maximum Number Volatile Msg. *	dmsMaxVolatileMsg.	8
Control Mode	dmsControlMode	2, 4, and 5

* Changeable messages in excess of the minimum requirement are considered to meet the specification for an equivalent number of Volatile messages.

The first permanent message shall be used to blank the sign display. The second permanent message shall be the diagnostic message.

Sign controller software shall implement the following tags (opening and closing where defined) of the Mark-Up Language for Transportation Information (MULTI) as defined in NTCIP 1203:

1. Flash
2. Font
3. Justification Line
4. Justification Page
5. Moving Text
6. New Line
7. New Page
8. Page Time

Documentation

Software shall be supplied with all documentation on a CD-ROM Disk(s). ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation 1 (ASN.1) format shall be provided on CD-ROM:

1. The official MIB Module referenced by the device functionality.
2. A manufacturer-specific version of the official MIB Module with the non-standardized range indicated in the SYNTAX field. The filename shall match the official MIB Module, with the extension "spc".
3. A MIB Module of all manufacturer-specific objects supported by the device with accurate and meaningful DESCRIPTION fields and the supported ranges indicated in the SYNTAX field.

Control Software

This work shall consist of furnishing Variable Message Sign (VMS) control software. The control software shall be a 32-bit application, designed to operate on Microsoft® Windows NT™, 98™, 2000™, VISTA and XP™ operating systems. The control software shall provide for command and control of the following functions:

VMS Control

Software shall retrieve, display, update and download/upload the following functional parameters to the local sign controller in response to user-initiated instructions. The sign controller shall not perform pixel service tests when VMS are displaying messages. Software shall perform the following operations in conjunction with its monitoring and logging functions:

- Display a message
- Blank the current message
- Change message priority
- Pixel service, lamp and fan tests
- Set time and date in the sign controller
- Retrieve sign controller ID, type, and manufacturer

Communications

Communications between the control software and sign controller shall be NTCIP compliant as specified in the Sign Controller Software section.

1
2 The control software shall verify all communications for errors. If a
3 response from a sign controller contains a communication error, or if there
4 is no response, the Control Software shall re-establish communications.
5

6 **Data Collection**

7 The control software shall retrieve errors detected, message number
8 currently being displayed, and current message priority. Using different
9 commands, the software shall retrieve message MULTI strings, a map of
10 defective pixels, the time and date, the event schedule, configuration
11 parameters, and information related to failed power supplies and
12 ventilation fans.
13

14 **Message Library**

15 The control software shall store messages and transfer messages to a
16 sign for storage and/or display. When a user desires to send a message
17 to a sign, the control software shall offer as choices only those messages
18 compatible with the sign in question. The control software shall allow
19 message names of up to 25 characters in length. If the selected name
20 already exists, the software shall notify the user and give the option of
21 replacing the existing message or selecting another name.
22

23 The control software shall display all character fonts supported by the
24 Variable Message Sign System. Messages shall be displayed on the
25 computer monitor in exactly the same format (font, text centering and
26 justification) as on the Variable Message Sign.
27

28 **Software Duplication Rights**

29 The Purchaser shall have the right to duplicate the Variable Message Sign
30 Control Software as needed for use in controlling signs under its
31 jurisdiction.
32

33 **Documentation**

34 The Contractor shall furnish five (5) copies of the Control Software user
35 manuals to the Purchaser. In addition, three (3) sets of the software,
36 installation program, instructions and user manual shall be furnished on
37 CD ROM to the Purchaser.
38

39 **VMS Ground-Mounted VMS Field Cabinet**

40 The cabinet shall have the same external dimensions and appearance of Model
41 334 cabinets as specified in Chapter 12 of FHWA IP-78-16. The cabinet shall
42 contain the main power feed from the 120/240v transformer.
43

- 44 1. Cabinets shall be fabricated of 0.125 inches sheet aluminum, 5052 alloy,
45 with mill finish, in accordance with Section 9-29.13(7)D, Item number 1, of
46 the Standard Specifications. Painted or anodized aluminum is not allowed.
47
- 48 2. Cabinet doors shall have a three-point latch and two-position stop
49 assembly with spring-loaded construction core lock capable of accepting a
50 Best Lock Company 6-pin CX series core. The Contractor shall supply
51 green construction cores with two master keys and one core removal key
52 per lock. The Contractor shall deliver the keys to the Purchaser.

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3. The cabinet shall be equipped with an electric strip heater and a ventilation fan. The strip heater shall be rated at 100 watts and 120 VAC and be shielded in a manner that prevents damage to nearby electrical cables. The ventilation fan shall be mounted in the top of the cabinet, be equipped with a screened guard, and exhaust at least 10 CFM.
4. The fan and strip heater shall be controlled by a high-low adjustable thermostat, which can be set to ensure the cabinet interior temperature remains between 60°F and 120°F.
5. Two shatterproof fluorescent interior cabinet lights with self-starting ballast shall be furnished, one fixture mounted on the rear rack near the top and the second mounted at the top of the front rack. Door switches shall automatically turn on both lights when either door is opened.
6. The cabinet shall be provided with two 15 amp, 120 VAC duplex receptacles. One of the receptacles is for a laptop and/or tools and shall be GFCI-protected. The second receptacle is for communications equipment and shall not be GFCI-protected.
7. The cabinet shall be provided with three (3) circuit breakers. One circuit breaker shall be rated at least 20 amps and shall operate the heater, ventilation fan, receptacles, and lamps. The second circuit breaker shall be two-pole and control the power to the VMS defog/defrost heater elements. The third circuit breaker shall operate all other sign equipment. The second and third circuit breakers shall be rated in accordance with the NEC. Separate terminal strips shall be provided for each circuit breaker and an unfused terminal for the neutral side of the power supply line.
8. The cabinet shall contain one VMS sign controller as specified under VMS Sign Controller. The cabinet shall be provided with two serial communication ports and two Ethernet ports.
9. One serial communication port shall be used to connect a laptop to the controller. The serial interface shall be wired as a 9-pin, EIA-232 DCE port. The port shall connect to a laptop computer using a null-modem (flipped) 9-pin cable. Two serial cables shall be supplied for each VMS.

The second serial communication port is for remote control of the sign from the central computer. The interface shall be wired as a 9-pin, EIA-232 DCE port. This port connects to a VMS Communication Interface Modem. A cable shall be supplied to connect the VMS communication port to the modem port (the modem port may be a non-standard pin-out and require a custom-made cable).

A reset button shall be provided in the cabinet that, when pressed, resets the VMS controller and all other VMS electronics.

One Ethernet communication port shall be used to connect a laptop to the controller. Two Ethernet cables shall be supplied in the Ground-Mounted

1 Field Control Cabinet for each VMS. See the Communication,
2 Communication Modes and Ethernet Port Sections of the specification
3 requirements for additional requirements.
4

5 The Second Ethernet communication port is for remote control of the sign
6 from the central computer. An Ethernet cable shall be supplied to connect
7 the VMS communication port to the Ethernet switch. See the
8 Communication, Communication Modes and Ethernet Port Sections of the
9 specification requirements for additional requirements.
10

11 10. A pullout, flip top drawer/shelf shall be provided in the cabinet to facilitate
12 a laptop during local testing and control of the VMS and for storage of
13 documentation.
14

15 11. Noise and voltage spike protection shall be provided in the cabinet as
16 stated in the Transient Current Protection section of this specification.
17

18 12. The conductor within the cabinet and the sign shall meet the requirements
19 of Section 9-29.24 the Standard Specifications. The conductors for
20 communication shall be a minimum number of 22 AWG.
21

22 **Other Documentation**

23 The Contractor shall attach a waterproof laminated set of wiring diagrams to
24 the inside of each Variable Message Sign control equipment cabinet. Drawings
25 shall be attached to the door with stainless steel fasteners. In addition, the
26 Contractor shall also provide an electronic copy of the wiring diagrams in either
27 dwg, dgn or in acceptable format to the Purchaser. The electronic version of
28 the wiring diagrams shall be furnished on rewritable CD-ROM.
29

30 **VMS Control System**

31 The VMS control system shall include all wiring, and all hardware associated with
32 providing power and communication between the local control cabinet and the sign.
33 It shall also include writing, providing, and installing all software and any needed
34 hardware to ensure the VMS is fully compatible with and completely capable of
35 being operated by the current version of the Ordering Agencies existing central
36 control software system including but not limited to Daktronics Vanguard; WSDOT
37 NG Central Freeway Management Software (WSDOT Contracting Agency);
38 Siemens TACTICS Central and i2TMS; Mercure; and TransPort ATMS while
39 requiring no additional software or software modifications to be installed in the
40 Purchaser's system. The Contractor shall install and setup the Variable Message
41 Signs Central Software on each desktop and laptop computer provided by the
42 Purchaser, in order to provide fully functional Variable Message Signs systems.
43 Three (3) copies of the Central Software operating manuals go to the Purchaser. In
44 addition, Three (3) sets of the software and its installation program and instructions
45 shall be furnished on CD ROM to the Purchaser.
46

47 **CIRCUIT BOARDS**

48 The manufacturer's submittal shall include a schematic diagram for each type
49 of circuit board used in the sign display and control system. Each circuit board
50 used in the VMS display and control system shall conform to the following:
51

1. The printed circuit board through-hole for each LED cathode lead shall be connected to a large copper trace pad having a minimum surface area of 0.04 square inch. The trace pads shall dissipate heat from the LEDs and shall be present on both the front and rear sides of the LED pixel board.
2. All exposed metal (except connectors) shall be protected from water and humidity exposure by a thorough application of acrylic conformal coating. Bench level repairs to individual devices, including discrete LED replacement and conformal coating repairs, shall be possible.
3. Printed circuit laminate shall be FR-4 fiberglass, having a minimum thickness of 1/16 inch. The circuit board traces shall be copper. Through- holes shall also be plated with copper.
4. All cables attaching to circuit boards shall be held in place by locking latch connectors that firmly hold the cables in place.

DISPLAY LEDs

LEDs used in the VMS display shall be from one LED manufacturer and of one part number. LEDs shall conform to the following minimum requirements:

1. LEDs shall be un-tinted, non-diffused, high-output, solid state lamps utilizing Indium Gallium Aluminum Phosphide (InGaAlP) technology.
2. The discrete LEDs size shall be T 1-3/4. LED package style shall be the through-hole flush-mount type, and all LEDs shall be soldered with the base of their lens mounted within 0.010 inches of the printed circuit board.
3. LEDs shall emit amber light, having a peak wavelength of 590 ± 5 nanometers. The half-life rating shall be 100,000 hours. Rated brightness per LED shall be a minimum of three (3) candelas.
4. LEDs shall be pre-sorted by the LED manufacturer for luminous intensity and color. LEDs used shall be obtained from a one-bin luminous intensity sort. A bin is defined such that when all LEDs from a given bin are driven with an identical forward current, the dimmest LED shall emit no less than half the luminous intensity of the brightest LED in the bin.
5. Operating temperature range shall be -22 to +185° F, and storage temperature range shall be -40 to +248° F.
6. Minimum half-power viewing angle shall be 15°. Half-power viewing angle is defined such that, at a given distance from the LED, luminous intensity measured at any point at an angle of 7.5° from the LEDs center axis shall be no less than half the luminous intensity measured directly on the LEDs center axis.
Note: Use a half-power view angle of 30° with a luminous intensity measured at any angle 15° from the LEDs center axis for Sign Item 5

7. The discrete LED manufacturer's data sheet showing compliance with this specification shall be provided with the VMS manufacturer's submittal.

LED MODULES

The VMS shall be constructed with multiple display circuit boards, each of which contains no less than five (5), but no more than forty-five (45) pixels. Each pixel, which is defined as the smallest programmable portion of a display matrix, shall consist of a cluster of closely spaced discrete LEDs (strings of LEDs) and shall conform to the following requirements:

1. The distance from the center of one pixel to the center of all adjacent pixels, both horizontally and vertically, shall be 66.0 millimeters.
2. Each LED string shall be in series with its own current limiting resistor. Current limiting resistors shall be rated to limit LED string forward current to 30 milliamperes whenever a forward voltage is applied.
3. Each pixel shall contain a minimum two (2) string of LEDs. Each LED string shall contain a minimum five (5) LEDs.
4. The failure of an LED string shall not cause a change in the forward current of any other LED string, nor shall it cause the failure of any other LED string. Similarly, the failure of any LED pixel shall not cause the failure of any other pixel in the VMS.
5. Each LED pixel shall emit a minimum luminous intensity of 40 candelas when driven with a forward current of 20 milliamperes DC per LED string. An independent laboratory that utilizes equipment and procedures traceable to N.I.S.T. standards shall certify LED pixel intensity. The independent laboratory's certification report shall be provided with the VMS manufacturer's submittal. This report shall contain the laboratory name, address, and contact information. The report shall also contain a description of the test procedure and test equipment used, test personnel name(s), pixel intensity test results, date(s) the VMS manufacturer's LED pixel samples were tested, and the VMS manufacturer's name.
6. Discrete LEDs shall be mounted perpendicular to their PC boards. Any variations in discrete LED color and intensity shall be thoroughly dispersed throughout the entire display, thereby creating a uniform visual appearance of both color and intensity.
7. The sign controller shall be able to measure the forward current of each LED pixel and determine if the pixel is operating normally. This information shall be stored in a read-only NTCIP object.

LED OUTPUT CONTROL

The LEDs shall be driven using Pulse Width Modulation (PWM) of a nominal 30 milliampere forward current, where pulse width is used to achieve the programmed LED intensity level for a given ambient lighting condition.

The current pulse shall be modulated from a 10-millisecond period, and pulse amplitude shall not be allowed to exceed 30 milliamperes per LED string. An illustration of the PWM drive current waveforms, which are used to achieve minimum and maximum LED intensity, shall also be provided with the VMS manufacturer's submittal.

LED INTENSITY CONTROL SYSTEM

The VMS shall be equipped with an LED intensity control system. The control shall support both manual and automatic control. LED intensity control shall consist of three (3) photo-sensors and associated circuitry. VMS controller analysis of these ambient light measurements shall automatically determine which of sixteen pre programmed LED intensity levels will provide the best VMS legibility for the given ambient light condition. The LED intensity control system shall not cause flickering of the LED display.

The LED intensity control system shall conform to the following minimum requirements:

1. The VMS controller shall contain a read-write NTCIP object that adjusts the maximum usable intensity threshold, the Maximum Pulse Width Modulation (MPWM). This number is a percentage of the absolute maximum possible intensity. At the time of VMS delivery, MPWM shall be set to 67%. The LED intensity control system shall be designed such that a MPWM value of 100% delivers a time-average current of 30 milliamperes, and the MPWM value of 67% delivers a time-average current of 20 milliamperes.
2. Automatic intensity control shall select one of sixteen LED intensity levels based on the sensed ambient light. The threshold points for each intensity levels shall be user programmable. LED intensity levels shall be available in 1% increments and in a range of 1% to 100% of maximum display intensity.

LED DISPLAY DRIVER CIRCUIT BOARDS

The VMS shall contain LED display modules, which are constructed as follows:

1. LED pixel circuit boards shall be mounted to the back of an aluminum panel to form a LED display module. The pixel board(s) shall be mounted to the aluminum panel with durable, non-corrosive fasteners, and their removal from the panel shall not require use of tools.
2. One electronic driver circuit board shall be provided for each LED pixel module and shall individually control all 45 pixels on that module.
3. Failure of a driver board shall not cause the failure of any other LED display module.

4. The aluminum module panel shall have a minimum thickness of 1.5 millimeters, and it shall contain a circular opening for each LED pixel. The openings shall be sized so they do not block any portion of the 15° LED viewing cone.
5. The front side of the aluminum module panel, which faces the viewing motorists, shall be primed and powder with flat black paint.
6. Display modules and all of their components shall be easily replaceable from inside walk in VMS housings and from the front of front access housings. Walk in sign display modules shall mount securely to a support frame located inside the sign housing using durable, non-corrosive hardware. Front access display modules shall be mounted to the rear of the display's front face panels using durable non-corrosive hardware. Module removal and replacement shall be accomplished with the use of simple hand tools or no tools.
7. All display module electrical connections shall be the quick-disconnect locking connector type. Removal of a display module from the VMS, or a pixel board or driver board from its display module, shall not require a soldering operation.

POWER SUPPLIES

The LED display matrix shall be powered by regulated switching DC power supplies that operate from 120 VAC input power and have an output of 24 volts DC or less. Power supplies shall be wired in a redundant parallel configuration that uses multiple supplies per display. The supplies shall have a "current sharing" capability, that allows them to provide equal amounts of current to their portion of the LED display. Power supplies shall be rated such that if one supply fails, the remaining supplies will be able to operate their portion of the display under full load conditions (all pixels on at maximum drive current) while in an ambient temperature of +140° F.

Power supplies shall operate within a minimum input voltage range of +90 to +135 volts AC. Power supply output at an ambient temperature of +140° F shall be no less than 65% of its room temperature (+70° F) output. Power supply efficiency shall be a minimum of 74%. Power supplies shall have a minimum power factor rating of 0.95. Power supplies shall be short circuit protected. Under short circuit conditions, the DC side of the power supply shall be powered down. The power supplies shall reset automatically after 5 seconds of AC power off. Power supplies shall be protected by a minimum overload allowance of 105%. Inputs to power supplies shall be fused or circuit breaker protected. A failed power supply shall not interfere with the other operating power supplies.

The VMS sign controller shall be capable of monitoring the operational status ("normal" or "failed") of each individual power supply by reading a diagnostic signal located on the supply's DC output.

A copy of the power supply manufacturer's data sheet and its UL product card shall be provided with the VMS manufacturer's submittal.

1
2 The VMS manufacturer's submittal shall contain calculations demonstrating
3 that the power supplies are rated for the criteria in this specification. These
4 calculations shall account for power supply output de-rating at a temperature
5 of +140° F.
6

7 **TRANSIENT CURRENT PROTECTION**

8 VMS and sign controller signal and power inputs shall be protected from
9 electrical spikes and transients.
10

11 AC power for all equipment shall be protected at the load center inside the field
12 cabinet. A parallel-connection surge suppresser, rated for a minimum surge of
13 10 kJ, shall be connected to the load center in a manner that protects the load
14 center and the equipment it feeds.
15

16 AC power for control equipment, such as the field controller and modem, shall
17 be further protected by the use of a series-connected surge suppresser
18 capable of passing 15 Amps of current. This device shall be UL 1449
19 recognized.
20

21 EIA 232/485 communication ports in the sign controller shall be protected by
22 avalanche diodes rated for 11.5 Volts at 10 Amps and 14 Volts at 70 Amps.
23 The diodes shall be connected between each signal line and ground
24

25 Digital input and output lines from the VMS to the control equipment shall be
26 protected at the control equipment by optically isolated input and output
27 modules, or optically-isolated solid state relays. The input and output modules
28 shall be external of the sign controller or easily accessible for replacement or
29 testing. Inputs shall include, but shall not be limited to the VMS regulated
30 power supply diagnostics and the AC power failure alarm. Outputs shall
31 include, but shall not be limited to the cooling fan and defog/defrost fan control.
32

33 **(*****)**

34 ***Accessible Pedestrian Signal***

35 Each accessible pedestrian signal (APS) shall be a complete APS pushbutton system at
36 each pedestrian pushbutton location shown in the plans. Equipment shall be purchased
37 from Campbell Company or a reseller authorized by Campbell Company. Each APS
38 unit shall be an Advisor Model AH.
39

40 The contractor will be required to construct a connector cable to connect the driver
41 board to the pedestrian signal display terminals. This connector cable shall be
42 composed of three 12 AWG (minimum) wires, shall have a 3 position Phoenix
43 Connector on one end, and a spade lug for each wire attachment to the pedestrian
44 signal display terminals on the other end.
45

46 **Fiber Optic Cable, Electrical Conductors, and Cable**

47 ***Fiber Optic Cable***

48 Section 9-29.3(1) is supplemented with the following:
49
50

(*****)

Quality Assurance for Communication System Cables and Interfaces

All materials described in this section shall meet or exceed the applicable provisions of the following documents:

1. CFR 1755.900, RUS Specification for Filled Fiber Optic Cables
2. ANSI, C8.47-1983, American National Standard for Polyolefin-insulated Thermoplastic Jacketed Communication Cables
3. EIA-455-27A, Method of Measuring (Uncoated) Diameter of Optical Waveguide Fibers
4. EIA-455-28B, Method For Measuring Tensile Failure Point of Optical Waveguide Fibers
5. EIA-455-34, Interconnection Device Insertion Loss Test
6. EIA-455-95, Absolute Optical Power Test for Optical Fibers and Cables
7. EIA-455-103, Buffered Fiber Bend Test
8. EIA-359-A-1, Special Colors

Cables

The Contractor shall provide all materials required for the installation and splicing of the specified communications cables, power cables and associated interface devices.

The Contractor shall provide an unconditional warranty on all installed cable for a period of one (1) year.

At the request of the Engineer, the Contractor shall submit a three-foot sample cable section to the Engineer for approval for each type of cable to be utilized.

The fiber optic cable network shall be capable of supporting both transmission speeds and protocols up to 2.4 Gb/s, and NTSC quality, color video applications.

The Contractor shall provide manufacturer's certification that the offered cable shall comply with the Rural Utilities Service (RUS) Specification 1755.900 as currently amended and with the requirements set forth in this special provision. Any deviations from these specifications shall be conspicuously noted in the Contractor's submittal.

Each cable shall contain the total number of optical fibers as specified in the Plans. For all 12-count fiber optic cables, the fibers shall be placed in loose buffer tubes in groups of 6. For all 48-count and 96-count fiber optic cables the fibers shall be placed in loose buffer tubes in group of 12.

Each fiber optic cable shall be suitable for placement in an underground duct.

1 All fibers in the cable shall be usable fibers and shall be sufficiently free of surface
2 imperfections and inclusions to meet or exceed the optical, mechanical, and
3 environmental requirements contained in this specification.
4

5 Cables shall be all dielectric cable (with no armoring) and shall be jacketed
6 (sheathed) with medium density polyethylene. The minimum nominal jacket
7 thickness shall be 0.07 inch. Jacketing material shall be applied directly over the
8 tensile strength members. The polyethylene shall contain carbon black to provide
9 ultra-violet light protection, and it shall not promote the growth of fungus.
10

11 The jacket or sheath shall be free of any holes, splits, or blisters.
12

13 The cable shall contain at least one ripcord under the sheath for easy sheath
14 removal.
15

16 The shipping, storage, and operating temperature range of the cable shall be -40°F
17 to +160°F. The installation temperature range of the cable shall be -22°F to
18 +160°F.
19

20 The fiber optic cable shall withstand a maximum pulling tension of 600 lbs during
21 installation (short term) with no damage and 135 lbs installed (long term).
22

23 Each optical fiber shall consist of a doped silica core surrounded by a concentric
24 silica cladding.
25

26 Void areas around the individual buffer tubes shall be protected with a moisture
27 resistant compound as a block against moisture migration.
28

29 All cables shall be free of material or manufacturing defects and dimensional non-
30 uniformity that would:
31

- 32 1. Interfere with the cable installation using accepted cable installation
33 practices.
- 34 2. Degrade the transmission performance and environmental resistance after
35 installation.
- 36 3. Inhibit proper connection to interfacing elements.
- 37 4. Otherwise yield an inferior product.
38

39 The outer jacket material shall be a medium density polyethylene (MDPE)
40 conforming to ASTM D1248, Type II, Class C, Category 4 or 5, Grade J4. The light
41 absorption coefficient, when measured in accordance with ASTM D3349, shall be a
42 minimum of 400 at a wavelength of 375 nanometers.
43

44 The outer jacket material used in construction of this cable shall be fungus inert as
45 described in ASTM G-21.
46

47 Fibers shall contain no factory splices.
48

49 The fiber optic cables shall be shipped on wooden reels in lengths as specified in
50 the purchase order with a maximum overage of 10%. The diameter of the drum
51 shall be at least 20 times the diameter of the cable.
52

Singlemode Fiber Optic Cable

All fiber shall be singlemode. Singlemode fibers utilized in the cables specified herein shall be fabricated from 100 kpsi proof stress glass and primarily composed of silica which shall provide a matched clad index of refraction (n) profile and the following physical and performance characteristics:

- Maximum Attenuation: 0.4/0.3 dB/km at 1310/1550 nanometers, respectively.
- The coating shall be mechanically or chemically strippable without damaging the fiber.

Fiber Optic Connectors

All fiber optic pigtails and patch cords shall use factory connectorized ST/UPC connectors. All pigtails shall be fusion spliced to the fiber optic cable.

Fiber Optic Patch Panels/Splice Panels

The Contractor shall provide and install fiber optic patch panels as specified in these Special Provisions and as shown in the Plans. The fiber optic patch panels shall be rated by the manufacturer as a patch panel, designed to hold the specified number of interconnection sleeves and splice trays, and be 19-inch rack mountable.

Each patch panel port shall be equipped with an ST/UPC interconnection sleeve. All un-terminated interconnection sleeves shall have protective dust covers installed.

A wiring diagram shall be supplied with each patch panel. The wiring diagram shall identify each fiber terminated in the patch panel using the fiber optic cable labeling method as specified later in these provisions. The wiring diagram shall be placed in a plastic sheet protector next to the patch panel.

24 Port Fiber Optic Patch Panel

The fiber optic patch panel shall be designed to hold a minimum of 24 ST/UPC fiber optic interconnection sleeves and splice trays with 24 splice capacity. The patch panel shall allow for full access to the splice trays and both sides of the fiber optic interconnection sleeves from the front of the patch panel. The splice trays and the fiber optic interconnection sleeves shall be enclosed on all sides by the patch panel when the patch panel is closed. The patch panel shall not exceed 6 inches in height.

48 Port Fiber Optic Patch Panel

The fiber optic patch panel shall be designed to hold a minimum of 48 ST/UPC fiber optic interconnection sleeves and splice trays with 48 splice capacity. The patch panel shall allow for full access to the splice trays and both sides of the fiber optic interconnection sleeves from the front of the patch panel. The splice trays and the fiber optic interconnection sleeves shall be enclosed on all sides by the patch panel when the patch panel is closed. The patch panel shall not exceed 6 inches in height.

96 Port Fiber Optic Patch Panel

The fiber optic patch panel shall be designed to hold a minimum of 96 ST/UPC fiber optic interconnection sleeves and splice trays with 96 splice capacity. The patch

1 panel shall allow for full access to the splice trays and both sides of the fiber optic
2 interconnection sleeves from the front of the patch panel. The splice trays and the
3 fiber optic interconnection sleeves shall be enclosed on all sides by the patch panel
4 when the patch panel is closed. The patch panel shall not exceed 6 inches in
5 height.
6

7 **48 Count Capacity Splice Tray Housing**

8 The splice tray housing shall be designed to hold a minimum of four 12-count splice
9 trays. The splice tray housing shall be enclosed on all sides when closed. The
10 Splice Tray Housing shall be no more than 12 inches in height.
11

12 **96 Count Capacity Splice Tray Housing**

13 The splice tray housing shall be designed to hold a minimum of eight 12-count
14 splice trays. The splice tray housing shall be enclosed on all sides when closed.
15 The Splice Tray Housing shall be no more than 12 inches in height.
16

17 **Data Transceiver**

18 Data transceiver system shall be by International Fiber Systems, Inc.
19

20 1. Equipment Model Numbers:

21 Singlemode:

22		
23		
24	Data Transceiver	D9130WDM
25	Data Transceiver	D9130EWDM
26	Data Transceiver	D7430WDM
27		

28 2. Manufacturer:

29 International Fiber Systems, Inc.
30 8985 Town Center Parkway
31 Bradenton, FL 34202-5129
32 Telephone: (425)576-8825
33 Sales @ gpmkt.com
34
35

36 The data transceiver units supplied shall be compatible with the fiber and
37 connectors specified in the Plans.
38

39 **Detector Loop Wire**

40 Section 9-29.3(2)F, is deleted and replaced by the following:
41

42 (*****)

43 Detector loop conductors for Standard Plan installation of loops shall use No.
44 14 AWG stranded copper conductors, class B, with Type XLP/USE insulation
45 or shall use No. 14 stranded copper conductors conforming to IMSA 51-3 or
46 IMSA 51-5 requirements.
47

48 **Ballast, Transformers**

49 Section 9-29.9 is supplemented with the following:
50

1 (*****)

2 Transformer cabinets furnished for this contract shall be pad mounted NEMA 3R
3 cabinets, fabricated in accordance with Section 9-29.25 except:

4 1. Cabinets shall be fabricated of 0.125-inch sheet aluminum, 5052 alloy, with mill
5 finish, in accordance with Section 9-29.13(7)D, Item number 1. Painted or
6 anodized aluminum is not allowed.

7 2. Cabinet doors shall be two-hinged with neoprene gasket and provided with a
8 three-point latch and two-position stop assembly with spring loaded
9 construction core lock capable of accepting a Best Lock Company 6-pin CX
10 series core. The Contractor shall supply red or blue construction cores with two
11 master keys and one core key per lock. The Contractor shall deliver the keys to
12 the Engineer.

13 3. The cabinet shall have two separate compartments, one for the transformer and
14 one for the power distribution circuit breakers. Each compartment shall be
15 enclosed with a dead front. Each breaker shall be labeled with the device
16 name it serves.

17 18 **Traffic Signal Controllers**

19
20 Item 1 of the eighth paragraph of section 9-29.13 is supplemented with the following:

21 (*****)

22
23 The WSDOT Materials Laboratory is located at 1655 S 2nd AVE, Tumwater, WA 98512.
24 See web page www.wsdot.wa.gov/biz/mats/ for directions.

25
26 Item 6 of the eighth paragraph of section 9-29.13 is deleted and replaced with the following:

27 (*****)

28
29 After the scheduled tests for the traffic signal controllers and cabinets have been
30 completed, the WSDOT Materials Lab will arrange for delivery of the signal equipment
31 to the WSDOT Olympic Region Signal Shop for additional testing.

32
33 The Contracting Agency will notify the Contractor when the testing is complete. The
34 Contractor, within at least three (3) working days advance notice, shall make
35 arrangements with the WSDOT Olympic Region Signal Shop, located at 5720 Capitol
36 Blvd. Tumwater, WA., for pickup of traffic signal controllers and cabinets. The contact is
37 Don Anders, Signal Superintendent, at (360) 357-2616. If the Contractor does not
38 pickup the controller and cabinets on the agreed upon day, they will be returned freight
39 collect. The signal system shall be operable within seven (7) working days after
40 installation and/or pickup, unless otherwise approved by the Engineer.

41
42 Section 9-29.13 is supplemented with the following:

43 (*****)

44 45 ***Type170E Controller for ITS Applications***

46 Each controller unit furnished shall meet the requirements specified in the Type 170E
47 Traffic Signal Control Hardware Specification, FHWA IP-78-16, as currently amended
48 and modified as follows:
49

- 1 1. The 170E CPU module shall operate a 68HC11F1 MPU at a crystal frequency
2 of 8MHz. The MPU shall be socket mounted in a PLCC socket.
- 3
- 4 2. The EPROM shall be resident on the CPU module. The EPROM socket shall
5 be a 32-pin lever-controlled ZIF device. The EPROM shall be either a 32K x 8
6 or a 128K x 8 device. The device size shall be jumper selectable.
- 7
- 8 3. Feature and Location switches shall be provided on the front portion of the
9 CPU module. Each switch shall be an 8-position front-reading dipswitch. The
10 switches shall be addressed as follows:
- 11
- 12 Location Switch at 7000 (Port A)
- 13 Feature Switch at 700A (Port E)
- 14
- 15 4. There shall be one LED indicator located on the front of the CPU module. This
16 LED shall be connected to pin 3 of Port G.
- 17
- 18 5. The 170E controller shall have a minimum of 28 kB of battery-backed static
19 RAM on the CPU module. RAM shall be continuous from location 0000 to
20 6FFF.
- 21
- 22 6. Four Asynchronous Communication Interface Adapters (ACIAs) shall be
23 provided on the same board as the CPU. The ACIAs shall be 6850 ICs
24 operating at a crystal frequency of 6.144MHz. Each ACIA shall have 5
25 programmable jumpers to select 5 communication baud rates (1200, 2400,
26 4800, 9600, 19200) for a total of 20 jumpers. All ACIAs shall be active. An
27 IRQ status register shall be provided at 75FF.
- 28
- 29 7. The Model 412C PROM module shall not be provided. A blank panel shall
30 cover the PROM slot.
- 31
- 32 8. Two blank 27C256 EPROM chips shall be provided with the CPU module.
- 33
- 34 9. Each controller shall have an ACIA C20 wrap-around with the following pin
35 connections:

C20 Function Pin		C20 Function Pin
(J) RTS	to	(M) CTS
(J) RTS	to	(H) DCD
(K) DATA-IN	to	(L) DATA-OUT

(*****)

Type 2070 Controllers

Type 2070 controllers for traffic signal systems shall be housed in a Model 333SD ITS/ATC cabinet. Each door shall be furnished with a construction core lock conforming to standard specification 9-29.13(7)D parts 5a, 5b, and 5c. A police panel with door, stainless steel hinge pin, and lock shall be provided. Two police keys, a minimum of 1 3/4" long shall be provided with each cabinet. Each of these cabinets shall be furnished with the equipment described in this section.

Signal cabinet equipment requirements shall include the following:

Composition

Unless otherwise specified, the model shall be furnished, ready for operation, with the following composition:

Model 333SD Cabinet (See Rack Layout Figure 9-29.13.A-1), which shall consist of:

333SD Housing

8" Riser Base

Cabinet Rack #1 (Left Side as viewed from front)

1 – Slide out Drawer Assembly

1 – PDA #2 with 206 Power Supply

1 – Output File #1B

1 – Detector Test Panel

1 – Aux File

Cabinet Rack #2 (Right Side as viewed from front)

2 – Input Files ("I" and "J")

2 – 336 Battery/Equipment Shelves

1 – 12 Position AC Outlet Strip (Rear)

333SD WSDOT C1 Harness

336 Service Panel

333 Input Panel

333 Interconnect Panel

Front Fan Panel

Rear Fan Panel

Rear Fluorescent Lamp

Generator Bypass Switch

Cabinet Plug-in Modules

6 – Model 430 Flash Transfer Relay

2 – Model 204 Two Circuit Flasher (25 Amp Output)

16 – Model 200 Load Switch (25 Amp)

2 – Model 242 DC Isolators

20 – Model LMD-222 Detectors (or equivalent)

1 – EDI Model 2010ECL Conflict Monitor (CMU)

All assemblies and files shall be mounted on the cage mounting rails per cabinet model detail. Cabinet model interface wiring shall be per specified C1 Harness, detailed wiring lists, and required One Line Wiring.

The cabinet shall be delivered mounted on a plywood shipping pallet. The pallet shall be bolted to the cabinet base. The cabinet shall be enclosed in a slipcover cardboard packing shell. The housing doors shall be blocked to prevent movements during transportation.

All bolts, nuts, washers, screws (size 8 or larger), hinges, and hinge pins shall be stainless steel unless otherwise specified.

A cage mounting clear area for the controller unit shall be provided in Rack Cage #1. The area shall be protected with suitable insulating material.

All conductors, terminals, and parts which could be hazardous to maintenance personnel shall be protected with suitable insulating material.

Housing

The housing shall include the following:

- Police Panel Enclosure
- Door Ventilation
- Latches/Locks
- Door Gaskets
- Hinges and Door Catches
- Cage Support and Mounting

Housing Construction

The housing shall be rainproof with the top of the enclosure crowned to prevent standing water. It shall have two front and two rear doors, each equipped with a lock.

The enclosure, doors, lifting eyes, gasket channels, police panel, and all supports welded to the enclosure and doors shall be fabricated of 0.125 in minimum thickness aluminum sheet. Bolted on supports shall be both the same material and thickness as the enclosure or 0.105 in minimum steel. The side panels and filter shall be fabricated of 0.080 in minimum thickness aluminum sheet.

All exterior seams for enclosure and doors shall be continuously welded and shall be smooth. All edges shall be filed to a radius of 0.03125 in minimum. Exterior cabinet welds shall be done by gas Tungsten arc TIG process only. ER5356 aluminum alloy bare welding electrodes conforming to AWS A5.10 requirements shall be used for welding on aluminum. Procedures, welders and welding operators shall conform to the requirements and practices in AWS B3.0 and C5.6 for aluminum. Internal cabinet welds shall be done by either gas metal arc MIG or gas Tungsten arc TIG process.

Aluminum surfaces shall conform to the following:

Natural (Mill) Finish

The enclosure doorframes shall be double flanged out on all four sides and shall have strikers to hold tension on and form a firm seal between the door gasketing and the frame. The dimension between the door edge and the enclosure external surface when the door is closed and locked shall be 0.156 (+/- 0.08) in.

Gasketing shall be provided on all door openings and shall be dust-tight. Gaskets shall be 0.25 in minimum thickness closed cell neoprene or silicone (BOYD R-10480 or equal) and shall be permanently bonded to the metal. If neoprene is used, the mating surface of the gasketing shall be covered with a silicone lubricant to prevent sticking to the mating metal surface. A Gasket Top Channel shall be provided to support the top gasket on the door (prevent gasket gravitational fatigue).

Cage bottom support mounting angles shall be provided on either side, level with the bottom edge of the door opening, for horizontal support and bolt

1 attachment. In addition, side cage supports shall be provided for the upper
2 cage bolt attachments. Spacer brackets between the side cage supports and
3 the cage shall be a minimum thickness of either 0.188 in aluminum or 0.105 in
4 steel.

5
6 The housing shall be provided with four lifting eyes for placing the cabinet on
7 its foundation. Each eye opening shall have a minimum diameter of 0.75 in.
8 Each eye shall be able to support a weight load of 1000 pounds.

9
10 All exterior bolt heads shall be tamperproof type.

11 12 **Door Latches and Locks**

13 The latching handles shall have provision for padlocking in the closed position.
14 Each handle shall be 0.75 in minimum diameter stainless steel with a minimum
15 0.5 in shank. The padlocking attachment shall be placed at 4.0 in from the
16 handle shank to the center to clear the lock and key. An additional 4.0 in
17 minimum gripping length shall be provided.

18
19 The latching mechanism shall be a three-point draw roller type. The pushrods
20 shall be turned edgewise at the outward supports and have a cross section of
21 0.25 in thick by 0.75 in wide, minimum.

22
23 When the doors are closed and latched, they shall be locked. The locks and
24 handles shall be on the right side of the left front and rear doors and on the left
25 side of the right front and rear doors. The lock and lock support shall be rigidly
26 mounted on the door. In the locked position, the bolt throw shall extend a
27 minimum of 0.25 +/- 0.03125 in into the latch cam area. A seal shall be
28 provided to prevent dust or water entry through the lock opening.

29
30 The locks shall be Best (Red Core). One key shall be supplied with each lock.
31 The keys shall be removable in the locked position only.

32
33 The center latch cam shall be fabricated of a minimum thickness 0.1875 in
34 steel or aluminum. The bolt surface shall horizontally cover the cam thickness.
35 The cam shall be structured to only allow the door to open when the handle is
36 moved toward the center of the door.

37
38 Rollers shall have a minimum diameter of 0.875 in with nylon wheels and steel
39 ball bearings.

40 41 **Ventilation**

42 The housing shall include ventilation for the intake, exhaust, filtration, fan
43 assembly and environmental control as follows:

44
45 The front doors shall be provided with louvered vents. The louvered vent
46 depth shall be a maximum of 0.25 in. A removable air filter shall be
47 housed behind the door vents. The filter filtration area shall cover the vent
48 opening area. A filter shell shall be provided that fits over the filter
49 providing mechanical support for the filter. The shell shall be louvered to
50 direct the incoming air downward. The shell sides and top shall be held
51 firmly in place with a bottom bracket and a spring loaded upper clamp. No

incoming air shall bypass the filter. The bottom filter bracket shall be formed into a waterproof sump with drain holes to the outside housing.

The intake (including filter with shell) and exhaust areas shall pass a minimum of 52 cubic feet of air per minute.

The housing shall be equipped with two electric fans with ball or roller bearings and a capacity of at least 100 cubic feet (each) of free air delivery per minute. The fans shall be mounted within the housing and vented.

The fans shall be individually thermostatically controlled and shall be manually adjustable to turn on between 32°F and 140°F with a differential of not more than 20°F between automatic turn on and off. The fan circuitry shall be protected at 125% of the fan motor maximum amperage rating. The manual adjustment shall be graded in 20°F increment scale. The thermostat shall be an Omega KT01101141900 or equivalent.

The filter shall be 16 in wide by 12 in high by 0.875 in thick. The filter shall be an ECO-AIR Products E35S12161 or equal.

Hinges and Door Catches

Three, two-bolt per leave, hinges shall be provided to bolt the enclosure to the door. Each hinge shall be 3.5 in minimum length and have a fixed pin. The pin ends shall be welded to the hinge and ground smooth. The pins and bolts shall be covered by the door edge and not accessible when the door is closed.

Front and rear doors shall be provided with catches to hold the door open at both 90 and 180 +/-10 degrees. The catch minimum diameter shall be 0.375 in for plated steel or aluminum rods or 0.25 in for stainless steel. The catches shall be capable of holding the door open at 90 degrees in a 60 mph wind acting at an angle perpendicular to the plane of the door.

Police Panel

A police panel assembly shall be provided to allow police officers limited access to intersection control. The police panel assembly including switches shall not extend into the cabinet more than 1.5 in.

The police panel door shall be equipped with a lock. The lock shall be keyed for a master police key. One key shall be furnished with each police lock. Each police key shall have a shaft at least 1.75 inches in length.

The police panel section shall contain two DPST Toggle Power Switches.

The police panel shall label one switch "ON-OFF" and the other "FLASH-AUTOMATIC".

The front and back of the panel shall be enclosed with a rigid metal covering so that no parts having line voltage are exposed.

The police panel assembly shall have a drain to prevent water collecting within the assembly. The drain shall be channeled to the outside.

Generator Bypass Switch

The generator bypass switch is to be a GenTran model TS3000130PL (or equivalent) to be shipped with a 12 foot pigtail for mounting in the field.

Cabinet Cage Requirements

Two standard EIA 19 inch rack cages shall be installed inside the housing for mounting the controller unit and cabinet assemblies.

The EIA rack portion of the cage shall consist of four pairs of continuous, adjustable equipment mounting angles. The angle nominal thickness shall be either 0.1345 in plated steel or 0.105 stainless steel. The angles shall be tapped with 10-32 threads with EIA universal spacing. The angles shall comply with Standard EIA RS-310-D and shall be supported at the top and bottom by support angles to form a cage.

Clearance between rails for mounting assemblies shall be 17.75 in.

The cages shall be bolted to the cabinet at 8 points, via the housing cage supports and associated spacer brackets, two at the top and two at the bottom of the rails.

The cage shall be centered within the cabinet.

Cabinet Assemblies

This section must comply with Caltrans TSCES 1989 and all subsequent addendums with the following additions or deviations.

Detector Test Panel

The detector test panel PCB shall consist of the following items:

- 1 – SPST Power Switch
- 40 – SPDT Detector Switches
- 41 – Red LEDs
- 2 – Interconnection Harnesses

The Detector Test Panel shall be an EIA compliant compatible rack mount item with dimensions measuring 19" x 4.5" x 0.125".

The Detector Test Panel Interconnection Harnesses shall be wired in accordance with the following connection charts:

CABLE DP3P	
PIN DP3P-	CONNECT TO
1	I1U-IN
2	I2U-IN
3	I3U-IN
4	I4U-IN
5	I1L-IN
6	I2L-IN
7	I3L-IN
8	I4L-IN
9	I5U-IN
10	I6U-IN

CABLE DP4S	
PIN DP4S-	CONNECT TO
1	I1U-OUT
2	I2U-OUT
3	I3U-OUT
4	I4U-OUT
5	I1L-OUT
6	I2L-OUT
7	I3L-OUT
8	I4L-OUT
9	I5U-OUT
10	I6U-OUT

11	I7U-IN
12	I8U-IN
13	I5L-IN
14	I6L-IN
15	I7L-IN
16	I8L-IN
17	I9U-IN
18	I12U-IN
19	I13U-IN
20	J1U-IN
21	I9L-IN
22	I12L-IN
23	I13L-IN
24	J1L-IN
25	J2U-IN
26	J3U-IN
27	J4U-IN
28	J5U-IN
29	J2L-IN
30	J3L-IN
31	J4L-IN
32	J5L-IN
33	J6U-IN
34	J7U-IN
35	J8U-IN
36	J9U-IN
37	J6L-IN
38	J7L-IN
39	J8L-IN
40	J9L-IN
49	+24VDC
50	DC- COM

11	I7U-OUT
12	I8U-OUT
13	I5L-OUT
14	I6L-OUT
15	I7L-OUT
16	I8L-OUT
17	I9U-OUT
18	I12U-OUT
19	I13U-OUT
20	J1U-OUT
21	I9L-OUT
22	I12L-OUT
23	I13L-OUT
24	J1L-OUT
25	J2U-OUT
26	J3U-OUT
27	J4U-OUT
28	J5U-OUT
29	J2L-OUT
30	J3L-OUT
31	J4L-OUT
32	J5L-OUT
33	J6U-OUT
34	J7U-OUT
35	J8U-OUT
36	J9U-OUT
37	J6L-OUT
38	J7L-OUT
39	J8L-OUT
40	J9L-OUT

Output Fuse Panel

An output fuse panel shall be supplied with each cabinet and mounted to the rear EIA Rails on the right hand rack assembly (when faced from the rear), directly behind Output Files #1B and #2.

The Fuse Panel shall have a 10 Amp fuse housed in its own fuse holder for every output termination on Output Files #1B and #2. A total of 54 fuses and holders are required. The fuse holder is to be a Buchanan Type 351 or equivalent.

The Fuse Panel shall be broken into three 18 Fuse/Fuse Holder Assemblies and be hinged on the bottom of the panel so that the entire panel can be dropped down to provide clear access to the rear panel terminals of Output Files #1B and #2. The top of the panel is to be secured using standard #10 EIA Rail hardware.

16 Channel Red Monitor

A means of selecting the active red monitor channel shall be provided on the rear of the monitor panel. Selection shall be accomplished by means of a two position jumper (shunt) with the center position wired to a red monitor input

and select of 115V AC to the right and red load switch output to the left. Moving the jumper to the right will provide continuous red input and override, while moving a jumper to the left will attach the monitor channel to the corresponding load switch output.

Hesco LF60 RIS Filter (or approved equivalent)

The cabinet shall have a Hesco LF60 RIS Filter or approved equal.

Tesco 10B Transient Surge Protector (or approved equivalent)

The cabinet shall have a Tesco 10B transient surge protector or approved equal.

Each unit shall comply with the following:

Clamping level of 400V peak normal mode and 500V peak common mode. Trace photos and other test related information shall be available upon request. EMI/EFI noise rejection derived via standardized 50 ohm insertion loss tests shall have amplitude of at least -20db over a minimum spectrum from 50 kHz with a -40db being the most desirable. Diagnostics indicators shall clearly display the status of the suppression circuit. The indication shall warn of the loss of protection. Transient energy suppression shall be in excess of 250 Joules. Rated voltage is 120V AC with rated output current minimum 15 amperes single phase operation.

Output File #1B Required Modifications

A Resistor Panel with twelve 10W 2kΩ resistors is to be mounted on the inside of the Output File on the right side panel (as viewed from the rear of the Output File with the rear panel dropped down). These resistors are to be connected between all Odd Phase Green and Yellow Outputs on one side and AC- on the other side.

A Display Interface Panel Harness with a 57 pin AMP 206151-1 (or equivalent) panel mount connector is to be mounted to the rear panel of the Output File and the other end terminated as follows:

DISPLAY INF (DP1S)		
(LOCATED IN OUTPUT FILE)		
PIN		CONNECT TO
1	Ø1 GREEN	127
2	Ø1 YELLOW	126
3	Ø1 RED	125
4	Ø2 GREEN	130
5	Ø2 YELLOW	129
6	Ø2 RED	128
7	Ø3 GREEN	118
8	Ø3 YELLOW	117
9	Ø3 RED	116
10	Ø4 GREEN	103
11	Ø4 YELLOW	102
12	Ø4 RED	101
13	Ø5 GREEN	133
14	Ø5 YELLOW	132
15	Ø5 RED	131

16	Ø6 GREEN	136
17	Ø6 YELLOW	135
18	Ø6 RED	134
19	Ø7 GREEN	124
20	Ø7 YELLOW	123
21	Ø7 RED	122
22	Ø8 GREEN	109
23	Ø8 YELLOW	108
24	Ø8 RED	107
25	Ø2 WALK	115
26	Ø2 DON'T WALK	113
27	Ø4 WALK	106
28	Ø4 DON'T WALK	104
29	Ø6 WALK	121
30	Ø6 DON'T WALK	119
31	Ø8 WALK	112
32	Ø8 DON'T WALK	110
33	NOT USED	
34	NOT USED	
35	NOT USED	
36	NOT USED	
37	NOT USED	
38	NOT USED	
56	AC+	TB01-11
57	AC-	TB01-10

Output File #2 Required Modifications

A total of eight 10W 2kΩ resistors are to be soldered directly to the Output File #2 Load Switch sockets of each Odd phase Yellow and Green Outputs. The resistors will connect to the standard phase Yellow and Green Outputs on one side and AC- on the other side.

Outlet Strip

The outlet strip shall consist of 12 Right Angle outlets (six facing into the cabinet and six facing out of the cabinet) and be an EIA Rail mounting version.

The outlet strip shall be mounted across the EIA Rails on the left hand rack at the bottom when viewed from the rear of the cabinet.

Cabinet Wiring

Cabinet Wiring Diagram

Two sets of non-fading (comparable to Xerox 2080) cabinet wiring diagrams and one CD with a .PDF version of wiring diagrams shall be supplied with each cabinet. The diagrams shall be nonproprietary. They shall identify all circuits in such a manner as to be readily interpreted. The wiring diagrams and CD shall be placed in the Rack Drawer.

One cabinet manual shall be provided in the Rack Drawer along with the wiring diagram.

Conductors

All conductors used in cabinet wiring shall terminate with properly sized clear insulated spring-spade type terminals except when soldered to a through-panel solder lug on the rear side of the terminal block or as specified otherwise. All crimp-style connectors shall be applied with a power tool which prevents opening of the handles until the crimp is completed.

Sizes

Conductors between the service terminal AC- and Equipment Ground and their associated bus, the equipment ground bus conductor to Power Distribution Assembly and cage rail, AC- Bus to Power Distribution Assembly shall be 8 AWG or larger.

Types

All conductors unless otherwise specified shall be 22 AWG or larger with a minimum of 19 copper strands. Conductors shall conform to Military Specification MIL-W-16878D, Type B, or better. The insulation shall have a minimum thickness of 10 mils and shall be nylon jacketed polyvinyl chloride except that conductors 14 AWG and larger may have type THHN insulation (without nylon jacket), and shall be stranded with a minimum of seven copper strands.

Labels

All conductors, except the main input AC+, AC-, and EQGND, shall be labeled. Labels attached to each end of the conductor shall identify the destination of the other end of the conductor.

Color Code Requirements

All conductors shall conform to the following color code requirements:

- (a) The grounded conductors of AC circuits shall be identified by solid white colored insulation.
- (b) The equipment grounding conductors shall be identified by solid green colored insulation.
- (c) The DC logic ground conductors shall be identified by solid white colored insulation with a red stripe.
- (d) The ungrounded AC+ conductors shall be identified by solid black colored insulation.
- (e) The logic ungrounded conductors shall be identified by any color insulation not specified above.

DC Logic Ground and Equipment Ground

Within the cabinet, resistance between any two of the DC Logic Ground, the Equipment Ground, and the AC Grounded Conductor shall be a minimum of 500MΩ when tested at 250V DC.

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AC- Copper Terminal Bus

The AC- copper terminal bus shall not be grounded to the cabinet or connected to logic ground. Nylon screws with a minimum diameter of 0.25 in shall be used for securing the bus to the service panel.

Power Supply DC Ground

The cabinet power supply DC Ground shall be connected to the DC logic ground bus using a 14 AWG or larger stranded copper wire.

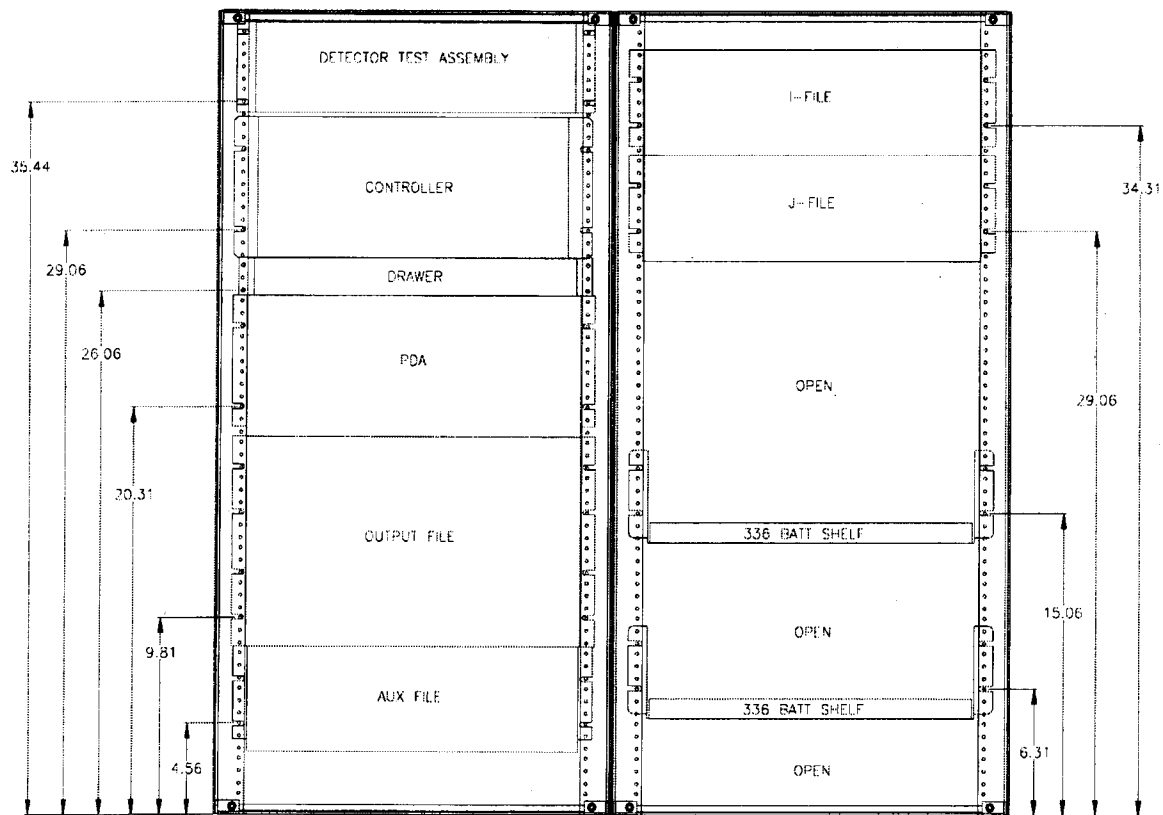
Input Terminal

Each detector lead-in pair, from the field terminals in the cabinet to the sensor unit rack connector, shall be a cable of UL Type 2092 or better. The stranded tinned copper drain wire shall be connected to a terminal on the input file terminal block. This input terminal shall be connected to the equipment grounding bus through a single conductor.

Terminal Blocks

The terminal blocks shall be barrier type rated at 20 Amperes, 600V RMS minimum. The terminal screws shall be 0.3125 in minimum length nickel plated brass binder head type with screw inserts of same material. Screw size is called out under associated cabinet assembly, file or side panel.

Figure 9-29.13.A-1 – WSDOT 333SD Cabinet Rack Layout



NOTES: ATTACH UPPER PORTION OF INPUT PNL WITH PEM STUD AND KEPS NUT. MODIFY PANEL HOLES AS NEEDED.

(REAR) MOUNT OUTLET STRIP ACROSS THE RAILS ON THE BOTTOM LEFT HAND SIDE AS VIEWED FROM THE REAR.

SERVICE PANEL MOUNTED ON THE TOP PORTION OF RAILS.

Additional Equipment

The following additional equipment shall be included with each signal controller cabinet:

One Econolite 2070 Controller (Oasis Software)

One Econolite Industrial 56K Dial-Up Modem

One GE/IFS Fiber Optic Data Transceiver as specified for each cabinet location below:

Model D9130E:

US 12 & Old 99/Elderberry

US 12 & I-5 NB Ramps

Model D9130:

US12 & I-5 SB Ramps

Two RS-232 Communication Cables

One DB9M to DB25M Straight Cable

One DB9M to DB9M Straight Cable

Two 3M Model 752 Phase Selectors (Opticom)

Cabinet at US12/NB I-5 Ramps Only:

One 48 Port Patch Panel (see special provision for Fiber Optic Cable)

Cabinet at US12/Elderberry Only:

One 24 Port Patch Panel (see special provision for Fiber Optic Cable)

Signal Head Mounting Brackets and Fittings

Section 9-29.17 is supplemented with the following:

(*****)

The plumbizer required for the Type M mount shall be bronze as shown in Standard Plan J-6g. The unit shall provide a wireway capable of accepting the 5-conductor cable without damage to the sheath, shall include three stainless steel set screws, shall be mounted with a 3/8 inch stainless steel through-bolt with washers and double nuts, and shall be painted with two coats of traffic signal green baked enamel.

Vehicle Detector

Section 9-29.18 is supplemented with the following:

(*****)

Video Detectors

Each Video Detection System shall be a complete system as shown in the contract plans for each signal system. Equipment shall be purchased from Kar-Gor, Inc. Video Detection Systems shall be comprised of the equipment described below for each location:

Temporary Signal System – US 12 and I-5 SB Ramps

This system requires the following additional equipment added to the existing video detection system:

- Rainbow Camera / Lens Combo BL58ZD65K
- Aegis Camera Housing / Sunshield
- Kar-Gor Mount for Side of Pole (Timber) mounting
- HESCO/RLS Coaxial Surge Suppressor HE75CX
- Camera Mount Utility Box with Connectors
- Fuse Block
- BNC to 2-Wire Connector
- Traficon VIP3D2 Video Processor
- Cable shall be combination RG59 U Coaxial / Conductor Power Cable (18 AWG, 600V) UL/CM for use as shown in the plans

Temporary Signal System – US 12 and I-5 NB Ramps

This system requires the following equipment in sufficient quantity to construct and operate a five camera system:

- Rainbow Camera / Lens Combo BL58ZD65K

- Aigis Camera Housing / Sunshield
- Kar-Gor Mount for Side of Pole (Timber) mounting
- HESCO/RLS Coaxial Surge Suppressor HE75CX
- Camera Mount Utility Box with Connectors
- Fuse Block
- BNC to 2-Wire Connector
- Traficon VIP3D1 Video Processor
- Traficon Programming Keypad
- Rainbow 9" B/W Monitor
- Cable shall be combination RG59 U Coaxial / 5 Conductor Power Cable (18 AWG, 600V) UL/CM for use as shown in the plans

Permanent Signal Systems

Each permanent signal system requires the following equipment in sufficient quantity to construct and operate a camera system with the number of cameras shown in the Plans:

- Rainbow Camera / Lens Combo BL58ZD65K
- Aigis Camera Housing / Sunshield
- Pelco Astro-Brac AS-0169-5-84-SS-ALO
- HESCO/RLS Coaxial Surge Suppressor HE75CX
- Camera Mount Utility Box with Connectors
- Fuse Block
- BNC to 2-Wire Connector
- Traficon VIP3D2 Video Processor
- Traficon Programming Keypad
- Rainbow 9" B/W Monitor
- Cable shall be combination RG59 U Coaxial / 5 Conductor Power Cable (18 AWG, 600V) UL/CM for use as shown in the plans

All video detection equipment installed as part of the temporary signal systems shall be new, and shall become the property of the Contracting Agency, to be delivered to the Olympic Region Signal Shop when no longer required.

Pedestrian Signals

Section 9-29.20 is supplemented with the following:

(***)**

Countdown Pedestrian Displays

Optical units for countdown pedestrian displays shall be Dialight Corporation part number 430-6479-001X.

APPENDICES (July 12, 1999)

The following appendices are attached and made a part of this contract:

APPENDIX A:

Log of Test Borings

APPENDIX B:

1	Summary of Geotechnical Conditions
2	
3	APPENDIX C:
4	Department of the Army Section 404 Individual Permit
5	
6	APPENDIX D:
7	Section 401 Water Quality Certification
8	
9	APPENDIX E:
10	NPDES Industrial Stormwater Permit for Construction Activities
11	
12	APPENDIX F:
13	Critical Area Ordinance Permit
14	
15	APPENDIX G:
16	Water Quality Implementing Agreement
17	
18	APPENDIX H:
19	Compliance Implementing Agreement
20	
21	APPENDIX I:
22	Temporary Erosion and Sediment Control Plan Narrative ***
23	

