

# CITY OF **AUBURN** WASHINGTON

## ENGINEERING CONSTRUCTION STANDARDS



**City of Auburn**  
Public Works Department

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# ENGINEERING CONSTRUCTION STANDARDS

COMPRISED OF  
**SECTION 1: SPECIAL PROVISIONS**  
&  
**SECTION 2: STANDARD DETAILS**

SEPTEMBER 2009

**City of Auburn**  
Public Works Department

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**Approved By:**

Dennis Selle  
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Assistant Public Works Director/City Engineer

9/9/09  
Date

**PREFACE FOR THE  
CITY OF AUBURN  
ENGINEERING CONSTRUCTION  
STANDARDS**

Grading, Utility, Street and other civil construction work within the City of Auburn shall utilize the 2008 WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (English Version) as supplemented and amended by the City of Auburn Special Provisions contained with in Section 1 of this document and the applicable Washington State Department of Transportation (WSDOT) Standard Plans for Road and Bridge Construction as supplemented by the City of Auburn Standard Details contained with in Section 2 of this document. These standards are to be used in addition to the information supplied on the approved plans.

Contractors are required to have the City of Auburn Engineering Construction Standards, WSDOT Standard Plans for Road and Bridge Construction, and the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction available at the job site during construction.

WSDOT Standard Plans and Specifications are available at a nominal charge from the Washington State Department of Transportation at Engineering Publications: Washington State Department of Transportation, Engineering Publications, PO Box 47304, Olympia, WA 98504, or at (360)705-7431, or at <http://www.wsdot.wa.gov/Publications/Manuals/PriceList.htm>.

The City of Auburn Engineering Construction Standards are available at a nominal charge from the City of Public Works Department at (253) 931-3010. It is the responsibility of the user to obtain the most current version and any associated revisions from the City of Auburn.

The WSDOT Standard Specifications, as modified or supplemented by these Special Provisions, shall govern all of the work. The deletion, alteration, or addition to any subsection or portion of the WSDOT Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

**All references within the engineering construction standards to measurement, payment or contractual obligations between the city and the contractor are in reference to a public contract and are not applicable to development projects**

Also incorporated into the City of Auburn Construction Standards by reference are the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, current edition, and the American Water Works Association Standards (AWWA), current edition.

In case of conflict between the various elements of the Engineering Construction Standards, refer to Section 1-04.2 (Coordination of Contract Documents, Plans, Special Provisions Specifications, and Addenda) of this document for order of precedence.

# REVISION DIRECTIONS

## CITY OF AUBURN ENGINEERING CONSTRUCTION STANDARDS EFFECTIVE DATE: September 10, 2014

### Revision No. 5 updated September 11, 2014

New, reprinted pages included with this revision are listed by page number in the right-hand column below. The left-hand column lists obsolete material, which should be removed from the book. Follow the instruction columns in sequence: remove and replace pages as necessary.

When completed, insert these directions in a convenient place near the front of the construction manual. For future reference, the person making these changes may also date and initial this page.

#### SECTION I: SPECIAL PROVISIONS

<u>Remove the following Pages:</u>	<u>Insert the following Pages:</u>	<u>Dated:</u>
xix	xix	9/2014
9-35 through 9-38	9-35 through 9-38 <i>updated</i>	9/4/2014

#### SECTION II-STANDARD DETAILS

<u>Remove the following Pages:</u>	<u>Insert the following Pages:</u>	<u>Dated:</u>
i-v	i-v	7/2014

  

<u>Remove the following Details:</u>	<u>Insert the following Details:</u>	<u>Dated:</u>
GENERAL-04	GENERAL-04	6/09/2014
EROSION-01	EROSION-01	7/15/2014
N/A	EROSION-04A	7/15/2014
TRAFFIC-35	TRAFFIC-35	6/09/2014
TRAFFIC-57	TRAFFIC-57	6/09/2014
N/A	TRAFFIC-66	6/09/2014
WATER-13	WATER-13	7/24/2014
WATER-14	WATER-14	7/24/2014
WATER-16	WATER-16	9/09/2014

Approved:

  
\_\_\_\_\_  
Ingrid Gaub, City Engineer

9/11/2014  
\_\_\_\_\_  
Date

**ENGINEERING CONSTRUCTION STANDARDS**

**DIVISION 1: GENERAL REQUIREMENTS ..... 1-1**

**1-01 DEFINITIONS AND TERMS**

1-01.3 DEFINITIONS..... Supplement

*Applicant* ..... Supplement

*Applicant's Engineer* ..... Supplement

*City* ..... Supplement

*Contract Documents* ..... Supplement

*Contracting Agency* ..... Supplement

*Contractor* ..... Supplement

*Current Edition*..... Supplement

Dates

*Completion Date* ..... ..

*Final Acceptance Date*..... ..

*Engineer* ..... Supplement

*Equal Products* ..... Supplement

*Measurement* ..... Supplement

*Notice to Proceed* ..... Supplement

*Payment* ..... Supplement

*Plans* ..... Supplement

*Project* ..... Supplement

*Special Provisions* ..... Supplement

*Standard Details*..... Supplement

*Standard Plans* ..... Supplement

*Standard Specifications*..... Supplement

*Traffic* ..... Supplement

*Shop drawings* ..... Supplement

**1-04 SCOPE OF THE WORK**

1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS, SPECIFICATIONS AND ADDENDA ..... Revision

**1-05 CONTROL OF WORK**

1-05.4 CONFORMITY WITH AND DEVIATIONS FROM PLANS AND STAKES ..... Revision

1-05.4(3) RECORD CONSTRUCTION DRAWINGS ..... New Section

1-05.7 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK ..... Supplement

1-05.10 GUARANTEES ..... Supplement

1-05.11 FINAL INSPECTION AND OPERATIONAL TESTING ..... Replacement

1-05.11(1) FINAL INSPECTION AND PHYSICAL COMPLETION DATE ..... New Section

1-05.11(2) OPERATIONAL TESTING ..... New Section

1-05.14(1) COOPERATION WITH OTHERS ..... New Section

**1-06 CONTROL OF MATERIAL**

1-06.7 SUBMITTALS ..... New Section

1-06.7(1) SUBMITTAL PROCEDURES ..... New Section

1-06.7(2) SCHEDULE OF SUBMITTALS ..... New Section

1-06.7(3) SHOP DRAWINGS, PRODUCT DATA, SAMPLES ..... New Section

**1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC**

1-07.1 LAWS TO BE OBSERVED ..... Supplement

1-07.5(5) CITY OF AUBURN REQUIREMENTS ..... New Section

1-07.6 PERMITS AND LICENSES ..... Supplement

1-07.13(2) RELIEF OF RESPONSIBILITY FOR COMPLETED WORK ..... Replacement

1-07.15 TEMPORARY WATER POLLUTION/EROSION CONTROL ..... Supplement

1-07.16 PROTECTION AND RESTORATION OF PROPERTY ..... Supplement

1-07.16(1)A PROTECTION AND RESTORATION OF EXISTING MARKERS AND MONUMENTS ..... New Section

1-07.16(2) VEGETATION PROTECTION AND RESTORATION ..... Supplement

1-07.17 UTILITIES AND SIMILAR FACILITIES ..... Replacement

1-07.17(1) DISRUPTIONS TO CITY WATER SERVICES ..... New Section

1-07.17(2) UTILITY POTHOLING .....New Section

1-07.23 PUBLIC CONVENIENCE AND SAFETY ..... Supplement

1-07.23(1) CONSTRUCTION UNDER TRAFFIC ..... Supplement/Revision

1-07.23(1)A DUST AND MUD CONTROL AND STREET CLEANING .....New Section

1-07.23(1)B DAILY CLEANUP AND MAINTENANCE ITEMS .....New Section

1-07.23(2) CONSTRUCTION AND MAINTENANCE OF DETOURS ..... Supplement/Revision

1-07.28 HAUL ROUTES .....New Section

**1-08 PROSECUTION AND PROGRESS**

1-08.0 PRELIMINARY MATTERS .....New Section

1-08.0(1) PRECONSTRUCTION CONFERENCE .....New Section

1-08.0(2) HOURS OF WORK .....New Section

1-08.4 NOTICE TO PROCEED AND PROSECUTION OF WORK ..... Replacement

1-08.6(1) SUSPENSION OF WORK ..... Revision

1-08.7 MAINTENANCE DURING SUSPENSION ..... Revision

**1-10 TEMPORARY TRAFFIC CONTROL**

1-10.1 GENERAL ..... Revision

1-10.2(2) TRAFFIC CONTROL PLANS ..... Supplement

1-10.3(1)B OTHER TRAFFIC CONTROL LABOR ..... Supplement

**DIVISION 2: EARTHWORK .....2-1**

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

2-01.1 DESCRIPTIONS ..... Supplement

2-01.2(1) DISPOSAL METHOD NO. 1 - OPEN BURNING ..... Supplement

2-01.2(2) DISPOSAL METHOD NO. 2 - WASTE SITE ..... Supplement

2-01.2(3) DISPOSAL METHOD NO. 3 - CHIPPING ..... Revision

2-01.3 CONSTRUCTION REQUIREMENT ..... Supplement

2-01.3(1) CLEARING ..... Revision

2-01.3(2) GRUBBING ..... Revision

**2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

2-02.3 CONSTRUCTION REQUIREMENTS

2-02.3(2) REMOVAL OF BRIDGES, BOX CULVERTS, AND OTHER DRAINAGE STRUCTURES..... Supplement

2-02.3(3) REMOVAL OF PAVEMENT, SIDEWALKS, CURBS, AND GUTTERS..... Supplement

2-02.3(4) REMOVAL AND RESETTING OF MISCELLANEOUS ITEMS .....New Section

2-02.3(5) REMOVE AND RESET FENCING .....New Section

2-02.3(6) REMOVE RAISED PAVEMENT MARKINGS .....New Section

2-02.3(7) REMOVE AND RESET PRIVATE SIGNS .....New Section

2-02.3(8) REMOVE AND RESET PRIVATE LUMINAIRES .....New Section

2-02.3(9) SALVAGE.....New Section

**2-03 ROADWAY EXCAVATION AND EMBANKMENT**

2-03.1 DESCRIPTION..... Revision/Supplement

2-03.3 CONSTRUCTION REQUIREMENTS

2-03.3(3) EXCAVATION BELOW SUBGRADE..... Revision

2-03.3(7)C CONTRACTOR-PROVIDED DISPOSAL SITE..... Supplement

2-03.3(14) EMBANKMENT CONSTRUCTION..... Supplement

2-03.3(14)E UNSUITABLE FOUNDATION EXCAVATION..... Supplement

2-03.3(14)M EXCAVATION OF CHANNELS ..... Revision

**2-06 SUBGRADE PREPARATION**

2-06.3(1) SUBGRADE FOR SURFACING..... Supplement

**2-07 WATERING**

2-07.3 CONSTRUCTION REQUIREMENTS ..... Supplement

2-07.4 MEASUREMENT ..... Supplement

2-07.4(1) WATER FROM CITY HYDRANTS.....New Section

**2-09 STRUCTURE EXCAVATION**

2-09.3(3)D SHORING AND COFFERDAMS..... Supplement

**DIVISION 3: PRODUCTION FROM QUARRY AND PIT SITES AND STOCKPILING.....3-1**

**3-01 PRODUCTION FROM QUARRY AND PIT SITES**

3-01.4 CONTRACTOR FURNISHED MATERIAL SOURCES ..... Supplement

**DIVISION 4: BASES.....4-1**

**DIVISION 5: SURFACE TREATMENTS AND PAVEMENTS.....5-1**

**5-02 BITUMINOUS SURFACE TREATMENT**

5-02.3(12) NON-WOVEN FABRIC FOR PAVEMENT OVERLAYS .....New Section

**5-04 HOT MIX ASPHALT .....Replacement**

5-04.1 DESCRIPTION

5-04.2 MATERIALS

5-04.3 CONSTRUCTION REQUIREMENTS

5-04.3(1) HMA MIXING PLANT

5-04.3(2) HAULING EQUIPMENT

5-04.3(3) HOT MIX PAVERS

5-04.3(4) ROLLERS

5-04.3(5) CONDITION OF EXISTING SURFACE

5-04.3(5)A PREPARATION OF EXISTING SURFACES

5-04.3(5)B PREPARATION ON UNTREATED ROADWAY

5-04.3(5)C CRACK SEALING

5-04.3(5)D SOIL RESIDUAL HERBICIDE

5-04.3(5)E PAVEMENT REPAIR

5-04.3(6) HEATING OF ASPHALT BINDER

5-04.3(7) PREPARATION OF AGGREGATES

5-04.3(7)A MIX DESIGN

5-04.3(8) MIXING

5-04.3(8)A ACCEPTANCE SAMPLING AND TESTING-HMA MIXTURE

5-04.3(8)B BASIS OF ACCEPTANCE

5-04.3(9) SPREADING AND FINISHING

5-04.3(10) COMPACTION

5-04.3(10)A GENERAL

5-04.3(10)B CONTROL

5-04.3(11) JOINTS

5-04.3(12) VACANT

5-04.3(13) SURFACE SMOOTHNESS

5-04.3(14) PLANING BITUMINOUS PAVEMENT

5-04.3(15) HMA ROAD APPROACH

5-04.3(16) WEATHER LIMITATIONS

5-04.3(17) PAVING UNDER TRAFFIC

5-04.3(18) VACANT

5-04.3(19) SEALING OF PAVEMENT SURFACES

5-04.3(20) ANTI-STRIPPING ADDITIVE

5-04.3(21) ASPHALT CONCRETE PAVEMENT BUTT JOINTS

5-04.3(22) ASPHALT COLD PATCH

5-04.3(23) INCIDENTAL HMA

**5-05 CEMENT CONCRETE PAVEMENT**

5-05.3(1) CONCRETE MIX DESIGN FOR PAVING ..... Supplement

5-05.3(7) PLACING, SPREADING, AND COMPACTING CONCRETE ..... Revision

5-05.3(8) JOINTS..... Revision

5-05.3(8)C THROUGH JOINTS..... Replacement

5-05.3(8)C1 ISOLATION JOINTS..... New Section

5-05.3(8)C2 CONSTRUCTION JOINTS ..... New Section

5-05.3(8)C3 SEALING THROUGH JOINTS..... New Section

5-05.3(9) CEMENT CONCRETE CURB ON NEW PAVEMENT ..... New Section

5-05.3(10) TIE BARS AND DOWEL BARS ..... Revision/Supplement

5-05.3(23) CEMENT CONCRETE PAVEMENT FOR ALLEY ..... New Section

5-05.3(23)A PAVEMENT AND ALLEY REQUIREMENTS .....New Section

5-05.3(23)B EXTRA CONCRETE FOR ALLEY APPROACH RAMP .....New Section

**5-06 TEXTURED ASPHALT .....New Section**

5-06.1 DESCRIPTION

5-06.2 MATERIALS

5-06.1 DESCRIPTION

5-06.2(1) COATING MATERIAL

5-06.2(2) COLORANT

5-06.3 CONSTRUCTION REQUIREMENTS

5-06.3(1) TEXTURED ASPHALT TERMS

5-06.3(2) CERTIFICATION

5-06.3(3) EQUIPMENT

5-06.3(3)A TEMPLATES

5-06.3(3)B RECIPROCATING INFRA-RED HEATER

5-06.3(3)C VIBRATORY PLAT COMPACTOR

5-06.3(3)D SPRAY EQUIPMENT

5-06.3(4) CONSTRUCTION

5-06.3(4)A SURFACE PREPARATION PRIOR TO COATING

5-06.3(4)B LAYOUT AND IMPRINTING

5-06.3(4)C HEATING OF ASPHALT

5-06.3(4)D SAMPLE AREA

5-06.3(4)E COATING INSTALLATION

5-06.3(5) QUALITY CONTROL

5-06.3(5)A GENERAL

5-06.3(5)B STAMPING DEPTH

5-06.3(5)C COATING THICKNESS

5-06.3(5)D PROTECTION OF EXISTING PAVEMENT MARKINGS

**DIVISION 6: STRUCTURES**.....6-1

**6-02 CONCRETE STRUCTURES**

6-02.1 DESCRIPTION..... Supplement

**6-04 TIMBER STRUCTURES**

6-04.1 DESCRIPTION..... Supplement

**6-07 PAINTING**

6-07.3(1) PAINTING NEW STEEL STRUCTURES..... Revision

**6-15 SOIL NAIL WALLS**

6-15.3(8)A VERIFICATION TESTING ..... Revision

6-15.3(8)B PROOF TESTING ..... Revision

**6-17 PERMANENT GROUND ANCHORS**

6-17.3(8)B PERFORMANCE TESTING ..... Revision

6-17.3(8)C PROOF TESTING..... Revision

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS** ..... 7-1

**7-01 DRAINS**

7-01.2 MATERIALS ..... Revision

7-01.3 CONSTRUCTION REQUIREMENTS ..... Supplement

**7-04 STORM SEWERS**

7-04.2 MATERIALS ..... Revision

7-04.3(1)F LOW PRESSURE AIR TEST FOR STORM SEWERS  
CONSTRUCTED OF NON-PERMEABLE MATERIAL ..... Supplement

7-04.3(1)G TELEVISION INSPECTION..... New Section

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

7-05.1 DESCRIPTION..... Replacement

7-05.2 MATERIALS ..... Supplement

7-05.2(1) TRASH RACKS..... New Section

7-05.3 CONSTRUCTION REQUIREMENTS ..... Supplement

7-05.3(1) ADJUSTING MANHOLES & CATCH BASINS TO GRADE..... Supplement

7-05.3(3) CONNECTIONS TO EXISTING MANHOLES ..... Supplement

7-05.3(5) CHANNELS FOR MANHOLES ..... New Section

**7-08 GENERAL PIPE INSTALLATION REQUIREMENTS**

7-08.1 DESCRIPTION..... Replacement

7-08.2 MATERIALS..... Replacement

7-08.3 CONSTRUCTION REQUIREMENTS ..... Supplement

7-08.3(1)EXCAVATION AND PREPARATION OF TRENCH

7-08.3(1)A TRENCHES..... Revision

7-08.3(1)B SHORING..... Supplement

7-08.3(1)C BEDDING THE PIPE ..... Supplement

7-08.3(2)B PIPE LAYING - GENERAL ..... Supplement

7-08.3(2)G JOINTING OF DISSIMILAR PIPE ..... Supplement

7-08.3(2)J JOINING HIGH DENSITY POLYETHYLENE PIPE (HDPE) PIPE ..... New Section

7-08.3(2)K PACKAGING, HANDLING, STORAGE  
HIGH DENSITY POLYETHYLENE PIPE (HDPE) PIPE..... New Section

7-08.3(2)L DEWATERING TRENCHES..... New Section

7-08.3(3) BACKFILLING..... Supplement

7-08.3(4) PLUGGING EXISTING PIPE ..... Replacement

7-08.3(5) PIPE TRENCH RESTORATION ..... New Section

**7-09 WATER MAINS**

7-09.1 DESCRIPTION..... Supplement

7-09.3(10) BACKFILLING TRENCHES ..... Supplement

7-09.3(19) CONNECTIONS..... Supplement

7-09.3(19)A CONNECTIONS TO EXISTING MAINS..... Supplement

7-09.3(19)B MAINTENANCE SERVICE..... Supplement

7-09.3(21) CONCRETE THRUST BLOCKING ..... Supplement

7-09.3(22) BLOWOFF ASSEMBLIES..... Replacement

7-09.3(23) HYDROSTATIC PRESSURE TEST ..... Supplement

7-09.3(24) DISINFECTION OF WATER MAINS..... Supplement

7-09.3(24)J PREVENTING REVERSE FLOW..... Supplement

7-09.3(24)N FINAL FLUSHING AND TESTING..... Supplement

**7-12 VALVES FOR WATER MAINS**

7-12.3 CONSTRUCTION REQUIREMENTS

7-12.3(2) ADJUST VALVE BOXES.....New Section

7-12.3(3) COMBINATION AIR RELEASE/AIR VACUUM VALVE ASSEMBLY.....New Section

7-12.3(4) VALVE WRENCH EXTENSION BOX.....New Section

**7-14 HYDRANTS**

7-14.3 CONSTRUCTION REQUIREMENTS ..... Supplement

7-14.3(1) SETTING HYDRANTS..... Replacement

7-14.3(4) MOVING EXISTING HYDRANTS..... Supplement

**7-15 SERVICE CONNECTIONS**

7-15.2 MATERIALS..... Supplement

7-15.3 CONSTRUCTION REQUIREMENTS ..... Supplement

**7-17 SANITARY SEWERS**

7-17.2 MATERIALS..... Replacement

7-17.3 CONSTRUCTION REQUIREMENTS

7-17.3(1) PROTECTIONS OF EXISTING SEWAGE FACILITIES..... Supplement

7-17.3(2) CLEANING & TESTING..... Supplement

7-17.3(2)A GENERAL..... Revision/Supplement

7-17.3(2)C INFILTRATION TEST ..... Revision

7-17.3(2)E LOW PRESSURE AIR TEST FOR SANITARY SEWERS CONSTRUCTED OF AIR-  
PERMEABLE MATERIALS..... Supplement

7-17.3(2)F LOW PRESSURE AIR TEST FOR SANITARY SEWERS CONSTRUCTED OF NON AIR-  
PERMEABLE MATERIALS..... Supplement

7-17.3(2)H TELEVISION INSPECTION..... Replacement

**7-18 SIDE SEWERS**

7-18.3 CONSTRUCTION REQUIREMENT ..... Supplement

7-18.3(1) GENERAL ..... Supplement

**DIVISION 8: MISCELLANEOUS CONSTRUCTION** .....8-1

**8-01 EROSION CONTROL AND WATER POLLUTION CONTROL**

8-01.1 DESCRIPTION..... Supplement

8-01.1(1)A SUBMITTALS ..... Supplement

8-01.3(2) SEEDING FERTILIZING AND MULCHING

8-01.3(2)B SEEDING AND FERTILIZING..... Supplement

8-01.3(2)D MULCHING..... Supplement

8-01.3(2)E TACKING AGENT AND SOIL BINDERS ..... Supplement

**8-02 ROADSIDE RESTORATION**

8-02.3 CONSTRUCTION REQUIREMENTS

8-02.3(1) RESPONSIBILITY DURING CONSTRUCTION ..... Supplement

8-02.3(4)A TOPSOIL TYPE A..... Supplement

8-02.3(4)C TOPSOIL TYPE C ..... Replacement

8-02.3(5) PLANTING AREA PREPARATION ..... Supplement

8-02.3(5)A PLACEMENT OF TOPSOIL.....New Section

8-02.3(5)B ROOT BARRIER CONTROL.....New Section

8-02.3(6) SOIL AMENDMENTS ..... Supplement

8-02.3(7) LAYOUT OF PLANTING ..... Supplement

8-02.3(8) PLANTING ..... Supplement

8-02.3(10) FERTILIZERS ..... Supplement

8-02.3(11) BARK OR WOOD CHIP MULCH..... Supplement/Revision

8-02.3(12) COMPLETION OF INITIAL PLANTING..... Replacement

8-02.3(13) PLANT ESTABLISHMENT ..... Supplement

8-02.3(14) PLANT REPLACEMENT ..... Supplement

8-02.3(16) LAWN INSTALLATION

8-02.3(16)A LAWN INSTALLATION ..... Supplement

8-02.3(16)B LAWN ESTABLISHMENT..... Supplement

8-02.3(16)C LAWN MOWING ..... Supplement

8-02.3(16)D FERTILIZER FOR SODDED AREA ..... New Section

**8-03 IRRIGATION SYSTEM**

8-03.1 DESCRIPTION..... Supplement

8-03.3 CONSTRUCTION REQUIREMENTS ..... Supplement

8-03.3(3) PIPING ..... Supplement

8-03.3(5) INSTALLATION ..... Supplement

8-03.3(6) ELECTRICAL WIRE INSTALLATION..... Supplement

8-03.3(7) FLUSHING AND TESTING ..... Supplement

8-03.3(9) BACKFILL..... Supplement

8-03.3(11) SYSTEM OPERATION..... Supplement

8-03.3(12) CROSS-CONNECTION CONTROL DEVICE INSTALLATION ..... Supplement

8-03.3(13) IRRIGATION WATER SERVICE ..... Replacement

8-03.3(14) IRRIGATION ELECTRICAL SERVICE ..... Replacement

**8-04 CURBS, GUTTERS AND SPILLWAYS**

8-04.3 CONSTRUCTION REQUIREMENTS ..... Supplement

8-04.3(1) CEMENT CONCRETE CURB, GUTTERS, AND SPILLWAYS ..... Supplement

8-04.3(1)A EXTRUDED CEMENT CONCRETE CURB..... Supplement

**8-05 TRENCH DEWATERING ..... New Section**

8-05.1 GENERAL..... New Section

8-05.1(1) DESIGN ..... New Section

8-05.1(2) DAMAGES ..... New Section

8-05.1(3) MAINTAINING EXCAVATION IN DEWATERING CONDITION ..... New Section

8-05.1(4) SYSTEM REMOVAL..... New Section

**8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES**

8-06.1 DESCRIPTION..... Replacement

8-06.2 MATERIALS ..... Replacement

8-06.3 CONSTRUCTION REQUIREMENTS ..... Revision/Supplement

**8-09 RAISED PAVEMENT MARKERS**

8-09.3 CONSTRUCTION REQUIREMENTS

8-09.3(1) SURFACE PREPARATION ..... Supplement

**8-13 MONUMENT CASES**

8-13.1 DESCRIPTION ..... Supplement

8-13.2 MATERIALS ..... Supplement

8-13.3 CONSTRUCTION REQUIREMENTS

8-13.3(1) REFERENCE POINTS ..... New Section

8-13.3(2) INSTALLATION ..... New Section

**8-14 CEMENT CONCRETE SIDEWALKS**

8-14.1 DESCRIPTION ..... Replacement

8-14.2 MATERIALS ..... Supplement

8-14.3(1) EXCAVATION ..... Supplement

8-14.3(2) FORMS ..... Supplement

8-14.3(3) PLACING AND FINISHING CONCRETE ..... Revision/Supplement

8-14.3(3)A WHEELCHAIR RAMP ..... New Section

8-14.3(3)B SPECIAL SIDEWALK ..... New Section

8-14.3(4) CURING ..... Replacement

**8-18 MAILBOX SUPPORTS**

8-18.2 MATERIALS ..... Supplement

8-18.3 CONSTRUCTION REQUIREMENTS ..... Supplement

**8-20 ILLUMINATION TRAFFIC SIGNAL SYSTEMS AND ELECTRICAL**

8-20.1 DESCRIPTION ..... Supplement

8-20.1(1) REGULATIONS AND CODE ..... Supplement

8-20.2 MATERIALS ..... Supplement

8-20.2(1) EQUIPMENT LIST AND DRAWINGS ..... Supplement

8-20.2(2) SALVAGED EQUIPMENT ..... New Section

8-20.3 CONSTRUCTION REQUIREMENTS ..... Supplement

8-20.3(1) GENERAL ..... Supplement

8-20.3(2) EXCAVATION AND BACKFILLING ..... Supplement

8-20.3(2)A CONDUIT TRENCH CONSTRUCTION..... New Section

8-20.3(2)B CONDUIT TRENCH BEDDING..... New Section

8-20.3(2)C CONDUIT TRENCH BACKFILL ..... New Section

8-20.3(3)A REMOVAL OF FOUNDATIONS ..... New Section

8-20.3(4) FOUNDATIONS..... Supplement

8-20.3(4)A FOUNDATIONS FOR LIGHT STANDARDS..... New Section

8-20.3(4)B FOUNDATION FOR SERVICE CABINET ..... New Section

8-20.3(4)C FOUNDATION FOR CONTROLLER CABINET ..... New Section

8-20.3(5) CONDUIT ..... Revision

8-20.3(6) JUNCTION BOXES, CABLE VAULTS AND PULL BOXES..... Supplement

8-20.3(8) WIRING ..... Supplement

8-20.3(9) BONDING, GROUNDING..... Supplement

8-20.3(10) SERVICES TRANSFORMER, INTELLIGENT TRANSPORTATION  
SYSTEM CABINET ..... Supplement

8-20.3(11) TESTING ..... Revision/Supplement

8-20.3(13) ILLUMINATION SYSTEMS

8-20.3(13)A LIGHT STANDARDS ..... Supplement

8-20.3(13)C LUMINAIRES ..... Supplement

8-20.3(13)F LUMINAIRE FUSING ..... New Section

8-20.3(13)G PHOTOELECTRIC CONTROLS ..... New Section

8-20.3(14) SIGNAL SYSTEMS

8-20.3(14)A SIGNAL CONTROLLERS ..... Supplement

8-20.3(14)B SIGNAL HEADS..... Supplement

8-20.3(14)C INDUCTION LOOP VEHICLE DETECTORS ..... Supplement

8-20.3(14)D TEST FOR INDUCTION LOOPS AND LEAD-IN CABLE..... Supplement

8-20.3(14)E SIGNAL STANDARDS ..... Supplement

8-20.3(14)F EMERGENCY VEHICLE PRE-EMPTION ..... New Section

8-20.3(14)G INTERCONNECT NETWORK.....New Section

8-20.3(14)H PEDESTRIAN PUSH BUTTONS AND SIGNS .....New Section

8-20.3(14)I VIDEO DETECTION.....New Section

8-20.3(18) AMERON POLES AND CROSSWALK SIGNS WITH FLASHING LED.....New Section

**8-21 PERMANENT SIGNING**

8-21.3 CONSTRUCTION REQUIREMENTS ..... Supplement

**8-22 PAVEMENT MARKINGS**

8-22.1 DESCRIPTION..... Supplement

8-22.2 MATERIALS ..... Supplement

8-22.3 CONSTRUCTION REQUIREMENTS ..... Supplement

**8-23 TEMPORARY PAVEMENT MARKINGS**

8-23.1 DESCRIPTION..... Supplement

**8-24 ROCK AND GRAVITY BLOCKWALL AND GABION ..... Replacement**

8-24.1 DESCRIPTION ..... Replacement

8-24.2 MATERIALS ..... Replacement

8-24.3 CONSTRUCTION REQUIREMENTS ..... Replacement

**8-30 WOOD FENCE AND GATES ..... New Section**

8-30.1 DESCRIPTION.....New Section

8-30.2 CONSTRUCTION REQUIREMENTS .....New Section

**8-31 COLOR STAMPED CONCRETE ..... New Section**

8-31.1 DESCRIPTION .....New Section

8-31.2 MATERIALS .....New Section

8-31.3 CONSTRUCTION REQUIREMENTS .....New Section

8-31.3(1) STAMPING .....New Section

**DIVISION 9: MATERIALS ..... 9-1**

**9-03 AGGREGATES**

9-03.8(7) HMA TOLERANCES AND ADJUSTMENTS .....New Section

**9-04 JOINT AND CRACK SEALING EQUIPMENT**

9-04.1(2) PREMOLDED JOINT FILLER FOR EXPANSION JOINTS ..... Revision

**9-05 DRAINAGE STRUCTURES, CULVERTS, AND CONDUITS**

9-05.7(1) PLAIN CONCRETE STORM SEWER PIPE ..... Supplement

9-05.7(2) REINFORCED CONCRETE STORM SEWER PIPE ..... Supplement

9-05.13 DUCTILE IRON SEWER PIPE ..... Revision

9-05.15(1) MANHOLE RING AND COVER..... Supplement

9-05.15(2) METAL FRAME, GRATE, AND SOLID METAL COVER FOR  
CATCH BASINS OR INLETS..... Supplement

9-05.21 HIGH DENSITY POLYETHYLENE PIPE (HDPE) ..... New Section

**9-06 STRUCTURAL STEEL AND RELATED MATERIALS**

9-06.5(5) BOLT, NUT, AND WASHER SPECIFICATIONS..... New Section

**9-09 TIMBER AND LUMBER**

9-09.1 GENERAL REQUIREMENTS ..... Revision

9-09.2 GRADE REQUIREMENTS ..... Revision

9-09.2(1) SURFACING AND SEASONING

9-09.2(1) STRUCTURES..... Revision

9-09.2(2) VACANT

9-09.2(2) GUARDRAIL POSTS AND BLOCKS..... Revision

9-09.2(3) INSPECTION

9-09.2(3) SIGNPOSTS, MILEPOSTS, SAWED FENCE POSTS, AND MAILBOX..... Replacement

**9-14 EROSION CONTROL AND ROADSIDE PLANTING**

9-14.1 SOIL

9-14.1(1) TOPSOIL TYPE A..... Supplement

9-14.1(3) TOPSOIL TYPE C..... Supplement

9-14.4 MULCH AND AMENDMENT ..... Supplement

9-14.4(3) BARK OR WOOD CHIPS..... Supplement

9-14.4(7) TACKIFIER..... Revision

9-14.6(3) HANDLING AND SHIPPING..... Revision

9-14.6(4) TAGGING..... Supplement

9-14.6(5) INSPECTION..... Supplement

9-14.6(6) SUBSTITUTION OF PLANTS ..... Revision/Supplement

9-14.6(7) TEMPORARY STORAGE ..... Revision/Supplement

**9-15 IRRIGATION SYSTEM**

9-15.1(2) POLYVINYL CHLORIDE PIPE AND FITTINGS..... Supplement

9-15.3 AUTOMATIC CONTROLLERS ..... Supplement

9-15.5 VALVE BOXES AND PROTECTIVE SLEEVES ..... Supplement

9-15.6 GATE VALVES ..... Supplement

9-15.7(2) AUTOMATIC CONTROL VALVES..... Supplement

9-15.8 QUICK COUPLING EQUIPMENT ..... Supplement

9-15.9 DRAIN VALVES..... Supplement

9-15.11 CROSS CONNECTION CONTROL DEVICES ..... Supplement

9-15.17 ELECTRICAL WIRE AND SPLICES ..... Supplement

9-15.18 DETECTABLE MARKING TAPE ..... Supplement

**9-16 FENCE AND GUARDRAIL**

9-16.1(1)A POST MATERIAL FOR CHAIN LINK FENCE..... Supplement

9-16.1(1)B CHAIN LINK FENCE FABRIC..... Revision

9-16.1(1)C TENSION WIRE

9-16.1(1)C TENSION WIRE AND TENSION CABLE..... Revision

9-16.1(1)D FITTINGS AND HARDWARE..... Supplement

9-16.1(1)E CHAIN LINK GATES..... Revision

9-16.2(1)A STEEL POST MATERIAL..... Revision

9-16.3(2) POSTS AND BLOCKS..... Revision

9-16.3(3) GALVANIZING..... Revision

9-16.3(4) HARDWARE ..... Revision

9-16.3(5) ANCHORS ..... Revision

9-16.4(2) WIRE MESH..... Revision

9-16.6(2) GLARE SCREEN FABRIC ..... Revision

9-16.6(3) POSTS ..... Revision

9-16.6(5) CABLE ..... Revision

9-16.6(6) CABLE AND TENSION WIRE ATTACHMENTS ..... Revision

9-16.6(9) FABRIC BANDS AND STRETCHER BARS ..... Revision

9-16.6(10) TIE WIRE ..... Replacement

9-16.6(10) TIE WIRE AND HOG RINGS ..... Revision

9-16.8(1) RAIL AND HARDWARE ..... Revision

**9-22 MONUMENT CASES**

9-22.1 MONUMENT CASES, COVERS AND RISERS ..... Supplement

**9-28 SIGNING MATERIALS AND FABRICATION**

9-28.14(2) STEEL STRUCTURE AND POSTS ..... Supplement

**9-29 ILLUMINATION, SIGNALS, ELECTRICAL**

9-29.1 CONDUIT, INNERDUCT, OUTERDUCT ..... Supplement

9-29.2 JUNCTION BOXES ..... Supplement

9-29.3 CONDUCTORS, CABLES ..... Supplement

9-29.6(1)B LIGHTING AND SIGNAL STANDARDS AND DAVIT ARMS ..... New Section

9-29.6(1)C WRAPPING ..... New Section

9-29.6(2)A ANCHOR BASES ..... New Section

9-29.6(4) WELDING ..... Supplement

9-29.6(5) FOUNDATION HARDWARE ..... Supplement

9-29.7 LUMINAIRE FUSING & ELECTRICAL CONNECTIONS AT LIGHT  
STANDARD BASES, CANTILEVER BASES AND SIGN BRIDGE BASES ..... Supplement

9-29.9 BALLAST, TRANSFORMERS ..... Supplement

9-29.10 LUMINAIRES ..... Supplement

9-29.11(2) PHOTOELECTRIC CONTROLS ..... Supplement

9-29.12(1) ILLUMINATION CIRCUIT SPLICES ..... Supplement

9-29.12(2) TRAFFIC SIGNAL SPLICE MATERIAL ..... Supplement

9-29.12(3) SEALANTS ..... New Section

9-29.13 TRAFFIC SIGNAL CONTROLLERS ..... Supplement

9-29.13(3) EMERGENCY PREEMPTION ..... Supplement

9-29.16(2) CONVENTIONAL TRAFFIC SIGNAL HEADS ..... Supplement

9-29.18 VEHICLE DETECTOR..... Supplement

9-29.19 PEDESTRIAN PUSH BUTTONS..... Supplement

9-29.20 PEDESTRIAN SIGNAL..... Supplement

9-29.24 SERVICE CABINETS ..... Supplement

9-29.26 TRAFFIC SIGNAL BATTERY BACKUP SYSTEM ..... New Section

**9-30 WATER DISTRIBUTION MATERIALS**

9-30.1(1) DUCTILE IRON PIPE ..... Supplement

9-30.2(1) DUCTILE IRON PIPE ..... Supplement

9-30.2(6) RESTRAINED JOINTS..... Supplement

9-30.3(1) GATE VALVES (3-inches to 6-inches)..... Replacement

9-30.3(3) BUTTERFLY VALVES ..... Supplement

9-30.3(4) VALVE BOXES ..... Supplement

9-30.3(8) TAPPING SLEEVE AND VALVE ASSEMBLY ..... Supplement

9-30.5 HYDRANTS..... Supplement

9-30.6 WATER SERVICE CONNECTIONS (2-INCHES & SMALLER)

9-30.6(1) SADDLES ..... Replacement

9-30.6(2) CORPORATION STOPS..... Supplement

9-30.6(3) SERVICE PIPES..... Supplement

9-30.6(5) METER SETTERS (Meter Yokes) ..... Supplement

9-30.6(5)A CURB VALVES ..... New Section

9-30.6(7) METER BOXES ..... Supplement

9-30.6(8) SHUT-OFF VALVES ..... New Section

**9-36 FILTER FABRIC**

9-36.1 FILTER FABRIC FOR INFILTRATION SYSTEMS ..... New Section

**1-01 DEFINITIONS AND TERMS**

1-01.3 DEFINITIONS

Supplement

*(April 2006 City of Auburn)*

Whenever the words “as directed”, “as required”, “as permitted”, or words of the like effect are used, it shall be understood that the direction, requirement or permission of the City of Auburn is intended. The words “sufficient”, “necessary”, “proper”, and the like shall mean sufficient, necessary or proper in the judgment of the City of Auburn. The words “approved”, “acceptable”, “satisfactory”, or other words of the like shall mean approved by, or acceptable to, the City of Auburn.

*(October 1, 2005 APWA GSP)*

All references in the Standard Specifications to the terms “State”, “Department of Transportation”, “Washington State Transportation Commission”, “Commission”, “Secretary of Transportation”, “Secretary”, “Headquarters”, and “State Treasurer” shall be revised to read “Contracting Agency”.

All references to “State Materials Laboratory” shall be revised to read “Applicant’s Materials Laboratory”.

**Applicant**

The term Applicant shall be used to mean the Owner and any agent of the Owner authorized to represent the Owner.

**Applicant’s Engineer**

The term Applicant’s Engineer shall be used to mean the individual, partnership, firm, corporation, or joint venture, contracting with the Applicant to complete the engineering design of the prescribed work.

**City**

The term City shall be used to mean the City Engineer or any designee thereof.

**Contract Documents**

The term Contract Documents shall be used to mean the combination of requirements as follows:

1. WSDOT Standard Specifications for Road, Bridge and Municipal Construction 2008 (English) edition, except as modified or superseded herein,
2. WSDOT Standard Plans (M21-01) for Road, Bridge and Municipal Construction,
3. City of Auburn Standard Details,
4. Manual on Uniform Traffic Control Devices for Streets and Highways, current edition,
5. American Water Works Association Standards, current edition,
6. The City approved plans, and
7. Any other documents reviewed and approved by the City and required as part of the development.

**Contracting Agency**

The term Contracting Agency shall mean the City of Auburn.

**Contractor:**

The term Contractor shall be used to mean the individual, partnership, firm, corporation, or joint venture, contracting with the Applicant to do the prescribed work.

**Current Edition**

The latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the project is approved, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes.

**Dates**

***Completion Date***

The day all the work specified for the project is completed and all the obligations of the Contractor are fulfilled. All required documentation must be furnished by the Contractor before establishment of this date.

***Final Acceptance Date***

The date upon which the City accepts the work for the project as being completed.

**Engineer**

The term Engineer shall be used to mean the City Engineer or any designee thereof.

**Equal Products**

The terms “or equal”, “approved equivalent”, etc., as used in the Contract Documents, shall mean equal as determined by the Auburn City Engineer.

**Measurement**

The term Measurement is used in reference to public contract bid items and is not applicable to development projects.

**Notice to Proceed**

The written notice from the City to the Contractor authorizing the Contractor to begin working.

**Payment**

The term Payment is used in reference to public contract bid items and is not applicable to development projects.

**Plans**

The City Approved Plans and the Standard Details and/or Standard Plans referenced in these Special Provisions, which show location, character, and dimensions of the prescribed work including layouts, profiles, cross-sections, and other details.

**Project**

The term Project shall mean the development project being governed by the Contract Documents under an approved permit with the City.

**Special Provisions**

The term Special Provisions shall be used to mean the supplemental specifications to the WSDOT Standard Specifications for Road, Bridge and Municipal Construction developed, prepared, and approved by the City of Auburn and contained in Section I of the manual titled “City of Auburn Construction Standards”. To clarify the purpose of each section provided, Special Provisions have the following section descriptions.

- Supplement: Text supplements or adds clarification to that Section of the Standard Specifications.
- Revision: Parts of that Section of the Standard Specification are altered.
- Replacement: Text replaces the entire identified Section of the Standard Specifications.
- New Section: This Section is a City of Auburn specification or is unique to this project and will not be found in the Standard Specifications.
- Deletion: This Section is deleted in its entirety.

**Standard Details**

Specific plans or drawings developed, prepared, and adopted by the City of Auburn and contained in Section II of the manual titled “City of Auburn Construction Standards” which shows frequently recurring components of work that have been standardized for use.

**Standard Plans**

A manual of specific plans or drawings developed, adopted and titled “Standard Plans (M21-01) for Road, Bridge and Municipal Construction” prepared by the Washington State Department of Transportation and the American Public Works Association, current edition;

**Standard Specifications**

The Standard Specifications for Road, Bridge and Municipal Construction, 2008 (English) edition as issued by the Washington State Department of Transportation, hereinafter referred to as the “Standard Specifications”.

**Traffic**

Both vehicular and non-vehicular traffic, such as pedestrians, bicyclists, wheelchairs, and equestrian traffic.

**Shop Drawings**

Same as “Working Drawings” as defined in the Standard Specifications.

**1-04 SCOPE OF THE WORK**

1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS, SPECIFICATIONS AND ADDENDA Revision

*(April 2006 City of Auburn)*

The second paragraph is deleted and replaced with the following:

Any inconsistency in the parts of the Contract Documents shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 3, 4, 5, 6, and 7; 2 presiding over 3, 4, 5, 6, and 7; and so forth):

1. Construction Standards Section I - Division 1 General Requirements;
2. Construction Standards Section I- Divisions 2 Technical Specifications;
3. City Approved Plans;
4. Construction Standards Section II - City of Auburn Standard Details;
5. Standard Specifications ;
6. Standard Plans;
7. Manual on Uniform Traffic Control Devices for Streets and Highways, current edition; and
8. American Water Works Association Standards, current edition.

**1-05 CONTROL OF WORK**

1-05.4 CONFORMITY WITH AND DEVIATIONS FROM PLANS AND STAKES Revision

*(April 2006 City of Auburn)*

Replace the second sentence of the second paragraph with the following:

The allowable tolerance for the Contractor’s work shall not exceed 0.02 feet from lines, grades, depths and cross-sections shown on the Plans unless otherwise specified in these contract documents.

1-05.4(3) RECORD CONSTRUCTION DRAWINGS New Section

*(April 2006 City of Auburn)*

The following requirements are intended to provide the project Contractor with the information necessary to furnish the City with satisfactory record construction drawings:

1. The Contractor shall be responsible for tracking all relevant field changes to the approved construction drawings. These changes shall be clearly identified in red ink in a comprehensive manner on the approved plans and provided to the City for concurrence prior to the creation of the Record Construction Drawings” by the Applicant’s Engineer.
2. The record construction drawings shall identify all existing or abandoned utilities that were encountered during construction that were not shown on the approved construction drawings.
3. The record construction drawings shall identify all deviations from the approved construction drawings as follows:

Sanitary Sewer

Manholes:

- Type/size of structure
- Location to the nearest 1-foot horizontal
- Rim elevations to the nearest 0.1-foot vertical
- Invert elevations to the nearest 0.1-foot vertical
- Pipe sizes to the nearest 1-inch inside diameter

Pipes:

- Type of pipe
- Location to the nearest 1-foot horizontal
- Length between structures to the nearest 1 foot
- Slopes based on invert elevations
- Pipe sizes to the nearest 1-inch inside diameter

Side Sewers:

- Type of pipe
- Location from reference manhole to the nearest 1 foot horizontal and consistent with the TV report
- Location to the nearest 1-foot horizontal
- Length between structures to the nearest 1 foot
- Slopes based on the constructed invert elevations
- Invert elevations at right-of-way lines to the nearest 0.5-foot vertical

Storm Drainage

Manholes/Catch Basins:

- Type/size of structure
- Location to the nearest 1-foot horizontal
- Rim elevations to the nearest 0.1-foot vertical
- Invert elevations to the nearest 0.1-foot vertical
- Pipe sizes to the nearest 1-inch inside diameter

Pipes:

- Type of pipe
- Location to the nearest 1-foot horizontal
- Length between structures to the nearest 1-foot
- Slopes based on the constructed invert elevations
- Pipe sizes to the nearest 1-inch inside diameter

Water

Pipes:

- Type of pipe and joints
- Deflection of bends to the nearest 1 degree
- Location to the nearest 1-foot horizontal
- Location to the nearest 0.5-foot vertical between valves at 50-foot stations and intersection with other utilities

Length between valves to the nearest 1 foot  
Pipe sizes to the nearest 1-inch inside diameter  
Valves, Hydrants, Blowoffs, Air Vacs, and PRV's:  
Type of facility  
Location to the nearest 1-foot horizontal

Meters and Services:  
Type of service material  
Location of service line to the nearest 1-foot horizontal  
Meter location to the nearest 1-foot horizontal  
Meter sizes to the nearest ¼-inch in diameter

Streets

Public Streets:  
Centerline elevations to the nearest 0.1-foot vertical at 100-foot stations  
Centerline slopes and vertical curve data based on the constructed centerline elevations  
Gutterline elevations to the nearest 0.1-foot vertical (if not a standard crown section)  
Gutterline slopes and vertical curve data based on the constructed gutterline elevations (if not a standard crown section)

Driveway and Sidewalk:  
Type of driveway (commercial or residential section)  
Centerline driveway location to the nearest 1-foot horizontal  
Driveway width to the nearest 1-foot horizontal  
Sidewalk width to the nearest 1-foot horizontal

Channelization:  
Type of buttons, reflectors, and curbs  
General layout location to the nearest 1-foot horizontal

Signing:  
Type of signs  
Location of signs to the nearest 1-foot horizontal

Illumination:  
Location of luminaries, junction boxes and service cabinets to the nearest 1-foot horizontal

Signalization:  
Location of signal poles, junction boxes, service cabinets, and controllers to the nearest 1-foot horizontal

Landscaping:  
Type and location of tree grates, street trees, onsite landscaping, and public irrigation systems

- 4. At the time the Contractor transmits the comprehensive redline Record Construction Drawings to the City, he shall certify that said drawings are in conformance to the above-referenced requirements;
- 5. The City shall receive and approve the Contractor’s certified “Record Construction Drawings” as specified herein prior to completion.

**A field set of Record Construction Drawings shall be kept current during the course of construction by the Contractor and be available for review upon request by the Engineer.**

1-05.7            REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

Supplement

*(October 1, 2005 APWA GSP)*

Supplement this section with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the Engineer, or fails to perform any part of the work required by the Contract Documents, the Engineer may correct and remedy such work as may be identified in the written notice, by such means as may deem necessary.

If the Contractor fails to comply with a written order to remedy what the Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, have the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred in correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Contractor. The Engineer will not release any financial securities for the Development project until such time as all monies due to the City by the Contractor have been paid. Such direct costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of the Contractor’s unauthorized work.

The rights exercised under the provisions of this section shall not diminish the Engineer’s right to pursue any other avenue for additional remedy or damages with respect to the Contractor’s failure to perform the work as required.

1-05.10      GUARANTEES

Supplement

*(April 2006 City of Auburn)*

The public work performed under these Contract Documents shall be guaranteed for a period of one year beyond the “Final Acceptance Date” thereof against defective materials, equipment, and workmanship, unless otherwise required by the City. Upon receipt of notice from the City of failure of any part of the material, equipment or workmanship during the guarantee period, the affected part or parts shall be replaced with new materials or equipment by, and at the expense of, the Applicant. This guarantee shall be financially secured in compliance with the City’s requirements.

The Contractor shall be available approximately sixty (60) calendar days prior to the expiration of the guarantee period to tour the project, with the Engineer, in support of the Engineer’s effort to establish a list of corrective work required under the guarantee. Upon the receipt of written notice of such required corrective work, the Contractor shall pursue vigorously, diligently, and without unauthorized interruption of the City Facilities, the work necessary to correct the items listed.

1-05.11      FINAL INSPECTION

Replacement

Delete the entire Section and replace with the following:

1-05.11      FINAL INSPECTIONS AND OPERATIONAL TESTING

1-05.11(1)    FINAL INSPECTION and PHYSICAL COMPLETION DATE

When the Contractor considers the work physically complete and ready for final inspection, the Contractor by written notice shall request the Engineer to schedule a final inspection. The Engineer will set a date for final inspection. The Engineer and the Contractor will then make a final inspection and the Engineer will notify the Contractor in writing of all particulars in which the final inspection reveals the work incomplete or unacceptable. The Contractor shall immediately take such corrective measures as are necessary to remedy the listed deficiencies. Corrective work shall be pursued vigorously, diligently, and without interruption until physical completion of the listed deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

If action to correct the listed deficiencies is not initiated within 7 days after receipt of the written notice listing the deficiencies, the Engineer may, upon written notice to the Contractor, take whatever steps are necessary to correct those deficiencies pursuant to Section 1-05.7.

Upon correction of all deficiencies, the Engineer will notify the Contractor, in writing, of the date upon which the work was considered physically complete. That date shall constitute the Physical Completion Date, but shall not imply acceptance of the work or that all the obligations of the Contractor have been fulfilled.

1-05.11(2) OPERATIONAL TESTING

*(October 1, 2005 APWA GSP)*

It is the intent of the Contracting Agency to have before final acceptance a complete and operable system. Therefore when the work involves the installation of pump stations, wells, reservoirs, machinery or other mechanical equipment; street lighting, electrical distribution, signal systems; irrigation systems; buildings; or other similar work, it may be desirable for the Engineer to have the Contractor operate and test the work for a period of time after final inspection but prior to the final acceptance. Whenever items of work are listed in the Contract Documents for operational testing, they shall be fully tested under operating conditions for the time period specified to ensure their acceptability prior to final acceptance. During and following the test period, the Contractor shall correct any items of workmanship, materials, or equipment which prove faulty, or that are not in first class operating condition. Equipment, electrical controls, meters, or other devices and equipment to be tested during this period shall be tested under the observation of the Engineer, so the Engineer may determine their suitability for the purpose for which they were installed. The final acceptance will not be established until testing and corrections have been completed to the satisfaction of the Engineer.

The costs for power, gas, labor, material, supplies, and everything else needed to successfully complete operational testing, shall be paid by the Contractor unless specifically set forth otherwise.

Operational and test periods, when required by the Engineer, shall not affect a manufacturer’s guaranties or warranties furnished under the terms of the contract.

1-05.14(1) COOPERATION WITH OTHERS

New Section

*(April 2006 City of Auburn)*

Should the Engineer determine that a property owner, a utility company or the City has adequate reason to avoid access closure or water shutoff at the time scheduled, the Contractor shall reschedule his work to meet the new conditions.

**1-06 CONTROL OF MATERIAL**

*(April 2006 City of Auburn)*

1-06.7 SUBMITTALS

New Section

1-06.7(1) SUBMITTAL PROCEDURES

All submitted information shall be clear, sharp high contrast copies. Accompany each submittal with a letter of transmittal containing the following information:

1. Contractor’s name and the name of subcontractor or supplier who prepared the submittal.
2. The Permit Number and identifying number.

3. Each new submittal shall be sequentially numbered (1, 2, 3, etc.). Each resubmittal shall include the original number with a sequential alpha letter added (1A, 1B, 1C, etc.).
4. Description of the submittal and reference to the contract requirement or technical specification section and paragraph number being addressed.

**1-06.7(2)      SCHEDULE OF SUBMITTALS**

Prior to beginning the work, the Contractor shall submit three (3) copies of a Schedule of Submittals showing the date by which each submittal required for product review or product information will be made. The Schedule of Submittals will identify the items that will be included in each submittal by listing the item or group of items and the specification section and paragraph number under which they are specified. Indicate whether the submittal is required for product review of proposed equivalents, Shop Drawings, Product Data or Samples or required for product information only.

The Contractor shall allow a minimum of 30 calendar days unless otherwise noted for the Engineer's review. The Contractor shall also allow adequate time for manufacturer delivery at the construction site without causing delay to the work. All submittals shall be in accordance with the approved Schedule of Submittals. Submittals shall be made early enough to allow for unforeseen delays such as:

1. Failure to obtain favorable review because of inadequate or incomplete submittal or because the item submitted does not meet the requirements of the Contract Documents.
2. Delays in manufacture.
3. Delays in delivery.

**1-06.7(3)      SHOP DRAWINGS, PRODUCT DATA, SAMPLES**

This paragraph covers submittal of Shop Drawings, Product Data and Samples required for the Engineer's review.

Number and type of submittals:

1. Shop Drawings: Submit five copies, two of which will be marked, stamped and returned to the Contractor. The Contractor shall make and distribute the required number of additional copies to its superintendent, subcontractors and suppliers.
2. Product Data: Submit five copies, two of which will be marked, stamped and returned to the Contractor. The Contractor shall make and distribute the required number of additional copies to its superintendent, subcontractors and suppliers.
3. Samples: Submit three labeled samples or three sets of samples of manufacturers' full range of colors and finishes. One sample will be returned to the Contractor.

Content of submittals:

1. Each submittal shall include all of the items and materials required for a complete assembly, system or Specification Section.
2. Submittals shall contain all of the physical, technical and performance data required by the specifications or necessary to demonstrate conclusively that the items comply with the requirements of the Contract Documents.
3. Include information on characteristics of electrical or utility service required and verification that such requirements have been coordinated with service provided by the work and by other interconnected elements of the work.
4. Provide verification that the physical characteristics of items submitted, including size, configurations, clearances, mounting points, utility connection points and service access points, are suitable for the space provided and are compatible with other interrelated items that are existing or have or will be submitted.
5. Label each Product Data submittal, Shop Drawing, and Sample with the information required in this Section. Highlight or mark every page of every copy of all Product Data submittals to show the specific items being submitted and all options included or choices offered.
6. Additional requirements for submittals are contained in the Technical Specification sections.
7. Designation of work as “NIC” or “by others” shown on the Shop Drawings, shall mean that the work will be the responsibility of the Contractor rather than the subcontractor or supplier who has prepared the Shop Drawings.

A separate letter explaining the deviations shall accompany submittals that contain deviations from the requirements of the Contract Documents. The Contractor’s letter shall:

1. Cite the specific requirement, including the Specification Section and paragraph number, for which approval of a deviation is sought.
2. Describe the proposed alternate material, item or construction and explain its advantages and/or disadvantages to the City.

The Engineer will stamp and mark each submittal prior to returning it to the Contractor. The stamps will indicate:

1. “NO EXCEPTIONS TAKEN” – Accepted subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission. Does not constitute approval or deletion of specified or required items not shown in the partial submission.
2. “MAKE CORRECTIONS NOTED” – Accepted subject to minor corrections that shall be made by the Contractor and subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission. Does not constitute approval or deletion of specified or required items not shown in the partial submission. No resubmission is required.





on the site to respond to weather changes and shall modify the system to accommodate seasonal changes. For projects that will have exposed soils or be worked on from October 1 to March 31, a Winterization Plan will be required and shall be complete and accepted by the City prior to September 30. Items required in the report will consist of the following:

1. Purpose is clearly stated.
2. Property location in provided.
3. Property description is provided.
4. Contacts are provided and include:
  - a. Name
  - b. Title
  - c. Organization
  - d. Phone number of person, or persons responsible for maintaining the site.\
5. Temporary Erosion and Sediment Control (TESC) Plan is provided.
6. Inspection and monitoring scheduled is provided.
7. Maintenance and repair responsibility is clearly identified.
8. A stockpile of TESC materials and their location is clearly identified.
9. An Exhibit A – legal description is provided.
10. An Exhibit B – vicinity map is provided.
11. Inspection report form is provided.
12. Best Management Practices (BMP’s) to be employed, that are site specific, are provided.

1-07.16      PROTECTION AND RESTORATION OF PROPERTY      Supplement

*(April 2006 City of Auburn)*

The Contractor shall not trespass upon private property and shall be responsible for all injury or damage to persons or property, directly or indirectly, resulting from the Contractor’s operations in completing this work. The Contractor shall comply with the laws and regulations of the City of Auburn, County, State, and Federal governments relating to the safety of persons and property and will be held responsible for, and required to make good, all injury and damage to persons or property caused by the Contractor’s operations.

Sprinkler irrigation systems that encroach within the limits of improvements shall be modified as necessary to ensure operation “equal or better than” the original condition upon completion of the improvements. This work will include, but not be limited to, cutting and capping existing pipe, relocating existing risers and sprinkler heads, new pipe heads and connections, and testing of the system.

The Contractor shall give prior notification to the owners of any ditches, irrigation lines and appurtenances that interfere with the work. The Contractor shall be liable for any damage to irrigation facilities by the Contractor’s operations and shall restore such damaged facilities to “equal or better than” original condition.

Asphalt concrete pavement or bituminous surfacing outside the project area that is disturbed by the work shall be restored to its original condition or better. Asphalt pavement

restoration shall comply with the provisions of Section 5-02 (Bituminous Surface Treatment) and 5-04 (Hot Mix Asphalt) of the Standard Specifications.

Existing cement concrete curb, gutter and sidewalk structures disturbed by the Contractor's operations shall be replaced to match existing, or as directed by the Engineer. Cement concrete shall be Class 3000 with entrained air in conformance with Section 6-02 (Concrete Structure) of the Standard Specifications.

Existing street shoulders disturbed by the Contractor's operation shall be resurfaced with 6 inches of compacted Gravel Borrow and 2 inches of compacted Crushed Surfacing Top Course sloped 1/2 inches per foot away from the paved street, or as directed by the Engineer. Street shoulder restoration shall be in conformance with Section 4-04.3(11) (Shoulder Ballast).

All other surfaces, mailboxes, fences, signs, lawn irrigation systems, etc., disturbed by the project, shall be promptly replaced or relocated to original or better condition. Gravel driveways disturbed by the work shall be resurfaced with a compacted 2-inch layer of Crushed Surfacing Top Course. All ditches shall be reconstructed as indicated on the drawings, or as directed by the Engineer.

The Contractor shall restore all disturbed landscaping in conformance with Section 8-02 (Roadside Restoration).

1-07.16(1)A PROTECTION AND RESTORATION OF EXISTING MARKERS AND MONUMENTS

New Section

*(April 2006 City of Auburn)*

All existing survey monuments and property corner markers shall be protected from movement by the Contractor. All existing survey markers and/or monuments that must be removed for construction purposes are to be referenced by survey ties and then replaced by the Contractor in accordance with WAC 332-120. All existing property corner markers disturbed or removed by the Contractor's operations shall be replaced, at the Contractor's own expense, by a Professional Land Surveyor registered in the State of Washington. Resetting of property corners for which there is no Record of Survey or Short Plat filed with the County Auditor may require exhaustive and expensive resurvey. This includes the City of Auburn benchmark system. Any damaged monuments must be reset to second order, first class specifications.

1-07.16(2) VEGETATION PROTECTION AND RESTORATION

Supplement

The Contractor shall give prior notification to the owners of any vegetation that interferes with the work designated on the plans.

1-07.17 UTILITIES AND SIMILAR FACILITIES

Replacement

This section is deleted in its entirety and replaced with the following.

*(April 2008 City of Auburn)*

The Plans show locations of various known existing above ground amenities and obstructions. The location of known existing underground utilities, as shown on the Plans, are indicated based on available information and may not be exact. The Contractor is responsible for determining their exact location.

A list of utilities and known contact persons will be available at the pre-construction conference for the Contractor's convenience.

The Contractor is responsible for coordination with the utility companies and arranging for the temporary or permanent movement or adjustment of their facilities within the project limits.

The Contractor must call the Utilities Underground Location Center (One-Call Center) for field location, not less than two (2) and not more than ten (10) business days before the scheduled date for beginning excavation that might affect underground utilities. A business day is defined as any day other than Saturday, Sunday, or a legal Local, State, or Federal holiday. The telephone number for the One-Call Center for this project is 1-(800)-424-5555.

The Contractor is responsible for any breakage of utilities or services resulting from his operations and shall hold the City harmless from any claims resulting from disruption of, or damages to, the same.

The Contractor is responsible for coordination with the utility companies and arranging for the temporary or permanent removal, replacement, bracing or holding of any utility or structure, including power and telephone poles, required to accomplish the work.

The Contractor is responsible for the complete repair (including materials) of any City-owned utility damaged by the work (including water services), whether or not shown on the Plans. Copper water service lines, if damaged, must be replaced in kind by one continuous service line from the water main to the meter. Splicing will not be permitted. The Contractor shall repair any damage caused by broken water mains or services. The Contractor shall have sufficient materials and qualified personnel available to effect immediate repairs of water and sewer lines that may be damaged by the work.

1-07.17(1) DISRUPTIONS TO CITY WATER SERVICES

*(April 2006 City of Auburn)*

All water service shutdowns caused by construction shall be approved by the City a minimum of two (2) working days before shutdown and performed by City Water Utility staff. All water service disruptions shall be limited to a maximum of 4 hours.

1-07.17(2) UTILITY POTHOLING

*(April 2006 City of Auburn)*

The Contractor shall physically locate, uncover, and document the location of underground utilities where necessary or directed using methods and equipment acceptable to the Engineer. The purpose of utility potholing is to allow sufficient time ahead of pipe laying operations to identify underground conflicts, allow ample time to make minor adjustments in pipe grade and/or alignment, and generally facilitate the Contractor's work schedule.

In no way shall the work described under Utility Potholing relieve the Contractor of any of the responsibilities described in Section 1-07.17 of the Standard Specifications and these Special Provisions.

1-07.23 PUBLIC CONVENIENCE AND SAFETY Supplement

*(April 2006 City of Auburn)*

Traffic control and street maintenance for the safety of the traveling public on this project shall be the sole responsibility of the Contractor and all methods and equipment used will be subject to the approval of the City of Auburn. Contractors and their surety shall be liable for injuries and damages to persons and property suffered because of Contractors operations or any negligence connected with them.

The use of any project area by vehicles or pedestrians before project acceptance is not to be construed as utilization by the City of Auburn.

The Contractor shall maintain normal two-way traffic through the work site(s) at all times, unless the Engineer gives written permission to alter this requirement.

1-07.23(1) CONSTRUCTION UNDER TRAFFIC Supplement/Revision

*(October 1, 2005 APWA GSP)*

Revise the second paragraph to read:

To disrupt public traffic as little as possible, the Contractor shall permit traffic to pass through the work with the least possible inconvenience or delay. The Contractor shall maintain existing roads, streets, sidewalks, and paths within the project limits, keeping them open, and in good, clean, safe condition at all times. The Contractor shall also maintain roads, streets, sidewalks, and paths adjacent to the project limits when affected by the Contractor's operations. The Contractor shall perform the following:

1. Remove or repair any condition resulting from the work that might impede traffic or create a hazard.
2. Keep existing traffic signal and highway lighting systems in operation as the work proceeds. (The Contracting Agency will continue the route maintenance on such system.)
3. Maintain the striping on the roadway. The Contractor shall be responsible for scheduling when to renew striping, subject to the approval of the Engineer.

- 4. Maintain existing permanent signing.
- 5. Keep drainage structures clean to allow for free flow of water.

*(April 2006 City of Auburn)*

All unattended excavations shall be barricaded at all times.

This section is supplemented with the following:

The Contractor shall obtain the approval of the Engineer of all barricading and lighting before leaving the job site each day. Failure to provide proper barricading and lighting will be cause for the City to call in a barricading company to install proper barricades and lights and charge the Contractor for all costs incurred. Engineer approval shall not relieve the Contractor of his legal responsibilities in case of project area accidents.

At the end of each working day, the Contractor shall place temporary patches or steel plates over unfinished portions of trenches crossing traveled ways. Material for temporary patches shall be hot or cold mix asphalt concrete.

Any asphalt concrete paving, asphaltic cold patch, crushed surfacing or other material required for maintaining traffic during the life of the work shall be placed by the Contractor immediately upon request by the Engineer, in the amounts designated.

Traffic control devices that are in conflict with required construction traffic devices or construction work shall be covered, removed and temporarily stored, or temporarily relocated by the Contractor, as directed by the Engineer.

Flagging, signs, and all other traffic control devices shall be in accordance with Section 1-10.3 (Traffic Control Labor, Procedures, and Devices).

1-07.23(1)A DUST AND MUD CONTROL AND STREET CLEANING New Section

*(April 2006 City of Auburn)*

The Contractor is responsible for controlling dust and mud within the project limits. All streets outside the project limits used by the Contractor during the Project shall be kept clean. The Contractor shall be prepared to use watering trucks equipped with high-velocity water jets and low-head sprinkling devices, power sweepers, and any other pieces of equipment necessary to render the streets free of all mud, debris, and foreign materials. Any damage caused by dust or mud accumulation on the streets and in the storm sewer system shall be the sole responsibility of the Contractor.

Watering trucks may be used on paved streets with an adequate storm drainage system. Watering trucks may also be used on unpaved streets for dust control, but no mud can be created. Where water flushing is not allowed, street sweepers (not power brooms) shall be used.

The Contractor shall provide for sweeping or flushing all surfaced roadways upon completion of each day's activities. Equipment required for this operation shall be on the

job site or available at all times. Failure to have this equipment on the job site or available may necessitate a shutdown of the project.

1-07.23(1)B DAILY CLEANUP AND MAINTENANCE ITEMS New Section

*(April 2006 City of Auburn)*

The Contractor shall clean all roadways, streets and appurtenances, including sidewalks which are open for public use, of all material or debris that has been dropped or otherwise deposited thereon, as a result of Contractor’s on- and off-site operations, at the conclusion of each working day, and at such other times as deemed necessary by the Engineer to ensure the safety of the traveling public and to prevent inconvenience to the public and owners of private property adjacent to the project.

If the Engineer determines that roadways, streets, and appurtenances are not properly cleaned to prevent public inconvenience, or the condition of the excavation or disposal sites so warrant, the Contractor shall provide facilities to remove clay or other deposits from tires, between wheels, and outside of truck beds before trucks and other equipment will be allowed to travel over paved streets.

Any violation of the above requirements will be sufficient grounds for the Engineer to order the roadways, streets and appurtenances cleaned or sprinkled by others at the expense of the Contractor.

1-07.23(2) CONSTRUCTION AND MAINTENANCE OF DETOURS Supplement/Revision

*(October 1, 2005 APWA GSP)*

Revise the first paragraph to read:

Unless otherwise approved, the Contractor shall maintain two-way traffic during construction. The Contractor shall build, maintain in a safe condition, keep open to traffic, and remove when no longer needed:

1. Detours and detour bridges that will accommodate traffic diverted from the roadway, bridge, sidewalk, or path during construction,
2. Detour crossings of intersecting highway, and
3. Temporary approaches.

*(April 2006 City of Auburn)*

This section is supplemented as follows:

The Contractor shall submit a written procedure for routing and maintenance of traffic. The City of Auburn Public Works Department, City of Auburn Police Department, and the Valley Regional Fire Authority must approve all street blockage, traffic routing, etc.

Some streets may be closed to through traffic with Engineer approval. The Contractor shall obtain written approval from the Engineer at least fifteen (15) working days prior to an

anticipated street closure. Street closures shall be such that they provide for maximum public safety and public convenience. They shall be opened to through traffic at such time as the work has been completed, or as the Engineer may direct.

Street closures and detours shall provide for the following:

1. Reasonable access to, and egress from, the properties adjacent to the project at all times.
2. At least one-way traffic on all existing roadways within the project limits during working hours and at the end of each working day provisions for the safe passage of two-way traffic during the non-working hours.
3. If the Contractor requires delays or limited term street closure the request shall be submitted, in writing, for the approval of the Engineer before the anticipated delay or closure. The delay or closure request shall state the reason, the locations, the time and date, and the duration of the required delay or closure.
4. The Contractor is required to remove all excess materials, debris, or other obstruction caused by his operation, from the streets or alleys as the work progresses, whether within the project limits or along haul routes. If the Contractor neglects to remove such materials or obstruction and return streets, sidewalks, driveways, and roads in suitable condition for traffic within one (1) working day after having received written notice from the Engineer, the work may be done by the City of Auburn and the cost thereof charged to the Contractor. The Contractor shall repair or replace any streets, sidewalks, roads, or culverts damaged by his operations, to the satisfaction of the Engineer and other concerned parties.
5. The Contractor must maintain convenient access for local traffic to driveways, houses, businesses and buildings along the work route. Such access shall be maintained as near as possible to that which existed before construction began. The Contractor shall provide three (3) working days advance notice to all property owners and tenants of street and alley closures or other restrictions, which may interfere with their access. When the abutting owners' access across right-of-way lines is to be eliminated and replaced by another access, the existing access shall not be closed until the replacement access facility is available. Advance coordination prior to City plan approval is required.

The Contractor shall be responsible for making detailed notifications of detours and closures as follows:

1. The Contractor shall provide written notification to the local Fire Authority and Police Department before the beginning of operations, so that these agencies may reroute their emergency vehicles around the construction zone. If the Fire Authority or Police Department determines that rerouting is not possible, the Contractor shall provide reasonable access through the construction zone at all times.
2. The Contractor shall notify all affected owners and agencies of all closures, detours and traffic interruptions at least ten working days in advance of such closure. Notification shall be in writing and must include the beginning and ending times and

dates of traffic disruption(s), names of streets or locations of alleys to be affected, detour routes, etc. The language of the notification will be approved by the City prior to distribution of the notification. The Contractor shall give the Engineer written certification of all notifications before all traffic disruptions. On large projects requiring extended traffic disruption, the Contractor shall make additional notifications, as conditions require.

1-07.28      HAUL ROUTES

New Section

*(April 2006 City of Auburn)*

Prior to moving any materials and equipment on public streets, the Contractor shall submit a haul route plan to the Engineer for approval per Section 1-06.7 (Submittals). The plan must be approved by the Engineer prior to the beginning of construction activities. Damage done to streets during the Contractor's hauling shall be repaired to pre-construction conditions at the Contractor's expense. The following needs to be provided in the haul route plan:

1. What type of material and equipment is being hauled? (Imported fill material for all structural fill and other fill activities shall be approved by the Engineer.
2. Total quantity hauled as part of this action.
3. Total haul days of this action.
4. Total quantity of material moved per day.
5. Estimated number of trips per day.
6. Estimated start date.
7. Estimated completion date.
8. Intended time of day of the haul.
9. Intended route of the haul. (Clearly shown on the site map)

**1-08 PROSECUTION AND PROGRESS**

1-08.0      PRELIMINARY MATTERS

New Section

1-08.0(1)      PRECONSTRUCTION CONFERENCE

*(April 2006 City of Auburn)*

Prior to beginning work on the Project, a preconstruction conference will be scheduled between the Applicant, the City and such other interested parties as may be invited.

The purpose of the preconstruction conference will be:

1. To review the initial progress schedule;
2. To establish a working understanding among the various parties associated or affected by the work;
3. To establish and review procedures for notifications, approvals, submittals, etc.;
4. To establish normal working hours for the work;
5. To review safety standards and traffic control; and
6. To discuss such other related items as may be pertinent to the work.

The Contractor shall prepare, and submit, at the preconstruction meeting, the following:

- 1. A preliminary schedule of submittals;

1-08.0(2)      HOURS OF WORK

*(October 2006 City of Auburn)*

Except in the case of emergency, or unless otherwise stated in the Plans or approved by the City, the normal straight time working hours for the contract shall be any consecutive 8-hour period between 7:00 a.m. and 6:00 p.m. of a working day, with a maximum 1-hour lunch break and a 5-day work week. The normal straight time 8-hour working period for the contract shall be established with Plan approval, at the preconstruction conference or prior to the Contractor commencing the work.

Permission to work longer than an 8-hour period between 7:00 a.m. and 6:00 p.m. is not required. Permission to work between the hours of 7:00 p.m. and 7:00 a.m. during weekdays and between the hours of 6:00 p.m. and 9:00 a.m. on weekends or holidays may also be subject to noise control requirements. If the Contractor desires to work during restricted times, the Contractor shall submit a written request to the City thirty (30) calendar days prior to the day for which the Contractor is requesting permission to work. The written request shall meet all requirements of Auburn City Code 8.28 and will include specific days and times and description of work to be performed and the reasons the work cannot be performed during the normal hours of work. If approval is granted, it may be revoked at any time the City receives complaints from the public or adjoining property owners regarding the noise from the Contractor’s operations.

Permission to work Saturdays, Sundays, and/or holidays for other than the agreed upon normal straight time working hours, Monday through Friday, may be given subject to certain other conditions set forth by the City. These conditions may include but are not limited to: requiring the Engineer or such assistants as the Engineer may deem necessary to be present during the work; requiring the Contractor to reimburse the City for the costs in excess of straight-time costs for the City employees who worked during such times; and considering multiple work shifts occur in a single 24-hour period. Assistants may include, but are not limited to, personnel from the City’s material testing lab; inspectors; and other City employees when, in the opinion of the Engineer, such work necessitates their presence.

1-08.4      NOTICE TO PROCEED AND PROSECUTION OF THE WORK

Replacement

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

*(April 2006 City of Auburn)*

The Contractor shall not commence with the work until the City has given the Notice to Proceed. The Contractor shall give the City at least three (3) working days advance notice



streets, sidewalks, or paths. No work shall be done on or adjacent to any traveled way until all necessary signs and traffic control devices are in place.

1-10.2(2)      TRAFFIC CONTROL PLANS      Supplement

*(June 2008 City of Auburn)*

Any Contractor-proposed Traffic Control Plan shall conform to the established standards for plan development as shown in the MUTCD, Current Edition, Part VI, and the WSDOT Standard Plans K-10.20-01 through K-80.37-00. The Contractor shall submit the Traffic Control Plan to the Engineer for review and approval at least five (5) working days in advance of the time the traffic control devices, including signs, are scheduled to be installed and utilized. The Engineer must approve the Traffic Control Plan before any onsite work begins on the project. Any modifications or deviations from the approved Traffic Control Plan will require review and approval by the Engineer.

Adhesive for all temporary raised pavement markers shall be of a material that does not mark or damage the existing pavement following removal of the raised pavement marker. Outside edges of the traveled way may be delineated with traffic safety drums or tubular markers providing that the requirements of Section 1-07.23(1) (Construction Under Traffic) are met. Barricades must comply with TRAFFIC-05, Barricades, Moveable Type III.

1-10.3(1)B      OTHER TRAFFIC CONTROL LABOR      Supplement

When working within signalized intersections, the Contractor shall schedule and coordinate the use of uniformed police officers to control traffic. Contractor is responsible for all coordination with the Police Department to secure a uniformed police officer as required. This coordination shall be done a minimum of three (3) working days in advance of the day a uniformed police officer is necessary. When the City of Auburn Police Department is not able to secure a uniformed police officer, the Contractor shall provide uniformed officers from outside police agencies. The Contractor shall contract for these services directly with the Police agency providing the service.

END OF DIVISION 1



2-01.3(2)     GRUBBING     Revision

*(April 7, 2008 WSDOT Amendment)*

Item 2.e, is revised to read:

Upon which embankments will be placed except stumps may be close-cut or trimmed as allowed in Section 2-01.3(1) item 4.

**2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

2-02.3     CONSTRUCTION REQUIREMENTS

2-02.3(2)     REMOVAL OF BRIDGES, BOX CULVERTS, AND OTHER DRAINAGE STRUCTURES     Supplement

The Contractor shall remove storm drainage structures as described in the plans or as designated by the Engineer. The resultant void shall be backfilled with compacted Gravel Borrow. All grates, frames and covers shall remain City property and will be salvaged as specified in Section 2-02.3(9) (Salvage).

2-02.3(3)     REMOVAL OF PAVEMENT, SIDEWALKS, CURBS AND GUTTERS     Supplement

*(April 7, 2008 WSDOT Amendment)*

The first sentence is supplemented with the following:

For removal of bituminous pavement, asphalt planing equipment may be used in lieu of sawcutting provided that a clean vertical edge remains.

*(April 2008 City of Auburn)*

Pavement, sidewalks, curbs, and gutters shall be sawcut in such a fashion as to form a neat break line.

2-02.3(4)     REMOVAL AND RESETTING OF MISCELLANEOUS ITEMS     New Section

The Contractor shall remove and reset miscellaneous items as described in the plans. Items requiring resetting shall be protected from damage during removal as far as practical. If, in the opinion of the Engineer, an item requires replacement because of Contractor negligence, the item shall be replaced in kind.

**2-02.3(5)      REMOVE AND RESET FENCING**

New Section

This work consists of removing and resetting interfering portions of fencing as required for construction activities. The owner of the fence shall retain all component parts unless otherwise stated in the Contract Documents.

The Contractor is responsible for ensuring that the remaining fence is undamaged. The Contractor shall repair any damage caused by the Contractor.

For the protection of pets and security of the property, the Contractor shall schedule removal of fencing with the property owner at least 3 calendar days in advance. Unless approved by the property owner, no site shall be left unfenced.

**2-02.3(6)      REMOVE RAISED PAVEMENT MARKINGS**

New Section

All raised pavement markings shall be removed before placing a new asphalt concrete pavement overlay. Removal of markers shall be conducted in a manner that prevents damage to existing pavement. Damage to the existing pavement caused by Contractor operations shall be repaired by the Contractor. Repairs shall be to the satisfaction of the Engineer.

**2-02.3(7)      REMOVE AND RESET PRIVATE SIGNS**

New Section

Where shown on the plans, and as directed by the Engineer, the Contractor shall remove existing private signs for placement in new locations determined by the property owner and the Engineer.

The Contractor is responsible for ensuring that the sign(s) and mounting apparatus(es) remain undamaged. Any damage caused by the Contractor shall be repaired or replaced by the Contractor. The new cement concrete foundation(s) shall be equal or larger in size than the existing foundation(s) unless otherwise designated in the Contract Documents.

All electrical work shall be performed in accordance with applicable subsections of Section 8-20 (Illumination, Traffic Signal Systems, and Electrical) of the Standard Specifications and as amended by these Special Provisions.

**2-02.3(8)      REMOVE AND RESET PRIVATE LUMINAIRES**

New Section

Where shown on the plans, and as directed by the Engineer, the Contractor shall move existing private luminaires to new locations determined by the property owner and the Engineer.

Following removal of the existing light fixture, the Contractor shall protect the fixture and all component parts from loss or damage until such time as the fixture is relocated. The Contractor shall replace lost, damaged, or destroyed fixtures and component parts in kind.

The new cement concrete foundation(s) shall be equal or larger in size than the existing foundation(s) unless otherwise designated in the Contract Documents.

All electrical work shall be performed in accordance with applicable subsections of Section 8-20 (Illumination, Traffic Signal Systems, and Electrical) of the Standard Specifications and as amended by these Special Provisions.

2-02.3(9)      SALVAGE      New Section

All casings, pipe, frames, grates, covers, and other material of recoverable value removed from the project shall be carefully salvaged and delivered to the City of Auburn Maintenance & Operations Building (1305 "C" Street SW) in their existing condition. The Engineer will determine what items are salvageable. The Contractor shall provide notice to the Engineer three (3) working days prior to delivery of any salvaged item. Items not identified to be salvaged shall become the property of the Contractor and removed from the site.

**2-03 ROADWAY EXCAVATION AND EMBANKMENT**

2-03.1      DESCRIPTION      Revision/Supplement

*(January 7, 2008 WSDOT Amendment)*

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

The Work described in this section, regardless of the nature or type of the materials encountered, includes excavating and grading the Roadway, excavating in borrow pits, excavating below grade, excavating channels and ditches, removing slide material, and disposing of all excavated material.

Roadway excavation shall include all material removed for roadway, parking areas, sidewalk and driveways.

*(June 2009, City of Auburn)*

Excavated material unsuitable for roadway embankment, such as broken pavement, curbs, sidewalks, etc., shall be disposed of.

The Contractor shall provide all work and material required to return any over excavated areas to their set limits or original conditions.

Control stakes will be set during construction to provide the Contractor with alignment, slope, and grade information for the construction of excavation and embankments.

Roadway excavation shall be used for embankment construction unless otherwise directed by the Engineer.

2-03.3      CONSTRUCTION REQUIREMENTS

2-03.3(3)      EXCAVATION BELOW GRADE      Revision

*(January 7, 2008 WSDOT Amendment)*

The section title is revised to read:

2-03.3(3)      EXCAVATION BELOW SUBGRADE      Revision

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

Compaction: If the density of the natural earth under any area of the Roadway is less than that required in Section 2-03.3(14)C, Method B, the Engineer may order the Contractor to perform any or all of the following.

2-03.3(7)C      CONTRACTOR-PROVIDED DISPOSAL SITE      Supplement

If, during the course of this project, it becomes necessary to dispose of either excess or unsuitable materials, the additional following requirements shall be observed:

In no case shall any waste materials be disposed of on any site within the City limits of Auburn unless the Contractor has a valid Grading (Fill) Permit according to Section 1-07.5(5) (City of Auburn Requirements) in this document;

Grading (Fill) Permits are issued by the City of Auburn after all conditions have been met to the satisfaction of the City;

The Grading Permits are issued to the legal owner of the property. Any questions regarding the requirements should be directed to the City of Auburn Permit Center;

Any waste material disposed of outside the City limits of Auburn shall be at Contractor risk. The Contractor is responsible to ensure that said Contractor has complied with all local codes and ordinances;

2-03.3(14)      EMBANKMENT CONSTRUCTION      Supplement

Embankments shall be constructed in compacted layers of uniform thickness by Method C of Section 2-03.3(14)C (Compacting Earth Embankments).

2-03.3(14)E      UNSUITABLE FOUNDATION EXCAVATION      Supplement

Where the Engineer deems subgrade material to be unsatisfactory, excavation of such unsuitable foundation will be required to such depths as the Engineer may direct. "Unsuitable Foundation Excavation" may include areas where the Contractor has completed work, and is required to return and remove unsatisfactory material, or where the additional

depth requires special equipment because of the presence of shallow utilities or other unforeseen conditions.

The unsuitable excavated material shall be replaced with roadway excavation or “Gravel Borrow” as directed by the Engineer and compacted in layers of uniform thickness by Method C of Section 2-03.3(14)C (Compacting Earth Embankments).

Any over excavation not specifically authorized by the Engineer shall be replaced with “Gravel Borrow,” per Section 2-03.3(14)J, and compacted by the Contractor as specified above.

2-03.3(14)M EXCAVATION OF CHANNELS Revision

*(January 7, 2008 WSDOT Amendment)*

This section including title is revised to read:

2-03.3(14)M EXCAVATION OF CHANNELS AND DITCHES

Channel Excavation: Open excavations 8-feet or more wide at the bottom, but excludes channels that are part of the Roadway.

Ditch Excavation: Open excavations less than 8-feet wide at the bottom, but excludes ditches that are part of the Roadway.

Before excavating channels or ditches, the Contractor shall clear and grub the area in accordance with Section 2-01.

**2-06 SUBGRADE PREPARATION**

2-06.3(1) SUBGRADE FOR SURFACING Supplement

Before placing ballast, subgrade shall be shaped to conform to the “typical cross-section” and as directed by the Engineer. Adequate water shall be spread on the subgrade to obtain optimum moisture content for compaction, as directed by the Engineer. The subgrade shall be graded to a uniform cross-section true to line and grade before placing base material.

**2-07 WATERING**

2-07.3 CONSTRUCTION REQUIREMENTS Supplement

When the Engineer determines that dust is a problem, the Contractor shall water to control the dust in accordance with Section 1-07.23(1) (Construction under Traffic), Item 6 of, “When traffic must pass through grading areas”. All means to disperse water shall be supplied by the Contractor. The Contractor shall have a water truck available for watering.

2-07.4      MEASUREMENT

Supplement

“Water” will be measured by the one thousand (1,000) gallons (Mgal) unit. Conversion from cubic feet will be:

$$\text{Mgal} = \frac{\text{cu. ft.} \times 7.48}{1,000}$$

2-07.4(1)      WATER FROM CITY HYDRANTS

New Section

The Contractor shall obtain a Fire Hydrant Permit from the City of Auburn Permit Center (25 West Main Street) before taking of water from hydrants. Water will be furnished by the City from the fire hydrant to be designated at the time a Fire Hydrant Permit is obtained and in accordance with the terms of the Fire Hydrant Permit. To obtain a Fire Hydrant Permit the applicant shall make a deposit of \$1,449.00 which covers the use of a water meter, hydrant wrench, brass adapter and hydrant gate valve, and is refundable if returned in acceptable condition. When the meter, hydrant wrench, and gate valve are returned in acceptable condition, the final charge for water usage will be deducted from the \$1,449.00 deposit and the balance refunded to or paid by the applicant. The applicant shall pay a base fee of \$31.00 per month and all water usage will be paid by the applicant at the rate of \$2.15 per hundred cubic feet. Meters will be read and billed monthly.

**NOTE:** These are current 2009 rates and may be revised periodically. The Contractor shall be responsible to contact the City and verify these rates.

The Contractor shall furnish all required equipment and material necessary for transporting the water from the hydrant, including gauges for testing (except the meter, wrench and valve as stated above).

**2-09 STRUCTURE EXCAVATION**

2-09.3(3)D      SHORING AND COFFERDAMS

Supplement

Providing “Shoring or Extra Excavation Class B” and all aspects involved therein shall be the sole responsibility of the Contractor. All trenches greater than 4 feet deep shall be shored. Shoring shall comply with Chapter 296-155 WAC and Chapter 49.17 RCW of the Washington Safety and Health Act. Extra Excavation Class B will be allowed only with the approval of the Engineer.

See also appropriate sections of Division 7 (Drainage Structures, Storm Sewers, Sanitary Sewers, and Conduits) for trenching and backfilling.

END OF DIVISION 2

**DIVISION 3: PRODUCTION FROM QUARRY AND PIT SITES, AND STOCK PILING**

**3-01 PRODUCTION FROM QUARRY AND PIT SITES**

3-01.4            CONTRACTOR FURNISHED MATERIAL SOURCES            Supplement

No source has been provided for any materials necessary for the construction of this improvement.

If the sources of materials provided by the Contractor necessitate hauling over roads other than City streets, the Contractor shall make all arrangements for use of the haul routes at no cost to the City.

END OF DIVISION 3

**NO REVISIONS**

END OF DIVISION 4

**5-02 BITUMINOUS SURFACE TREATMENT**

5-02.3(12) NON-WOVEN FABRIC FOR PAVEMENT OVERLAYS New Section

“Non-woven Fabric” shall be placed as shown in the plans, or as directed by the Engineer.

Materials

Asphalt Binder PG 64-22 per Section 9-02 (Bituminous Materials). All cost associated with Asphalt Cement shall be considered incidental to the unit contract price for Non-Woven Fabric.

Fabric: Non-woven polypropylene material.

Elastic Recovery, at 15 pounds wet or dry	100%
Weight	3 to 5 oz./square yard
Tensile Strength, either direction	80 pounds minimum
Elongation	50% minimum
Asphalt Retention	0.2 gallons/square yard minimum
Melting Point	300 degrees or greater
Minimum Width	75 inches

Equipment Requirements

All equipment, tools, and machines are subject to the approval of the Engineer.

Surface cleaning equipment shall be capable of removing oil, grease, and other objectionable materials from the pavement surface.

Application equipment shall consist of brooms and distributor. The distributor shall have a capacity of not less than 1,000 gallons. Asphalt shall be uniformly applied at the specified rate.

The distributor shall be equipped with a 10-foot spray bar and extensions, pressure pump and gauge, volume gauge located to be easily read by an inspector from the ground, a tachometer to accurately control the speed and spread of the asphalt, and two thermometers indicating continuous asphalt temperatures, (one of which is permanently installed).

An independent power unit developing a minimum of 25-psi pressure at the spray bar shall supply power for the pressure pump.

Surface Preparation

The pavement surface shall be dry and free of all foreign materials such as dirt, grease, oil, etc. Cracks shall be filled per Section 5-04.3(5)C (Crack Sealing). Holes shall be repaired per Section 5-04.3(5)E (Pavement Repair).

Where existing ACP depths are 2 inches or less, soil residual herbicide shall be applied to the roadway surface per Section 5-04.3(5)D (Soil Residual Herbicide).

#### Asphalt Application

The asphalt, with a minimum temperature of 290 degrees F, shall be sprayed uniformly at the rate of 0.25 to 0.30 gallons per square yard over the area to be fabric covered. The Contractor shall shield the preceding application to avoid laps and ridges where separate applications of asphalt meet. In inaccessible areas asphalt application may be provided by a suitable hand sprayer.

#### Fabric Application

The Contractor shall not begin fabric application until the Engineer has determined that all materials, equipment, and labor are ready.

Fabric cannot be moved once placed, therefore, the initial alignment is very important. If alignment is to be changed, the fabric shall be cut and realigned with an overlapping joint a minimum of 6 inches in the direction of traffic. Fabric shall be also lapped a minimum of 6 inches at transverse and longitudinal fabric joints. The lapped top 6 inches of fabric shall be folded back and asphalt shall be applied to the bottom fabric at the rate of 0.05 gallons per square yard. The top fabric shall be immediately replaced and the joint shall be broomed and squeegeed to form a smooth, tight lapjoint.

The fabric shall be broomed into the asphalt eliminating all air bubbles. Air bubble removal can be best accomplished by brooming from the center of the fabric toward the outer edges.

#### Weather Limitations

Work shall only be done during dry conditions above 60 degrees F.

#### Membrane Curing

The entire surface of the fabric shall be pneumatically rolled until the fabric is well embedded into the asphalt.

#### Asphalt Concrete Overlay

The asphalt concrete overlay shall immediately follow the fabric installation in accordance with Section 5-04 (Hot Mix Asphalt (HMA)).

The fabric manufacturer's recommendations and requirements regarding asphalt temperature, protection of fabric, rolling temperature and techniques, etc., shall be followed.

A representative of the manufacturer shall be on the project at the beginning of fabric placement. The representative shall remain on the site until the Contractor has demonstrated to the Engineer that he has the understanding required to satisfactorily perform the work.

The Contractor shall not place more fabric than can be overlaid in the same day.

No fabric, except that which is required for normal lapped joints, shall be exposed to traffic. If traffic must drive on the fabric, the fabric shall be dusted with sand to prevent vehicles from picking up the asphalt. Before resuming asphalt overlay, the sand shall be swept clean from the fabric.

**5-04 HOT MIX ASPHALT**

**Replacement**

Delete Section 5-04 in its entirety and replace it with the following:

5-04.1 DESCRIPTION

This work shall consist of providing and placing one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans.

HMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

HMA Class A, Class B, Class B Modified, Class D, Class F, and Class G are designated as leveling or wearing courses. HMA Class E is designated as a pavement base course. With the exception of HMA Class D, all mixtures are considered dense graded HMA.

5-04.2 MATERIALS

Materials shall meet the requirements of the following sections:

Asphalt Binder (PG 64-22)	9-02.1(4)
Cationic Emulsified Asphalt	9-02.1(6)
Anti-Stripping Additive	9-02.4
Aggregates	5-04.3(8)A2
Blending Sand	9-03.8(4)
Mineral Filler	9-03.8(5)

The Contractor shall be required to furnish such materials in the amounts required for the designated mix. Mineral materials include coarse and fine aggregates, blending sand, and mineral filler.

The Contractor shall have the option of utilizing recycled asphalt pavement (RAP) in the amount up to 20 percent of total aggregate weight in combination with new aggregate in the

production of HMA. The RAP may be from HMA removed under the contract, if any, or old HMA from an existing stockpile. Recycled materials shall not be used in HMA Class D.

The grade of asphalt binder shall be as required by the contract. Prior to the submittal of the mix design, the Contractor shall provide a written designation of the grade of performance grade (PG) asphalt binder to be used. The Contractor may propose the substitution of alternate grades of PG asphalt binder at no cost to the Contracting Agency. The proposal will be approved if the proposed alternate asphalt binder has an average 7-day maximum pavement design temperature that is equal to or higher than the specified asphalt binder and has a minimum pavement design temperature that is equal to or lower than the specified asphalt binder. The substituted alternate grade of asphalt binder shall be used in all HMA contract items of the same class and originally specified grade of asphalt binder. Blending of asphalt binder from different sources is not permitted.

Production of aggregates shall comply with the requirements of Section 3-01 (Production from Quarry and Pit Sites).

Preparation of stockpile site, the stockpiling of aggregates and the removal of aggregates from stockpiles shall comply with the requirements of Section 3-02 (Stockpiling Aggregates).

Tack coat shall be emulsified asphalt grade CSS-1 as specified in Section 9-02.1(6) (Cationic Emulsified Asphalt) and will be used at locations specified, or as directed by the Engineer, and shall be applied in accordance with Section 5-04.3(5)A (Preparation of Existing Surfaces).

5-04.3            CONSTRUCTION REQUIREMENTS

5-04.3(1)        HMA MIXING PLANT

Plants used for the preparation of HMA shall conform to the following requirements:

1.    **Equipment for Preparation of Asphalt Binder.**  
Tanks for the storage of asphalt binder shall be equipped to heat and hold the material at the required temperatures. The heating shall be accomplished by steam coils, electricity, or other approved means so that no flame shall be in contact with the storage tank. The circulating system for the asphalt binder shall be designed to ensure proper and continuous circulation during the operating period. A valve for the purpose of sampling the asphalt binder shall be placed in either the storage tank or in the supply line to the mixer.
  
2.    **Thermometric Equipment.**  
An armored thermometer, capable of detecting temperature ranges expected in the HMA mix, shall be fixed in the asphalt binder feed line at a location near the charging valve at the mixer unit. The thermometer location shall be convenient and safe for access by inspectors.

The plant shall also be equipped with an approved dial-scale thermometer, a mercury actuated thermometer, an electric pyrometer, or another approved thermometric instrument placed at the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates. This device shall be in full view of the plant operator.

**3. Sampling and Testing of Mineral Materials.**

The HMA plant shall be equipped with a mechanical sampler for the sampling of the mineral materials. The mechanical sampler shall meet the requirements of Section 1-05.6 (Inspection of Work and Materials) for crushing and screening operation.

**5-04.3(2) HAULING EQUIPMENT**

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions include (or are forecast to include) during the work shift precipitation or an air temperature less than 45°F, the canvas cover shall be securely attached to protect the HMA.

In order to prevent the HMA mixture from adhering to the hauling equipment, truck beds are to be sprayed with an environmentally benign release agent. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating materials that contaminate or alter the characteristics of the HMA shall not be used. For hopper trucks, the conveyer shall be in operation during the process of applying the release agent.

**5-04.3(3) HOT MIX ASPHALT PAVERS**

HMA pavers shall be self-contained, power-propelled units, provided with an internally-heated vibratory screed or strike-off assembly and shall be capable of spreading and finishing courses of HMA plant mix material in lane widths required by the paving section shown in the Plans.

The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. Extensions will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the primary screed or strike off assembly. Extensions without, augers, vibration and heated screeds shall not be used in the traveled way.

When laying HMA, the paver shall be operated at a uniform forward speed consistent with the plant production rate and roller train capacity to result in a continuous operation. The auger speed and flight gate opening shall be adjusted to coordinate with the operation.

The paver shall be equipped with automatic screed controls with sensors for either or both sides of the paver. The controls shall be capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing automatic signals that operate the screed to maintain the desired grade and transverse slope. The sensor shall be constructed so it will operate from a reference line or a mat referencing device.

The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. The paver shall be equipped with automatic feeder controls, properly adjusted to maintain a uniform depth of material ahead of the screed.

Manual operation of the screed will be permitted in the construction of irregularly shaped and minor areas. These areas include, but are not limited to, gore areas, road approaches, tapers and left-turn channelization.

Reference lines for vertical control may be required. Lines shall be placed on both outer edges of the traveled way of each roadway. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a mat referencing device and a slope control device. When the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. A joint matcher may be used subject to the approval of the Engineer. The reference line may be removed after the completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

The Contractor shall furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Engineer may suspend work as allowed by Section 1-08.6 (Suspension of Work). Any cleaning or solvent type liquids spilled on the pavement shall be thoroughly removed before paving proceeds.

#### 5-04.3(4) ROLLERS

Rollers shall be of the steel wheel, vibratory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of Section 5-04.3(10) (Compaction). The use of equipment that results in crushing of the aggregate will not be

permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results will not be used.

5-04.3(5)      CONDITIONING OF EXISTING SURFACE

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the plans or approved by the Engineer.

Preleveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

5-04.3(5)A    PREPARATION OF EXISTING SURFACES

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. The Contractor shall remove existing pavement markers and lane markers as specified in Section 2-02.3(6) (Remove Raised Pavement Markers) of this document. The Contractor shall remove existing plastic markings as specified in Section 8-22.4 (Measurement) of this document. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA mix and the surface of the patched area shall be leveled and compacted thoroughly.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots. A heavy application of tack coat will be applied to all joints. For roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

Unless otherwise approved by the Engineer, the tack coat shall be CSS-1 emulsified asphalt. The CSS-1 emulsified asphalt may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. The emulsified asphalt shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

5-04.3(5)B    PREPARATION OF UNTREATED ROADWAY

The existing roadway shall be prepared and the roadway primed as provided in Section 5-02.3(2)A (Untreated Surfaces), except that only one application of asphalt and one

application of aggregate, which shall conform to aggregate for HMA Class B as listed in Section 5-04.3(8) (Mixing) or other granular materials approved by the Engineer, will be required. All other provisions of Section 5-02 (Bituminous Surface Treatment) pertaining to new Construction of bituminous surface treatment shall apply, except as hereinafter modified.

Before placement of asphalt on untreated roadway, the Contractor shall apply soil residual herbicides as specified in Section 5-04.3(5)D (Soil Residual Herbicide). Cost shall be incidental to the bid item(s) for asphalt. The prime coat shall be applied over the full length of the project, and HMA shall not be placed until the prime coat has cured for 5 days unless otherwise approved by the Engineer.

Should any holes, breaks, or irregularities develop in the roadway surface after the prime coat has been applied, they shall be patched with HMA, as described in Section 5-04.3(5)A (Preparation of Existing Surfaces), in advance of placing the HMA. The Contractor shall maintain the completed prime coat by blading or brooming with equipment and procedures approved by the Engineer, until the HMA pavement is placed.

After the maintenance, patching or repair work has been completed and immediately prior to placing the HMA, the surface of the prime coat shall be swept clean of all dirt, dust, or other foreign matter.

When the prime coat application is not specified in the Special Provisions or shown in the Plans, the Contractor shall prepare the untreated roadway as described above and shall omit the prime coat treatment. The HMA shall be constructed on the prepared subgrade.

In areas used as turnouts or which will receive heavy service, the Engineer may order a change in the grade to provide a greater depth of pavement.

The Contractor shall prepare untreated shoulders and traffic islands by blading and compacting to provide a sound base for paving and shall omit the prime coat treatment. The HMA shall be constructed on the prepared subgrade.

If the Contractor protects the completed untreated surfacing materials to the degree that the surface meets the requirements of Section 5-02.3(2)A (Untreated Surfaces) at the time of construction of the prime coat or the construction of the pavement if the prime coat is not required, the Contractor will not be required to perform the work specified in Section 5-02.3(2)A (Untreated Surfaces) but shall be compensated for the item of work preparation of untreated roadway.

#### 5-04.3(5)C CRACK SEALING

All cracks and joints ¼-inch and greater in width shall be cleaned with a stiff-bristled broom and compressed air and then shall be filled completely with sand slurry.

The sand slurry shall consist of approximately 20 percent CSS-1 emulsified asphalt, approximately 2 percent Portland cement, water (if required), and the remainder clean U.S. No. 4-0 paving sand. The components shall be thoroughly mixed and then poured into the cracks and joints until full. The following day, any cracks or joints that are not completely filled shall be topped off with additional sand slurry. After the sand slurry is placed, the filler shall be struck off flush with the existing pavement surface and allowed to cure. The HMA overlay shall not be placed until the slurry has fully cured. The requirements of 1-06 will not apply to the Portland cement and paving sand used in the Sand Slurry.

5-04.3(5)D SOIL RESIDUAL HERBICIDE

The Contractor shall apply one application of an approved soil residual herbicide. Paving shall begin within 24 hours after application of the herbicide. Any area that has not been paved within the time limit or that has been rained on, shall be treated again at the Contractor's expense. The herbicide shall be applied uniformly in accordance with the manufacturer's recommendations.

The material to be used shall be registered with the Washington State Department of Agriculture for use under pavement. Before use, the Contractor shall receive approval of the material to be used and the proposed rate of application, from the Engineer. The following information shall be included in the request for approval of the material: Brand name of the material, manufacturer, Environmental Protection Agency (EPA) registration number, material safety data sheet, and proposed rate of application.

5-04.3(5)E PAVEMENT REPAIR

The Contractor shall excavate pavement repair areas and shall backfill these with HMA in accordance with the details shown in the Plans and as marked.

The actual excavation depth may vary to a maximum depth of 1-foot maximum, depending upon where stable foundation material is encountered, as determined by the Engineer.

The minimum width of any pavement repair area shall be 3 feet unless shown otherwise in the Plans. All pavement repair areas shall be sawcut before removal, or shall be removed by a pavement grinder approved by the Engineer.

Asphalt for tack coat shall be required as specified in Section 5-04.3(5)A (Preparation of Existing Surfaces), and shall be applied to all edges of existing pavement in the pavement repair area.

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

Excavated materials will become the property of the Contractor for disposal off the right of way.

The Contractor shall conduct the excavation operations in a manner that will protect the pavement areas not designated to be removed. Pavement not designated to be removed that is damaged as a result of the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Contracting Agency.

Placement of the HMA backfill shall be accomplished in lifts. Each lift shall not exceed 0.35 foot compacted depth. Compaction shall be accomplished by mechanical tamper or a roller as approved by the Engineer.

HMA for pavement repair shall be HMA Class B or as shown in the Plans.

#### 5-04.3(6) HEATING OF ASPHALT BINDER

The temperature of the asphalt binder shall not exceed the maximum recommended by the asphalt binder manufacturer. The asphalt binder shall be heated in a manner that will avoid local variations in heating. The heating method shall provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F.

#### 5-04.3(7) PREPARATION OF AGGREGATES

The aggregates shall be stockpiled according to the requirements of Section 3-02 (Stockpiling Aggregates). Sufficient storage space shall be provided for each size of aggregate. The aggregates shall be removed from stockpile(s) in a manner to ensure a minimum of segregation when being moved to the HMA plant for processing into the final mixture. Different aggregate sizes shall be kept separated until they have been delivered to the HMA plant.

#### 5-04.3(7)A MIX DESIGN

The Contractor shall obtain representative samples from mineral aggregate stockpiles, and blend sand sources to be used for HMA production and submit them for development of a mix design. Sample submittal shall include asphalt binder grade and sources, production mix gradation and combining ratios of mineral aggregate stockpiles and blend sand that will be used in production. This will be the basis for the mix design and job mix formula. The Contractor shall refer to Section 1-06 (Control of Material) for time allowance required for submittal approval. Additional time may be required if the proportions will not make an adequate design as determined by the Engineer, or if the Contractor requests more than one asphalt binder source approval. The Contractor is also advised that production of the HMA shall not commence until the job mix formula has been established. Adjustments to the job mix formula may be made per Basis of Acceptance.

The Contractor shall obtain the Engineer’s approval prior to changing the source of asphalt binder during the production of HMA. Blending of different asphalt binder grades sources will not be permitted.

5-04.3(8) MIXING

After the required amounts of mineral materials and asphalt binder have been introduced into the mixer the HMA shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt binder throughout the mineral materials is ensured.

When discharged, the temperature of the HMA shall not exceed the maximum temperature recommended by the asphalt binder manufacturer. A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Engineer.

Storing or holding of the HMA in approved storage facilities will be permitted during the daily operation but in no event shall the HMA be held for more than 24 hours. HMA held for more than 24 hours after mixing shall be rejected. Rejected HMA shall be disposed of by the Contractor at no expense to the Contracting Agency. The storage facility shall have an accessible device located at the top of the cone or about the third point. The device shall indicate the amount of material in storage. No HMA shall be accepted from the storage facility when the HMA in storage is below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift.

5-04.3(8)A ACCEPTANCE SAMPLING AND TESTING-HMA MIXTURE

1. **General.**

Acceptance of HMA shall be as provided under nonstatistical or commercial evaluation.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores and other nonstructural applications as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer. The proposal quantity of HMA that is accepted by commercial evaluation will be excluded from the quantities used in the determination of statistical and nonstatistical evaluation.

2 **Aggregates.**

A. General Requirements. Aggregates for HMA shall be manufactured from ledge rock, talus, or gravel in accordance with Section 3-01 (Production from Quarry and Pit Sites). The material from which they are made shall meet the following test requirements:

Los Angeles Wear, 500 Revs	30% max
Degradation Factor, Wearing Course	30 min
Degradation Factor, Other Courses	20 min

It shall be uniform in quality, substantially free from wood, roots, bark, extraneous materials, and adherent coatings. The presence of a thin, firmly adhering film of weathered rock will not be considered as coating unless it exists on more than 50% of the surface area of any size between consecutive laboratory sieves.

Aggregate removed from deposits contaminated with various types of wood waste shall be washed, processed, selected or otherwise treated to remove sufficient wood waste so that oven-dried material retained on a U.S. No. 4 sieve shall not contain more than 0.1% by weight of material with a specific gravity less than 1.0.

B. Test Requirements. Aggregate for HMA shall meet the following test requirements:

	<b>Class of HMA</b>						
	<b>A</b>	<b>B</b>	<b>B (Mod)</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Fracture, by weight (See Note)	1	2	2	3	4	4	2
Sand Equivalent Min.	45	45	45	---	45	35	45

<sup>1</sup>The fracture requirements are at least one fractured face on 90 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

<sup>2</sup>The fracture requirements are at least one fractured face on 75 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

<sup>3</sup>The fracture requirements are at least two fractured faces on 75 percent and at least one fractured face on 90 percent of the material retained on each specification sieve, U.S. No. 8 and above, if that sieve retains more than 5 percent of the total sample.

<sup>4</sup>The fracture requirements are at least one fractured face on 50 percent of the material retained on each specification sieve size U.S. No. 10 and above, if that sieve retains more than 5 percent of the total sample.

When material is being produced and stockpiled for use on a specific contract or for a future contract, the fracture and sand equivalent requirements shall apply at the time of stockpiling. When material is used from a stockpile that has not been tested as provided above, the requirements for fracture and sand equivalents shall apply at the time of its introduction to the cold feed of the mixing plant.

The properties of the aggregate in a preliminary mix design for HMA shall be such that, when it is combined within the limits set forth in Proportions of Materials and mixed in the laboratory with the designated grade of asphalt binder, HMA mixtures with the following test values can be produced:

	Class of HMA						
	A	B	B (Mod)	D	E	F	G
Stabilometer Value Min.	37	35	35	---	35	35	35
Cohesimeter Value Min.	100	100	100	---	100	50	100
Percent Air Voids	2-4.5	2-4.5	2-4.5	---	2-4.5	2-4.5	2-4.5
Modified Lottman Stripping Test	Pass	Pass	Pass	Pass	Pass	Pass	Pass

- C. Gradation. The materials of which HMA is composed shall be of such sizes, gradings, and quantities that, when proportioned and mixed together, they will produce a well graded mixture within the requirements listed in the table which follows.

The percentage of aggregate refers to completed dry mix, and includes mineral filler when used.

Sieve Size	Grading Requirements					
	Class A and B	Class B (Modified)	Class D	Class E	Class F	Class G
	Percent Passing					
1 1/4 square	---	---	---	100	---	---
1 square	---	---	---	90-100	---	---
3/4 square	100	100	---	---	100	---
5/8 square	---	---	---	67-86	---	---
1/2 square	90-100	90-100	100	60-80	80-100	100
3/8 square	75-90	75-90	97-100	---	---	97-100
1/4 square	---	55-75	---	---	---	---
U.S. No. 4	46-66	---	30-50	34-56	38-70	50-78
U.S. No. 8	---	---	5-15	---	---	---
U.S. No. 10	30-42	25-35	---	25-40	30-50	32-53
U.S. No. 40	11-24	8-16	---	10-23	---	11-24
U.S. No. 200	3.0-7.0	3-7	2.0-5.0	2.0-9.0	2.0-8.0	3.0-7.0

5-04.3(8)B BASIS OF ACCEPTANCE

1. HMA will be accepted based on its conformance to the project Job Mix Formula (JMF). For the determination of a project JMF, the Contractor shall submit to the Engineer, representative samples of the various aggregates and blend sand to be used along with the gradation data showing the various aggregate stockpile averages and the proposed combining ratios and the average gradation of the completed mix. Based on this submittal from the Contractor, the Engineer will determine the asphalt binder content, anti-strip requirement, and ignition furnace correction factor in the mix design process. Using the representative samples submitted and proposed proportion of each, trial mix tests will be run to determine the percentage of asphalt binder, by weight, to be added. The JMF thus established shall be changed only upon order of the Engineer.

The intermingling of HMA mixtures produced from more than one JMF is prohibited. Each strip of HMA pavement placed during a working shift shall conform to a single job mix formula established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

No HMA shall be produced for use on the project until the amount of asphalt binder and anti-strip additive to be added has been established.

2. Job Mix Formula — Statistical Acceptance

The average gradation of the completed HMA mix submitted by the Contractor in the mix design proposal, as required in Gradation and the resulting Mix Design Recommendations, shall be the JMF. Any change or adjustment of percentages in any constituent of the JMF creates a new JMF.

3. Job Mix Formula Tolerances and Adjustments

A. Tolerances — Statistical Acceptance. After the JMF is determined, the several constituents of the mixture at the time of acceptance shall conform to the following tolerances:

<b>Constituent of Mixture</b>	<b>Tolerance Limits</b>
	The tolerance limit for each mix constituent shall not exceed the broad band specification limits specified in 5-04.3(8)C except the tolerance limits for sieves designated as 100% passing will be 99-100.
Aggregate passing 1", 3/4", 5/8", 1/2", and 3/8" sieves	Broad band specification limits Section 5-04.3(8)C
Proportions of Materials	
Aggregate passing No. 4 sieve	± 6%
Aggregate passing No. 10 sieve	± 5%
Aggregate passing No. 40 sieve	± 4%
Aggregate passing No. 200 sieve	± 2.0%
Asphalt cement	± 0.5%

For open graded mix: Tolerance limits shall be for aggregate gradation only and shall be as specified in Proportions of Materials.

B. Tolerances — Nonstatistical Acceptance. After the JMF is determined, the constituents of the mixture at the time of acceptance shall conform to the range of

the proportion specified in the broad band specifications in for gradation and the design mix asphalt binder content plus or minus 0.7 percent.

C. Adjustments

1. **Aggregates.** Upon written request from the Contractor, the Engineer may approve field adjustments to the JMF including the Contractor's proposed combining ratios for mineral aggregate stockpiles and blend sand. The maximum allowed gradation change shall be 2 percent for the aggregate retained on the No. 10 sieve and above, 1 percent for the aggregate passing the No. 10 and No. 40 sieves, and 0.5 percent for the aggregate passing the No. 200 sieve. Blend sand may be changed a maximum of 5 percent. The above adjustments and/or any further adjustments as ordered by the Engineer will be considered as a new JMF. Adjustments beyond these limits will require development of a new JMF. The adjusted JMF plus or minus the allowed tolerances shall be within the range of the broad band specifications.
2. **Asphalt Binder Content.** The Engineer may order or approve the Contractor's request to change asphalt binder content a maximum of 0.3 percent from the approved JMF. No field adjustments of the JMF relative to the asphalt binder content exceeding 0.3 percent from the initial JMF will be made without the approval of the Engineer.

- D. **Commercial HMA Acceptance.** The contractor shall submit a certification that the mix design submitted meets the requirements of Proportions of Materials. Verification of the mix design by the Contracting Agency is not required. The Engineer will determine anti-strip requirements for the HMA.

4. Hot Mix Asphalt Mixture

A. Sampling

1. A sample will not be obtained from either the first or last 25 tons of mix produced in each production shift.
2. Samples for compliance of gradation and asphalt binder content will be obtained on a random basis from the hauling vehicle. The Contractor shall provide adequate platforms to enable samples to be obtained in accordance with WAQTC FOP for AASHTO T 168. The platforms shall allow the sample to be taken without the Engineer entering the hauling vehicle.

- B. **Definition of Sampling Lot and Sublot.** For the purpose of acceptance sampling and testing, a lot is defined as the total quantity of material or work produced for each Job Mix Formula (JMF), placed and represented by randomly selected samples tested for acceptance. All of the test results obtained from the acceptance

samples shall be evaluated collectively and shall constitute a lot. Only one lot per JMF will be expected to occur. The JMF is defined in Basis of Acceptance.

The Contractor may request a change in the JMF. If the request is approved, all of the material produced up to the time of the change will be evaluated on the basis of available tests and a new lot will begin. The quantity represented by each sample will constitute a subplot. Sampling and testing for statistical evaluation shall be performed on a random basis at the frequency of one sample per subplot, with a minimum of five sublots per class of HMA. Sublot size shall be determined to the nearest 100 tons to provide not less than five uniform sized sublots, based on proposal quantities, with a maximum subplot size of 800 tons.

Sampling and testing for nonstatistical evaluation shall be performed on a random basis at a minimum frequency of one sample for each subplot of 400 tons or each day's production, whichever is least. When proposal quantities exceed 1,200 tons for a class of HMA under nonstatistical evaluation, subplot size shall be determined to the nearest 100 tons to provide not less than three uniform sized sublots, based on proposal quantities, with a maximum subplot size of 800 tons.

- C. Test Results. The Engineer will furnish the Contractor with a copy of the results of all acceptance testing performed in the field at the beginning of the next paving shift. The Engineer will also provide the Composite Pay Factor (CPF) of the completed sublots after three sublots have been produced. The CPF will be provided by the midpoint of the next paving shift after sampling.

Individual acceptance sample test results (gradation and asphalt binder content) may be challenged by the Contractor. A written challenge of the test results by the Contractor shall be received by the Engineer within five working days after receipt of the specific test results. A split of the original acceptance sample shall be sent, for testing, to the City's testing laboratory as determined by the Engineer. The challenged sample will not be tested with the same equipment or by the same tester that ran the original acceptance sample. The challenge sample will be tested for a complete gradation analysis and asphalt binder content.

The results of the challenge sample will be compared to the original results of the acceptance sample test and evaluated according to the following criteria:

<b>Deviation</b>	
No. 4 sieve and larger	±4 percent
No. 6 sieve to No. 80 sieve	±2 percent
No. 100 and No. 200 sieve	±0.4 percent
Asphalt binder %	±0.3 percent

If the deviation of the challenge sample is within each parameter established, the acceptance sample will be used to determine to composite pay factor and the cost

of testing will be deducted from any monies due or that may come due the Contractor under the contract, at the rate of \$250 per test.

If the deviation of the challenge sample is outside of any one parameter established, the challenge sample will be used to determine the composite pay factor and the cost of testing will be the Contracting Agency's responsibility.

- D. Test Methods. Acceptance testing for compliance of asphalt binder content will be WSDOT FOP for AASHTO Test Method T 308.

Acceptance testing for compliance of gradation will be WAQTC FOP for AASHTO T 27&T11.

- E. Reject Mixture

1. Rejection by Contractor. The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material at no expense to the Contracting Agency. Any such new material will be sampled, tested, and evaluated for acceptance.
2. Rejection Without Testing. The Engineer may, without sampling, reject any batch, load, or section of roadway that appears defective in gradation or asphalt binder content. Material rejected before placement shall not be incorporated into the pavement. Any rejected section of roadway shall be removed.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests that the rejected material be tested. If the contractor elects to have the rejected material tested, a minimum of three representative samples will be obtained and tested. Acceptance of rejected material will be based on conformance with the statistical acceptance specification. If the material does not meet specifications, then the cost of retesting will be the responsibility of the Contractor.

3. A Partial Sublot. In addition to the preceding random acceptance sampling and testing, the Engineer may also isolate from a normal subplot any material that is suspected of being defective in gradation or asphalt binder content. Such isolated material will not include an original sample location. A minimum of three random samples of the suspect material will be obtained and tested. This material will be considered a separate lot.
4. An Entire Sublot. If an entire subplot is rejected in accordance with Section 1-06.2 (Acceptance of Materials), four additional random samples from this subplot will be obtained and the subplot evaluated as an independent lot with the

original test result included as a fifth test with the new independent lot instead of with the original lot.

- 5. A Lot in Progress. The Contractor shall shut down operations and shall not resume HMA placement until such time as the Engineer is satisfied that specification material can be produced.

5-04.3(9) SPREADING AND FINISHING

The HMA shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) (Hot Mix Asphalt Pavers) shall be used to distribute the HMA mixture. Unless otherwise directed by the Engineer or specified in the Plans or in these Special Provisions, the nominal compacted depth of any layer of any course shall not exceed the following depths:

HMA Class E	0.35 foot
HMA Class A and B when used for Base Course	0.35 foot
HMA Class A, B, B (Modified), and F	0.25 foot
HMA Class G	0.10 foot
HMA Class D	0.08 foot

In all instances, wearing courses of 3 inches or greater shall be created using a maximum depth of 1 ½-inch lifts.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, the material produced for each JMF, shall be placed by separate spreading and compacting equipment.

5-04.3(10) COMPACTION

5-04.3(10)A GENERAL

Immediately after the HMA mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, or irregularities and in conformance with the line, grade, and cross-section shown in the Plans or as established by the Engineer. If necessary, the mix design may be altered to achieve desired results, with the approval of the engineer.

Compaction shall take place when the HMA is in the proper condition so that no undue displacement, cracking, or shoving occurs. All compaction units shall be operated at the

speed, within specification limits, that will produce the required compaction. Areas inaccessible to large compaction equipment shall be compacted by mechanical or hand tampers. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt binder, or is in any way defective, shall be removed and replaced at no additional cost with fresh HMA which shall be immediately compacted to conform with the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided specification densities are attained. An exception shall be that the pneumatic tired roller shall be used between October 1 and April 1. Coverage's with a vibratory or steel wheel roller may precede pneumatic tired rolling. When HMA Class D is being constructed, the use of pneumatic rollers will not be required.

Vibratory rollers shall not be operated in the vibratory mode when the internal temperature of the HMA is less than 175°F without permission of the Engineer. In no case shall a vibratory roller be operated in a vibratory mode when checking or cracking of the mat occurs at a greater temperature. Vibratory rollers in the vibratory mode are also prohibited on bridge decks.

#### 5-04.3(10)B CONTROL

HMA Classes A, B, B Modified, E, and F used in traffic lanes, including lanes for ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10 foot, shall be compacted to a specified level of relative density. The specified level of relative density shall be a minimum of 91.0 percent of the reference maximum density as determined by WSDOT FOP for AASHTO T 209. The reference maximum density shall be determined as the moving average of the most recent five determinations for the lot of HMA being placed. The specified level of density attained will be determined by the statistical evaluation of five nuclear density gauge tests taken in accordance with WAQTC FOP TM 8 and WSDOT SOP T 729 on the day the HMA is placed (after completion of the finish rolling) at locations determined by the stratified random sampling procedure conforming to WSDOT Test Method 716 within each density lot. The quantity represented by each density lot will be no greater than a single day's production or 400 tons, whichever is less. The final lot for each day of paving may be increased to 600 tons.

The Engineer will furnish the Contractor with a copy of the results of all acceptance testing performed within one working day. Acceptance of pavement compaction will be based on the statistical or non-statistical evaluation as determined by the Engineer.

At the start of paving, the Contractor must demonstrate to the Engineer that the HMA is compactable by constructing compaction test section(s). Test section(s) shall be constructed using the compaction train and a variety of rolling patterns that the Contractor expects to use in the paving operation. A test section will be considered to have established compatibility, based on the results of three density determinations, when the average of the three tests exceeds 92 percent of Rice or when all three tests individually exceed 91 percent of Rice. This will require consideration of the presence of a correlation factor for the nuclear gauge

and may require final resolution after the factor for the gauge is known. When construction of the test section(s) has demonstrated that the HMA is not compactable, paving must stop. To resume paving, all factors contributing to compaction shall be analyzed and Engineer approved changes made, which may require a new mix design. When paving is resumed, the Contractor must again, as previously defined, demonstrate that the HMA is compactable. If the Contractor does not construct test section(s), the HMA is considered compactable and all HMA placed will be evaluated according to these provisions.

HMA Class A, B, B Modified, E, F, and G constructed under conditions other than listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA Class D and preleveling HMA shall be compacted to the satisfaction of the Engineer.

In addition to the randomly selected locations for tests of the density, the Engineer may also isolate from a normal lot any area that is suspected of being defective in relative density. Such isolated material will not include an original sample location. A minimum of 5 randomly located density tests will be taken. The isolated area will then be evaluated for price adjustment in accordance with the statistical evaluation section, considering it as a separate lot.

#### 5-04.3(11) JOINTS

The Contractor shall conduct operations such that the placing of the top or wearing course is a continuous operation or as close to continuous as possible. Unscheduled transverse joints will be allowed and the roller may pass over the unprotected end of the freshly laid HMA only when the placement of the course must be discontinued for such a length of time that the HMA will cool below compaction temperature. When the work is resumed, the previously compacted HMA shall be cut back to produce a slightly beveled edge for the full thickness of the course.

Where a scheduled transverse joint or when an unscheduled joint that must be left in place after a workshift is being made in the wearing course, strips of heavy wrapping paper shall be used. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course prior to resumption of paving. When the transverse joint will be open to traffic a temporary wedge of HMA shall be constructed 50H:1V or flatter. The material that is cut away shall be wasted and new HMA shall be laid against the fresh cut. Rollers or tamping irons shall be used to seal the joint.

The longitudinal joint in any one course shall be offset from the course immediately below by not more than 6 inches nor less than 2 inches. All longitudinal joints constructed in the wearing course shall be located at a lane line or an edge line of the traveled way.

If a hot-lap joint is allowed, two paving machines shall be used; a minimum compacted density in accordance with Section 5-04.3(10)B (Control) shall be achieved throughout the traffic lane; and construction equipment other than rollers shall not operate on any uncompacted HMA.

When HMA is placed adjacent to cement concrete pavement, the Contractor shall construct longitudinal joints between the HMA and the cement concrete pavement. The joint shall be sawed to the dimensions shown on Standard Plan A-40.10-00 and filled with joint sealant meeting the requirements of Section 9-04.2 (Joint Sealants).

5-04.3(12) VACANT

5-04.3(13) SURFACE SMOOTHNESS

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than 1/8-inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than 1/4-inch in 10-feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

1. Removal of material from high places by grinding with an approved grinding machine, or
2. Removal and replacement of the wearing course of HMA, or
3. By other method approved by the Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

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

When utility appurtenances such as manhole covers and valve boxes are located in the traveled way, the roadway shall be paved before the utility appurtenances are adjusted to the finished grade.

**5-04.3(14) PLANING BITUMINOUS PAVEMENT**

Planing of the existing pavement shall provide a surface that is slightly grooved or roughened to ensure a bond to the ACP. Planing shall be performed in such a manner that the underlying pavement is not torn, broken, or otherwise damaged by the planing operation. The full depth beginning and end of each lane of planing shall be squared-off to form a uniform, transverse joint. The Contractor shall construct and maintain a temporary asphalt concrete wedge across the entire width of the transverse edge when traffic is allowed on the planed surface prior to paving. The wedge shall be constructed before opening the lane to traffic. The Contractor shall provide for safe vehicle travel over existing manholes, valve boxes, catch basins, etc., for planed areas opened to traffic. Before opening the roadway to traffic, any delaminating of the planed asphalt surface shall be removed and the resulting holes patched with incidental HMA. Also, the surface shall be cleaned by sweeping to remove dust and foreign matter. The Contractor shall remove the temporary asphalt concrete wedge immediately prior to paving.

The planings shall become the property of the Contractor and shall be removed from the right-of-way. The planings may be utilized as RAP, within the requirements of Section 5-04.2 (Materials) or 9-03.21 (Recycled Material). The Contractor shall dispose of all other debris resulting from the planing operation in a Contractor-provided site off the right-of-way.

Planing damage outside the limits shown on the plans, where specified or from Contractor operations shall be repaired by the Contractor at no cost to the City.

For mainline planing operations, the equipment shall have automatic controls, with sensors for either or both sides of the equipment. The controls shall be capable of sensing the proper grade from an outside reference line, or a mat-referencing device. The automatic controls shall also be capable of maintaining the desired transverse slope. The transverse slope controller shall be capable of maintaining the mandrel at the desired slope (expressed as a percentage) within plus or minus 0.1 percent.

Planing tailings may be used as trench backfill. They may also be used as crushed surfacing when mixed with Crushed Surfacing per Section 9-03.9(3) (Crushed Surfacing) per Section 4-04.3(3) (Mixing).

**5-04.3(15) HMA ROAD APPROACH**

HMA approaches shall be constructed at the locations shown in the Plans or as directed by the Engineer. The work shall be performed in accordance with Section 5-04 (Hot Mix Asphalt).

**5-04.3(16) WEATHER LIMITATIONS**

HMA for wearing course shall not be placed on any traveled way between October 1 of any year and April 1 of the following year without written approval from the Engineer.

Asphalt for prime coat shall not be applied when the ground temperature is lower than 50°F, without written permission of the Engineer.

HMA Class D shall not be placed when the air temperature is less than 60°F.

HMA shall not be placed on any wet surface, or when the average surface temperatures are less than those specified in the following table, or when weather conditions otherwise prevent the proper handling or finishing of the HMA mixtures:

<b>Compacted Thickness (Feet)</b>	<b>Surface Temperature Limitations</b>	
	<b>Surface Course</b>	<b>Sub-Surface Courses</b>
Less than 0.10	55 F	55 F
0.10 to 0.20	45 F	35 F
0.21 to 0.35	35 F	35 F
More than 0.35	DNA	25 F*

\*Only on dry subgrade, not frozen and when air temperature is rising.

5-04.3(17) PAVING UNDER TRAFFIC

When the roadway being paved is open to traffic, the following requirements shall apply:

The Contractor shall keep intersections open to traffic at all times except when paving an intersection or paving across an intersection. During such time, and provided that there has been an advance warning to the public, the intersection may be closed for the minimum time required to place and compact the HMA. In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

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

During paving operations, temporary pavement markings shall be maintained throughout the project. Temporary pavement markings shall be installed on the roadway prior to opening to traffic. Temporary pavement markings shall be in accordance with Section 8-23 (Temporary Pavement Markings).

All costs in connection with performing the work in accordance with these requirements, except the cost of temporary pavement markings, shall be included in the unit contract prices for the various bid items involved in the contract.

5-04.3(18) VACANT5-04.3(19) SEALING OF PAVEMENT SURFACES

Where shown in the Plans, the Contractor shall apply a fog seal. Before application of the fog seal all surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. The fog seal shall be CSS-1 or CSS-1h uniformly applied to the pavement free of streaks and bare spots at the rate 0.03 to 0.05 residual gallons per square yard. The emulsified asphalt shall be diluted at a rate of one part water to one part emulsified asphalt unless otherwise directed by the Engineer. The emulsified asphalt shall be applied within the temperature range specified in Section 5-02.3(3) (Application of Asphalt). Unless otherwise approved by the Engineer, the fog seal shall be applied prior to opening to traffic.

5-04.3(20) ANTI-STRIPPING ADDITIVE

When directed by the Engineer, an anti-stripping additive shall be added to the HMA material in accordance with Section 9-02.4 (Anti-Stripping Additive).

5-04.3(21) ASPHALT CONCRETE PAVEMENT BUTT JOINTS

The Contractor shall provide butt joints where the new asphalt concrete pavement meets the existing pavement as shown on the Plans or as directed by the Engineer in a manner to produce a smooth riding connection to the existing pavement. The depth of butt joint required shall be determined by the depth of new asphalt concrete pavement specified on the Plans, but not less than 2 inches. The surface elevation of new and existing Asphalt Concrete Pavement shall be the same at all butt joints.

All asphalt concrete joints shall be sealed with asphalt binder PG 64-22 per Section 9-02 (Bituminous Materials) or as directed by the Engineer.

5-04.3(22) ASPHALT COLD PATCH

“Asphalt Cold Patch Mix” for temporary pavement patching shall be placed by the Contractor immediately upon the request of Engineer as required for maintenance of traffic as specified in Section 1-07.23(1) (Construction Under Traffic) in this document. “The Asphalt Cold Patch Mix” shall be removed in its entirety before asphalt concrete pavement is placed.

5-04.3(23) INCIDENTAL HMA

“Incidental HMA” shall be HMA Class B unless otherwise specified on the Plans, and the work shall consist of restoration and adjustment to paved areas, including driveway approaches, asphalt ramps, patching around utility structures, patching utility trenches, and as directed by the Engineer.

**SECTION 5-05, CEMENT CONCRETE PAVEMENT**

**5-05 CEMENT CONCRETE PAVEMENT**

5-05.3(1) CONCRETE MIX DESIGN FOR PAVING

Supplement

**Proportioning of Concrete**

- A. The Contractor shall design the concrete mix determining the proportions of Portland cement, coarse and fine aggregate, and water necessary to produce a workable concrete meeting the following requirements:
  - (1) A compressive strength of 5,000 psi at 28 days.
  - (2) A maximum slump of 3 inches for fixed form paving and 2 ½ inches for slip form paving.
  - (3) If air-entrained concrete is used, the mix shall contain not more than 6 percent entrained air as determined by AASHTO T 152.
  
- B. The Contractor shall design the mix on the basis of an absolute volume method such as outlined in the American Concrete Institute (ACI) Standard 211.1, “Recommended Practice for Selecting Proportions for Normal Weight Concrete”.
  
- C. Water reducing, set retarding or superplasticizer chemical admixtures may be used at the option of the Contractor but subject to approval by the Engineer. The Contractor shall indicate in advance the particular type and name product of admixtures that he proposes to use and only such admixtures approved by the Engineer may be incorporated into the concrete mix. Admixtures selected for use shall be compatible with all other components of the concrete. The use of calcium chloride as an admixture will not be permitted.
  
- D. The Contractor shall submit for the record, not later than 15 days prior to the start of paving operations, the proposed mix design including the aggregates grading to be used. The submission shall be accompanied with certified laboratory reports on the tests performed on the trial mixes. In the event that the concrete mix designed by the Contractor does not produce concrete of the specified strength and workability, the Contractor shall adjust the mix as required to meet the specified requirements and shall submit new certified test results.
  
- E. In the event the Contractor elects to use an air-entraining admixture, he shall determine by trials the amount of the selected admixture that will produce concrete having the desired air content and the amount shall not be varied except as approved by the Engineer. The admixture shall be added during batching at the plant in accordance with the admixture manufacturer’s recommendations.
  
- F. The Contractor shall determine the proportions and batch weights for air-entrained concrete in the same manner as for regular concrete provided, however, that in making such adjustments as may be necessary by reason of air-entrainment, the minimum

quantity of fine aggregate and the minimum quantity of water shall be used which will provide concrete of the required workability.

- G. Whenever the Contractor modifies the concrete mix, other than minor adjustments in the relative quantities of fine and coarse aggregates, he shall submit copy of the new mix design, together with certified copies of tests results, to the Engineer.
- H. No change in the sources or character of the materials shall be made without due notice to the Engineer. No new materials shall be used until approved by the Engineer and until new trial mixes have been designed, tested and accepted.

5-05.3(7) PLACING, SPREADING, AND COMPACTING CONCRETE Revision

The second paragraph is revised to read:

The average density of the cores shall be at least 97 percent of the approved mix design density or the actual concrete density when determined by the Contractor using AASHTO T 121 with no cores having a density of less than 96 percent.

5-05.3(8) JOINTS Revision

The first paragraph is revised to read:

Transverse and longitudinal joints shall be contraction or through joints (including construction joints). Joints shall be constructed in accordance with Standard Detail Traffic-35B and shall be of the type and at the locations indicated on the Plans. The faces of all joints shall be constructed perpendicular to the surface of the cement concrete pavement.

5-05.3(8)C THROUGH JOINTS Replacement

5-05.3(8)C1 ISOLATION JOINTS New Section

Isolation joints are placed only where shown on the Plans. The joint alignment shall be at right angles to the Pavement Structure centerline unless otherwise specified in the Contract Documents.

Longitudinal isolation joints shall be constructed with premolded material, 1/2-inch in thickness and conform to Section 9-04.1(2) (Premolded Joint Filler for Expansion Joints). They shall extend from 1 inch below the bottom of pavement to 3/4 inch below the top of pavement.

The joint material shall be held accurately in place during the placing and finishing of the concrete by a bulkhead, a holder, metal cap or any other approved method. The joint shall be perpendicular to the paved surface and the holder shall be in place long enough to prevent sagging of the joint material.

A wood filler strip or metal cap shall be placed on the top of the premolded joint filler to form the groove 3/4 inch deep, and shall remain in place until after the finishing and the concrete is sufficiently set to resist sloughing in the groove. The joint filler shall be stapled together at the ends to preserve continuity.

Immediately after removal of side forms, the edges of the pavement shall be carefully inspected and wherever the joint filler is not fully exposed, the concrete shall be chipped down until the edge of the filler is fully exposed for the entire depth.

5-05.3(8)C2 CONSTRUCTION JOINTS

New Section

When placing of concrete is discontinued for more than 45 minutes, a transverse construction joint shall be installed. Construction joints shall be as shown in the WSDOT Standard Plan A-40.10-00

Transverse construction joints shall be constructed between cement concrete pavement and reinforced concrete bridge slabs.

All transverse and longitudinal construction joints, including the joint between new and existing pavement when widened, shall be sawed and sealed with joint filler conforming to the requirements of Sections 5-05.3(8A) (Joints) and 9-04.2 (Joint Sealants).

5-05.3(8)C3 SEALING THROUGH JOINTS

New Section

After the pavement is cured and before carrying any traffic, the space left by the removal of the wood filler strip or the metal cap above the top of the expansion joint filler strip shall be thoroughly cleaned of all loose material. The 3/4 inch wide groove shall be completely free of any projecting concrete from the sides and the groove shall be continuous across the slab to each edge. It shall then be filled level with the pavement surface with joint sealant meeting the requirements of Section 9-04.2 (Joint Sealants).

The joint sealant material shall be heated and placed in accordance with the manufacturer's instructions. Burned material will be rejected. The through joint groove shall be dry at the time of pouring the sealing compound.

5-05.3(9) CEMENT CONCRETE CURB ON NEW PAVEMENT

New Section

Doweled curb on new pavement shall be constructed as shown in the Plans.

The pavement width shall be extended to the back of the curb. The pavement where the curb is to be placed shall be roughened or otherwise treated so that a permanent bond can be secured between the curb and the pavement. Curing compound shall not be used on the pavement where the curb is to be constructed.

Curb shall be constructed in accordance with Section 8-04.3(1) (Cement Concrete Curbs, Gutters and Spillways) and the Contract Plans.

5-05.3(10) TIE BARS AND DOWEL BARS Revision/Supplement

The first paragraph is revised to read:

Epoxy-coated tie bars shall be placed at all longitudinal contraction and construction joints, in accordance with the requirements shown in the Plans. In addition, epoxy-coated dowel bars shall be installed when concrete curbs are constructed on top of concrete pavement in accordance with the requirements shown in the Plans.

Curb dowels shall be placed at 28 inches on center in the fresh concrete pavement. Curb dowels shall be placed in all segments of curbing that is full depth and shall be placed in transition areas for curb cuts in which a minimum of 1 inch of cover from the top of the finished curb can be achieved.

Dowel bars shall be set while the concrete is still plastic enough to not require hammering them into place.

5-05.3(23) CEMENT CONCRETE PAVEMENT FOR ALLEY New Section  
5-05.3(23)A PAVEMENT AND ALLEY REQUIREMENTS New Section

Cement concrete pavement for Alleys shall meet the requirements of Section 5-05 (Cement Concrete Pavement). Alleys shall meet the requirements for driveways in Section 8-06 (Cement Concrete Driveway Entrances).

5-05.3(23)B EXTRA CONCRETE FOR ALLEY APPROACH RAMP New Section

When constructing and finishing cement concrete Alley pavement, the Engineer may in some cases require the Contractor to place additional concrete over the surface of the Alley pavement to serve as an integral ramp or vehicular access to abutting private property. Such extra concrete shall be placed and finished to the additional thickness directed by the Engineer. Additional thickness for such ramps shall not exceed 6 inches above the original planned concrete surface at any point.

**5-06 TEXTURED ASPHALT**

New Section

5-06.1 DESCRIPTION

This work consists of texturing and coloring asphalt concrete pavement in areas indicated on the Contract Drawings. Work includes imprinting the hot mix asphalt surface with a textured finish, and coating the finish surface with a colored epoxy material. All imprinting work shall be performed by an Authorized StreetPrint Applicator or substituted in its entirety with an approved equal.

5-06.2 MATERIALS

The following specifications and methods are referenced as part of these Special Provisions.

American Society for Testing and Materials

- 1) ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester
- 2) ASTM D-4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- 3) ASTM D-2697 Standard Test Method for Volume of Nonvolatile Matter in Clear or Pigmented Coatings

5-06.2(1) COATING MATERIAL

The coating material shall be a premium high performance material consisting of epoxy modified acrylic polymers blended with sand and aggregate, "StreetBond SP150E," or an approved equal.

5-06.2(2) COLORANT

The colorant shall be a highly concentrated, high quality, UV stable pigment blend designed to be added to coating material to provide color to the coating. The colorant shall be StreetBond Colorant, with the color "Bedrock," and the same colorant shall be used in each coating layer applied to the asphalt surface. One pint of StreetBond Colorant shall be used with one 5-gallon pail of StreetBond SP150E Coating Material.

5-06.3 CONSTRUCTION REQUIREMENTS

The Contractor shall follow the latest StreetPrint Application Procedures as issued by Integrated Paving Concepts Inc.

5-06.3(1)      TEXTURED ASPHALT TERMS

**Textured Asphalt Pavement** shall be described as “StreetPrint Pavement Texturing”, “StreetPrint”, or approved equivalent pavement on the Contract Plans and documents related to the project.

**Pavement Texturing** is defined as a finishing system, which treats the surface of Hot Mix Asphalt (HMA) by imprinting fully compacted asphalt pavement with “grid style” or other styles of depressions to replicate, in relief, the concrete grout depressions common to hand-laid brick or cobblestone, or any other design as shown on the Plans or described in the specifications, and coating the imprinted asphalt surface using an approved surfacing system. This system shall be the “StreetPrint” system utilizing the “StreetBond HW Surfacing System” or an approved equivalent.

**Imprinting Asphalt Concrete Pavement** is defined as pressing flexible templates into hot, *fully-compact*ed, Asphalt Concrete Pavement to create the appearance of grout lines or patterns in the asphalt surface.

**Surfacing System** is defined as multiple applications of premium coating material, and shall be StreetBond HW Surfacing System applying StreetBond SP150E.

**“Authorized StreetPrint Applicator”** is a contractor licensed by Integrated Paving Concepts Inc., (Tel. 800-688-5652), and shall have a foreman, supervisor or lead hand on site who has successfully completed a StreetPrint Level 1 or Level II Accreditation Training Program.

5-06.3(2)      CERTIFICATION

The contractor shall furnish certification of test results showing that surfacing materials has the following properties:

- 1) Adhesion (PLI) To an Asphalt substrate (ASTM D-4541) Result: Cohesive failure of asphalt prior to adhesive failure.
- 2) Taber Abrasion H-10(Dry Wear Index) (ASTM D-4060). Maximum of 0.98 grams/1000 cycles after 7 days cure.
- 3) Solids by Volume (%) (ASTM D-2697). Minimum = 24 +/-2%.

5-06.3(3)      EQUIPMENT

All equipment, tools, and machines used to perform the work shall be maintained in satisfactory working order at all times. Descriptive information on the surfacing application equipment shall be submitted to the Engineer for approval not less than five (5) days before the work starts.

5-06.3(3)A TEMPLATES

Templates shall be manufactured from flexible, woven wire rope cut and welded into the patterns used for imprinting Asphalt Concrete Pavement.

5-06.3(3)B RECIPROCATING INFRA-RED HEATER

Reciprocating Infra-Red Heater shall be used to apply heat to the asphalt surface in designated areas for imprinting. The heating equipment used shall allow continuous monitoring of the surface temperature to ensure the asphalt does not over heat and burn. Equipment that is specifically excluded from this section and shall not be used for reheating of the asphalt is any form of direct flame heaters.

5-06.3(3)C VIBRATORY PLATE COMPACTOR

Vibratory Plate Compactor shall be used for pressing the wire templates into the heated asphalt to create the specified pattern.

5-06.3(3)D SPRAY EQUIPMENT

Spray Equipment shall be capable of applying the coating material to the asphalt surface in a controlled thin film.

5-06.3(4) CONSTRUCTION

5-06.3(4)A SURFACE PREPARATION PRIOR TO COATING

The asphalt surface shall be free of dirt, debris, oil or anything that will adversely affect the adhesion of the new coating system. All loose material on the asphalt surface shall be removed and prior to applying the coatings, the asphalt surface shall be completely dry.

5-06.3(4)B LAYOUT AND IMPRINTING

Layout and imprinting of the pattern into the surface of the HMA is shown in the Plans.

5-06.3(4)C HEATING OF ASPHALT

Direct flame heaters shall not be allowed for the purpose of heating the asphalt. Hot air portable heaters may only be used for heating isolated areas. The temperature of the asphalt surface shall be regularly monitored during the reheating process. The asphalt pavement shall be adequately heat soaked (softened) to a depth of at least 1/2 inch, without burning the asphalt. If during the re-heating process the surface is overheated and begins to emit black smoke, the contractor shall stop work immediately. The damaged surface area shall be removed by milling the upper 1-1/2" and replaced by a partial depth patch with the topmost

layer matching the existing surface layer mix and binder. Patching and all work associated with the repair effort shall be at no cost to the City.

5-06.3(4)D SAMPLE AREA

Prior to installing the Surfacing System to the entire project, a sample area shall be completed. Upon approval from the Engineer for appearance of color, the Contractor may proceed with completing the Surfacing System installation.

5-06.3(4)E COATING INSTALLATION

The Contractor shall apply the Surfacing System only when the air temperature is at least 50°F and rising, and will not drop below 50°F within 8 hours of application of the coating material. There should be no precipitation expected within 2 hours after applying the final layer of coating material.

5-06.3(5) QUALITY CONTROL

5-06.3(5)A GENERAL

At all times the Contractor shall have a representative familiar with all manufacturer's recommendations for products used on site, or if the StreetPrint process is utilized then a foreman, supervisor or lead hand who is registered with Integrated Paving Concepts, Inc., as a Level 1 or Level II Accredited StreetPrint Installer shall be onsite at all times during installation; certification must be submitted for approval five (5) days prior to commencing construction.

5-06.3(5)B STAMPING DEPTH

Upon completion, the patterned area shall be checked for proper depth of print. 98% of the stamped area shall have an imprint depth of 1/4 inch. If any sample areas have an imprint depth that is less than 1/4 inch, those areas shall be re-heated and re-stamped prior to applying the coatings.

5-06.3(5)C COATING THICKNESS

The total thickness shall be monitored by measuring the volume of material used per unit area. For this project an average coverage area for the combined coating layers shall be per manufacturer's recommendation or 150 square feet coated per 5-gallon pail of StreetBond SP150E material used. The Contractor shall provide proof of material usage.

5-06.3(5)D PROTECTION OF EXISTING PAVEMENT MARKINGS

The Contractor shall protect all existing pavement markings from contamination from the asphalt sealant including any existing markings on curbing. All disturbed pavement

markings shall be returned to their original condition, at no additional cost to the City as specified in Section 8-22 (Pavement Markings).

END OF DIVISION 5



**6-17 PERMANENT GROUND ANCHORS**

6-17.3(8)B PERFORMANCE TESTING

Revision

*(January 7, 2008 WSDOT Amendment)*

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

If the load hold is extended, the anchor movement shall be recorded at 20 minutes, 30, 40, 50, and 60 minutes.

6-17.3(8)C PROOF TESTING

Revision

*(January 7, 2008 WSDOT Amendment)*

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

If the load hold is extended, the anchor movements shall be recorded at 20 minutes, 30, 40, 50, and 60 minutes.

END OF DIVISION 6



**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

Concrete Storm Sewer Pipe	9-05.7(1) (Plain Concrete Storm Sewer Pipe) 9-05.7(2) (Reinforced Concrete Storm Sewer Pipe)
Solid Wall Polyvinyl Chloride (PVC) Pipe, SDR-35	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)
Polyvinyl Chloride (PVC) pipe, SDR-21	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)
Ductile Iron Pipe, Special Class 52, Storm Pipe	9-05.13 (Ductile Iron Sewer Pipe)
High Density Polyethylene Pipe (HDPE)	9-05.21 (High Density Polyethylene Pipe (HDPE))

The laying length for PVC (SDR-35) shall not exceed 14 feet.

The last paragraph prior to the Table of “Storm Sewer Pipe Schedules” and the Storm Sewer Pipe Schedules Table are deleted.

7-04.3(1)F LOW PRESSURE AIR TEST FOR STORM SEWERS CONSTRUCTED OF NON AIR-PERMEABLE MATERIALS Supplement

If the test shows zero leakage after a five-minute test time, the Engineer has the authority to accept and end the test immediately.

7-04.3(1)G TELEVISION INSPECTION New Section

All of the provisions of 7-17.3(2)H (Television Inspection) shall apply.

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

7-05.1 DESCRIPTION Replacement

This work shall consist of constructing manholes, inlets, drywells, trash racks, and catch basins and connecting to existing structures of the types and sizes designated in accordance with the Plans, all provisions of the Specifications, and the Standard Plans, in conformity with the lines and grades staked.

7-05.2 MATERIALS Supplement

Manholes shall be complete with frames and covers. All manhole frames and covers shall be bolt-down as shown in Standard Detail No. SEWER-04 (24” Dia. Manhole Frame and Cover). Catch Basins shall be complete with frames and grates unless otherwise specified on the plans to be provided with solid metal covers or manhole frames and covers. Castings for

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

manhole frames shall be gray iron or ductile iron and covers and grates shall be ductile iron. All storm sewer grates shall have the words "OUTFALL TO STREAMS, DUMP NO POLLUTANTS" cast in place. Manhole and catch basin steps and handholds shall be steel-reinforced copolymer polypropylene (ASTM D4101) with ½ inch steel reinforcing bar (ASTM A615 Grade 60) and in conformance with ASTM C478.

The fabricator of all precast sanitary manholes shall seal them with Tamoseal Cement Based Waterproof Finish or approved equal applied to all interior and exterior surfaces in accordance with the manufacturer's recommendations. The Contractor shall have adequate product on hand to seal any field modifications to sanitary sewer manholes.

Trash racks shall be constructed in accordance with Section 6-02 (Concrete Structures), 6-03 (Steel Structures) and as detailed in the plans.

7-05.2(1)      TRASH RACKS      New Section

7-05.3      CONSTRUCTION REQUIREMENTS      Supplement

All pipes entering or leaving new or existing manholes, catch basins or inlets shall be placed on firmly compacted bedding, particularly within the area of the manhole excavation, which normally is deeper than that of the pipe trench. Special care shall be taken to see that the openings through which pipes or adapters (see below) penetrate the manhole are completely and firmly rammed full of non-shrink grout to ensure water tightness.

Manhole adapters will be provided when connecting PVC or Polyethylene pipes to any new or existing manholes, catch basins or inlets. All manhole adapters for PVC and Polyethylene pipe shall be of a style as required and manufactured for the specific application with sufficient tangent at the ends to allow for proper joint connections. Field fabrication manhole adapters will not be permitted. All manhole adapters to be provided on this project must have approval from the Engineer in writing before being installed on this project.

7-05.3(1)      ADJUSTING MANHOLES & CATCH BASINS TO GRADE      Supplement

Adjustment shall also be in accordance with Standard Detail No. TRAFFIC-12 (Adjustment of New and Existing Utility Structures to Finish Grade). Manholes or catch basins shall not be adjusted until the asphalt paving is completed, at which time the center of each structure shall be carefully relocated from references previously established by the Contractor. The pavement shall be cut in a restricted area and the base material removed to permit removal of the frame or ring. The structure shall be adjusted to finish street grade. Temporary access to manholes, catch basins, and water valves shall be provided as soon as practical after paving.

The frame or ring shall be placed on concrete blocks and/or wedged up to the desired grade. The asphalt concrete pavement shall be cut and removed, the dimensions of which shall be equal to the inside dimensions of the opening plus 2 feet. The base materials and crushed rock shall be removed and Class 3000 cement concrete shall be placed so that the entire

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

volume of the excavation is replaced to within, but not to exceed 6 inches of the finished pavement surface. Once manholes or catch basins have been adjusted to finished grade and the cement concrete backfill has cured (the day following placing the cement concrete), the HMA Class B patches shall be placed and compacted with hand tampers and a patching roller within 48 hours or as directed by the engineer. A quick setting admixture shall be added to the cement concrete backfill.

7-05.3(3)      CONNECTIONS TO EXISTING MANHOLES      Supplement

Where shown in the plans or as directed by the Engineer, new storm drain lines shall be extended to connect to an existing manhole. The pipe extension shall be the same diameter as the existing pipe. Dissimilar pipes shall be joined per Section 7-08.3(2)G (Jointing of Dissimilar Pipe) of these Special Provisions.

7-05.3(5)      CHANNELS FOR MANHOLES      New Section

Channels for manholes shall be made to conform accurately to the sewer grade, and shall be brought together smoothly with well-rounded junctions. Channel sides shall be carried up vertically to the crown elevation of the various pipes, and the concrete shelf between channels shall be smoothly finished and warped evenly with slopes to drain in accordance with WSDOT Standard Plans No. B-15.20-00, B-15.40-00, and B-15.60-00.

Channels for manholes shall be constructed with non-shrinking mortar. Mortar shall be composed of approximately one part Type II Portland Cement, 1½ to 2 parts sand, and 2 to 3 fluid ounces of water-reducing retarder per sack of cement. Sand, cement, and water shall be as specified for concrete. Water-reducing retarder shall be Master Builder's Pozzoloth, Sika Chemical Corporation Plastiment, or an equal product and shall meet ASTM C494 specification for chemical admixture for concrete.

**7-08 GENERAL PIPE INSTALLATION REQUIREMENTS**

7-08.1      DESCRIPTION      Replacement

This information shall cover the general requirements for installing culverts, storm sewers, sanitary sewers, and water mains. The Contractor shall also follow all provisions of Sections 7-02 (Culverts), 7-04 (Storm Sewers), 7-09 (Water Mains), 7-17 (Sanitary Sewers), and 1-07.23 (Public Convenience and Safety) as it applies to the specific kind of work.

7-08.2      MATERIALS      Replacement

Imported bedding, backfill and foundation materials shall meet the requirements of the following sections:



**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

Pipe bedding shall be per the trench detail(s) shown on the plans or as directed by the Engineer.

7-08.3(2)B PIPE LAYING - GENERAL Supplement

The Contractor shall use neat, vertical full-depth saw cuts for trenching through existing asphalt or cement concrete pavement surfaced areas.

All pipe shall be neatly cut using an approved mechanical cutter without causing damage to the pipe.

7-08.3(2)G JOINTING OF DISSIMILAR PIPE Supplement

Where new pipe is connected to existing pipe, the Contractor shall verify the type of existing pipe and join pipes with a pipe adapter specifically manufactured for joining the pipes involved or as directed by the Engineer.

7-08.3(2)J JOINING HIGH DENSITY POLYETHYLENE PIPE (HDPE) PIPE New Section

Sections of HDPE shall be joined into continuous lengths on the job site above ground. The joining shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer, including but not limited to, temperature requirements of 400 degrees F, alignment, and 75 psi interfacial fusion pressure.

7-08.3(2)K PACKAGING, HANDLING, STORAGE HIGH DENSITY POLYETHYLENE PIPE (HDPE) PIPE New Section

The manufacturer shall package the pipe in a manner designed to deliver the pipe to the project neatly, intact, and without physical damage. The transportation carrier shall use appropriate methods and intermittent checks to insure the pipe is properly supported, stacked, and restrained during transport such that the pipe is not nicked, gouged, or physically damaged. Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking shall be done in accordance with the pipe manufacturer's recommendations. The handling of the pipe shall be done in such a manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.

Sections of pipe having been discovered with cuts or gouges in excess of 10% of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using butt fusion joining method.

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable type chokers must be avoided. Nylon slings are preferred. Spreader bars are recommended when lifting long fused sections. Care must be exercised to avoid cutting or gouging the pipe.

7-08.3(2)L DEWATERING TRENCHES New Section

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

“Normal Trench Dewatering” is defined as dewatering methods occurring in, or directly adjacent to, the trench, including trash pumps, sump pumps, or other methods in the excavated areas. “Normal Trench Dewatering” does not include a dewatering system such as well points, well screens, or deep wells.

Dewatering may be required for this project. See Section 8-05 for dewatering system requirements. Where groundwater cannot be removed using “Normal Trench Dewatering” methods, the dewatering system will be used to lower the water table 2 feet below the depth of excavation. The dewatering plan must be received ten (10) calendar days prior to dewatering operations and approved by the Engineer before underground utility installation begins.

7-08.3(3) BACKFILLING Supplement

Unless otherwise shown in the plans “Select Pipe Trench Backfill” shall be used where trenches are excavated across existing paved streets.

Unless otherwise shown in the plans “Controlled Density Fill” shall be used where trenches are transverse to major arterial roadways. The Engineer may require “Controlled Density Fill” where uniform compaction around other utilities, foundations or other fixed objects is not possible.

7-08.3(4) PLUGGING EXISTING PIPE Replacement

All existing pipes shown on the plans or designated by the Engineer to be abandoned shall be plugged on the inlet and outlet ends for a distance of three times the diameter with Class 3000 cement concrete. Care shall be used in placing the concrete in the pipe to ensure that the openings are completely filled and thoroughly plugged.

All existing pipes shown on the plans or designated by the Engineer to be filled shall be filled with controlled density fill (CDF) for the entire length of pipe specified.

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-08.3(5) PIPE TRENCH RESTORATION New Section

Trenches excavated as part of a new street construction shall be completed to subgrade before placing surfacing materials and sidewalks. Final restoration will be completed with the street surfacing.

In existing streets, sidewalks and other native or landscaped areas, the restoration shall be to a minimum of the existing adjacent surfaces. Asphalt and cement concrete pavement, sidewalks, etc., shall be replaced upon a firm unyielding base to match existing surface thickness as directed by the Engineer. The minimum asphalt concrete pavement repair section shall be 2 inches thick.

**7-09 WATER MAINS**

7-09.1 DESCRIPTION Supplement

The Contractor shall also follow the requirements of Section 7-08 (General Pipe Installation Requirements).

7-09.3(10) BACKFILLING TRENCHES Supplement

Water mains shall be installed with 42-inch minimum finished pipe cover, unless the Engineer determines less cover is adequate where existing facilities, not to be relocated, might interfere with the pipe laying operation.

7-09.3(19) CONNECTIONS

7-09.3(19)A CONNECTIONS TO EXISTING MAINS Supplement

The Contractor shall field verify all existing piping, dimensions, and elevations to ensure proper fit prior to any connections being made to existing mains.

7-09.3(19)B MAINTAINING SERVICE Supplement

Water main shut-offs shall be in accordance with Section 1-07.17(1) (Disruption to City Water Services).

7-09.3(21) CONCRETE THRUST BLOCKING Supplement

All bends, tees, dead-ends and crosses shall be blocked in accordance with Standard Detail No. WATER-01 (Water Main Blocking) or anchored in accordance with WSDOT Standard Plan B-90.40-00.

Where trench conditions are such that thrust restraint is not accomplishable with concrete, the Contractor shall provide restrained joints in accordance with Section 9-30.2(6) (Restrained

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

Joints) to replace or supplement concrete blocking or anchors and any such costs thereof shall be incidental. Supplement and replacement restrained joints shall be provided as recommended by the manufacturer and approved by the Engineer.

7-09.3(22) BLOWOFF ASSEMBLIES Replacement

Blow off assemblies shall be constructed at the locations shown on the Plans and in accordance with Standard Detail No. WATER-03 (2" Blowoff Assembly Detail).

7-09.3(23) HYDROSTATIC PRESSURE TEST Supplement

Add the following sentence at the beginning of the first paragraph:

Hydrostatic tests shall be made on all new pipeline in accordance with the applicable portions of this Standard Specification and ANSI/AWWA C600, except as modified in this document.

Add the following sentence between the first and second sentence of the first paragraph:

Test pressures shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

Add the following sentence at the end of the second paragraph:

Sections of pipe between valves shall be pressure tested immediately upon completion of each section. Each section shall be immediately backfilled upon the Engineer approving the hydrostatic pressure test results.

7-09.3(24) DISINFECTION OF WATER MAINS Supplement

The City will take bacteriological test samples. The Contractor shall insert corporation stops in the main at all locations required to take bacteriological test samples. Retesting will be at the Contractors expense.

7-09.3(24)J PREVENTING REVERSE FLOW Supplement

Prior to beginning the water main installation the Contractor shall prepare a plan showing the intended method, in detail, which will be incorporated to insure the prevention of reverse flows from entering the existing distribution system. The plan shall meet the requirement of WAC 246-902-490.

The Contractor shall consider this plan as a submittal, and submit it per the specifications in Section 1-06 (Submittals). The Engineer must approve this plan prior to the Contractor starting work on the water main.

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-09.3(24)N FINAL FLUSHING AND TESTING Supplement

Accomplish line flushing in accordance with the latest provisions of AWWA C601. Flush all dead end mains with a temporary blow off in conformance with the Standard Detail WATER-04 (Temporary Blow Off Detail) and as directed by the Engineer. The Contractor is responsible for disposal of water flushed from the line. An approved bacteriological test is required before connection to the existing system.

**7-12 VALVES FOR WATER MAINS**

7-12.3 CONSTRUCTION REQUIREMENTS

7-12.3(2) ADJUST VALVE BOXES New Section

“Adjust Valve Box” shall be in accordance with Standard Detail No. TRAFFIC-12 (Adjustment of New and Existing Utility Structures to Finish Grade) and the applicable portion of Section 7-05.3(1) (Adjusting Manholes and Catch Basins to Grade).

7-12.3(3) COMBINATION AIR RELEASE/AIR VACUUM VALVE ASSEMBLY New Section

“Combination Air Release/Air Vacuum Valve Assembly” shall be constructed at locations shown on the plans and shall be a minimum of 1 inch diameter in accordance with Standard Detail WATER-02 (Typical Air and Vacuum Relief Valve Detail).

7-12.3(4) VALVE WRENCH EXTENSION BOX New Section

The Contractor shall provide for “Valve Wrench Extension Box” in accordance with Standard Detail No. WATER-18, WATER-18a, and WATER-18b for deep buried valves, where directed by the Engineer. Install “Valve Wrench Extension Box” where the valve nut will exceed 48 inches below the top of the finished valve box and finish grade for this project.

**7-14 HYDRANTS**

7-14.3 CONSTRUCTION REQUIREMENTS Supplement

A type 2BB Blue Raised Pavement Marker(s) is required at each hydrant location. Location of the blue marker shall be 1-foot offset of centerline in the direction of the hydrant at each hydrant location and as directed by the Engineer. Hydrants located within 50-feet of the curb face of an intersection shall be marked on both streets. The reflective surfaces of the raised pavement markers shall be perpendicular to the flow of traffic. The Raised Pavement Markers shall be installed in accordance with Section 8-09 (Raised Pavement Markers).

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-14.3(1)      SETTING HYDRANTS      Replacement

Where shown in the plans, the “Hydrant Assembly” shall be installed perpendicular to the supply main in accordance with Standard Detail No. WATER-07 (5 ¼” M.V.O. Hydrant Setting Detail). A 6-inch resilient-wedge gate valve with valve box in accordance with Section 7-12 (Valves for Water Mains) shall be installed on each hydrant supply line.

All hydrants shall be inspected upon delivery in the field to ensure proper working order. After installation, fire hydrants, auxiliary gate valves, and other appurtenances thereto shall be subjected to a hydrostatic test and disinfection procedures as specified in Section 7-09 (Water Mains).

After installation each hydrant shall receive 2 field-coats of paint. The first coat shall be Formula B-1-57 iron oxide, and the second coat shall be Safety Yellow Enamel conforming to Federal Specification TT-E-489C Enamel, Alkyd, Gloss, Federal Color No. 1063. The outside surface below the ground shall be coated with asphalt varnish.

During the chlorination process for the newly laid pipe, all valves associated with each “Hydrant Assembly” shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.

Any hydrant not in service shall be identified by covering with a burlap or plastic bag properly secured.

7-14.3(4)      MOVING EXISTING HYDRANTS      Supplement

Existing hydrants shall be moved where shown in the Plans. “Moving Existing Hydrants” shall include removal of all component parts from the water main to the hydrant. The Contractor shall provide and install the following new components at the new hydrant location shown on the plans: 6 inch ductile iron, Special Class 52 pipe; 6 inch tee or tapping tee and gate valve with box; restraint system; and blocking. Construction shall conform to Standard Detail No. WATER-07 (5 ¼” M.V.O. Hydrant Setting Detail).

**7-15 SERVICE CONNECTIONS**

7-15.2      MATERIALS      Supplement

Saddles (1½ inch & 2 inch services)	9-30.6(1) (Saddles)
Corporation Stops	9-30.6(2) (Corporation Stops)
Service Pipe & Tail Piece	9-30.6(3) (Service Pipes)
Meter Setters (Yoke)	9-30.6(5) (Meter Setters)
Meter Stops	9-30.6(5)A (Meter Stops)
Meter Check Valves	9-30.6(5)B (Meter Check Valves)
Curb Valves	9-30.6(5)C (Curb Valves)
Meter Boxes	9-30.6(7) (Meter Boxes)

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-15.3 CONSTRUCTION REQUIREMENTS

Supplement

Supplement this section with the following:

Water service connections shall be installed where shown on the drawings or where directed by the Engineer in accordance with these documents and Standard Details. Multiple service connections to the same main must be made with a 2 foot minimum separation at the main and be staggered horizontally, so that adjacent services are at differing elevations along the pipe. Meter box and water meters shall not be placed in locations which are subjected to vehicular traffic (including driveways, etc.) unless approved by the Engineer and a traffic bearing meter box is provided. Tail pieces (that portion of the service line between the meter and the property line) shall be furnished and installed and shall be of the same material and size as the service line. Connection of the tail piece to the service line from the building shall be made with compression couplings or capped as appropriate. Service pipes shall be installed without joints from the water main to the curb valve near or within the meter box. Tailpieces shall also be installed without joints from the water meter outlet to its termination (18 inches minimum beyond the meter but not beyond the right-of-way line). Location of water services shall be marked by neatly imprinting a 2-inch letter "W" in the top of the curb before the concrete hardens.

All new materials (service line, meter setter, tailpiece, and meter box) shall be used for water meter relocations. Materials shall match existing size unless otherwise shown on the plans.

**7-17 SANITARY SEWERS**

7-17.2 MATERIALS

Replacement

Materials allowed for a specific project will be as indicated on the Plans. Materials shall be in accordance with following Sections:

Concrete Sewer Pipe	9-05.7(1) (Plain Concrete Storm Sewer Pipe) 9-05.7(2) (Reinforced Concrete Storm Sewer Pipe)
Solid Wall Polyvinyl Chloride (PVC) Pipe, SDR-35	9-05.12(1) (Solid Wall PVC Culvert Pipe, Solid Wall PVC Storm Sewer Pipe, and Solid Wall PVC Sanitary Sewer Pipe)
Polyvinyl Chloride (PVC) pipe, SDR-21	9-30.1(5) (Polyvinyl Chloride (PVC))
Ductile Iron Pipe, Special Class 52	9-30.1(1) (Ductile Iron Pipe)
High Density Polyethylene Pipe (HDPE)	9-05.21 (High Density Polyethylene Pipe (HDPE))

The laying length for PVC (SDR-35) shall not exceed 14 feet.

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-17.3 CONSTRUCTION REQUIREMENTS

7-17.3(1) PROTECTION OF EXISTING SEWERAGE FACILITIES Supplement

Connections to the existing system shall be plugged during the entire period of sewer construction to prevent dirt, water, and debris from entering the existing system

7-17.3(2) CLEANING AND TESTING Supplement

7-17.3(2)A GENERAL Revision/Supplement

Delete the first paragraph and replace with the following:

Sewers and appurtenances, where required in the Plans, shall be cleaned and tested after backfilling by the low pressure air method except if the Engineer approves hydrostatic testing of short sections of small diameter pipe.

Insert the following sentence between the first and second sentences of the last paragraph:

Special sealants shall not be used to seal leaks and the use of any such materials will be cause for rejection of the sewer lines.

Insert the following paragraph at the end of this section:

Before final acceptance, the Contractor shall have all sewer lines inspected by the use of a television camera, utilizing a City approved private inspection services. An approved list of inspection services may be obtained from the Engineer. Manholes and other structures shall be cleaned and tested per Section 7-07 (Cleaning Existing Drainage Structures).

7-17.3(2)C INFILTRATION TEST Revision

In the second paragraph,

$$\text{“Maximum leakage (in gallons per hour)”} = 0.16 \times \frac{\sqrt{H}}{\sqrt{6}} \times D \times \frac{L}{100}$$

7-17.3(2)E LOW PRESSURE AIR TEST FOR SANITARY SEWERS CONSTRUCTED OF AIR-PERMEABLE MATERIALS Supplement

Acceptability of the test will be determined by the minimum decompression time allowed for the pressure to drop from 3.5 to 2.5 psig greater than the average back pressure of the groundwater above the centerline of the pipe as determined by the following:

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

Groundwater Pressure:

$$P = 0.4332(Z) \text{ where}$$

Z = Distance between groundwater surface and the centerline of the pipe in feet; and  
P = Average pressure of groundwater in psi and shall be added to the specified test pressure

Minimum air test time:

$$T = \frac{3.206 (D^2L + d^2l)}{R} \quad \text{where;}$$

$$R = 0.00925(DL+dl) \quad \text{when;}$$

R is equal to or greater than 2.0 and less than or equal to 3.5. When the calculation for R is less than 2.0, R = 2.0 and when the calculation for R is greater than 3.5, R = 3.5.

Where:

T = minimum test time in seconds

D = sewer main diameter in feet

d = side sewer diameter in feet

L = sewer main length being test in feet, and

l = side sewer length being tested in feet

For convenience, the City has herein included minimum decompression timetables for air-permeable pipe (concrete, etc.) for various sanitary sewer pipe sizes with 6 inch side sewer lengths.

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

***Air Test Times for Air-permeable Sanitary Sewer Pipe***

All times are in seconds.

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 8" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	36	56	76	96	116	136	156	176	178
	100	71	91	111	131	151	171	188	186	184
	150	107	127	147	167	187	195	193	191	189
	200	142	163	183	203	202	199	197	195	193
	250	178	198	214	209	205	202	200	198	196
	300	214	220	215	211	208	205	202	202	214
	350	227	221	217	213	210	207	211	223	234
	400	227	222	218	214	211	220	232	243	254

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 10" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	56	76	96	116	136	156	176	192	190
	100	111	131	151	171	191	211	211	207	203
	150	167	187	207	227	233	227	222	217	214
	200	223	243	257	248	241	235	230	225	222
	250	278	271	262	253	247	241	236	239	251
	300	283	273	265	257	251	248	260	271	282
	350	283	274	267	260	268	280	291	303	314
	400	283	276	277	289	300	312	323	335	346

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

*Air Test Times for Air-permeable Sanitary Sewer Pipe*

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 12" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	80	100	120	140	160	180	200	208	204
	100	160	180	200	220	240	246	238	232	227
	150	240	260	280	283	272	263	255	249	243
	200	321	321	306	294	283	275	267	263	275
	250	340	325	312	301	292	286	298	309	321
	300	340	327	316	309	321	332	343	355	366
	350	340	332	343	355	366	378	389	401	412
	400	366	378	389	401	412	424	435	447	458

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 15" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	125	145	165	185	205	225	245	237	231
	100	250	270	291	311	312	298	286	276	268
	150	376	395	371	352	336	323	312	302	306
	200	425	402	383	366	352	343	355	366	378
	250	425	406	390	392	404	415	426	438	449
	300	429	441	452	464	475	487	498	509	521
	350	501	512	524	535	547	558	570	581	592
	400	572	584	595	607	618	630	641	653	664

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

*Air Test Times for Air-permeable Sanitary Sewer Pipe*

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 18" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	180	200	220	240	260	280	283	272	263
	100	361	381	401	397	374	356	340	327	316
	150	510	476	448	425	406	389	378	389	401
	200	510	484	462	447	458	469	481	492	504
	250	515	527	538	550	561	572	584	595	607
	300	618	630	641	653	664	675	687	698	710
	350	721	733	744	756	767	779	790	801	813
	400	824	836	847	859	870	882	893	904	916

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 21" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	245	265	286	306	326	345	327	312	299
	100	491	511	501	468	441	418	399	383	372
	150	595	558	527	501	478	478	489	501	512
	200	595	572	584	595	607	618	630	641	653
	250	701	713	724	736	747	758	770	781	793
	300	841	853	864	876	887	899	910	922	933
	350	982	993	1005	1016	1028	1039	1050	1062	1073
	400	1122	1133	1145	1156	1168	1179	1191	1202	1214

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

*Air Test Times for Air-permeable Sanitary Sewer Pipe*

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 24" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	321	341	361	381	401	397	374	356	340
	100	641	624	578	541	510	484	462	447	458
	150	680	641	607	584	595	607	618	630	641
	200	733	744	756	767	779	790	801	813	824
	250	916	927	939	950	962	973	985	996	1008
	300	1099	1111	1122	1133	1145	1156	1168	1179	1191
	350	1282	1294	1305	1317	1328	1340	1351	1362	1374
	400	1465	1477	1488	1500	1511	1523	1534	1546	1557

		Linear feet of 6 inch Side Sewer								
		0	50	100	150	200	250	300	350	400
Linear feet of 30" concrete pipe	0	0	20	40	60	80	100	120	140	160
	50	501	521	541	561	548	510	479	454	432
	100	850	788	737	693	656	630	641	653	664
	150	859	870	882	893	904	916	927	939	950
	200	1145	1156	1168	1179	1191	1202	1214	1225	1236
	250	1431	1443	1454	1465	1477	1488	1500	1511	1523
	300	1717	1729	1740	1752	1763	1775	1786	1797	1809
	350	2004	2015	2026	2038	2049	2061	2072	2084	2095
	400	2290	2301	2313	2324	2336	2347	2358	2370	2381

**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

7-17.3(2)F LOW PRESSURE AIR TEST FOR SANITARY SEWERS CONSTRUCTED OF NON AIR-PERMEABLE MATERIALS Supplement

If the test shows zero leakage after a five minute test time, the Engineer has the authority to accept and end the test immediately.

Cleaning and testing of pipes and structures shall be incidental to the pipe and structure bid item.

7-17.3(2)H TELEVISION INSPECTION Replacement

Before final acceptance, the City shall require all sewer lines to be inspected by the use of a television camera, utilizing City approved private inspection services.

After completion of the following, authorization from the City shall be required before the Contractor can perform the initial television camera work:

1. The acceptable placement of applicable pipe, ballast, bedding, and backfill material.
2. The acceptable completion of all applicable channels and grout work.
3. The acceptable debris removal, cleaning, and flushing of all applicable pipes and structures.

The television inspection requirements shall include the provisions of:

1. A color VHS television camera with a pan and tilt capacity in order to view all main lines, lateral lines, and structures including channels.
2. A dye solution to be introduced in sufficient quantity to travel from the structure that is the highest point of inspection to the downstream terminus of the inspection limits. Red or purple dye shall be used for PVC pipe and green dye for ductile iron and concrete pipe.
3. A one-inch reference ball to be mounted to the camera in order to drag along the bottom of the pipe during the entire inspection procedure.
4. Linear measure references to be measured from the center of the beginning structure to the center of the next inline structure and include the direction of flow. The locations of lateral pipes and all distinctive pipe conditions shall be referenced to the centerline of the beginning structure. All structure references shall utilize the designated structure reference numbers shown on the plans.



**DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS**

The Contractor shall be responsible for verifying all City customers originally connected to the sanitary sewer conveyance line are connected to the new sanitary sewer conveyance line. Prior to project completion the Contractor shall document to the City that all City customers have had their services re-established.

All pipes for side sewer and sewer stubs (pipes not ending in a manhole) shall be adequately plugged or capped as directed by the Engineer.

END OF DIVISION 7



Fertilizer:

The Contractor shall submit three samples of existing soil in the project area, and one of each specified type of topsoil to a soil laboratory for testing to determine fertilizer/amendment composition. Results shall be submitted to the Engineer and fertilizer and soil amendment formulation and application rates will be based on the laboratory recommendations. However, the minimum fertilizers requirements are as follows:

- Total Nitrogen as N<sup>-3</sup> pounds per 1,000 square feet;
- Available Phosphoric Acid as P<sub>2</sub>O<sub>5</sub><sup>-1</sup> pounds per 1,000 square feet;
- Soluble Potash as K<sub>2</sub>O<sup>-2</sup> pounds per 1,000 square feet;
- 2 pounds of nitrogen applied per 1,000 square feet shall be derived from ureaform or ureaformaldehyde. The remainder may be derived from any source.

The fertilizer formulation and application rate shall be approved by the Engineer before use.

8-01.3(2)D MULCHING Supplement

Wood cellulose fiber mulch shall be applied at a rate of 2,000 pounds per acre

8-01.3(2)E TACKING AGENT AND SOIL BINDERS Supplement

The tacking agent for hydroseeding shall be a bonded fiber matrix with integral tackifier specifically manufactured for hydroseeding applications and erosion control. The bonded fiber matrix (BFM) shall be dyed an appropriate color to facilitate visual metering of application of the materials. The bonded fiber matrix (BFM) shall be ‘ECO-AEGIS’ as manufactured by Canfor, or approved alternate.

**8-02 ROADSIDE RESTORATION**

8-02.3 CONSTRUCTION REQUIREMENTS

8-02.3(1) RESPONSIBILITY DURING CONSTRUCTION Supplement

Landscape construction is anticipated to begin after all curbs, sidewalks, rockeries, utilities, and associated roadside work is completed.

The Contractor shall keep the premises clean, free of excess soils, plants, and other materials, including refuse and debris, resulting from his work throughout the planting operation. The Contractor shall maintain continuous pedestrian access and shall not stockpile materials or park equipment in any manner that may create hazards or obstacles to this access. At the end of each workday, and as each planting area is completed, it shall be neatly dressed and all surrounding walks and paved areas shall be cleaned to the satisfaction of the Engineer.





Trees shall be handled by the rootball, not by the trunk. Burlap and wire shall remain intact until trees are set in their positions within each planting pit. Remove all wire, twine, and burlap from the top third of the rootball before backfilling. Plant trees and shrubs upright, rotating them to give the best placement to adjacent plants, topography, and structures. Hold plant rigidly in position until topsoil has been backfilled and tamped firmly around the ball or roots.

When the planting pit is backfilled halfway, place the specified quantity of fertilizer plant tablets and stakes, if necessary, as shown on the plans. Evenly space the fertilizer tablets around the perimeter of and immediately adjacent to the root system. Carefully place, water, and compact planting topsoil filling all voids. Do not injure the root system.

When the planting pit is three-quarters (3/4) backfilled, fill with water and allow it to soak away. Fill pits with additional topsoil and continue backfilling as detailed on plans. Ground bark shall be placed over all tree-planting saucers to a compact depth of 2 inches. Water trees immediately after planting.

Install tree frame and grate as detailed on plans.

The root systems of all bare root plant material shall be dipped in a slurry of silt and water immediately prior to planting.

8-02.3(10)     FERTILIZERS     Supplement

Trees, shrubs, and groundcover shall be fertilized as follows:

Formula 4-2-2 “Transplanter” as manufactured by Pacific Agro Co., with Hercules nitroform and W.R. Grace’s “Magamp” and trace elements. Apply at a rate of:

- Trees            8 ounces
- Shrubs           2 ounces
- Groundcover   1 ounce

Agriform Tablets: Planting tablets, 21-ram size, as manufactured by Agriform International Chemicals, Inc., 20-10-5 analysis. Apply at a rate of:

- Trees            4 tablets for every foot of rootball diameter
- Shrubs           3 tablets
- Groundcover   1 tablet

8-02.3(11)     BARK OR WOOD CHIP MULCH     Supplement/Revision

Ground bark shall be placed over all planting beds and over all tree-planting saucers to a compact depth of 2 inches. Ground bark shall be placed around existing trees and bushes disturbed by construction to a compact depth of 2 inches. Thoroughly water and hose down plants with a fine spray to wash the leaves of the plants immediately after bark application.

8-02.3(12) COMPLETION OF INITIAL PLANTING Replacement

Upon completion of the initial planting and per the request of the Contractor, the Engineer will make an inspection of all plant material and notify the Contractor, in writing, of any replacements or corrective action necessary to meet the Contract Document requirements. The Contractor shall replace all materials requested or missing and correct unsatisfactory conditions within fifteen (15) working days.

Completion of initial planting includes the following:

1. Installation of root control barriers and watering systems for trees.
2. Installation of all required planting materials (trees, shrubs, and groundcovers).
3. Planting area cleanup.
4. Full operation of the irrigation system, complete bark mulch coverage, and all planting areas in a weed-free condition.
5. Approval of Plant Establishment Plan.

8-02.3(13) PLANT ESTABLISHMENT Supplement

The Contractor shall maintain all plant materials in the project during the life of the project and for a period of 1 year from the final acceptance of the overall project per section 1-05.10 (Guarantees) of this document, unless otherwise indicated on the Plans. During the project and maintenance period, the Contractor shall maintain a healthy growing condition for all plant materials and water, prune, spray, weed, and perform other necessary maintenance operations. Planting beds shall be kept free of all weeds, grass and other undesirable vegetation. Plants shall be inspected by the Contractor at least monthly from October 1<sup>st</sup> to April 30<sup>th</sup> and at least once a week from May 1<sup>st</sup> to September 30<sup>th</sup> and maintenance performed promptly. Dead or impaired plants shall be promptly replaced during the planting season of November 15 through March 30 and all soil ridges shall be removed from around the watering basins, as directed by the Engineer, before the end of the maintenance period. Replacement plants will require an additional acceptance and 1 year maintenance period.

Correctable work shall include the removal and disposal of all dead plant material.

8-02.3(14) PLANT REPLACEMENT Supplement

Final acceptance of the overall project will include the acceptance of plantings.

8-02.3(16) LAWN INSTALLATION

8-02.3(16)A LAWN INSTALLATION Supplement

Lawn seeding will not be permitted on this project. "Lawn Sod" per Section 9-14.6(8) (Sod) shall be laid smoothly in place in accordance with the typical section(s) in the plans.

Prior to installing “Lawn Sod” all dry soil shall be moistened by sprinkling with water. On sloped areas, the sod shall be laid with the long dimension parallel to the toe or top of slope. The “Lawn Sod” shall be rolled and heavily watered by sprinkler after placement.

8-02.3(16)B LAWN ESTABLISHMENT Supplement

The lawn establishment period shall begin immediately after all lawn planting has been completed and shall continue through the duration of the project and the 1 year maintenance period as defined in Section 1-05.10(Guarantees).

The Contractor shall be responsible for watering and fertilizing the lawn areas during the establishment period. 6-2-4 fertilizer shall be applied at 6-week intervals at the rate of 1½ pounds of available nitrogen per 1,000 square feet per application during the growing season of April through September.

The Contractor shall correct all conditions unsatisfactory to the Engineer within a 10-day period, weather permitting, immediately following the final inspection as defined in Section 1-05 of this document.

8-02.3(16)C LAWN MOWING Supplement

Lawn mowing shall begin immediately after the lawn planting has been completed and shall extend through the duration of the project and the 1 year maintenance period as defined in Section 1-05.10 (Guarantees). The Contractor shall mow lawn areas to a height of 2 inches whenever the average height of grass reaches 3 inches.

8-02.3(16)D FERTILIZER FOR SODDED AREA New Section

Prior to placing sod, a 10-2-10 fertilizer shall be rototilled into the top 3 inches of the soil at a rate of 4 pounds of available nitrogen per 1,000 square feet.

**8-03 IRRIGATION SYSTEMS**

8-03.1 DESCRIPTION Supplement

This work consists of installing an irrigation system as either a temporary system for plant establishment or to be owned and maintained by the City within either City’s property or public right-of-way.

8-03.3 CONSTRUCTION REQUIREMENTS Supplement

The Contractor shall submit catalog cuts of all heads, quick coupling valves and controller to the Engineer for approval per the requirement of Section 1-06.7 (Submittals). See Section 9-15 (Irrigation System) for Materials.

Water service connections shall be made by the Contractor as indicated in the Plans and such installations and equipment shall conform to the requirements set forth by the Engineer.

8-03.3(3)      PIPING

Supplement

Irrigation conduit shall be PVC pipe and be in accordance with Section 9-15.1(2) (Polyvinyl Chloride Pipe and Fittings).

A. PVC Sleeves

All new piping and wiring to be installed under sidewalks and roadways shall be placed in sleeves as specified in Section 9-15 (Irrigation System). Sleeves shall be installed either by tunneling under existing surfaces or saw cutting and patching surface to match existing condition.

B. PVC Pipe and Fittings

Due to the nature of PVC pipe and fittings, the Contractor shall exercise care in handling, loading, unloading and storing to avoid damage. The pipe and fittings shall be stored under cover and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat, so as not to be subject to undue bending or concentrated external load at any point. Any pipe that has been dented or damaged shall be set aside until such damage has been cut out and the pipe is rejoined with a coupling.

Solvent welded joints shall be given at least 15 minutes set-up time before moving or handling. Pipe shall be partially center loaded to prevent arching and slipping. No water shall be permitted in pipe until a period of at least 10 hours has elapsed for solvent weld setting and curing.

Backfilling shall be done when pipe is not in an expanded condition due to heat or pressure. Cooling of the pipe can be accomplished by operating the system for a short time before backfilling, or by backfilling in the early part of the morning before the heat of the day.

Before pressure testing, soluble weld joints shall be given at least 24 hours curing time.

No PVC pipe may be threaded or connected to a threaded fitting without an adapter.

The Contractor shall take great care to insure that the inside of the pipe is absolutely clean. Any pipe ends not being worked on shall be protected and not left open.

C. Galvanized Pipe and Fittings

All galvanized pipe, including risers and hose connections, shall be painted with at least one coat of "Carbon Elastic Paint" to prevent acid corrosion. Cast fittings need not be painted. Do not add any solvent to the paint. If the paint is too thick, heat without applying direct flame. Care must be taken to thoroughly paint all male threads. When painting is done before assembly, the paint should be touched up after assembly.

8-03.3(5)      INSTALLATION      Supplement

Detectable marking tape shall be placed on all main and lateral lines, and elsewhere as directed on the plans or by the Engineer.

8-03.3(6)      ELECTRICAL WIRE INSTALLATION      Supplement

Splices shall be made with a dry-splice wire connector, PVC construction body and snap-lock plug with copper crimp sleeve, three flapped openings for wires and sealer packet such as Rainbird ST-03UL/PT-55 Snap-Tite, UL Wire Connectors and PT-55 Sealer System, Glendora, California or equal. Install per manufacturer's specifications.

8-03.3(7)      FLUSHING AND TESTING      Supplement

Before backfilling and installation of automatic valve, all sprinkler lines with risers installed and capped shall be flushed and pressure-tested at 150 psi with all joints exposed. This pressure shall be maintained until all joints, fittings, and risers have been inspected by the Engineer. Any leakage noted shall be corrected and the test repeated until the system is watertight.

The final test must be performed and approved under the direction and supervision of the Engineer.

The location, inspection and testing provisions of these specifications shall be strictly adhered to. Any part of the sprinkler system backfilled before location, testing, or approved inspection by the Engineer, will be completely uncovered and exposed until approved for backfilling by the Engineer.

8-03.3(9)      BACKFILL      Supplement

Trenches under roads or paved areas shall be backfilled and tamped with a mechanical tamper in successive 6 inch lifts. Paving shall be replaced to the satisfaction of the Engineer. Jacking under paved areas will be allowed with Engineer's approval.

Unless otherwise specified, trenches shall be deep enough to allow 18 inches cover over sprinkler lines and 24 inches cover over supply lines. All trenches must be straight and not have abrupt changes in grade. The trench bottom must be free of rocks and sharp-edged objects.





damage to existing structures. Where necessary to these purposes, the Contractor shall lower water levels in advance of excavation, utilizing wells, well points, jet educators, or similar positive methods. The water level as measured by piezometers shall be maintained a minimum of 2 feet below prevailing excavation level.

The Contractor shall commence dewatering prior to any appearance of water in excavation and continue until work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.

Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.

The Contractor shall install wells and/or well points, if required, with suitable screens and filters, so that continuous pumping of fines does not occur, arrange discharge to facilitate collection of samples by the City. During normal pumping, and upon development of well(s), levels of fine sand or silt in the discharge water shall not exceed 5 ppm. The Contractor shall install sand tester on discharge of each pump during testing to verify that levels are not exceeded.

The Contractor shall control grading around excavations to prevent surface water from flowing into excavation areas.

#### 8-05.1(1) DESIGN

Contractor shall designate and obtain the services of a qualified dewatering specialist to provide a dewatering plan as may be necessary to complete the work.

Contractor shall be responsible for the accuracy of the drawings, design data, and operational records required.

Contractor shall be solely responsible for the design, installation, operation, maintenance, and any failure of any component of the system.

#### 8-05.1(2) DAMAGES

Contractor shall be responsible for and shall repair any damage to work in place, or other contractor's equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, natural resources, habitat, existing wells, and the excavation, including, damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor's negligence, inadequate or improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.

The Contractor shall remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to the Owner.

8-05.1(3)      MAINTAINING EXCAVATION IN DEWATERING CONDITION

Dewatering shall be a continuous operation. Interruptions due to power outages or any other reason will not be permitted.

The Contractor shall continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until the critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation or other hydrostatic pressure imbalance.

The Contractor shall provide standby equipment on site, installed, wired, and available for immediate operation if required to maintain dewatering on a continuous basis in the event any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils.

System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components and any other work required to maintain excavation in dewatered condition.

8-05.1(4)      SYSTEM REMOVAL

The Contractor shall abandon and remove from the site, in accordance with WAC Chapter 173-160 and RCW Chapter 18.104, all groundwater control and monitoring system elements. The Contractor shall be, or employ the services of, a water well contractor licensed in the State of Washington to abandon all wells, and/or well points. The Contractor shall assume ownership and responsibility for the disposal of all removed groundwater control pumps, pipes, and other assorted system hardware.

The Contractor shall abandon and remove the groundwater control and monitoring systems in such a manner that groundwater does not flow or seep through groundwater control or monitoring system penetrations into any structure or facility.

**8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES**

8-06.1      DESCRIPTION      Replacement

Driveway aprons shall be constructed in accordance Standard Detail No. TRAFFIC-07 (Residential Driveway), TRAFFIC-08 (Alternate Residential Driveway) and TRAFFIC-09 (Commercial/Industrial Driveway) and TRAFFIC-10 (Alternate Commercial/Industrial Driveway Retrofit) and to the size shown on the plans or as directed by the Engineer.

A driveway approach shall be considered to be that portion of the driveway behind the property line. An existing driveway approach is required to be removed and replaced to provide transition to the new cement concrete driveway apron.

8-06.2        MATERIALS

Replacement

Materials shall meet the requirements of the following sections:

Portland Cement	9-01
Aggregates	9-03
Premolded Joint Fillers	9-04.1
Concrete Curing Materials and Admixtures	9-23

8-06.3        CONSTRUCTION REQUIREMENTS

Revision/Supplement

The first paragraph is revised to read:

Cement concrete driveways shall be constructed with air entrained concrete Class 3000 conforming to the requirements of Section 6-02 (Concrete Structures).

Concrete driveways shall be cured per methods described in Section 5-05.3(13) (Curing), with the following exceptions if the curing compound method is used:

- The Contractor shall use Type I clear curing compound per Section 9-23 (Concrete Curing Materials and Admixtures).
- The Contractor shall not use white pigmented curing compound.
- The curing agent shall be applied immediately after brushing and be maintained for a period of 5 calendar days.

The Contractor shall have readily available sufficient protective covering, such as waterproof paper or plastic membrane, to cover the pour of an entire day in event of rain or other unsuitable weather.

Additional requirements for curing in hot weather shall be as follows:

In periods of low humidity, drying winds, or high temperatures, a fog spray shall be applied to concrete after placement as soon as conditions warrant to prevent the formation of shrinkage cracks. The spray shall be continued until conditions permit the application of liquid curing membrane or other curing media. The Engineer shall make the decision when the use of a fog spray is necessary.

Additional requirements for curing in cold weather shall be as outlined in Section 5-05.3(14) (Cold Weather Work).



to Remove or Destroy a Survey Monument” in accordance with WAC 332.120.070, prepared by a Washington State Licensed professional survey or engineer, is required. Upon completion of the activity that caused the removal or destruction of the survey monument or land boundary corner, the surveyor licensed in the State of Washington shall reset a survey marker in compliance with state law and file a “Completion Report for Monument Removal or Destruction” in accordance with WAC 332.120.060.

8-13.3(2)      INSTALLATION      New Section

Where called for on the plans, or where directed by the Engineer, the Contractor shall construct a poured “Monument Type A or Type B (Modified)” in accordance with these specifications and Standard Detail Nos. TRAFFIC-20 (Poured in Place Monument, Type A Modified) and TRAFFIC-21 (Poured in Place Monument, Type B Modified). The bronze plug marker shall be inserted in the concrete mix to the required line and grade in accordance with RCW 58.09.120. The concrete base shall be placed on a well-compacted foundation. When Type B monuments are installed, the monument case shall be placed in such a manner that will not disturb the bronze plug markers.

The Contractor shall install monuments after the final course of surfacing has been placed. After the monument or monument case has been in place for a minimum of three days, the roadway surface shall be patched in a workman like manner with HMA Class B or as directed by the Engineer.

Where called for on the plans, or where directed by the Engineer, the Contractor shall adjust existing monuments to the grade as staked or otherwise directed by the Engineer. The existing cast iron case and cover shall first be removed and thoroughly cleaned for reinstalling at the new grade.

**8-14 CEMENT CONCRETE SIDEWALKS**

8-14.1      DESCRIPTION      Replacement

This work shall consist of construction of cement concrete sidewalks, including wheelchair ramps with detectable warning strips, and driveway aprons in accordance with these Specifications, the Plans and the Standard Details, or as directed by the Engineer.

8-14.2      MATERIALS      Supplement

Materials shall also meet the requirements of the following sections:

Reinforcing Steel      9-07

The concrete for sidewalks and driveways (aprons and approaches) shall be air entrained concrete Class 3000 in accordance with the requirements of Section 6-02 (Concrete Structures).

8-14.3(1)      EXCAVATION      Supplement

Excavation for sidewalk and for driveways (aprons and approaches) shall be in accordance with Section 2-03, (Roadway Excavation and Embankment).

Embankments shall be compacted by Method B as specified in Section 2-03.3(14)C (Compacting Earth Embankments). Approved tampers shall be used in areas inaccessible to normal compaction equipment.

The subgrade shall be graded to within 1 inch of established grade and the area between the sidewalk and the adjacent private property line shall be shaped to line, grade, and section shown on the plans before the forms are set.

8-14.3(2)      FORMS      Supplement

Low areas in the subgrade shall be backfilled with select materials or suitable native material as directed by the Engineer and the backfill shall then be compacted to the satisfaction of the Engineer. All high areas in the subgrade shall be cut down to meet the subgrade requirements.

8-14.3(3)      PLACING AND FINISHING CONCRETE      Revision/Supplement

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

The detachable warning pattern shall have the truncated dome shape shown in the Standard Plans and Standard Details and may be formed by either embossing the wet concrete, adding a manufactured material before or after the concrete has cured, or installing masonry or ceramic tiles.

Through joints and dummy joints shall be located and constructed in accordance with Standard Details Nos. TRAFFIC-23 (Sidewalk with Landscape Strip) and TRAFFIC-24 (Commercial/Industrial Sidewalk without Planter Strip).

Dummy joints shall be formed by first cutting a groove in the concrete with a tee bar of a depth equal to, but not greater than the joint filler material, and then working the pre-molded joint filler into the groove. Pre-molded joint filler for both through and dummy joints shall be positioned in true alignment at right angles to the line of the sidewalk and be normal to and flush with the surface. Where the sidewalk will be contiguous with the curb, it shall be constructed with a thickened edge as shown on the Standard Detail No. TRAFFIC-24 (Commercial/Industrial Sidewalk without Planter Strip).

Joints shall be edged with a ¼ inch radius edger and the sidewalk edges shall be edged with a ½ inch radius edger.









Abandoned controller cabinet foundations shall be removed completely and disposed of by the contractor. Abandoned conduits shall be removed, unless otherwise shown on the plans.

8-20.3(4)      FOUNDATIONS      Supplement

All foundations shall be Class 3000 reinforced concrete. Foundations shall accommodate all required conduits.

Concrete shall be placed against undisturbed earth where possible. Before placing the concrete, the Contractor shall block out around any other underground utilities that may lie in the excavated base to prevent foundation adherence to the utility line. Concrete foundations shall be troweled, brushed, and edged. Exposed anchor bolts and conduits shall be promptly cleaned of any concrete after installation.

Where no sidewalk is planned or exists the top of the foundation shall be 12 inches above roadway centerline. Poles and related appurtenance shall be a minimum of 2 feet from face of pole to face of curb where no sidewalk is present.

All foundations shall be installed so that the traffic signal and/or luminaire mast arm is perpendicular to the centerline of the roadway it serves, unless otherwise noted on the plans.

8-20.3(4)A      FOUNDATIONS FOR LIGHT STANDARDS      New Section

Foundations for light standards shall conform to Standard Detail Nos. TRAFFIC 49 (Luminaire Pole), TRAFFIC-61 and 61a (Downtown Pedestrian Lighting Standard), TRAFFIC-62 (Local Residential Ornamental Street Lighting Standard) and/or TRAFFIC-63 (Downtown Street Lighting Standard) and shall be constructed per the manufacturer's recommendations. Each concrete base shall have one (1) 2" PVC, Schedule 40, conduit sweep from inside the pole through the concrete base for each direction of wire run shown on the plans. The PVC conduit shall not extend more than 1½ inch above the concrete base. Anchor bolts shall be per Section 9-29.6(5) (Foundation Hardware).

Pole foundations next to or in sidewalks shall be placed 4 inches below the finished surface of the sidewalk. A 4-inch concrete pad per Standard Detail No. TRAFFIC-48 (Luminaire and Conduit Layout) shall be poured concurrently with the sidewalk. The pole foundation and sidewalk shall be separated by a ¾ inch expansion joint such that the foundation can be removed without damage to the surrounding sidewalk.

8-20.3(4)B      FOUNDATION FOR SERVICE CABINET      New Section

The Power Service Cabinet foundation shall conform to Standard Detail No. TRAFFIC-51 (Power Service Cabinet Detail) or TRAFFIC-52 and 52a (Power Service and UPS Cabinet Detail) and TRAFFIC-53 (Traffic Signal Controller and UPS Foundation Detail) and Section 8-20.3(10) (Services Transformer, Intelligent Transportation System Cabinet) of this document.

8-20.3(4)C FOUNDATION FOR CONTROLLER CABINET

New Section

The controller foundation shall conform to Standard Detail No. TRAFFIC-53 (Traffic Signal Controller Foundation Detail). In addition to the required conduit there shall be a spare 3-inch conduit that will terminate in the nearest traffic signal junction box.

The controller cabinet concrete foundation pedestal height shall be 20 inches to 24 inches. The joint between the cabinet and the foundation shall be sealed using a clear, waterproof, silicone caulk.

8-20.3(5) CONDUIT

Revision

Conduit shall be in accordance with all provisions of Section 9-29.1 (Conduit, Innerduct, and Outerduct).

The conduit runs shown on the plans are schematic, however, they shall be followed as closely as site conditions will allow and may be revised, as directed by the Engineer, to allow for unforeseen obstructions.

The contractor shall install the conduit in the approximate locations and to the size shown on the plans and as directed by the Engineer. Conduits installed under sidewalk and driveway areas may be Schedule 40 PVC unless otherwise noted on the plans. All conduit in roadways shall be placed before any pavement construction. Schedule 80 PVC shall be used for all roadway crossings. The same schedule and type of conduit shall be used for the entire length of the run from outlet to outlet and from Schedule 80 PVC conduit crossing the roadway to the nearest junction box. Bends shall be no less than 4 feet in diameter. The exceptions are for interconnect and fiber optic system where additional bends, elbows, or junction boxes must be approved by the Engineer. All conduit entering or leaving junction boxes shall have bell end PVC bushings.

Stubouts shall be installed as shown on the plan or as directed by the Engineer. A No. 12 copper pull wire or a pull rope shall be installed in conduits which are to receive future conductors. The pull rope shall consist of a flat, woven, lubricated, soft-fiber polyester tape with a minimum tensile strength of 2,000 lbs and shall have printed sequential measurement markings at least every 3 feet. At least 2 feet of pull wire or rope shall be doubled back into the conduit at each termination. Stubouts that are installed before the final lift of pavement shall be surrounded with a 6 inch PVC sleeve. This sleeve shall be extended below the top of the stubout and be flush with finished grade.

All conduit shall be appropriately capped and sealed with a molded plug cap. Molded plug cap installation shall comply with manufacturer's installation and recommendations. With the exception of connections to HDPE conduit, joints shall be connected with medium grade gray cement solvent applied per the manufacturer's recommendations. The loop wires shall pass through a hole in the cap. The end of the conduit will also be sealed with moldable duct

sealing compound. Sifted sand will be used to cover all exposed loop wires before final filling with loop sealant.

All conduit shall display the Underwriter Laboratories certification (UL Listed). All conduit shall continue to meet the requirements of Section 9-29.1 (Conduit, Innerduct, and Outerduct) unless specified otherwise.

8-20.3(6) JUNCTION BOXES, CABLE VAULTS, and PULL BOXES Supplement

Cable vaults and pull boxes shall conform to Standard Detail Nos. GENERAL-05 & 05a (Splice Vault Detail), and GENERAL-06 & 06a (Pull Box Details), and shall be installed in accordance with WSDOT Standard Plan J-90.10-00 (Pull Box) and J-90.20-00 (Cable Vault). No cable vault shall be located within the travelway, wheelchair ramps or driveway area, except where noted on the plans. All lids shall open away from the travelway. Prior to construction of finished grade, if cable vaults are installed or adjusted, pre-molded joint filler for expansion joints may be placed around the cable vaults. The joint filler shall be removed prior to adjustment to finished grade.

The Contractor shall remove and dispose of junction boxes for the existing illumination system that are no longer needed.

Junction boxes shall be installed in accordance with all provision of Section 9-29.2 (Junctions Boxes, Cable Vaults and Pull Boxes) and in accordance with WSDOT Standard Plan J-40.10-00 (Locking Lid Standard Junction Box, Types 1 & 2), and Standard Detail No. TRAFFIC-48 (Luminaire and Conduit Layout). Junction Box type shall be as indicated on the plans, alternate A or B may be used for Type 1 boxes. All Junction Boxes, including type 1 boxes, shall be equipped with locking lids with Penta Head tamper resistant bolts manufactured by “Fogtite” or approved equivalent.

Where specified, existing junction boxes shall be adjusted to the final grades designated on the Plans or as specified by Engineer.

The junction box or the foundation for the junction box (if required) shall rest on a pad of 5/8 inch minus crushed rock to a minimum depth of 6 inches. Six inches of washed drain rock shall be placed inside the junction box and be spread evenly around all conduits. No junction box shall be located within the travelway, wheelchair ramps or driveway area, except where noted on the plans. Type III modified dual lid junction boxes shall be placed such that the lids open away from the travelway.

All three-way service connections leading to luminaires, including street crossings and service cabinet junction boxes shall be made with a SEC Model 1791-DP or approved equal.

Box lids shall be inscribed with the message “LT” if used exclusively for lighting, “TS” if used exclusively for Traffic Signals, “INTC” if used exclusively for interconnect, “ITS” for fiber optic cable and “TS” “LT” if jointly used. The lids and frames shall be hot dipped galvanized after they are inscribed.

8-20.3(8)      WIRING

Supplement

All cable entering cabinets shall be neatly bundled and wrapped. All service connections and splices shall be made within junction boxes.

The Contractor shall pull out and dispose of wire for the existing illumination system that is no longer needed.

8-20.3(9)      BONDING, GROUNDING

Supplement

Bonding and Grounding shall be installed in accordance with Standard Details No. TRAFFIC-51 (Power Service Cabinet Detail) or TRAFFIC 52 and 52a (Power Service and UPS Cabinet Detail) and No. TRAFFIC-50 (Uniform Luminaire Wiring Detail), and as detailed in the plans

The Contractor shall provide junction boxes over all grounding rods.

All junction boxes containing conductors carrying 120 volts or higher will have the lid and frame bonded to the system ground. The connections to the lid and frame will be made with approved compression type ring terminals. The braid will be of sufficient length so that the lid may be easily removed and placed next to the junction box. It will be routed around all cables so that it does not pass through any cable loops. In the case of Type III modified junction boxes, both lids shall be bonded.

When loop lead-in wires or interconnect wire are the only wires in the junction box, bonding is not required.

8-20.3(10)      SERVICES TRANSFORMER, INTELLIGENT  
TRANSPORTATION SYSTEM CABINET

Supplement

A three-wire electrical service shall be used at 120/240 volts. The service shall be inspected by Washington Department of Labor and Industry per Section 8-20.1(1) (Regulations and Code).

Electrical service cabinets per Standard Detail Nos. TRAFFIC-51 (Power Service Cabinet Detail), TRAFFIC-52 and 52a (Power Service and UPS Cabinet Detail) and TRAFFIC-53 (Traffic Signal Controller and UPS Foundation Detail), and per Section 9-29.24 (Service Cabinets) shall be installed where shown on the plans and as directed by the Engineer. The service cabinets shall be attached to a minimum of a 24 inch x 24 inch x 6 inch thick concrete pad by 4 hot-dipped galvanized foundation bolts, washers, and nuts. The Pad shall be reinforced with 6 inch x 6 inch x #10 welded wire fabric.

Overhead electrical service shall be brought to the power service cabinet through a conduit riser with a weather head on the service pole. The service shall be split in the load center into a 120 VAC/240 VAC circuit for the traffic signal and street lighting systems.



Anchor bases, per Section 9-29.6(2) (Slip Base Hardware) shall be installed as directed by the Engineer. The poles shall be plumb with no shims. The poles shall be plumbed on leveling nuts secured to the anchor bolts and locking nuts on top of the base flange. The side of the shaft opposite the load shall be plumbed using the leveling nuts or as directed by the Engineer.

The void between the foundation and the pole flange shall be no larger than 2 inches and shall be completely filled around the conduit(s) with dry pack mortar and neatly troweled. A ¼ inch weep hole shall be installed on the downward slope side of the pad.

The dry pack mortar consists of 1:2 cement to fine sand mixture with enough water to allow the mixture to stick together when molded into a ball by hand, but which will not exude water when pressed.

8-20.3(13)C LUMINAIRES

Supplement

All luminaires, shall be in accordance with all provisions of Section 9-29.10 (Luminaires) and shall be installed according to the manufacturer's recommendations, as directed by the Engineer and as specified herein. Contractor shall furnish man-lift truck for use in final inspection of luminaire system. Luminaires shall be leveled in 2 planes. One plane perpendicular to the curb (parallel to davit arm), the other plane shall be 90 degrees to the first plane. All luminaires shall be installed with the handhole opposite of traffic flow.

The luminaire shall be bolted to the davit arm by means of cast-in inserts and this detail shall be coordinated with the standard manufacturer to ensure proper fit. The terminal board shall have lugs of a 240-volt 3-wire power source. Terminals shall be labeled line-neutral-line. The neutral terminal shall be grounded to the metal housing of the luminaire. The Contractor shall ascertain the correct lamp socket setting from the luminaire manufacturer to achieve the distribution pattern indicated above. For warranty purposes all lamps shall be dated on the base with the installation month and year.

Install an approved ¾” to 1 ½” galvanized reducing washer with a ¾” set screw cable clamp strain-relief connector on all luminaire lead-in wires just before the luminaire connections.

All luminaires shall be provided with markers for positive identification of light source and wattage per Section 9-29.10 (Luminaires) of the Standard Specifications.

8-20.3(13)F LUMINAIRE FUSING

New Section

Luminaire fusing and electrical connections at lighting standard bases shall be per Section 9-29.7 (Luminaire Fusing and Electrical Connections at Light Standard Bases, Cantilever Bases and Sign Bridge Bases) except that light standards shall be provided with 2 in-line fuse holders, per this section, with the fuses mounted inside the pole and readily accessible from the access hole, electrical splices shall be in the junction box near each pole as shown on

Standard Detail No. Traffic-50 (Uniform Luminaire Wiring Detail). All luminaries shall be fused in the pole base with a “Y” type quick disconnect fuse system.

8-20.3(13)G PHOTOELECTRIC CONTROLS New Section

Photocells shall be installed on the service cabinet in conformance with Section 9-29.11(2) (Photoelectric Controls) of the Standard Specifications.

8-20.3(14) SIGNAL SYSTEMS

8-20.3(14)A SIGNAL CONTROLLERS Supplement

The entire controller cabinet, complete with all auxiliary equipment, shall be delivered to the City of Auburn Maintenance & Operation facility, located at 1305 C Street SW, for testing in the Traffic Signal Shop. The period of testing shall be for a minimum of 2 weeks in duration and is intended to demonstrate the operation of all equipment. Any deficiencies or equipment failures discovered shall be corrected by the Contractor.

In the event that it is not possible for the City and the Contractor to agree on the cause of a malfunction, the City's decision shall be binding.

The successful completion of the performance test will constitute acceptance of the equipment by the City.

8-20.3(14)B SIGNAL HEADS Supplement

Vehicular Signal Heads

All signal heads shall be LED and meet the requirements of Section 9-29.16(2) (Conventional Traffic Signal Heads). Lens sizes shall be shown in plan view of design.

Overhead mounted signals shall be adjusted in the field such that a person standing on the pavement can see the brightest image of all vehicle signal sections from a distance complying with current MUTCD standards. Signal heads shall be plumbed, and aiming shall be by reference to the RED signal section.

Masking of optically programmed signal heads shall take place just before “turn-on” and after all field adjustments have been made. After masking, no further head position adjustments shall be made without the approval of the Engineer. Any final adjustments required shall be made in the Engineer’s presence.

Pedestrian Signal Heads

Pedestrian signals shall be in accordance with all provisions of Section 9-29.20 (Pedestrian Signals). Pedestrian signal heads shall utilize a countdown LED display.

Pedestrian signal heads shall be mounted with the bottom of the signal housing 8 feet above the sidewalk or ground surface.

8-20.3(14)C INDUCTION LOOP VEHICLE DETECTORS Supplement

Loops shall be located and constructed as shown on the plans and in accordance with Standard Detail No. TRAFFIC-59 (Standard Detector Loop Spacing) and as shown on WSDOT Standard Plan No. J-8c (Type 3 Induction Loop). After installation of loops, cuts shall be sealed with Crafclo loop sealant or approved equivalent.

Saw cuts shall not remain empty for a duration longer than twenty-four hours after the saw cut is completed. Saw cuts shall be cleared of debris with high-pressure water and dried with 100-psi minimum air pressure before installing loop wire.

Loops shall be wound clockwise and consist of 4 turns of loop conductor.

From the loops to the junction box, the loop wires shall be twisted two turns per foot and labeled at the junction box in accordance with the loop schematics included in the plans. A 3/8-inch saw cut will be required for the twisted pair.

Loop wires shall be connected to the lead-in cable using compression sleeves and sealed with 2" wide rubber mastic tape, 3m 2228 or approved equivalent. An extra 10 feet of both loop wires and lead-in cable shall be coiled neatly in the junction boxes for future work. Loops shall be round and saw cuts shall be 6-foot diameter and shall be constructed using equipment designed for cutting round loops. The equipment shall use a concave, diamond-segmented blade. The saw cuts shall be vertical and shall be a minimum of 0.25 inches wide. The saw cut depth shall be minimum of 2 1/2 inches and maximum of 3 inches measured at any point along the perimeter. The bottom of the saw cut shall be smooth. No edges created by differences in saw cut depths will be allowed.

8-20.3(14)D TEST FOR INDUCTION LOOPS AND LEAD-IN CABLE Supplement

The inductance of the loop shall be measured and the inductance reading shall not be less than 60 or greater than 120 micro henries. If any of the installations fail to pass all specified tests, the installation shall be repaired or replaced and retested to the satisfaction of the Engineer. Continuity checks of pre-formed loops shall be done before installation, and both continuity and resistance to ground after the loops are embedded in the pavement.

8-20.3(14)E SIGNAL STANDARDS Supplement

The poles shall be installed on leveling nuts secured to the anchor bolts and locking nuts on top of the base flange. The side of the shaft opposite the load shall be plumbed using the leveling nuts.

The void between the foundation and the pole flange shall be no larger than 2 inches and shall be completely filled around the conduit(s) with dry pack mortar and neatly troweled. A ¼ inch diameter weep hole shall be placed in the mortar to provide drainage from the interior of the pole to the exterior.

The dry pack mortar consists of 1:2 cement to fine sand mixture with enough water to allow the mixture to stick together when molded into a ball by hand but will not exude water when pressed.

**8-20.3(14)F EMERGENCY VEHICLE PRE-EMPTION**

New Section

**Detector**

The contractor shall provide and install 3M Company 700 Series preemption detectors at locations as shown in the plans. The emergency preemption detectors shall be solid-state devices in weather resistant housing. The detectors shall be capable of detecting an optical signal generated by an Opticom brand emitter (3M Company). The detectors shall detect the optical signals from the emitter, amplify the signal, and transmit it to the phase selector. The detectors shall have a range control capable of being adjusted up to a maximum of 1/3 mile. Detectors shall be installed in compliance with manufacturer installation instructions and recommendations.

**Phase Selector**

The subcontractor shall provide phase discriminator units as required to obtain the necessary number of channels for each leg of the intersection. The phase discriminator shall be a solid state, rack mounted device which shall provide power to the detectors. The phase selector shall receive the amplified signal from the detector, verify it as valid, and send an input to the controller. This input shall be for the duration of the detected signal plus 8 to 10 seconds additional time after the signal is lost. Four channels shall be provided.

The phase selector shall also include the following features:

1. High and low priority discrimination,
2. Settable signal intensity threshold for up to at least 2,500 feet,
3. Computer based user interface,
4. Front panel switches and indicators for testing, and
5. 20,000 priority/ vehicle class/ vehicle code ID combinations.

**8-20.3(14)G INTERCONNECT NETWORK**

New Section

Traffic signal interconnect cable shall be installed as shown in the plans and in accordance with all provisions of Section 9-29.3 (Conductors, Cable). All cable shall be installed in compliance with the manufacturer's installations and recommendations.

Installation

## Multiconductor Cable

For aerial installation of the interconnect cable, the Contractor shall be responsible for sizing the proper hardware for installing the cable (i.e., suspension clamps, necessary messenger and guy wires, dead-end clamps, ready access closures, down guy anchors, etc.) and shop drawings shall be submitted to the City in accordance with Section 1-06.7 (Submittals) a minimum of 10 working days prior to installation. The aerial cable shall be installed with a minimum of 18 feet clearance at its lowest sag point measured at mid span. The cable shall be at least 12 inches clear of any other utility cables on the poles and shall be installed above the existing telephone cables whenever practical.

When pulling interconnect cable in conduit, the cable pulling equipment must demonstrate that the total force on the cable does not exceed the accepted, published manufacturer's recommendations for each cable. Pulling through junction boxes will be allowed with proper guides or pulleys. The Contractor shall observe caution while pulling the cable through conduit to prevent damage to cable jackets, shields, or conductors. All cable ends shall be taped to exclude moisture during installation and shall be kept taped until connections are made with terminal strips.

Interconnect cables shall not be spliced, unless otherwise approved by the Engineer. Interconnect cables shall be terminated at the locations shown on the plans.

Each reel of cable shall be equipped with the cable manufacturer's factory installed pulling-in eyes. 100% of the conductors shall be attached to the pulling-in eye. Field-cut cable ends shall be provided with a woven (basket) cable grip. A swivel with a minimum of ¾ inch (1.9 cm) links shall be used between the pulling-in eyes or cable grip and the pulling strand.

Cable pulling shall be stopped immediately if the cable on a reel binds or does not pay off freely. The cause of the binding must be cleared to the satisfaction of the Engineer before the pulling-in operation is continued. The cable reel shall turn freely or the cable be fed by hand.

A cable feeder guide of suitable dimensions shall be used between the cable reel and the face of the duct to protect the cable and guide it into the duct as it is paid off the reel. The cable shall not be bent at any location to a radius less than 10 times the cable outside diameter.

The mechanical stress placed upon a cable during installation shall not be such that the cable is twisted or stretched. The direction in which the cable is to be pulled shall be provided by the Engineer.

As the cable is paid off the reel, it shall be carefully inspected for jacket defects. If defects are noticed, the pulling operation shall be stopped immediately and the Engineer will determine what corrective action shall be taken.

As the cables are paid off the reel into the cable feeder guide, they shall be sufficiently lubricated with a type of lubricant recommended by the cable manufacturer and approved by the Engineer. A cable lubricator (funnel) shall be placed around the cable just ahead of the cable feeder to facilitate proper lubrication of the cable.

After the cable has been placed, the exposed cable in the junction boxes and cabinets shall be wiped clean of cable lubricant with a cloth.

Sufficient cable, 10 feet where bending radius permits, shall be left in each cabinet to properly terminate the cables. All pulled ends should be examined for evidence of damage due to the pulling operation. The cable sheath should not be pulled beyond the cable core.

8-20.3(14)H PEDESTRIAN PUSH BUTTONS AND SIGNS

New Section

Push buttons shall be in accordance with Section 9-29.19 (Pedestrian Push Buttons) per the manufacturer's directions and recommendations.

Pedestrian signs and push buttons shall be securely fastened to the signal standard using stainless steel fasteners and aluminum channel. Signal standards shall be drilled and tapped for mounting push buttons. Push buttons shall be installed 42" from the centerline of push buttons above sidewalk or ground level.

An informational sticker explaining the use and meaning of displays shall be installed on the pole centered between the button housings. The bottom of the sticker shall be 12 inches above the top of the housing. In the case of single button locations the sticker shall be centered above the housing. The sticker shall be the type approved by the Engineer.

8-20.3(14)I VIDEO DETECTION

New Section

When video detection is shown in the plans, the Contractor shall install either Econolite Solo Pro II or Traficon video detection systems as identified on the plans.

The detection cameras shall be Econolite Autoscope Solo Pro II Machine Vision Processors. The communications panel shall be Econolite Autoscope Communications Panel and the interface panel shall be the Econolite Mini-Hub TS2.

For Traficon systems the presence detector board shall be Traficon VIP3.2, which monitors two cameras. The Contractor shall provide a VIP set-up keypad. The camera housings shall be Philips LTC 9380 Series Outdoor Housings or approved equal. The detection cameras shall be Rainbow CCTV BL58D or approved equal. Video monitor shall be Rainbow CCTV RMB92 or approved equal. Coaxial cable shall be 5 conductor cable ISDTEC X341667-00.

Cameras shall be installed where indicated on the plans or as directed by the Engineer. Final adjustment will be done by the City of Auburn Traffic Signal Technician.

8-20.3(18) AMERON POLES AND CROSSWALK SIGNS WITH FLASHING LED

New Section

The crosswalk signs, poles, pole foundations, luminaires, wiring and all other parts and appurtenances, conduits, and messenger wires shall be provided and installed by the Contractor for the mid-block crossings.

The installation of the special Ameron poles and flashing crosswalk signs with LED shall include installing the custom street light poles with luminaires, attaching the signs to the messenger cables, attaching the wires to the messenger cables per WSDOT Standard Specification 8-20.3(7) (Messenger Cable, Fittings), and wiring the signs so the signs and LED lights shall be continuously functioning (i.e. no photo cell).

The Contractor shall install the messenger cables per WSDOT Standard Specifications Section 8-20.3(7) (Messenger Cable, Fittings) to allow for 6 ft of sag at the centerline of the street.

See Section 8-20.2 (Materials) for material specifications for the mid-block crossings.

**8-21 PERMANENT SIGNING**

8-21.3 CONSTRUCTION REQUIREMENTS

Supplement

Signs shall be manufactured and installed in accordance with the current edition of the Washington State Sign Fabrication Manual of the Department of Transportation, and the Manual on Uniform Traffic Control Devices, and all provisions of Section 9-28 (Signing Materials and Fabrication). Code numbers on the plans are in reference to the Washington State Sign Fabrication manual.

Roadside mounted signs shall be mounted on 1¾ inch square steel posts, per Standard Detail No. TRAFFIC-55 (Typical Sign Post Installation). Signs located in sidewalks or paved areas only shall be installed with Sono tubes per Standard Detail No. TRAFFIC-55 (Typical Sign Post Installation). Relocated signs shall be installed on new posts unless otherwise specified. Postholes shall allow placement of backfill around the post in accordance with the Standard Detail No. TRAFFIC-55 (Typical Sign Post Installation).

**8-22 PAVEMENT MARKING**

8-22.1 DESCRIPTION

Supplement

Before installing pavement markings the Contractor shall pre-mark the layout of all channelization and receive approval from the Engineer. Pre-marks shall consist of painted spot markings or temporary pavement marking tape. The Contractor shall notify the Engineer of intention to receive approval of the channelization pre-mark at least 48 hours in advance.



Spall Backfill for Walls	9-13.1
Perforated PVC Underdrain Pipe	9-05.2(6)

Rock used for rock wall shall be sound, hard, durable, ledge rock of a uniform color and obtained from a commercial quarry. Rock is to be free of seams, cracks, loose stratification or other defects tending to destroy its resistance to weather. The rock shall have a density of at least 145 pounds per cubic foot.

All rock sizes used in rock walls shall be as shown on the Standard Detail No. GENERAL-04 (Rock Wall Detail). All two-man rocks (200-600 pounds) shall be a minimum of 12 inches in the least dimension. All three-man rocks (600-1,000 pounds) shall be a minimum of 18 inches in the least dimension.

8-24.3            CONSTRUCTION REQUIREMENTS

The rock wall shall be constructed one course at a time. Rock selection and placement shall be such that at least 80% of the exposed face of the wall is rock.

Each horizontal row of rocks shall be seated and bedded by placing the specified backfill behind the rock to provide a stable condition for the entire wall. Each rock shall be keyed into adjacent rocks by utilizing the natural irregular shapes of the rocks. Voids larger than 2 inches shall be filled by wedging smaller rock of the same quality into the voids until the maximum remaining void is 2 inches or less.

**8-30 WOOD FENCE AND GATES** New Section

8-30.1            DESCRIPTION

This work shall consist of installing new “Wood Fence” and “Wood Gate” where shown and as detailed on the plans as directed by the Engineer.

8-30.2            CONSTRUCTION REQUIREMENTS

All work shall be in accordance with the applicable portions of Section 6-04 (Timber Structures), 8-11 (Guardrail), 8-12 (Chain Link Fence and Wire Fence), 9-06 (Structural Steel and Related Materials), 9-09 (Timber and Lumber), and 9-16 (Fence and Guardrail) of the Standard Specifications and these Special Provisions.

All lumber shall be Douglas fir Surfaced four side (S4S), Number 1 Structural per Western Lumber Grading Rules-unless otherwise noted. All lumber shall be pressure treated with Chemonite™ or approved equivalent per AWPB-LP22. Fencing boards shall be tight knot western red cedar, Number 2 or better.

Metal fabrications, fasteners and hardware shall be in accordance with Section 9-06.22 (Bolts, Washers, and Other Hardware) of Standard Specifications.

Nail fasteners shall be galvanized standard wire nails.

Concrete shall be Cement Concrete Class 3000 in accordance with Section of 6-02 (Concrete Structures) of the Standard Specifications.

**8-31 COLORED STAMPED CONCRETE**

New Section

8-31.1 DESCRIPTION

This work consists of constructing colored concrete flatwork and applying a stamped finish pattern in accordance with the Contract Documents.

8-31.2 MATERIALS

Materials shall meet the requirements of the following sections:

Portland Cement	9-01
Aggregates	9-03
Premolded Joint Filler	9-04.1
Concrete Curing Materials and Admixtures	9-23

8-31.3 CONSTRUCTION REQUIREMENTS

Stamped concrete for median islands shall be air entrained concrete Class 3000 in accordance with the requirements of Section 6-02.

Solomon Liquid Colors Inc. colorant (Solomon Colors, PO Box 8288, Springfield, Illinois 62791. Phone (800) 624-0261 / (217) 522-3112. Fax (800) 624-3147 / (217) 522-3145. Web Site [www.solomoncolors.com](http://www.solomoncolors.com). E-Mail [sgs@solomoncolors.com](mailto:sgs@solomoncolors.com)), or Engineer approved equivalent, shall be added to the concrete mixture per the following specifications:

**Colorant Material Specifications:**

- ◆ Color: ColorFlo Liquid Color
- ◆ Name: Dark Redwood
- ◆ Number: 489
- ◆ Compliance: ASTM C 979.
- ◆ Material: Predispersed iron oxide pigments containing high pigment solids in aqueous base liquid.
- ◆ Produce uniform and consistent color.
- ◆ Permanent, inert, stable to atmospheric conditions, sunfast, weather resistant, alkali resistant, water insoluble, lime proof, and nonbleeding.
- ◆ Free of deleterious fillers and extenders.
- ◆ Particle Size: 95 to 99 percent minus 325 mesh.
- ◆ Specific Gravity: 1.9 to 2.0.

**Color Mixing Specifications:**

- ◆ Mixer shall be loaded to a minimum of 40% capacity to ensure good color suspension.
- ◆ The mix design shall be consistent and the water cement ratio shall be maintained with a maximum 4" slump.
- ◆ The Contractor shall reverse the drum, bringing the concrete to the back of the truck, prior to adding color to the ready mix truck.
- ◆ The Contractor shall mix the concrete at high speed for a minimum of 5 minutes before pouring concrete.

Calcium chloride shall not be permitted in the concrete mix, as it causes discoloration.

Forms shall be as specified in Section 8-14.3(2).

**8-31.3(1)      STAMPING**

While the initially finished concrete is plastic, the Contractor shall accurately align and place stamp "skins" or semi rigid mats in sequence and changing direction of patterns as necessary to produce the pattern shown in the Plans. The Contractor shall uniformly load mats and press into concrete to produce the required imprint pattern and depth of imprint on the concrete surface. The Contractor shall remove the stamp mats immediately. The Contractor shall hand stamp edges and surfaces unable to be imprinted by stamp mats.

The Contractor shall utilize a stamping template that matches the pattern specified in the Plans. Upon completion, the patterned area shall be checked for proper depth of print. 98% of the stamped area shall have an imprint depth of 1/4 inch. If any sample areas have an imprint depth that is less than 1/4 inch, those areas shall be re-stamped prior to applying the coatings. The stamped pattern shall be neat, with clean lines and intersections.

END OF DIVISION 8

**9-03 AGGREGATES**

9-03.8(7) HMA TOLERANCES AND ADJUSTMENTS

Revision

Item 1 is deleted and replaced with:

*(May 25, 2006 APWA GSP)*

1. **Job Mix Formula Tolerances.** After the JMF is determined as required in 5-04.3(7)A, the constituents of the mixture at the time of acceptance shall conform to the following tolerances:

	<b>Nonstatistical Evaluation</b>	<b>Commercial Evaluation</b>
Aggregate, percent passing		
1", 3/4", 1/2", and 3/8" sieves	±6%	±8%
U.S. No. 4 sieve	±6%	±8%
U.S. No. 8 sieve	±6%	±8%
U.S. No. 200 sieve	±2.0%	±3.0%
Asphalt Binder	±0.5%	±0.7%

These tolerance limits constitute the allowable limits as described in Section 1-06.2. The tolerance limit for aggregate shall not exceed the limits of the control points section, except the tolerance limits for sieves designated as 100% passing will be 99-100. The tolerance limits on sieves shall only apply to sieves with control points.

**9-04 JOINT AND CRACK SEALING MATERIALS**

9-04.1(2) PREMOLDED JOINT FILLER FOR EXPANSION JOINTS

Revision

*(January 7, 2008 WSDOT Amendment)*

This section is revised to read:

Pre-molded joint filler for use in expansion (through) joints shall conform to either AASHTO M 213 Specifications for "Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction" except the requirement for water absorption is deleted, or ASTM D 7174 Specifications for "Preformed Closed-Cell Polyolefin Expansion Joint Fillers for Concrete Paving and Structural Construction."

**9-05 DRAINAGE STRUCTURES, CULVERTS, AND CONDUITS**

9-05.7(1) PLAIN CONCRETE STORM SEWER PIPE

Supplement

Concrete storm drainpipe shall conform to ASTM C14 Class 3.

9-05.7(2)      REINFORCED CONCRETE STORM SEWER PIPE      Supplement

Reinforced concrete storm drainpipe shall conform to ASTM C76, Class IV.

9-05.13      DUCTILE IRON SEWER PIPE      Revision

Delete the first sentence of the last paragraph and replace it with the following:

All fittings shall be ductile. All joints including fittings shall be push-on rubber gasket joints. Mechanical joints shall not be used.

9-05.15(1)      MANHOLE RING AND COVER      Supplement

Castings for manhole rings and covers and Catch Basin Type II shall conform to Standard Detail No. SEWER-04 (24" Diameter Manhole Frame and Cover) in Appendix A of this document. Castings for manhole rings shall be gray iron or ductile iron and covers shall be ductile iron.

9-05.15(2)      METAL FRAME, GRATE, AND SOLID METAL COVER  
FOR CATCH BASINS OR INLETS      Supplement

Metal frames, grates and solid metal covers for catch basins or inlets shall conform to WSDOT Standard Plan Nos. B-30.10-00, B-30.20-01, B-30.30-00, and B-30.50-00 unless otherwise specified. Castings for metal frames shall be gray iron or ductile iron and covers and grates shall be ductile iron. Solid Metal Covers shall conform to Standard Detail No. SEWER-04 (24" Diameter Manhole Frame and Cover).

9-05.21      HIGH DENSITY POLYETHYLENE PIPE (HDPE)      New Section

High Density Polyethylene Pipe (HDPE) and fittings shall be manufactured from Phillips Marlex TR-480 feedstock resin. The resin shall have a cell class that is a high density, high molecular weight, and meets the criteria for a Type III, Class C, Category 5, grade P34 piping material in accordance with ASTM D-1248.

The pipe shall meet the Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23 degrees centigrade and 800 psi at 60 degrees centigrade based on TR/3 as derived from ASTM D-2837 test methodology.

The polyethylene material designation code is PE 3408 CDD.

The pipe and fittings shall meet ASTM D3350 and have a cell classification of PE 345434C. Dimensions and workmanship shall be as set forth in ASTM F714.

High Density Polyethylene Pipe (HDPE) and fittings shall be Driscopipe 1000 or equal.

**9-06 STRUCTURAL STEEL AND RELATED MATERIALS**

9-06.5(5)      BOLT, NUT, AND WASHER SPECIFICATIONS      New Section

The following referenced specifications are applicable as modified by these Specifications:

<u>Application</u>	<u>AASHTO Specification</u>	<u>ASTM Specification</u>
Unfinished Bolts and Machine Bolts		A 307 Grade A, B
High Strength Bolts for Structural Joints	M 164 Type 1, 2, 3 M 253 Type 1, 2, 3	A 325 Type 1, 3 A 490 Type 1, 2, 3
Large Diameter High Strength Bolts		A 354 Grade BD
Anchor Bolts	M 164	A 449 Type 1, 2
Nuts – Structural Steel Bolts	M 291 Grade C, DH, C3, DH3 M 292 Grade 2H	A 563 Grade C, DH, C3, DH3 A 194 Grade 2H
Nuts – ASTM A 307 Bolts		A 563
Washers – High Strength Bolts	M 293	F 436
Washers – ASTM A 307 Bolts		F 844
Direct Tension Indicator		F 959
Galvanizing	M 232 M 298 Class 55	A 153 B 695 Class 55

**9-09 TIMBER AND LUMBER**

9-09.1      GENERAL REQUIREMENTS      Revision

*(January 7, 2008 WSDOT Amendment)*

This section is revised to read:

All timber and lumber shall be sized as indicated in the Plans.

All timber and lumber to be painted shall be surfaced on all sides. All timber and lumber to be painted shall be thoroughly air or kiln dried to an equilibrium moisture content and shall be stored in such a manner as to remain in a thoroughly dry condition until placed into the work.

9-09.2      GRADE REQUIREMENTS      Revision

*(January 7, 2008 WSDOT Amendment)*

This section is revised to read:

Timber and lumber shall conform to the grades and usage listed below.

Timber and lumber shall be marked with a certified lumber grade stamp provided by one of the following agencies:

- West Coast Lumber Inspection Bureau (WCLIB)
- Western Wood Products Association (WWPA)
- Pacific Lumber Inspection Bureau (PLIB)
- Any lumber grading bureau certified by the American Lumber Standards Committee

For structures, all material delivered to the project shall bear a grade stamp and have a grading certificate. The grade stamp and grading certificate will not constitute final acceptance of the material. The Engineer may reject any or all of the timber or lumber that does not comply with the specifications or has been damaged during shipping or upon delivery. The grading certificate shall be issued by either the grading bureau whose stamp is shown on the material, or by the lumber mill, which shall be under the supervision of one of the grading bureaus listed above. The certificate shall include the following:

- Name of the mill performing the grading
- The grading rules being used
- Name of the person doing the grading with current certification
- Signature of a responsible mill official
- Date the lumber was graded at the mill
- Grade, dimensions, and quantity of the timber or lumber

For Guardrail Posts and Blocks, Sign Posts, Mileposts, Sawed Fence Posts, and Mailbox Posts, the material delivered to the project shall either bear a grade stamp on each piece or have a grading certificate as defined above. The grade stamp or grading certificate shall not constitute final acceptance of the material. The Engineer may reject any or all of the timber or lumber that does not comply with the specifications or has been damaged during shipping or upon delivery.

9-09.2(1)      SURFACING AND SEASONING      Revision

*(January 7, 2008 WSDOT Amendment)*

This section including title is revised to read:

9-09.2(1)      STRUCTURES      Revision

All timber and lumber for structures shall be Douglas Fir-Larch unless specified otherwise in the contract, and shall conform to the following:

Materials 2” to 4” nominal thick, 5” nominal and wider	No. 1 and better, grade (Section 123-b of WCLIB)
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(Structural Joists and Planks)	or (Section 62.11 of WWPA)
Materials 5” nominal and thicker (Beams and Stringers)	No. 1 and better, grade (Section 130-b of WCLIB) or (Section 70.11 of WWPA)

Timber lagging for soldier pile walls shall be Douglas Fir-Larch, grade No. 2 or better or Hem-Fir No. 1.

When the material is delivered to the project, the Engineer will check the order for the appropriate grade stamp. The invoice and grading certificate accompanying the order must be accurate and complete with the information listed above. The grading certificate and grade markings shall not constitute final acceptance of the material. The Engineer may reject any or all of the timber or lumber that does not comply with the specifications or has been damaged during shipping or upon delivery.

9-09.2(2)      VACANT      Revision

*(January 7, 2008 WSDOT Amendment)*

This section including title is revised to read:

9-09.2(2)      GUARDRAIL POSTS AND BLOCKS      Revision

Timber and lumber for guardrail posts and blocks (classified as Posts and Timbers) shall conform to the species and grades listed below.

Douglas Fir	No. 1 and better, grade (Section 131-b WCLIB) or (Section 80.11 WWPA)
Hem Fir	Select Structural, grade (Section 131-a WCLIB) or (Section 80.10 WWPA)
Southern Yellow Pine	No. 1 and better, grade (Southern Pine Inspection Bureau)

When the material is delivered to the project, the Engineer will check the order for the appropriate grade stamp. The grade markings shall not constitute final acceptance of the material. The Engineer may reject any or all of the timber or lumber that does not comply with the specifications or has been damaged during shipping or upon delivery.

9-09.2(3)      INSPECTION

Replacement

*(January 7, 2008 WSDOT Amendment)*

This section including title is replaced with the following:

9-09.2(3)      SIGN POSTS, MILEPOSTS, SAWED FENCE POSTS, AND MAILBOX POSTS

The allowable species of timber and lumber for signposts, and mileposts shall be Douglas Fir-Larch or Hem Fir. Timber and lumber for sawed fence posts and mailbox posts shall be Western Red Cedar, Douglas Fir-Larch, or Hem Fir.

Sign posts, mileposts, sawed fence posts, and mailbox posts shall conform to the grades shown below.

4" × 4"	Construction grade (Light Framing, Section 122-b WCLIB) or (Section 40.11 WWPA)
4" × 6"	No. 1 and better, grade (Structural Joists and Planks, Section 123-b WCLIB) or (Section 62.11 WWPA)
6" × 6", 6" × 8", 8" × 10"	No. 1 and better, grade (Posts and Timbers, Section 131-b WCLIB) or (Section 80.11 WWPA)
6" × 10", 6" × 12"	No. 1 and better, grade (Beams and Stringers, Section 130-b WCLIB) or (Section 70.11 WWPA)

**9-14 EROSION CONTROL AND ROADSIDE PLANTING**9-14.1      SOIL9-14.1(1)      TOPSOIL TYPE A

Supplement

The topsoil shall be a loamy sandy loam textural class as determined by the U.S. Department of Agriculture Classification System, free from materials toxic to plant growth, noxious weed seeds, rhizomes, roots, subsoil, and debris. The contractor shall furnish sufficient quantities of topsoil for placement in all seeding areas (4 inch depth topsoil) and planting areas (6 inch depth topsoil) and for tree and shrub planting soil requirements, plus a reserve quantity for restoring additional areas outside designated planting and seeding areas that are disturbed by the Contractor's activities.

9-14.1(3) TOPSOIL TYPE C Supplement

In addition to the “Standard Specifications”, the small tree/brush stumps and roots shall be removed and topsoil shall contain no more than two percent (2%) aggregate by weight remaining on a ½ inch sieve.

9-14.4 MULCH AND AMENDMENTS Supplement

Specific topsoil amendment and fertilizer specification for the plant types specified on the plans shall be as per a certified soils laboratory recommendations from, representative topsoil samples furnished by the Contractor to the approved Soils Laboratory.

9-14.4(3) BARK OR WOOD CHIPS Supplement

Bark chip mulch shall be standard commercial product, fine ground bark mulch with a minimum of 95 percent of the material passing through a 1 and ½ inch sieve and no more than 55 percent, by loose volume passing through a ¼ inch sieve. Submit sample for approval before delivery to the job site. Bark shall be ground fir or hemlock bark of uniform color, free from weed seeds, sawdust and splinters, and shall not contain resin, tanning, wood fiber or other compounds detrimental to plant life. Source shall be from freshwater mill.

Sawdust shall not be used as mulch.

9-14.4(7) TACKIFIER Revision

The first sentence in the first paragraph is deleted.

9-14.6(3) HANDLING AND SHIPPING Revision

The last sentence in the sixth paragraph is deleted.

9-14.6(4) TAGGING Supplement

All plant material except groundcover shall be legibly tagged. Tagging may be by specie or variety with minimum of one tag per 10 trees or shrubs.

9-14.6(5) INSPECTION Supplement

Samples may be submitted to the Engineer for approval as to size, grade, and overall specifications. The Contractor shall notify the Engineer twenty-four (24) hours in advance of all plant materials delivered to the project.

9-14.6(6) SUBSTITUTION OF PLANTS Revision/Supplement

The second paragraph is revised to read:

Container or balled and burlapped plant material may be substituted for bare root plant material. Container grown plant material may be substituted for balled and burlapped plant materials. When substitution is allowed, use current ASNS standards to determine the correct rootball volume (container or balled and burlapped) of the substituted material that corresponds to that of the specified material. These substitutions shall be approved by the Engineer and be at no cost to the Contracting Agency.

If non-availability is claimed by the Contractor and the Engineer provides a normal market source located in the Pacific Northwest, the Contractor shall compensate the Engineer at a rate of eighty-five dollars \$85.00 per hour, not to exceed five hundred dollars \$500.00 plus costs incurred for long distance phone.

9-14.6(7)      TEMPORARY STORAGE

Revision/Supplement

The third paragraph is revised to read:

Cuttings shall continually be shaded and protected from wind. Cuttings must be protected from drying at all times and shall be heeled into moist soil or other insulating material or placed in water if not installed within 8 hours of cutting. Cuttings to be stored for later installation shall be bundled, laid horizontally, and completely buried under 6 inches of water, moist soil or placed in cold storage at a temperature of 34 F and 90% humidity. Cuttings that are not planted within 24 hours of cutting shall be soaked in water for 24 hours prior to planting. Cuttings taken when the temperature is higher than 50°F shall not be stored for later use. Cuttings that already have developed roots shall not be used.

The fourth paragraph is deleted.

Temporary storage directly on paved areas without insulation between plants and pavement will not be permitted.

All plants that must be stored longer than one month shall be planted in nursery rows and maintained by the Contractor at his expense.

**9-15 IRRIGATION SYSTEM**

9-15.1(2)      POLYVINYL CHLORIDE PIPE AND FITTINGS

Supplement

The triple-swing joint assembly shall be constructed as detailed with Schedule 80 PVC nipples and “Marlex” street ells as manufactured by “LASCO Fluid Distribution Products” or approved equal.

**9-15.3      AUTOMATIC CONTROLLERS      Supplement**

Controller shall be Weathermatic Valcon SL Series Controller with Remote Control Technology “FLM” Series Connector installed at controller for remote control operation from the City of Auburn central control station.

The automatic controller electrical enclosure shall be a Metered Cold Rolled Steel Vandal Resistant enclosure #SB-24CR/120V with CSA controller subassembly. Enclosure shall be installed on a concrete base and shall be prime-coated and painted with baked enamel finish; dark green color as selected by the Engineer as manufactured by “V.I.T. Product, Inc” or approved equal.

**9-15.5      VALVE BOXES AND PROTECTIVE SLEEVES      Supplement**

Install a gravel sump at the bottom of each valve box.

The automatic control boxes shall be Model No. 1320 valve box with locking cover, and extensions as required as manufactured by “Carson Industries, Inc.” or approved equal

**9-15.6      GATE VALVES      Supplement**

The gate valve boxes shall be 5 and ¼ inch Roadway Valve Box #111129-03 with cast iron “Water” cover #111026 as manufactured by “Ametek” or approved equal.

**9-15.7(2)      AUTOMATIC CONTROL VALVES      Supplement**

Automatic control valves shall be Weathermatic 8200CR brass valves capable of communicating with the controller. Size as noted on drawing.

**9-15.8      QUICK COUPLING EQUIPMENT      Supplement**

The quick coupler valves shall be Buckner QB5LRC10 quick coupling valves with RC25001 valve keys or approved equal. Quick coupler valves shall be installed at the point of connection at the end of the main line, and at each cluster of automatic control valves.

The quick coupling valve boxes shall be Model 910-12B 10 inch Round Valve Box with locking green top extensions as manufactured by “Carson Industries, Inc.” or approved equal.

**9-15.9      DRAIN VALVES      Supplement**

Drain valves shall be 1 inch diameter.

The drain valve box shall be 5 and ¼ inch Roadway Valve Box #111129-03 with cast iron “Water” cover #111026 as manufactured by “Amtek” or approved equal.

9-15.11      CROSS CONNECTION CONTROL DEVICES      Supplement

The Double check valve assembly shall be a 1 inch Febco 805Y or approved equal.

The Double-Check Valve Backflow Assembly Vault shall be a No. 25-TA Concrete Vault with Locking Metal Cover as manufactured by PIPE, Incorporated or approved equal.

9-15.17      ELECTRICAL WIRE AND SPLICES      Supplement

Electrical wire shall be #14 UF wire. Utilize 3M™ DBY Splice kits. Do not splice or connect wires outside of valve boxes. Coil 3 feet length of wire at each connection.

Provide four (4) extra valve wires (yellow) routed from the controller through each valve box to the farthest valve.

9-15.18      DETECTABLE MARKING TAPE      Supplement

Detectable marking tape shall be 3-inch wide detectable tape on main lines only.

**9-16 FENCE AND GUARDRAIL**9-16.1(1)A POST MATERIAL FOR CHAIN LINK FENCE      Supplement

*(January 7, 2008 WSDOT Amendment)*

The first paragraph is supplemented with the following:

- **Round Post Material**  
Round post material shall be Grade 1 or 2.
- **Roll Form Material**  
Roll-formed post material shall be Grade 1.  
Roll-formed end, corner, and pull posts shall have integral fastening loops to connect to the fabric for the full length of each post. Top rails and brace rails shall be open rectangular sections with internal flanges as shown in ASTM F1043.

The **Round Post Material** and **Roll Form Material** information following the third paragraph is deleted.

9-16.1(1)B CHAIN LINK FENCE FABRIC      Revision

*(January 7, 2008 WSDOT Amendment)*

The first paragraph is revised to read:

Chain link fabric shall consist of 11 gage wire for chain link fence Types 3, 4, and 6, and 9 gage wire for chain link fence Type 1. The fabric shall be zinc-coated steel wire conforming

to AASHTO M 181, Class C. Zinc 5-percent Aluminum-Mischmetal alloy meeting the requirements of ASTM B 750 may be substituted for zinc coating (hot-dipped) at the application rate specified by AASHTO M 181 for hot-dip zinc coating. Coating for chain link fence fabric shall meet the requirements of ASTM A 817 with minimum weight of coating of uncoated wire surface 1.0 oz/sq ft (305 g/m<sup>2</sup>).

9-16.1(1)C    TENSION WIRE    Revision

*(January 7, 2008 WSDOT Amendment)*

This section including title is revised to read:

9-16.1(1)C    TENSION WIRE AND TENSION CABLE    Revision

Tension wire shall meet the requirements of AASHTO M 181. Tension wire galvanizing shall be Class 1.

Tension cable shall meet the requirements of Section 9-16.6(5).

9-16.1(1)D    FITTINGS AND HARDWARE    Supplement

*(January 7, 2008 WSDOT Amendment)*

Fabric bands and stretcher bars shall meet the requirements of Section 9-16.6(9).

Thimbles, wire rope clips, anchor shackles, and seizing shall meet the requirements of Section 9-16.6(6).

9-16.1(1)E    CHAIN LINK GATES    Revision

*(January 7, 2008 WSDOT Amendment)*

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

Gate frames shall be constructed of not less than 1 1/2-inch (I.D.) galvanized pipe conforming to AASHTO M 181 Type I, Grade 1 or 2 as specified in Section 9-16.1(1)A.

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

All welds shall be ground smooth and painted with an A-9-73 galvanizing repair paint or A-11-99 primer meeting the requirements of Section 9-08.2.

9-16.2(1)A    STEEL POST MATERIAL    Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to “hot dip galvanized” in the first sentence in the second paragraph is revised to “galvanized”.

9-16.3(2)      POSTS AND BLOCKS      Revision

*(January 7, 2008 WSDOT Amendment)*

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

Timber posts and blocks shall conform to the grade specified in Section 9-09.2(2).

9-16.3(3)      GALVANIZING      Revision

*(January 7, 2008 WSDOT Amendment)*

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

W-beam or three beam rail elements and terminal sections shall be galvanized in accordance with AASHTO M-180, Class A, Type 2, except that the rail shall be galvanized after fabrication, with fabrication to include forming, cutting, shearing, punching, drilling, bending, welding, and riveting.

9-16.3(4)      HARDWARE      Revision

*(January 7, 2008 WSDOT Amendment)*

This section is revised to read:

Unfinished Bolts (ordinary machine bolts), nuts, and washers for High Unfinished Bolts, shall conform to 9-06.5(1). High Strength bolts, nuts, and washers for High Strength Bolts shall conform to 9-06.5(3).

Unfinished bolts will be accepted by field verification and documentation that bolt heads are stamped 307A. The Contractor shall submit a manufacturer's certificate of compliance per 1-06.3 for high strength bolts, nuts, and washers prior to installing any of the hardware.

9-16.3(5)      ANCHORS      Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to "hot dip galvanized" in the tenth paragraph is revised to "galvanized".

9-16.4(2)      WIRE MESH      Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to "hot dip galvanized" in the second sentence in the third paragraph is revised to "galvanized".

9-16.6(2)      GLARE SCREEN FABRIC      Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to “A 491” in the second sentence in the first paragraph is revised to “ASTM A 491”.

9-16.6(3)      POSTS

Revision

*(January 7, 2008 WSDOT Amendment)*

The first paragraph is revised to read:

Line posts for Type 1 glare screen shall be 1 1/2-inches by 1 7/8-inches galvanized steel H column with a minimum weight of 2.8 pounds per linear foot. Line posts for Type 2 glare screen shall be 1 5/8-inches by 2 1/4-inches galvanized steel H column with a minimum weight of 4.0 pounds per linear foot, or 2-inch inside diameter galvanized steel pipe with a nominal weight of 3.65 pounds per linear foot provided only one type shall be used on any one project.

The first paragraph is supplemented with the following:

End, corner, brace, and pull posts for Type 1 Design A shall be 1 1/2-inches by 1 7/8-inches steel H column with a minimum weight of 2.8 pounds per linear foot.

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

End, corner, brace, and pull posts for Type 1 Design B and Type 2 shall be 2-inch inside diameter galvanized steel pipe with nominal weight of 3.65 pounds per linear foot.

The reference to “hot dip galvanized” in the third sentence in the second paragraph is revised to “galvanized”.

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

All posts shall be galvanized in accordance with AASHTO M 181, Section 32. The minimum average zinc coating is per square foot of surface area.

9-16.6(5)      CABLE

Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to “hot dip galvanized” is revised to “galvanized”.

9-16.6(6)      CABLE AND TENSION WIRE ATTACHMENTS

Revision

*(January 7, 2008 WSDOT Amendment)*

The reference to “hot dip galvanized” in the first sentence in the first paragraph is revised to “galvanized”.

The third sentence in the first paragraph is deleted.

**9-16.6(9)      FABRIC BANDS AND STRETCHER BARS      Revision**

*(January 7, 2008 WSDOT Amendment)*

The reference to “hot dip galvanized” is revised to “galvanized”.

**9-16.6(10)      TIE WIRE      Replacement**

*(January 7, 2008 WSDOT Amendment)*

This section including title is replaced with the following:

**9-16.6(10)      TIE WIRE AND HOG RINGS      Revision**

Tie wire shall be 9 gage aluminum wire complying with the ASTM B 211 for alloy 1100 H14 or 9 gage galvanized wire meeting the requirements of AASHTO M 279. Galvanizing shall be Class 1.

Hog rings shall be 12 gage galvanized steel wire.

**9-16.8(1)      RAIL AND HARDWARE      Revision**

*(January 7, 2008 WSDOT Amendment)*

The word “**Composition**” following the first paragraph is deleted.

**9-22 MONUMENT CASES****9-22.1      MONUMENT CASES, COVERS AND RISERS      Supplement**

Castings shall be in accordance with Standard Detail No. TRAFFIC-22 (Monument Case and Cover).

**9-28 SIGNING MATERIALS AND FABRICATION****9-28.14(2)      STEEL STRUCTURES AND POSTS      Supplement**

Pavement marker adhesive shall be “Stemsonite Bituminous Adhesive #2202031” or approved equal supplied in 55-pound factory labeled packages and installed in strict accordance with the manufacturers recommendations.

**9-29 ILLUMINATION, SIGNAL, ELECTRICAL****9-29.1      CONDUIT, INNERDUCT, OUTERDUCT      Supplement**

Street light conduit shall be rigid hot-dipped galvanized steel or Schedule 40 PVC-ASTM D1785, as shown on the plans. All galvanized conduit ends shall have galvanized OZ



- The conductors shall be covered with a foil shield and protected with an outer jacket. The cable shall conform to IMSA Spec. No. 50-2.
8. Detector Loop Wire (sawcut) shall be No. 14 AWG class B stranded copper wire with cross-linked polyethylene type USE insulation and conform to IMSA Spec. 51-3.
  10. The detector lead-in cable for EVP shall be 3M Opticom Model 138 shielded detector cable or approved equal. No splicing will be allowed between the detector and the controller cabinet.
  11. Signal Cable shall be copper or fiber as shown in the plans. For Copper the traffic signal interconnect system shall conform to REA Spec. PE-38 (self-supporting combination signal cable and messenger cable). The signal cable shall consist of 12 pair No. 19 AWG conductors. Clifford Inc. part no 12P19-B1ALPB or approved equal. For Fiber optic cable, the cable shall be single mode all dielectric gel free loose tube fiber with a minimum of 48 count.

9-29.6(1)B     LIGHTING & SIGNAL STANDARDS & DAVIT ARMS                      New Section

Lighting Standards

All lighting standards furnished and installed under this contract shall be aluminum, davit-style units in accordance with Section 9-29.6 (Light and Signal Standard) of the Standard Specifications and these special provisions.

Mounting heights for light fixtures shall be 35 feet, or as noted on the plans.

The davit-style bracket arm shall have a nominal length as shown in the Design Standards, measured from the centerline of the shaft, with a radius of 5 feet, 9 inches.

Lighting standards shall have 2 through-bolts where the davit arm intersects the pole per Standard Detail No. TRAFFIC-49 (Luminare Pole).

All poles and bracket arms shall be designed for the street lighting luminaire with a minimum weight of 50 pounds and to withstand pressures caused by wind loads of 100-miles per hour with a gust factor of 1.3.

All poles to be furnished shall maintain a minimum safety factor of 4.28 on yield strength of weight load and 2.33 for basic wind pressure. All materials shall be natural polished aluminum color.

The shafts shall be provided with a 4 inch x 6 inch (minimum dimensions) non-flush handhole near the base designed to prevent loss of shaft strength and provided with matching metal covers secured with stainless steel hex-head screws or bolts. The handholes shall be located near the base and on the side of the shaft opposite approaching traffic. A grounding nut or provision in the handhole frame for accommodating a threaded bolt for the purpose of

attaching a grounding connector shall be provided on the inside of the shaft. After fabrication, the handhole shall have the mechanical strength of not less than the temper of the material utilized for the manufacturer of the pole.

All shafts shall be round and tapered

All bolts, nuts, screws, and washers, but not including anchor bolts and unless otherwise specifically designated herein, shall be stainless steel.

#### SPECIALIZED DOWNTOWN LIGHTING

Mounting heights for light fixtures shall be as shown on the plans and per Standard Details TRAFFIC-61 (Downtown Pedestrian Lighting Standard) and TRAFFIC-61a (Downtown Pedestrian Pole Mount Lighting Standard) and TRAFFIC-63 (Downtown Street Lighting Standard).

All poles shall have standard aggregate, "Buff" color cement and finish #313, a clear acrylic sealcoat applied per the manufacturer's standard method. Finish shall be exposed.

All poles shall be designed for the street lighting luminaire with a minimum weight of 50 pounds and to withstand pressures caused by wind loads of 100-miles per hour with a gust factor of 1.3.

All poles to be furnished shall maintain a minimum safety factor of 4.28 on yield strength of weight load and 2.33 for basic wind pressure.

The shafts shall be provided with a handhole near the base designed to prevent loss of shaft strength and provided with covers secured with stainless steel hex-head screws or bolts. The handholes shall be located near the base and on the side of the shaft opposite approaching traffic. A grounding nut or provision in the handhole frame for accommodating a threaded bolt for the purpose of attaching a grounding connector shall be provided on the inside of the shaft.

All shafts shall be round and tapered.

The poles shall be plumb with no shims. The poles shall be plumbed on leveling nuts secured to the anchor bolts and locking nuts on top of the base flange. The side of the shaft opposite the load shall be plumbed using the leveling nuts or as directed by the Engineer.

All bolts, nuts, screws, and washers, but not including anchor bolts and unless otherwise specifically designated herein, shall be stainless steel.

All luminaire standards shall be labeled. The labeling shall consist of a 3 inch x 4 inch, 0.080 gauge aluminum plate epoxied to the curb side of the pole 18 inches above the base plate. The numbers shall be 2 inches, non-reflective, black Series "C" pressure sensitive and shall be mounted to the aluminum plate.

**DOWNTOWN STREET LIGHT STANDARDS:**

All street light standards shall be constructed in conformance with Standard Detail No. TRAFFIC-63 (Downtown Street Lighting Standard).

Concrete luminaire standards shall be provided where shown on the plans. The standard shall be round, tapered pre-stressed concrete, anchor base spun hollow standards machine made in steel molds by the centrifugal process. Cast-in threaded inserts shall be provided for attachment of the street lighting luminaire and this detail shall be coordinated with the luminaire manufacturer to ensure that the mounting bolts match the centers of the standard.

Aggregate shall be standard conforming to ASTM C33 and shall be uniformly graded from a maximum size of ½ inch to 5% passing a #100 sieve. Cement shall conform to ASTM C150 Type I or Type III as the manufacturer selects. Water shall not contain quantities of alkalis, oil or organic matter which shall be harmful to the quality of the concrete. Pre-stressing wire shall conform to the ASTM A82 and reinforcing bar to ASTM A615. Reinforcing shall be placed to assure that no cracking shall occur during normal handling. The minimum opening for the raceway shall be 2 inches x 7 inches and the concrete cover over the pre-stressing wire shall not be less than ½ inch.

The standard shall be cured with low pressure steam (175° F. maximum) for as long as needed to reach a minimum compressive strength of 3500 psi before transfer of the pre-stressing force.

A minimum 28 day compressive strength of 7000 psi after atmosphere curing shall be required. The standards shall be Ameron Centrecon MBR# or prior approved equal.

**DOWNTOWN PEDESTRIAN LIGHT STANDARDS:**

All pedestrian light standards shall be constructed in conformance with Standard Detail No. TRAFFIC-61 (Downtown Pedestrian Lighting Standard) and TRAFFIC-61a (Downtown Pedestrian Pole Mount Lighting Standard).

Pedestrian lighting standards shall be installed as shown on the plans. They shall be prestressed concrete, anchor base spun hollow standards machine made in steel molds by the centrifugal process. Prestressing wire, caging and other reinforcement shall be placed in a manner that assures no cracking during normal handling. The pole shall have a pole top tenon for attaching the pedestrian luminaires. This detail shall be coordinated with the pedestrian luminaire manufacturer to ensure a proper fit. The pole shall be base plate mounted.

The pole shall be 18 feet in height, Ameron Victorian #VBR or prior approved equal.

The poles shall have 110 volt GFI Festoon outlets with covers.

Concrete luminaire standards shall be provided where shown on the plans. The standard shall be round, tapered pre-stressed concrete, anchor base spun hollow standards machine made in steel molds by the centrifugal process. Cast-in threaded inserts shall be provided for attachment of the street lighting luminaire and this detail shall be coordinated with the luminaire manufacturer to ensure that the mounting bolts match the centers of the standard.

Aggregate shall be standard conforming to ASTM C33 and shall be uniformly graded from a maximum size of ½ inch to 5% passing a #100 sieve. Cement shall conform to ASTM C150 Type I or Type III as the manufacturer selects. Water shall not contain quantities of alkalis, oil or organic matter which shall be harmful to the quality of the concrete.

### Signal Standard

A signal standard shall consist of the following components: a round tapered steel vertical pole shaft, a round tapered horizontal mast arm, a davit style luminaire arm attachment, anchor bolts with nuts, washers and all associated hardware.

The pole shaft and signal mast arm shall not vary in roundness more than  $1/16$  inch in straight sections.

Longitudinal seam welds shall have full penetration for not less than 98% of their full length. Butt welds in the shafts shall have back-up rings and full penetration for 100% of the circumference. All welds shall be deburred.

Materials, construction and assembly techniques shall be as specified on Standard Plan No. J-7a and the Detail Sheet as shown in the Plans. All materials shall be hot-dipped galvanized after fabrication in accordance with ASTM A-123.

Design shall be in accordance with the requirements of the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and the values on the Detail Sheet as shown in the Plans. Sizes on the Detail Sheet as shown in the Plans shall govern in differences between the Standard Plan and the Detail Sheet as shown in the Plans.

The following loads shall be used: dead loads shall consist of the weight of the signals and signs times a safety factor of two; wind loads shall be taken as 30 PSF for the signals and signs and 24 PSF for the supporting structure, (including the effect of gust and shape factors), on the greatest area of signals, signs and structure in any elevation view; live load may be omitted.

The vertical deflection at the free end of any cantilever arm to the dead load of the signals and signs only shall not exceed two percent (2%) of the cantilever arm length. The horizontal deflection perpendicular to the arm at the free end of any cantilever arm due to the design

wind load on the signals and signs and structure shall not exceed five percent (5%) of the cantilever arm length.

Complete calculations for structural design shall be submitted with the shop drawings for approval before fabrication or ordering material. These calculations shall include the stresses in the pole and cantilever arms, deflections at the free end of the cantilever, the attachment of the signals and signs to the structure, the connection between the cantilever arms and vertical pole, pole section at handhole, base plate, anchor bolts and foundations.

### Pole Shaft

The round tapered pole shaft shall be made of one-ply, hot-rolled basic open-hearth steel. Structural steel having a minimum yield point of 33,000 psi or more shall be used for all structural parts and shall be galvanized after fabrication in accordance with ASTM A-123.

A flange plate shall be attached to the vertical pole shaft for the purpose of mounting the mast arm. The flange plate shall be supported by side plates tangent to the shaft and gusset plates on top and bottom. A 3-inch wire way hole shall be provided (matching the wire way hole in the mast arm flange plate). Four holes for mounting the mast arm shall be drilled and tapped for high tensile bolts.

Terminal cans shall be attached to the backside of the signal pole no lower than 7 feet high.

A 4-inch x 6½ inch reinforced hand hole frame and rain-tight cover shall be provided. The frame shall be welded into the shaft 18 inch above the base plate on the opposite side of the mast arm attachment. A grounding nut or provision for accommodating a threaded bolt or stud shall be provided in the frame.

A second hand hole shall be provided and welded into the shaft directly opposite the mast arm mounting plate. A J-hook wire support shall be provided inside the pole shaft between the frame and mast arm mounting plate.

### Vehicle Signal Mast Arm

The vehicle signal mast arm shall be sized as shown on the Plans.

A mast arm flange plate matching the pole shaft flange plate shall be welded to the mast arm base segment. The flange plate shall have a hole cut in the center equal to the outside diameter of the mast arm base. Mount the flange plate around the outside of the mast arm base. To accommodate welding the flange to the mast arm leave a gap between the bottom face of the flange and the bottom face of the mast arm. The gap shall be equal to the thickness of the bottom face of the mast arm.

The flange plate shall be welded to the mast arm by two continuous arc welds, one on the outside and the other on the inside. The outside weld shall be on top face of the flange plate.

The inside weld shall be in the gap between the bottom face of the mast arm and the inside face of the flange hole. See WSDOT Standard Plan No. J-7a for welding details.

Four holes for high tensile bolts shall be drilled in the flange plate matching the four tapped holes in the pole shaft mast arm mounting flange plate.

For the purpose of mounting the traffic signal displays, 2 inch couplings shall be welded to the mast arm extension segment at the locations specified on the Detail Sheet as shown in the Plans. A ½ inch diameter hole shall be drilled in each coupling to allow for the thru-bolt.

#### Signal Pole Anchor Base

A one-piece steel anchor base of the shape and size indicated on the Detail Sheet as shown in the Plans shall be secured to the base of the pole shaft by two continuous arc welds. See WSDOT Standard Plan No. J-7a for welding details.

Four holes sized to receive the anchor bolts shall be drilled in the base. Slotted holes ¼ inch larger than the anchor bolt shall be permitted. Minimum bolt circle pattern shall be as specified on the Detail Sheet as shown in the Plans.

Four high-strength anchor bolts A307 shall be furnished with each pole. Each anchor bolt shall have an "L" bend at the bottom end or multiple anchor plates per the manufacturer's recommendation, and shall have 7-inch minimum thread on top. Anchor bolt dimensions shall be per Detail Sheet as shown in the Plans or per Manufacturer's recommendations whichever is larger. All anchor bolts shall be furnished with 2 heavy hex nuts, two standard washers, bolt covers and provisions for mounting with stainless steel screws. Threaded ends of bolts, nuts and washers shall be galvanized in accordance with ASTM A-123.

#### Luminaire Attachment

Unless otherwise indicated in the plans all traffic signal poles shall be equipped with davit style luminaire arms as shown on the Detail Sheet as shown in the Plans. The davit style arm shall be secured to the top of the pole shaft using a cone reducer providing a flush, smooth transition. From the cone reducer the luminaire shaft shall be continuously tapered at the same rate as the pole shaft while incorporating a 5-foot, 9-inch radius bend at the end. A pipe tenon of the diameter and length specified for the luminaire shall be provided in the end of the davit arm. The tenon shall be two degrees above level.

#### 9-29.6(1)C WRAPPING

New Section

The shaft and bracket arm assembly shall be entirely wrapped with a heavy, water-resistant paper for protection during shipment. Any marks or stain resulting from wrapping materials shall be cause for rejection. Scratching, marking, denting, or other damage to poles and fittings at the point of delivery shall also be cause for rejection.

9-29.6(2)A ANCHOR BASES

New Section

A one-piece anchor base of adequate strength, shape, and size shall be secured to the lower end of the shaft so that the base shall be capable of resisting the bending movement of the shaft at its yield-strength stress. The base shall be provided with four (4) slotted or round holes to receive the anchor bolts. Bolt covers shall be provided with each pole.

9-29.6(4) WELDING

Supplement

All welds shall be deburred.

9-29.6(5) FOUNDATION HARDWARE

Supplement

Four high-strength steel anchor bolts, as shown on the Standard Detail No. TRAFFIC-49 (Luminaire Pole) shall be furnished with the poles. Each anchor bolt shall have an "L" bend at the bottom end and threaded at the top end. Threaded ends and all nuts and washers shall be hot-dipped galvanized. The anchor bolts shall be capable of resisting at yield-strength stress the bending movement of the shaft at its yield-strength stress.

9-29.7 LUMINAIRE FUSING & ELECTRICAL CONNECTIONS  
AT LIGHT STANDARD BASES, CANTILEVER BASES  
AND SIGN BRIDGE BASES

Supplement

Luminaire fusing and electrical connections at light standard bases shall also conform to Standard Detail No. TRAFFIC-50 (Uniform Luminaire Wiring). Fuses shall be Bussmann KTK or approved equal.

Fuse connector kits shall be SEC Model 1791-SF (2 each) or approved equal.

Connector kits to connect luminaires to the system in the junction box shall be SEC Model 1791-DP, or approved equal.

9-29.9 BALLAST, TRANSFORMERS

Supplement

The luminaire shall contain an integral high-power factor-regulator ballast suitable for 240-volt operation with a 10% voltage variation. The ballast shall be prewired to the lamp socket and terminal board, requiring only connection of the power supply leads to the terminal board.

9-29.10 LUMINAIRES

Supplement

The luminaires shall be a flatglass high-pressure sodium fixture. The luminaire housing shall contain the ballast and be bracket arm mounted. The entire power door assembly shall be quickly and easily removable and replaceable through the use of quick disconnect plugs. Each fixture shall include the ballast and high-pressure sodium lamp.

The luminaire fitter clamp shall be capable of adapting to a 1¼ inch through 2 inch pipe-size mounting brackets without the need of separate mounting parts or rearrangement of mounting components. Leveling and clamping of the luminaire to the bracket shall be accomplished by the tightening of 4 bolts accessible internally. The reflector shall be secured to the upper housing and shall contain an EPT rubber gasket for sealing between the reflector and lens. The optical assembly shall contain an activated charcoal filter to filter out contaminants in the air. The socket shall be adjustable for Type II and Type III distribution patterns. All luminaires shall be cutoff units for glare control.

A three-wire electrical service shall be used at 120/240 volts, 60 Hz AC. The Contractor shall have the service inspected by the Department of Labor and Industry and coordinated with the Power Company to have the service installed.

Four 250 watt, clear burning, high-pressure sodium light source rated at a minimum of 50,000 initial lumens with an average rated life of 24,000 hours shall be used on traffic signal standards at intersections.

Clear burning high-pressure sodium light sources of the ratings shown in the lighting schedule shall be used where indicated on the Plans.

All luminaires shall be high-pressure sodium, medium cutoff type III units as manufactured by General Electric or approved equal as listed in the following table.

Wattage	ANSI Lamp Type	G.E. Part Number
100	S54	M2AC10S3M1GMC32
150	S55	M2AC15S3M1GMC32
250	S50	MDCL25S3M12FMC32
400	S51	MDCL40S3M12FMC32

NOTE: 250-watt luminaries shall be provided on traffic signal standards unless otherwise specified.

### **DOWNTOWN STREET LIGHTS:**

#### **Round Arm Mount – “Hockey Style”**

Luminaires shall be round with formed and welded aluminum housing and bracket arm. The lens shall be plain, flat, heat and impact resisting glass in a mitered extruded aluminum neoprene gasketed frame. Reflectors shall be provided and the lamp position selected such that the luminaire produces an IES-ANSI Medium Type II distribution with essentially complete light cutoff above 75° from Nadir when operated with a high pressure sodium lamp, E-23½.

The luminaire housing shall contain the ballast and be bracket arm mounted. The ballast shall be quad rated 120/208/240/277 volt ±10 percent and be of the auto-reg. design. The



## 3. 3M Black 5000

Installation shall conform to the manufacture recommendations.

9-29.13 TRAFFIC SIGNAL CONTROLLERS

Supplement

General

The contractor shall furnish and install one Type "P" traffic signal controller cabinet as manufactured by Econolite. The controller shall be a fully actuated NEMA TS2, Type 1, Full 8 phase controller, Econolite ASC/3 2100 model number with the ability to provide either sequential or concurrent timing operations. It shall be capable of operating as a fully actuated, semi-actuated, or pre-timed unit. The controller will come complete with the functions, features, and accessories specified herein.

The traffic controller shall have the following features:

- Data Key Module
- Ethernet Support
- Keyboard Entry
- Backup Timing Prom
- Solid State Circuitry
- Digital Timing
- Pedestrian Timing
- Manual Control Circuit
- Stop Time
- Hold by Phase
- Check Circuit
- Force Off
- Phase Omit
- Specific Power Failure Operation
- Coordination Ability
- Internal Emergency Preemption (6 ea.)
- Internal 52 Week Time Base Coordination
- Phase Recall (min, max I, max II & ped)
- Call to Non-Actuated 1 & 2
- Locking or Non-Locking Vehicle Detection
- Exclusive Phase Selection
- Dual Entry
- Conditional Service
- Four Programmable Overlaps
- Selective Restart Procedure
- Internal Detector Delay and Extension
- Phase Rotation
- Telemetry Module

### Asynchronous Communications Port

The traffic signal controller shall meet or exceed the requirements of Section 14 of the National Electrical Manufacturers Association (NEMA) Standard Publication No. TS 2-1992, and all other sections not in conflict with this section.

All integral functions necessary for employment of special features and trouble shooting, such as manual circuit, stop time, hold, etc., shall be accessible outside the controller and terminated on a terminal strip or similar device.

All active devices used for logic timing or control functions shall be solid-state design and shall be sufficiently derated to insure no material shortening of life under conditions of maximum power dissipation at maximum ambient temperatures.

Individual components shall be grouped and soldered to epoxy glass printed circuit boards with two-ounce or better copper track, forming modular plug-in assemblies, internal to the controller. These assemblies, when collectively grouped, shall have a mean-time-before-failure of not less than 3 years. The design life of individual components less than 24 hours per day operation in the circuit application shall not be less than 5 years.

The controller shall be designed with slide-ways and positive locking devices, to insure proper pin alignment and pin contact area.

The controller's timing, decision-making, and control elements shall utilize a stored program microcomputer. The microcomputer system shall encompass, but not be limited to:

Micro-processor unit (MPU);

Programmable read-only memory (PROM) and random access memory (RAM), which together store the computer programs and data necessary to operate the MPU;

PROM containing backup signal timing data.

All electronic components used in the controller and the cabinet including PROM's or ROM's shall be available through local distributors, local manufacturers' outlets, or local jobbers. The control equipment manufacturer shall not be the only source of any electronic device or component used in the equipment.

An indicator panel formed of liquid crystal arrays shall be provided and labeled on the controller front to give a visual indication as to the operation of the controller. They shall be commercially available and have a minimum design life 20,000 hours.

The front panel display shall indicate which phases are in use and which phases will be serviced next. It shall show which intervals are being timed to include minimum green, vehicle interval, yellow clearance, red clearance, walk or pedestrian clearance. It shall show

the presence of a vehicle call and the presence of a pedestrian call. The reason for the termination of a green shall be shown whether it be gap out or maximum time out. Finally, it shall show if the controller is in the rest state.

The regulated power supply shall be designed to generate the voltage required for operation of the controller.

A time base coordinator shall be provided internal to the controller that shall provide coordination for the NEMA 8-phase traffic controller on a 52-week schedule. This schedule shall be programmable by day of year, hour of day, minute of the hour and second of the minute. Further, it shall be programmable to automatically adjust for time changes, due to the transition caused by daylight savings time. 160-programmed events shall be available for execution during a 52-week program period. These events shall include 16 separate day programs, 10-week programs and 36 exception days. Further, these plans shall provide for 4 separate cycle lengths, 4 separate splits per cycle, split and offset shall be 0-255 seconds, in 1-second increments. The time base coordinator shall have programmable resync time, which can be set to any value from 00:00 to 23:59.

The coordinator shall provide a minimum of 12 programmable outputs to and from the local controller, which can be used for such things as: force off, hold, phase omit, ped omit, dial, offset and sync commands. These system outputs shall be assignable by phase. Further, these outputs to the local controller shall be disabled when a preemption command is input into the local controller.

The coordinator shall be programmed through the use of an integral front panel keyboard and be provided with clearly written programming instructions, which have been laminated with plastic to insure durability in the field. Once programmed, the coordinator unit and the local controller. The controller, coordinator and timebase clock shall also have the capability to download its data to another similar unit by the use of hand held data transfer module or portable computer. The date in the coordinator shall be protected from loss through the use of a battery backup, which shall last for a minimum of 60 days. The accuracy of the clock shall be within 1 second a year. The transfer to battery power and return to AC power shall be automatic and without interruption.

The recharging of the battery shall be automatic. Battery operation shall not accumulate an error greater than .005% over 100 hours of battery operation.

The controller unit shall have a set of backup timing parameters resident in the nonvolatile PROM at all times and this data shall be accessible from the keyboard.

The asynchronous communications port and the telemetry module shall be able to operate simultaneously without any interruption in service or function of either feature.

### Auxiliary Equipment

Load switches shall meet all NEMA specifications. They shall use modular solid-state relays and have status indicators for each input & output. They shall be interchangeable. The load switches shall be rack mounted and supported to relieve tension on the connections. Load switches shall be provided for all load bays. The cabinet shall be furnished with a 16-position load bay.

The interior cabinet light shall be 20-watt fluorescent with main door switch that will turn on when door is opened and off when closed.

### Controller Cabinet

The encased controller shall be furnished in an aluminum weatherproof, Type "P", outdoor cabinet, with shelves of sufficient size to easily house the controller, loop detector units, a Malfunction Management Unit, Opticom phase selectors, harnesses, etc., without utilizing the floor of the cabinet. The cabinet shall be clean-cut in design and appearance. The finish shall be Polished Aluminum. The cabinet shall be equipped for foundation mounting, with anchor bolts, nuts and washers. The cabinet shall be provided with 2 keys for each lock, cored for 6 tumbler Best Locks. Hinges, handle and hardware shall be stainless steel.

The controller cabinet shall have the following appurtenances:

- Auxiliary Panel
- Police Panel
- Vent Fan and Filtered Air Intake
- Solid State Flash Unit (two circuit)
- NEMA Malfunction Management Unit (MMU)
- Power Panel Assembly
- Stop Time Enable and Bypass Switch
- Convenience Outlet
- Fluorescent Light and Door Switch
- Line Filter
- Loop Amplifiers
- Surge Protector
- Load Switches
- Field Terminal Labels
- Emergency Vehicle Preemption
- Telemetry Interface Board and Module
- Device Labeling
- Display Panel
- Schematics and Manuals

There shall be 2 neutral buss bars, one on each side of the cabinet.

A terminal block shall be provided for the pedestrian common with a minimum of 8 termination points.

The controller subassemblies shall be neatly and systematically arranged and labeled, to make possible a thorough inspection while the controller is operating in accordance with its normal function.

The cabinet shall have a pullout computer shelf, 16 inches wide & 12 inches deep centered under the lower shelf.

#### Auxiliary Panel

The auxiliary panel shall contain an Auto-Flash switch which, when placed in the “Flash” position, operates as the switch in the police panel, except that it shall not stop time the controller. A second switch shall be a Controller Power On-Off switch. A third switch shall be the Stop Time switch, which shall cause the controller to stop time when activated. The three-position switch shall function such that in the up position, if the MMU puts the intersection on flashing, the controller is stop timed. In the down position the controller is manual stop timed. The center position of the 3-position switch shall be MMU stop time bypass, allowing the controller to resume all timing functions.

#### Main Door and Police Panel

The main door of the cabinet shall include a 2-position bar stop. The door shall be secured with a standard City of Auburn Best Six tumbler mortise cabinet lock with dead bolt. The main door shall also contain a police door with a conventional police lock. Inside the police panel there shall be a signal on-off switch, which shall prohibit any signal display on the street but will allow the control equipment to operate when placed in the “off” position. A second switch shall be the Auto-Flash switch. When placed in the “Flash” position, puts the system into flashing mode. Controller power shall remain “on” and controller shall stop time. A door interlock switch shall be installed, and wired to the Alarm 2 function, such that when the police door is open it will be recorded as an Alarm 2 event.

#### Power Panel Assembly

The power panel shall be covered by an easily removable, clear plexiglass cover.

#### Convenience Outlet

Two convenience outlets shall be furnished in the cabinet. The outlets shall be mounted one on each side of the cabinet near the top shelf, not on the door. The outlet mounted on the right side shall be a ground fault interrupter.

### Loop Amplifiers

The loop detector racks shall provide for 16 channels of detection and there shall be a loop amplifier in each position. Two channel loop amplifiers are required.

### Surge Protector (Lightning Arrestor)

The cabinet shall have an input voltage surge protector that shall protect the controller power supply input from any voltage surges that could damage it. This shall be provided in addition to the power panel surge protector.

### Field Terminal Labels

Field terminals shall be labeled with City of Auburn numbering as well as manufacturers.

### Device Labeling

Every module or device shall have affixed thereto; permanent nametags or nameplates stating the component's function within the composite signal control system. Specifically each loop detector unit shall be labeled, so as to indicate the loop numbers connected to each channel. The front of the shelf where each item is to be placed shall have a similar label so those items can be replaced during maintenance in an expedient fashion.

### Schematics, Software and Manuals

The controller cabinet shall have a waterproof envelope with a side access attached to the inside of the cabinet door. At the time of delivery, the envelope shall have one complete set of schematics and manuals for each assembly and subassembly located in the cabinet, and a complete wiring diagram for the cabinet and the controller assembly. In addition, a duplicate copy of the above shall be provided to the City of Auburn Traffic Engineering Section.

Using included software on an IBM-PC compatible computer, it shall be possible to display an intersection condition diagram, which shall be created using separate custom graphics program (not in contract) to show real-time operation of each local controller in the telemetry system. Automatic logging of system operation program changes, alarms and events to the remote computer, shall be provided. Automatic logging of data from system detectors to the remote computer shall be provided. The provided software shall be the current edition of Econolite Aries Signal System monitoring program, or fully compatible equivalent.

### 9-29.13(3) EMERGENCY PREEMPTION

Supplement

Emergency Preemption System equipment shall be compatible with the operational requirements of the existing Opticom brand (3M Company) emitters, detectors, and phase selectors owned by the City.

9-29.16(2) CONVENTIONAL TRAFFIC SIGNAL HEADS

Supplement

Signal head housing, doors, elevator plumbizer and brackets shall be powder-coated traffic signal green. The inside of the visors shall be flat black on vehicular signals. Vehicular signal head housings shall be sectional, cast aluminum, and be weather-tight and shall utilize **vaned aluminum backplates**. They shall be designed to withstand winds of 80 MPH with a 0.25 gust factor without permanent distortion or failing (torque at attachment of 6,000 pound-feet).

Elevator plumbizer shall be cast bronze. Vehicle signal head housings shall be rigid mount type M.

Lamps for vehicle signal heads shall be LED meeting the ITE (Institute of Traffic Engineers) compliance and shall be certified in the Intertek Traffic Signal Modules Certification Program and labeled accordingly. The LED's shall have a 60 month manufactures warranty. The LED shall be Dialight Light Emitting Diode (LED) or approved equal. Part numbers for Dialight LEDs are as follows:

<i>Size</i>	<i>Description</i>	<i>Part Number</i>
12 inch	RED Ball	433-1210-003
12 inch	AMBER Ball	433-3230-001
12 inch	GREEN Ball	433-2220-001
12 inch	RED Arrow	432-1314-001
12 inch	AMBER Arrow	431-3334-001
12 inch	GREEN Arrow	432-2374-001
12 inch	GREEN/AMBER Arrow	430-6370-001

9-29.18 VEHICLE DETECTOR

Supplement

Vehicle Detectors shall be 2 channel rack mount style and compliant with NEMA TS1 and TS2 standards. They shall be capable of auto tuning and be able to withstand temperatures ranging from minus 40 degrees to plus 80 degrees C. They shall have a minimum of 15 sensitivity levels, 4 frequencies plus sequential scanning to avoid crosstalk, and have pulse and short and long presence modes. They shall have separate detect and fault LED's on the front face.

9-29.19 PEDESTRIAN PUSH BUTTONS

Supplement

The Pedestrian Push Button Assembly shall be a Style H with a Chrome Mushroom Plunger, DCC 500 manufactured by H.D. Campbell Company, 1486 NW 70<sup>th</sup> Street, Seattle, WA 98117. See Standard Detail No. TRAFFIC-46 (Pedestrian Push Button Detail).

9-29.20 PEDESTRIAN SIGNALS

Supplement

Pedestrian signals shall be a LED, filled hand/walking person countdown display.

The maximum overall dimensions of the signal shall be 19 inch wide by 18¾ inch high by 8¾ inch deep, including the egg crate Z type visor and hinges. The signal shall be furnished complete and ready to operate. In order to facilitate installation and maintenance, the signal shall be designed so that all components are readily accessible from the front by opening the door.

Each signal shall be provided with an egg crate visor constructed of polycarbonate material. The egg crate or “Z” crate type sun shield, if used, shall be held in place by the use of stainless steel screws. The complete egg crate or “Z” crate assembly shall be 1½ inch deep.

The case shall be one-piece corrosion resistant aluminum alloy die-casting. Integrally cast hinge lug pairs, two at the top and two at the bottom of each case, shall be provided for operation of a swing door down. Color shall be “Traffic Green”. The unit shall be mounted with Type E mountings unless indicated otherwise on the attached plans. All terminal compartments shall be either ferrous metal or bronze.

Pedestrian signal heads shall be Gelcore Light Emitting Diode (LED) or approved equals. The part number for the Gelcore LEDs are as follows:

<i>Size</i>	<i>Description</i>	<i>Part Number</i>
16”x18”	LED Countdown Pedestrian Signal Module	PS7-CFF1-01A-18

9-29.24 SERVICE CABINETS

Supplement

Service cabinet shall be a metered aluminum Skyline Electric Series 47700A1, Rhino (Brownsfield) Manufacturing Inc. or approved equal with Underwriters Laboratory label on the panel boards as Standard Detail TRAFFIC-51 (Power Service Cabinet Detail). The cabinet shall be equipped with a stainless steel handle, a three-point locking system, and a Best six-tumbler mortise cabinet lock with dead bolt.

Two copper ground rods shall be installed per WSDOT and the NEC.

The cabinet shall contain the following branch breakers as applicable:

15 AMP	2 pole	Lighting Circuit
15 AMP	2 pole	Lighting Circuit
20 AMP	1 pole	Traffic Signal
100 AMP	2 pole	Main

9-29.26 TRAFFIC SIGNAL BATTERY BACKUP SYSTEM

New Section

All traffic signal battery back-up power units shall employ a 24 Volt DC battery system. 12 and 48 Volt battery configurations will not be accepted.

All battery backup power units shall utilize the **Dimensions** Inverter/Charger unit, complete with associated remote control display panel.

Batteries shall be connected utilizing approved quick-connect modular battery connectors. Battery connection scheme must provide a “Hot-Swap” capability during operation. Battery cable sizing shall be appropriate for the type and quantity of batteries supplied.

Batteries shall be 12 Volts DC, 100 Amp Hour minimum, Absorbed Glass Mat type, Group 27. Batteries shall meet or exceed Specification MIL B-8565J (Sec 4.6.22). The quantity of batteries to be supplied shall be four batteries.

All battery backup power units shall possess an AC voltage bypass/disconnect switch or relay. The bypass/disconnect method shall couple the normal AC power source directly to the signal controller cabinet, while completely isolating the inverter/charger unit from the circuit.

All battery backup power units shall possess a 0-4 hour Time Delay Relay, with both “delay on make” and “delay on break” contact sets. This relay shall be energized upon loss of AC input power, or “Inverter On” condition. Relay contacts must be easily accessible, and clearly labeled.

Cabinets shall be equipped with thermostatically controlled fan ventilation.

Equipment supplied shall be the pre-approved model listed below, or approved equal.

<b>Manufacturer/Vendor</b>	<b>Model/Type</b>
Rhino(Brownfield) Manufacturing, Inc.	BMI-7000 Traffic Light Backup Power Unit

**Installation/Cabinet Mounting Style:**

Traffic UPS Cabinets shall not exceed 30 inches in width and 18 inches in depth. Cabinet height shall be sufficient to accommodate the quantity of batteries required by the contract, or specified by the project engineer. Installation shall be performed in accordance with City of Auburn Construction Standards.

**9-30 WATER DISTRIBUTION MATERIALS**9-30.1(1)      DUCTILE IRON PIPE      Supplement

All ductile iron pipe used on this project shall be “Special Class 52”, except pipe to be joined using bolted flange joints shall be “Special Class 53”.

9-30.2(1)      DUCTILE IRON PIPE      Supplement

All pipe fittings, adapters and joints for ductile iron pipe shall be ductile iron designed to AWWA Specification (unless otherwise approved in writing by the Engineer) with sufficient tangent at the ends to allow for proper joint connections and shall be coated to give protection to them equal to that given the pipe. Field fabrication fittings will not be permitted. Flexible couplings shall be of the style as required for specific application.

9-30.2(6)      RESTRAINED JOINTS      Supplement

Restrained joint (R.J.) pipe and fittings, where shown on the Plans, shall be suitable for 350 psi working pressures and be US Pipe TR Flex or American Pipe Flex-Ring. Pipe manufacturer restrained joints using exposed bolts in the thrust restraint assembly and restraining systems using set screws, anchor lugs, wedges, or other friction devices will not be considered equal to the systems listed. All welding associated with the restraint system shall be performed in the pipe manufacturer’s shop. No field welding will be permitted.

9-30.3(1)      GATE VALVES (3-inches to 16-inches)      Replacement

Resilient wedge gate valves shall be used on all 12” and smaller water lines and shall be manufactured by Clow, American Darling, Waterous, Dresser M & H or Mueller with epoxy-coated valve interiors. The valves shall conform to ANSI/AWWA Specifications C-509 with a 200-psi working pressure rating. They shall be iron bodied, bronze-mounted, non-rising stem and counterclockwise opening with a 2 inch square operating nut. All valves on the fire hydrant line(s) shall be 6-inch diameter mechanical joint by flange. All other valves shall be either mechanical joint by flange or Mechanical joint shackled to tees or crosses. Valve stems shall be provided with O-ring seals.

9-30.3(3)      BUTTERFLY VALVES      Supplement

Butterfly valves conforming to AWWA Specification C-504, Class 150 B shall be used on all 14 inch and larger water mains. They shall have Mechanical joint ends and be rated at 150 psi working pressure. Operator shall have standard AWWA 2 inch square nut.

9-30.3(4)      VALVE BOXES      Supplement

Valve boxes shall be two-piece, adjustable, cast-iron (with additional extension pieces, if necessary), as manufactured by the Olympic Foundry Company, or equal, with a minimum

inside diameter of 5 inch. The word "WATER" shall be cast in relief on the top of all valve box covers. In addition, the letters "NC" shall be cast in place on valve box covers for those valves that are normally closed. Valve box covers shall be of a design and thickness so traffic will not allow them to be flipped out.

**9-30.3(8) TAPPING SLEEVE AND VALVE ASSEMBLY**

Supplement

Tapping sleeves and valves shall conform to the following:

1. For wet taps on mains 12 inch diameter and larger or size-on-size, the tapping sleeve shall be the full M.J. type, cast-iron, twin seal as manufactured by Mueller, Tyler, Taylor, M & H, or epoxy-coated fabricated-steel, as manufactured by JCM, Rockwell or equal;
2. For wet taps on mains 10 inch diameter and smaller, or at least 2 inch diameter smaller than the main size, the tapping sleeve shall be the wraparound style, stainless steel or epoxy-coated fabricated-steel, or cast-iron M.J. as manufactured by Romac, Ford, M & H, Rockwell, Smith Blair, or equal.

**9-30.5 HYDRANTS**

Supplement

Fire hydrants shall have two 2½-inch hose ports (National Standard Thread) and one 4½-inch pumper port (National Standard Thread) with caps and no chains, 1¼ inch pentagonal operating nut (counterclockwise) opening, O-ring-type stuffing box, automatic barrel drain, and 5¼ inch valve opening. Hydrants shall be equipped with a 5" Storz adapter with blind cap, or approved equal, where required by the Fire Department. Hydrants shall conform to the latest revision of AWWA Standard Specification No. C-502 for dry-barrel fire hydrants for ordinary water service. Hydrants shall be Mueller "Centurion" #A-423, M & H Style 929 Resilient (Brass-to-Brass Seats), or American AVK 2780.

**9-30.6 WATER SERVICE CONNECTIONS (2-INCHES & SMALLER)****9-30.6(1) SADDLES**

Replacement

*(July 2014, City of Auburn)*

Saddles for 1 inch, 1½ inch, and 2 inch pipe taps shall be epoxy-coated ductile iron, with double stainless steel straps and cemented in place neoprene gaskets. Saddles shall have I.P.S. female threads.

**9-30.6(2) CORPORATION STOPS**

Supplement

*(July 2014, City of Auburn)*

Corporation stops for 1 inch service shall have AWWA tapered thread inlets for insertion directly into the pipe main and the outlets shall have a compression connection suitable for connecting to Type K copper tubing per Section 9-30.6(3)A (Copper Tubing). Corporation stops shall be Mueller B-25008N, Ford FB1000-4-Q-NL or approved equal for 1 inch service.

The City allows 1 inch corporation stops to be installed with saddle at the pipe main. If a saddle is used, corporation stops shall be Mueller B20013N with H-15451N outlet coupling or Ford FB500-4-NL with C14-44-Q-NL outlet coupling, or approved equal for 1" service.

Corporation stops for 1½ inch, and 2 inch services shall be installed with saddle at the pipe main. Corporation stops shall be Mueller B-2969N with H-15451N outlet coupling or Ford FB500-6-NL with C14-66-Q-NL outlet coupling or approved equal for 1½ inch service. Corporation stops shall be Mueller B-2969N with H-15451N outlet coupling or Ford FB500-7-NL with C14-77-Q-NL outlet coupling or approved equal for 2 inch service. Outlet coupling shall be suitable for connecting to Type K copper tubing per Section 9-30.6(3)A (Copper Tubing) or high density polyethylene (HPDE) SDR-9 (in copper tube size).

9-30.6(3) SERVICE PIPES  
(July 2014, City of Auburn)

Supplement

The City allows Type K copper tubing for all water service connections. For 1½ inch and 2 inch service, high density polyethylene (HPDE) SDR-9 (copper tube size) with stainless steel liners in all couplings and wrapped with a #10 insulated copper tracer wire is acceptable.

9-30.6(5) METER SETTERS  
(July 2014, City of Auburn)

Supplement

Meter yokes shall be equal to the following:

- A. 1 inch service meter yokes shall have multi-purpose threaded ends, lock wing angle ball valve and angle dual check valve. Meter yokes shall be Mueller B-2404R-2N reduced port with H-14222N inlet and H-14227N outlet couplings or approved equal. Contractor shall provide meter adapters for replacement projects. Meter adapters shall be Mueller H-10879 5/8 inch x ¾ inch x 1 inch for ¾ inch meters, or equal.
- B. 1½ inch and 2 inch service meter yokes shall have F.I.P. threaded ends, lock angle ball valve, angle dual check valve, and bypass with lock wing ball valve and check valve.
- C. 1½ inch service meter yokes shall be Mueller B-2423-2N with H-15428N outlet coupling or Ford VBHH76-12BHC-11-66-NL with C84-66-Q-NL outlet coupling or approved equal.
- D. 2 inch service meter yokes shall be Mueller B-2423-2N with H-15428N outlet coupling or Ford VBHH77-12BHC-11-77-NL with C84-77-Q-NL outlet coupling or approved equal.
- E. All meter yokes shall be set with a spacer pipe with hole drilled in pipe. Do not install gaskets with spacer pipe.

9-30.6(5)A CURB VALVES  
(July 2014, City of Auburn)

New Section

Curb valves shall be straight ball-type, having outlets suitable for connecting to bronze threaded nipples per Section 9-30.6(6) (Bronze Nipples and Fittings) and equal to the following:

- A. 1-inch service: curb valves shall be Mueller B-20200N with H-15428N inlet coupling or Ford B11-444W-NL with C84-44-Q-NL inlet coupling suitable for connecting to Type K copper tubing per Section 9-30.6(3)A (Copper Tubing);
- B. 1½ inch service: curb valves shall be Mueller B-20200N with H-15428N inlet coupling or Ford B11-666W-NL with C84-66-Q-NL inlet coupling suitable for connecting to Type K copper tubing per Section 9-30.6(3)A (Copper Tubing) or high density polyethylene (HPDE) SDR-9 (in copper tube size);
- C. 2 inch service: curb valves shall be Mueller B-20200N with H-15428N inlet coupling or Ford B11-777W-NL with C84-77-Q-NL inlet coupling suitable for connecting to Type K copper tubing per Section 9-30.6(3)A (Copper Tubing) or high density polyethylene (HPDE) SDR-9 (in copper tube size);
- D. Locate curb valves in the meter boxes where possible and 1 foot outside the meter boxes where the inside room is not available.

**9-30.6(7) METER BOXES**

Supplement

*(July 2014, City of Auburn)*

Meter boxes shall be the following:

- A. Boxes for 1 inch service shall be Raven RMB 13"x24"x12" or Mid-States Plastics BCF Series MSBCF-1324-12. Lids shall be ductile or cast iron reader cover with 2 inch AMR port. Traffic rated cover shall be used in areas of vehicular traffic or as required by the Engineer;
- B. Boxes for 1½ inch and 2 inch services shall be Raven RMB 17"x30"x12" or Mid-States Plastics MSBCF-1730-12. Lids shall be ductile or cast iron reader cover with 2 inch AMR port. Traffic rated cover shall be used in areas of vehicular traffic or as required by the Engineer.

**9-30.6(8) SHUT-OFF VALVES**

New Section

*(September 2014, City of Auburn)*

Private shut-off valves shall be straight ball-type with lever handle, having outlets suitable for connecting to bronze threaded nipples per Section 9-30.6(6) and equal to the following:

- A. 1 inch, 1 ½ inch, and 2 inch shut-off valves shall be Mueller B-20200N with B-202989900 short handle, or equal.
- B. Shut-off valves shall be provided with ADS riser pipe and cap.

**9-36 FILTER FABRIC****9-36.1 FILTER FABRIC FOR INFILTRATION SYSTEMS**

New Section

Filter fabric for permanent infiltration systems shall be a non-woven polypropylene geotextile fabric, Contech C45-NW as manufactured by Contech Construction Products Inc., or equivalent.

END OF DIVISION 9