



CITY OF AUBURN

KING AND PIERCE COUNTIES,
WASHINGTON

**TECHNICAL SPECIAL
PROVISIONS
DIVISIONS 2 – 9
(WSDOT/APWA Format)**

for

2016 JOB ORDER CONTRACTING

Contract Nos. JOC16-(A/B)

City of Auburn
Engineering Division
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DIVISION 2 EARTHWORK**2-01 CLEARING, GRUBBING AND ROADSIDE CLEANUP**

2-01.1 DESCRIPTION Supplement

Clearing and grubbing shall be done to the construction limits shown on the plans and as directed by the Engineer. When no clearing and grubbing limits are shown, the clearing and grubbing limits shall be the smallest area required to complete the other Contract Work.

2-01.2 DISPOSAL OF USABLE MATERIAL AND DEBRIS

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

Open burning will not be permitted on this project.

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

No waste site has been provided for the disposal of excess material. See also 1-07.6 (Permits and Licenses). The Contractor shall make his own arrangements for obtaining waste sites. The Contractor shall provide the Engineer with copies of all permits necessary for the disposal of surplus materials before removing materials from the site. All cost associated with disposal shall be incidental to other bid items.

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

Unsold chips shall not be spread on the project site unless approved by the Engineer. Unsold chips shall be disposed of by Disposal Method No. 2.

2-01.3 CONSTRUCTION REQUIREMENTS Supplement

Property owners are responsible for relocating or removing trees, shrubs, or any other landscaping material within the work areas that they wish to save unless specified elsewhere in the contract documents. The Contractor shall notify property owners a minimum of 5 working days in advance of clearing the site to allow the owner time to remove landscape material.

All landscape materials that remain in the work area shall be removed and disposed of by the Contractor, except when the Engineer specifically orders salvage or protection.

Before removing landscaping material, the Contractor must receive written approval from the Engineer to begin his work.

2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

2-02.1 DESCRIPTION Supplement

The quantities listed below are to be included in the unit bid price for “Removal of Structures and Obstructions.” They are estimates only and are provided for Contractor convenience as a basis for bidding only. The Contractor shall verify the quantities before bidding. The unit bid price for “Removal of Structures and Obstructions” shall include all

work specified in Section 2-02 (Removal of Structures and Obstructions) whether listed below or not, except for the unit priced items listed in Section 2-02.5 (Payment).

2-02.3 CONSTRUCTION REQUIREMENTS Revision

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 or as directed by the Engineer. 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

(July 2010 City of Auburn)

Pavement, sidewalks, curbs, and gutters shall be saw cut in such a fashion as to form a neat break line. Saw cutting costs shall be included in the bid item involved.

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

(December 2015 City of Auburn)

The Contractor shall remove and reset miscellaneous items as described in the plans. Unless a separate and applicable pay item is included in the Contract Documents, removal and resetting of miscellaneous items is incidental to other bid items in the contract. 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 at Contractor expense.

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's operation at no additional cost to the City.

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 at the Contractor's expense. 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 at the Contractor's expense. 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 at Contractor expense. 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

(July 2010, City of Auburn)

The second paragraph is supplemented as follows:

4. Removal Items being separately paid for under 2-02 of these contract documents.

Excavation that is not classified as Structure Excavation under Section 2-09 (Structure Excavation) and is not included under other bid items shall be measured and paid at the unit contract price per cubic yard for "Roadway Excavation Including Haul" and shall include removal of such items as asphalt or cement concrete pavement.

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

Excavated material unsuitable for roadway embankment, such as broken pavement, curbs, sidewalks, etc., shall be disposed of. All cost associated with hauling and disposal of the excavated material shall be considered incidental to the unit contract price for "Roadway Excavation Including Haul".

Any excavation beyond the set limits, unless ordered by the Engineer in writing, shall not be paid for. The Contractor, at Contractor expense, shall provide all work and material required to return these over excavated areas to their set limits or original conditions.

The original ground elevation will be determined only once on this project. Measurement for Roadway Excavation and Embankment will be based on the original ground elevations recorded before the award of this Contract, and the alignment, profile, grade, and roadway section as shown in the plans. Control stakes will be set during construction to provide the Contractor with alignment, slope, and grade information for the construction of excavation and embankments.

If discrepancies are discovered in the ground elevations that will change the original bid quantities of earthwork by more than 25%, the original computations of earthwork quantities will be adjusted accordingly.

Earthwork quantities will be computed, either manually or electronically, by using the average end area method.

Copies of the ground cross-section notes will be available for the bidder's inspection before the opening of bids at the City of Auburn Public Works Department, Customer Service Center, One East Main Street, Auburn, Washington. Upon award of the Contract, copies of the original ground cross-sections will be furnished the successful bidder upon request to the Engineer.

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

2-03.3 CONSTRUCTION REQUIREMENTS**2-03.3(7) DISPOSAL OF SURPLUS MATERIAL****2-03.3(7)B HAUL Replacement**

Haul and disposal of surplus or unsuitable materials is incidental to the unit Contract price for "Roadway Excavation Including Haul," per cubic yard.

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:

1. 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;
2. Grading (Fill) Permits are issued by the City of Auburn Building Division after all conditions have been met to the satisfaction of the Building Official;
3. 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 Building Division;
4. 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;
5. Failure to comply with the above requirements shall be grounds to withhold payment of money due until such time as the requirements have been satisfied;
6. Time lost by failure to satisfy these requirements shall be insufficient reason for granting of extensions of Contract time.

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).

Embankment construction is incidental to the unit Contract price for "Roadway Excavation Including Haul".

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, at no expense to the City.

“Unsuitable Foundation Excavation” shall be field measured by the cubic yard and paid for at the unit Contract price per cubic yard for “Unsuitable Foundation Excavation”.

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(1) WATER FROM CITY HYDRANTS New Section

The Contractor shall obtain a Fire Hydrant Meter Permit from the City of Auburn Permit Center (1 East 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 Meter Permit is obtained and in accordance with the terms of the Fire Hydrant Meter Permit. To obtain a Fire Hydrant Meter Permit the applicant shall make a deposit of \$1,965.00 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 an acceptable condition and all water usage fees have been paid, the \$1,965.00 deposit will then be refunded to the applicant. The applicant shall pay a base fee of \$44.85 per month and all water usage will be paid by the applicant at the rate of \$3.57 per hundred cubic feet.

NOTE: These are current 2015 rates and may be revised periodically. The Contractor shall be responsible to contact the City and verify these rates when preparing the bid. Adjustment of these rates by the City will not be the basis for any contract unit price adjustment.

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).

END OF DIVISION 2

DIVISION 4 BASES

No changes made to this section.

END OF DIVISION 4

DIVISION 5 SURFACE TREATMENTS AND PAVEMENTS BASES

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.

5-03 SLURRY SEAL SURFACE TREATMENT

New Section

5-03.1 DESCRIPTION

This work consists of applying an emulsified asphalt slurry seal to prepared designated street surfaces in complete and strict accordance with these Special Provisions.

The slurry seal surface shall consist of a mixture of emulsified asphalt, mineral aggregate, and water, properly proportioned, mixed, and spread evenly on the surface as specified in this document and as directed by the Engineer. The cured slurry shall have a homogenous appearance, fill all cracks, adhere firmly to the surface, and have a skid resistant texture.

5-03.1(1) APPLICABLE SPECIFICATIONS

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

AASHTO __ American Association of State Highway Testing Officials;
ASTM __ American Society for Testing and Materials;
ISSA __ International Slurry Seal Association.

5-03.2 MATERIALS

5-03.2(1) ASPHALT EMULSION

Emulsified asphalt shall conform to the requirement of ASTM or ISSA Specification for type SS1h, CSS1h, or QUICK SETTING MIXING GRADE EMULSION.

5-03.2(2) AGGREGATE

The mineral aggregate shall consist of natural or manufactured sand, slag, crusher fines, and others or a combination thereof. Smooth-textured sand of less than 1.25% water absorption shall not exceed 50% of the total combined aggregate. The aggregate shall be clean and free of vegetable matter and other deleterious substances. When tested by AASHTO T176 or ASTM D2419, the aggregate blend shall have a sand equivalent of not less than 45. When tested according to AASHTO T104 or ASTM C88 the aggregate shall show a loss of not more than 15%. When tested according to AASHTO T-96 or ASTM C131 the aggregate shall show a loss of not more than 35. Mineral fillers such as Portland Cement, limestone dust, fly ash, and others shall be considered part of the blended aggregate and shall be used in minimum required amounts and must meet the gradation requirements of ASTM D242. Mineral fillers shall only be used if needed to improve the workability of the mix or gradation of the aggregate.

The combined mineral aggregate shall conform to the following gradation:

| Sieve Size | Percent Passing (Type III) |
|--------------------|----------------------------|
| ½ inch - (12.5mm) | |
| 3/8 inch - (9.5mm) | 100 |
| No. 4 (4.75mm) | 70-90 |

| | |
|--|--------|
| No. 8 (2.36mm) | 45-70 |
| No. 16 (1.18mm) | 28-50 |
| No. 30 (600xm) | 19-34 |
| No. 50 (300xm) | 12-25 |
| No. 100 (150xm) | 7-18 |
| No. 200 (75xm) | 5-15 |
| Theoretical Asphalt Content % Dry | |
| Aggregate | 6.5-12 |

5-03.2(3) WATER

All water used with the slurry mixture shall be potable and free from harmful soluble salts.

5-03.2(4) LABORATORY TESTING

Sources for all materials shall be selected before to the time the materials are required for use on the project. All samples must be taken according to previously mentioned procedures. All materials shall be pretested in a qualified laboratory to determine their suitability for use in slurry. The theoretical asphalt content shall be determined. The laboratory shall also determine if mineral filler is required, and if so, how much should be used. Test samples shall be made and tested on a Wet Track Abrasion Machine.

The Contractor must submit the complete laboratory analysis and test report with abraded and unabraded slurry test samples, to the Engineer before application of the slurry seal can begin.

5-03.2(5) STOCKPILING OF AGGREGATES

Precautions shall be taken to insure that stockpiles do not become contaminated with oversized rock, clay, silt, or excessive amounts of moisture. The stockpile shall be kept in areas that drain readily. Segregation of the aggregate will not be permitted.

5-03.2(6) STORAGE

The Contractor shall provide suitable storage facilities for the asphalt emulsion. The container shall be equipped to prevent water from entering the emulsion. Suitable heat shall be provided, if necessary, to prevent freezing.

5-03.2(7) SAMPLING

The Contractor shall furnish samples of materials and of the finished slurry surface during progress of the work. The Contractor may be requested to supply test reports as additional materials arrive.

5-03.2(8) VERIFICATION

Each machine will make test strips after calibration and before construction. Test strips shall be a portion of the project. Samples of the Slurry Seal will be taken and verification made as to mix consistency and proportioning. Verification of the rate of application will

also be made. If any of the tests fail to meet minimum standards, additional test strips will be required until the Engineer approves each unit. These additional test strips will be performed at no additional cost to the City. Any unit failing to pass the tests after the third trial will not be permitted to work on the project. Test strips must be accepted or rejected within 24 hours after application.

5-03.3 CONSTRUCTION REQUIREMENTS

5-03.3(1) EQUIPMENT

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

5-03.3(1)A SLURRY MIXING EQUIPMENT

The slurry-mixing machine shall be a continuous flow-mixing unit and shall be capable of accurately delivering a predetermined proportion of aggregate, water, and asphalt emulsion to the mixing chamber and to discharge the thoroughly mixed product on a continuous basis. The aggregate shall be prewetted immediately before mixing with the emulsion. The mixing unit of the mixing chamber shall be capable of thoroughly blending all ingredients. No violent mixing is permitted. The mixing machine shall be equipped with an approved fines feeder that provides an accurate metering device or method to introduce a predetermined proportion of mineral filler into the mixer at the same time and location as the aggregate. The fines feeder shall be used whenever added mineral filler is a part of the aggregate blend.

5-03.3(1)B SLURRY SPREADING EQUIPMENT

A mechanical type squeegee distributor shall be attached to the mixing machine. It shall be equipped with flexible material in contact with the pavement and shall be maintained to prevent loss of slurry from the distributor. It shall also be adjustable to ensure uniform spread. There shall be a steering device and a flexible strike-off. The spreader box shall have an adjustable width. The box shall be kept clean, and build-up of asphalt and aggregate on the box will not be permitted. The Engineer shall approve the use of burlap drags or other drags.

5-03.3(1)C CLEANING EQUIPMENT

Power brooms, power blowers, air compressors, water flushing equipment, and hand brooms shall be suitable for cleaning the surface and cracks of the old surface.

5-03.3(1)D AUXILIARY EQUIPMENT

The Contractor shall provide hand squeegees, shovels, and other equipment as necessary to perform the required work.

5-03.3(1)E CALIBRATION

Each slurry-mixing unit used to perform the work shall be calibrated in the presence of the Engineer, before construction. Documentation of previous calibration that covers the exact materials being used may be an acceptable substitute provided they were made during the same calendar year. The documentation shall include an individual calibration of each material at various settings that can be related to the machine's metering device(s). No machine will be allowed to work on the project until calibration has been completed and accepted.

5-03.3(2) PREPARATION OF SURFACE

Immediately before applying the slurry, the surface shall be cleaned of all loose material, silt spots, vegetation, and other objectionable material. Any standard cleaning method to clean pavements is acceptable, except water flushing which is not permitted in areas where there are numerous cracks present in the pavement surface. The Engineer shall give final approval of the surface preparation.

5-03.3(3) COMPOSITION AND RATE OF APPLICATION OF THE SLURRY MIX

The amount of asphalt emulsion to be blended with the aggregate shall be as determined by the laboratory report after final adjustment in the field. A minimum amount of water shall be added as necessary to obtain a fluid and homogeneous mixture. The rate of application shall be at least 15 pounds per square yard but not greater than 20 pounds per square yard.

Adjustment may be required during construction based on field conditions. The Engineer will give final approval for all such adjustments.

5-03.3(4) WEATHER LIMITATIONS

The slurry seal surface shall not be applied if either the pavement or air temperatures are 55 degrees F or below and falling, but may be applied when both the air and pavement temperatures are 45 degrees F or above and rising. The mixture should not be applied if high relative humidity prolongs curing beyond a reasonable time.

5-03.3(5) TRAFFIC CONTROL

The Contractor is responsible for all Traffic Control. Suitable methods such as barricades, flaggers, pilot cars, etc., shall be used to protect the uncured slurry surface from all types of traffic. Any damage to the uncured slurry will be the responsibility of the Contractor. The Engineer shall give final approval to the traffic control methods used.

5-03.3(6) APPLICATION OF SLURRY SURFACES**5-03.3(6)A GENERAL**

The surface may be prewetted by fogging ahead of the slurry box if required by local conditions. Water used in prewetting the surface shall be applied at a rate so that the entire surface is damp with no apparent flowing water in front of the slurry box. The slurry mixture shall be of the desired consistency when deposited on the surface and no additional

elements shall be added. Total time of mixing shall not exceed 4 minutes. A sufficient amount of slurry shall be carried in all parts of the spreader at all times so that complete coverage is obtained. No lumping, balling or unmixed aggregate shall be permitted. If the coarse aggregate settles to the bottom of the mix, the slurry will be removed from the pavement. No excessive breaking of the emulsion will be allowed in the spreader box. No streaks, such as those caused by oversized aggregate, will be left in the finished pavement.

5-03.3(6)B JOINTS

Neither excessive build-up nor unsightly appearance shall be permitted on longitudinal or transverse joints.

5-03.3(6)C HAND WORK

Approved squeegees shall be used to spread slurry in areas not accessible to the slurry mixer. Care shall be exercised so that no unsightly appearance results from handwork.

5-03.3(6)D CURING

Treated areas will be allowed to cure until the Engineer permits their opening to traffic.

Rolling is normally not required on slurry surfaces. However, in areas of slow turning traffic the paved surface should be rolled by a five-ton roller. The paved area should be subjected to a minimum of five coverages. If a pneumatic roller is used, it should be operated at a tire pressure of 50 pounds per square inch.

5-03.3(6)E PROTECTION OF EXISTING MONUMENTS AND UTILITY COVERS

The Contractor shall protect all existing survey monuments and utility covers during the resurfacing operation by placing a paper plate or similar material over them. Following the resurfacing operation, paper plates or similar materials shall then be removed to leave the monuments clean and exposed.

5-04 HOT MIX ASPHALT

5-04.1 DESCRIPTION

Supplement/Revision

Delete the second and third sentence of the first paragraph.

Supplement this section as follows:

HMA Class 3/8-inch, Class 1/2-inch, and Class 3/4-inch are designated as leveling or wearing courses. HMA Class 1-inch is designated as a pavement base course. All mixtures are considered dense graded HMA.

Where Contract Documents refer to HMA mixes A, B, B Modified, E, F or G, the Contractor shall provide an equivalent PG type mix as indicated in the table below:

| Specified Mix | Equivalent |
|-------------------|---------------------------|
| HMA Class A, B, B | HMA Cl. 1/2-inch PG 64-22 |

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| | |
|-------------|---------------------------|
| Modified | |
| HMA Class E | HMA Cl. 1-inch PG 64-22 |
| HMA Class F | HMA Cl. 3/4-inch PG 64-22 |
| HMA Class G | HMA Cl. 3/8-inch PG 64-22 |

5-04.2 MATERIALS Supplement/Revision

Delete the following item from the list in the first paragraph:

Warm Mix Asphalt Additive 9-02.5

Delete the fifth paragraph (begins with “The Contractor may use warm mix asphalt”).

Supplement this section as follows:

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) HOT MIX ASPHALT MIXING PLANT Revision

The last sentence of item 3 in the numbered list is deleted.

5-04.3(3) HOT MIX ASPHALT PAVERS Supplement/Revision

Replace the first sentence of the seventh paragraph with the following:

Reference lines for vertical control may be required.

This section is supplemented as follows:

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.

5-04.3(3)A MATERIAL TRANSFER DEVICE/VEHICLE Supplement

This section only applies to paving on State Routes and within the right of way of the State.

5-04.3(5)A PREPARATION OF EXISTING SURFACES Supplement/Revision

Replace the fourth paragraph with the following:

Unless otherwise approved by the Engineer, the tack coat shall be CSS-1h emulsified asphalt. The CSS-1h 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.

This section is supplemented as follows:

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

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shall remove existing plastic markings as specified in Section 8-22.4 (Measurement) of this document.

5-04.3(5)B PREPARATION OF UNTREATED ROADWAY Supplement/Revision

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

The existing roadway shall be prepared and primed.

Replace the third sentence of the first paragraph with the following:

The aggregate shall conform to the requirements of Section 9-03.8 (Aggregates for Hot Mix Asphalt) for HMA Class 1/2" or shall consist of other material approved by the Engineer.

This section is supplemented as follows:

Before placement of HMA on untreated roadway, the Contractor shall apply soil residual herbicides as specified in Section 5-04.3(5)D (Soil Residual Herbicide).

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.

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 (New Construction) 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 (New Construction) but shall be compensated for the item of work preparation of untreated roadway.

5-04.3(5)D SOIL RESIDUAL HERBICIDE Revision/Supplement

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

The Contractor shall apply one application of an approved soil residual herbicide.

The first paragraph is supplemented as follows:

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.

5-04.3(5)E PAVEMENT REPAIR Revision/Supplement

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

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

This section is supplemented as follows:

HMA for pavement repair shall be HMA Class 1/2-inch PG 22-64 or as shown in the Plans.

5-04.3(7)A MIX DESIGN Replacement

(March 2010, City of Auburn)

Delete this section and replace it with the following;

5-04.3(7)A1 GENERAL

Prior to the production of HMA, the Contractor shall determine a design aggregate structure and asphalt binder content in accordance with WSDOT Standard Operating Procedure 732. Once the design aggregate structure and asphalt binder content have been determined, the Contractor shall submit the HMA mix design on DOT form 350-042 demonstrating the design meets the requirements of Sections 9-03.8(2) (HMA Test Requirements) and 9-03.8(6) (HMA Proportion of Materials). HMA accepted by nonstatistical evaluation requires a mix design verification. For HMA accepted by commercial evaluation only the first page of DOT form 350-042 and the percent of asphalt binder is required. In no case shall the paving begin before the determination of anti-strip requirements has been made. Anti-strip requirements will be determined by:

- a. Testing by WSDOT in accordance with TM 718.
- b. Testing by Contractor in accordance with WSDOT TM 718.
- c. Historical aggregate source anti-strip use provided by WSDOT.

For commercial HMA, aggregate shall meet the requirements of Section 9-03.8 (Aggregates for Hot Mix Asphalt) for HMA Class ½-inch and asphalt binder shall meet the requirements of Section 9-02.1(4) (Performance Graded Asphalt Binder) for PG 64-22.

The mix design will be the initial Job Mix Formula (JMF) for the HMA being produced. Any additional adjustments to the JMF will require the approval of the Engineer and may be made per Section 9-03.8(7) (HMA Tolerances and Adjustments).

5-04.3(7)A2 MIX DESIGN VERIFICATION

Verification shall be accomplished by one of the following processes:

- a. The Contractor shall submit samples to WSDOT State Materials Lab for WSDOT verification testing in accordance with WSDOT Standard Specifications. All costs associated with providing, submitting, and testing the samples shall be included in the unit contract price for the associated HMA.
- b. Reference a mix design that has been verified by the WSDOT State Materials Lab on a previous project.
- c. Reference a mix design that has been verified by the City of Auburn on a previous project in accordance with section 5-04.3(7)A3 (Field Verification Testing Process)
- d. Perform Field Verification Testing on a sample of HMA provided by the Contractor prior to paving.

Mix design verification is valid for one year from the date of verification. At the discretion of the Engineer, agencies may accept mix designs verified beyond the verification year with certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

5-04.3(7)A3 FIELD VERIFICATION TESTING PROCESS

The Contracting agency will collect three Production Samples of HMA per AASHTO T 168 sampling procedures.

- a. The Contracting agency will test one Production Sample in accordance with section 5-04.3(8)A (Acceptance Sampling and Testing—HMA Mixture) for field verification per the requirements of Section 9-03.8(7) (HMA Tolerances and Adjustments).
- b. If the test results from the first Production Sample are within the tolerances of section 9-03.8(7) (HMA Tolerances and Adjustments), the mix design will be considered verified and the test results will be used as acceptance sample number one.
- c. If the test results from the first Production Sample are outside the tolerances of section 9-03.8(7) (HMA Tolerances and Adjustments), the other two samples will be tested and the results of all three tests will be used for acceptance in accordance with Section 5-04.5(1) and will be used in the calculation of the CPF. The maximum CPF shall be 1.00.

5-04.3(7)A4 IGNITION FURNACE CALIBRATION SAMPLES

Prior to the first day of paving, six Ignition Furnace Calibration Samples shall be obtained to calibrate the Ignition Furnaces used for acceptance testing of the HMA. Calibration samples shall be provided by the Contractor when directed by the Engineer. Calibration samples shall be prepared in accordance with WSDOT SOP 728.

5-04.3(8) MIXING

Revision

Delete the second sentence of the second paragraph.

5-04.3(8)A1 GENERAL

Deletion

This section is deleted in its entirety.

5-04.3(8)A2 AGGREGATE

Replacement

(March 2010, City of Auburn)

Delete these sections and replace them with the following:

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

Nonstatistical evaluation will be used for all HMA not designated as Commercial HMA in the contract documents.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: restoration and adjustment to paved areas, including driveway approaches, asphalt ramps, patching around utility structures, and patching utility trenches outside the roadway section. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer. Commercial HMA can be accepted by a contractor certification letter stating the material meets the HMA requirements defined in the contract.

5-04.3(8)A4 DEFINITION OF SAMPLING LOT AND SUBLOT

Replacement

(March 10, 2010 APWA GSP)

Delete this section and replace it with the following:

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. Only one lot per mix design will be expected to occur. The initial JMF is defined in Section 5-04.3(7)A (Mix Design). The Contractor may request a change in the JMF in accordance with Section 9-03.8(7) (HMA Tolerances and Adjustments). If the request is approved, all of the material produced up to the time of the change will be evaluated on the basis of tests on samples taken from that material and a new lot will begin.

For proposal quantities less than 2500 tons sampling and testing for evaluation shall be performed as described in 5-04.3(7)A3 (Field Verification Testing Process). The verification sample referenced in item 'b' of Section 5-04.3(7)A3 (Field Verification Testing Process) may be used as an acceptance sample, additional testing will be at the discretion of the Engineer. When using a previously verified mix design, testing for volumetric properties may be waived at the engineer's discretion. At least one acceptance sample is required when using this method of acceptance.

For proposal quantities greater than 2500 tons sampling and testing for evaluation shall be performed as described in 5-04.3(7)A3 (Field Verification Testing Process), for the first 2500 tons of mix placed. The verification sample referenced in item 'b' of Section 5-04.3(7)A3 (Field Verification Testing Process) may be used as an acceptance sample for the first 2500 tons of mix placed. Additional testing will be at the rate of one sample per 800 tons of mix placed or as directed by the Engineer. When using a previously verified mix design, testing for volumetric properties may be waived at the engineer's discretion.

5-04.3(8)A5 TEST RESULTS

Replacement

(March 2010, City of Auburn)

Delete this section and replace it with the following:

When request by the Contractor, the Engineer will furnish the Contractor with a copy of the results of all acceptance testing performed in the field within two working days after the results are received from the outside testing lab hired by the City. The Engineer will also provide the Composite Pay Factor (CPF) of the completed sublots after three sublots have been produced. Sublot sample test results (gradation and asphalt binder content) may be challenged by the Contractor. To challenge test results, the Contractor shall submit a written challenge within 7-calendar days after receipt of the specific test results. A split of the original acceptance sample will be sent for testing to either the Region Materials Laboratory or the State Materials Laboratory as determined by the Engineer. The split of the sample with challenged results will not be tested with the same equipment or by the same tester that ran the original acceptance test. The challenge sample will be tested for a complete gradation analysis and for 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:

DeviationU.S. No. 4 sieve and larger Percent passing ± 4.0

U.S. No. 8 sieve Percent passing ± 2.0
 U.S. No. 200 sieve Percent passing ± 0.4
 Asphalt binder Percent binder content ± 0.3
 Va Percent Va ± 0.7

If the results of the challenge sample testing are within the allowable deviation established above for each parameter, the acceptance sample test results will be used for acceptance of the HMA. 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 challenge sample. If the results of the challenge sample testing are outside of any one parameter established above, the challenge sample will be used for acceptance of the HMA and the cost of testing will be the Contracting Agency's responsibility.

5-04.3(9) SPREADING AND FINISHING Revision/Supplement

Replace the last sentence of the first paragraph with the following:

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:

This section is supplemented as follows:

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

5-04.3(10) COMPACTION

5-04.3(10)A GENERAL Revision/Supplement

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

The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, checking, cracking, or irregularities and shall conform to the line, grade, and cross-section shown in the Plans or as established by the Engineer.

This section is supplemented as follows:

All compaction units shall be operated at the speed, within specification limits, that will produce the required compaction.

5-04.3(10)B1 GENERAL Revision

The third sentence of the second paragraph is replaced with the following:

The subplot locations within each density lot will be determined at the discretion of the Engineer or by a representative from the outside testing lab hired by the City.

5-04.3(10)B4 TEST RESULTS Revision

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

The nuclear moisture-density gauge results of all compaction acceptance testing and the CPF for each lot will be available to the Contractor within two working days after the results are received from the outside testing lab hired by the City.

5-04.3(12)B LONGITUDINAL JOINTS

Revision

Replace the second paragraph including the numbered list with the following:

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.

5-04.3(12)C ASPHALT CONCRETE PAVEMENT BUTT JOINTS

New Section

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(14) PLANING BITUMINOUS PAVEMENT

Supplement

Planing of the existing pavement shall provide a surface that is slightly grooved or roughened to ensure a bond to the ACP. The full depth beginning and end of each lane of planing shall be squared-off to form a uniform, transverse joint.

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.

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(17) PAVING UNDER TRAFFIC

Revision

Replace the first two sentences of the first paragraph with the following:

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.

Replace the second paragraph with the following:

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

5-04.3(21) ASPHALT COLD PATCH New Section

“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.

5-04.5(1) QUALITY ASSURANCE PRICE ADJUSTMENTS Revision

Delete the fourth sentence of the first paragraph.

5-04.5(1)A PRICE ADJUSTMENTS FOR QUALITY OF HMA MIXTURE Replacement

(March 10, 2010 APWA GSP)

Delete this section and replace with the following:

Statistical analysis of quality of gradation and asphalt content will be performed based on Section 1-06.2 using the following price adjustment factors:

| Table of Price Adjustment Factors | |
|--|-------------------|
| Constituent | Factor “f” |
| All aggregate passing: 1 1/2”, 1”, 3/4”, 1/2”, 3/8” and No. 4 sieves | 2 |
| All aggregate passing No. 8 | 15 |
| All aggregate passing No. 200 sieve | 20 |
| Asphalt binder | 52 |

A pay factor will be calculated for sieves listed in Section 9-03.8(7) for the class of HMA and for the asphalt binder.

1. **Nonstatistical Evaluation.** Each lot of HMA produced under Nonstatistical Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit contract price with no further evaluation. When one or more constituents fall outside the nonstatistical acceptance tolerance limits in Section 9-03.8(7), the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The nonstatistical tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the street shall be tested to provide a minimum of three sets of results for evaluation.

2. **Commercial Evaluation.** If sampled and tested, HMA produced under Commercial Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit contract price with no further evaluation. When one or more constituents fall outside

the commercial acceptance tolerance limits in Section 9-03.8(7), the lot shall be evaluated to determine the appropriate CPF. The commercial tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the street shall be tested to provide a minimum of three sets of results for evaluation.

For each lot of HMA produced under Nonstatistical or Commercial Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The Job Mix Compliance Price Adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit contract price per ton of the mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the composite pay factor.

**5-04.5(1)B PRICE ADJUSTMENTS FOR QUALITY OF HMA
COMPACTION**

Replacement

(March 10, 2010 APWA GSP)

Delete this section and replace it with the following:

The maximum CPF of a compaction lot is 1.00

For each compaction lot of HMA when the CPF is less than 1.00, a Nonconforming Compaction Factor (NCCF) will be determined. THE NCCF equals the algebraic difference of CPF minus 1.00 multiplied by 40 percent. The Compaction Price Adjustment will be calculated as the product of the NCCF, the quantity of HMA in the lot in tons and the unit contract price per ton of the mix.

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 4,000 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 at no additional cost to the City 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(8) JOINTS

Revision

The first paragraph is revised to read:

The Contractor shall submit for approval to the Engineer a Joint Plan at least three (3) working days prior to the commencement of any pavement construction. Transverse and

longitudinal joints shall be contraction or through joints (including construction joints). Joints shall be constructed in accordance with the detail shown in the Contract Plans and shall be of the type and at the locations indicated on the Contract Plans. The faces of all joints shall be constructed perpendicular to the surface of the cement concrete pavement.

5-05.3(8)D ISOLATION JOINTS

Replacement

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.

Longitudinal isolation joints shall be constructed with premolded material, ½-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 ¾ 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 ¾ 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)E 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 ¾ 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 Contract 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.

DIVISION 5: SURFACE TREATMENTS AND PAVEMENTS BASES

5-05.3(10) TIE BARS AND CORROSION RESISTANT 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 Contract 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 Contract 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, and will be addressed in accordance with Section 1-04.4 (Changes).

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 described here in accordance with 1-06.7(4) (Proposed Equivalents).

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-compacted**, 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).

5-07 STAMPED COLORED CEMENT CONCRETE

New Section

5-07.1 DESCRIPTION

This work shall be for the completion of stamped concrete medians as indicated on the Plans.

5-07.2 MATERIALS

Stamped concrete 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. E-Mail 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.

5-07.3 CONSTRUCTION REQUIREMENTS

Construction Requirements for Stamped Colored Concrete:

Measuring, Batching, Mixing, and Delivering Concrete: As specified in Section 6-02, except as specified in this section.

1. Measure, batch, mix, and deliver concrete with pigments in accordance with manufacturer's instructions.
 2. Ensure mixer is clean and free of washout water before loading.
 3. Load mixer to a minimum of 40 percent capacity.
 4. Do not load mixer beyond recommended capacity.
 5. Add concrete materials to mixer in same order for each batch.
 6. Do not add pigment to mixer as first concrete material.
 7. Maintain consistent amounts of batch water in each batch.
- Placing, Finishing, and Curing Concrete: As specified in Section 6-02, except as specified in this section.
 1. Place, finish, and cure concrete with pigments in accordance with manufacturer's instructions.
 2. Allow excess surface water to evaporate before finishing.
 3. Do not over-finish surface. Avoid burning surface.
 4. Do not fog with water or cover surface of colored concrete during initial curing process for a minimum of 48 hours.
 - Add liquid pigments to concrete batch automatically by use of metering, volumetric, or weight measuring system or manually by weight or volume in accordance with manufacturer's instructions.
 - Recycle liquid pigments while in their container before use to ensure uniformity and proper viscosity.
 - Add liquid pigments to concrete batch after prewetted aggregate and before cement addition.

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).

Cleaning:

- Clean concrete of efflorescence in accordance with manufacturer's instructions.
- Ensure concrete has sufficiently cured before cleaning.
- Use concrete cleaner approved by pigment manufacturer. Do not use cleaners containing acid.
- Apply cleaner in accordance with cleaner manufacturer's instructions.

5-07.3(1) STAMPING

The Contractor shall apply a **Brickform**, or Engineer approved equivalent, Antique Release agent, to the concrete as soon as all standing water has disappeared from the concrete surface and prior to beginning the stamping process.

The Contractor shall apply a **Brickform**, or Engineer approved equivalent, concrete sealer to the finished concrete after it has cured for 28 days.

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 5

DIVISION 6 STRUCTURES**6-02 CONCRETE STRUCTURES**

6-02.1 DESCRIPTION Supplement

This work shall consist of constructing cast-in-place cement concrete walls as shown on the plans.

6-04 TIMBER STRUCTURES

6-04.1 DESCRIPTION Supplement

Provide fixed and removable timber bollards where shown in the plans in accordance with Standard Detail No. [TRAFFIC-06](#) (Bollards). These bollards shall be placed five feet on center where shown on the plans.

END OF DIVISION 6

DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

DIVISION 7 DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS AND CONDUITS

7-01 DRAINS

7-01.2 MATERIALS Replacement

Replace the first two paragraphs after the list of materials with the following:

All drainpipe shall be manufactured of polyvinyl chloride meeting the requirements of Section 9-05.12 (Polyvinyl Chloride (PVC) Pipe). Trench drains shall be **Polydrain Part No. 420 with stainless steel grates Polydrain Part No. 440** or approved equal placed on cement concrete Class 3000 per Section 6-02 (Concrete Structures).

7-01.3 CONSTRUCTION REQUIREMENTS Supplement

PVC drainpipe shall be used to connect existing roof drains and downspouts to the roadway drainage system. The amount of pipe shown in the proposal is approximate and provided for bidding purposes only.

Wherever a drain pipe trench is located in the roadway, sidewalk, or other area where minor settlement would be detrimental and where the Engineer determines that the native material is not suitable for backfill, the trench shall be backfilled with "Select Pipe Trench Backfill" per trench detail(s) shown in the plans or as directed by the Engineer.

The trench drain shall be installed per the manufacturer's recommendations and shall be flush with the cement concrete surface to provide the proper surface drainage control. The trench drain shall be connected to the nearest catch basin with "PVC Drain Pipe – 4 inch Diam." or "PVC Drain Pipe – 6 inch Diam." as shown on the plans or as directed by the Engineer.

7-04 STORM SEWERS

7-04.2 MATERIALS Revision

Replace the first paragraph and list of materials with the following:

Only the pipe materials listed below are approved for use on City storm sewer systems. Materials shall be in accordance with all provisions of the following sections:

| | |
|--|---|
| 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) |
| Solid Wall Polyvinyl Chloride (PVC) Pipe, | 9-05.12(1) (Solid Wall PVC Culvert Pipe, |

DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

| | |
|---|--|
| SDR-21 | 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 CONSTRUCTION REQUIREMENTS

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

Sanitary sewer and storm drain structures shall be constructed per the following details, except as modified by the Contract Documents:

| | |
|--|--|
| Sanitary or Storm Sewer Manhole (48-inch to 60-inch) | WSDOT Standard Plan B-15.20-01 |
| Sanitary or Storm Sewer Manhole (72-inch to 96-inch) | WSDOT Standard Plan B-15.40-01 |
| Storm - Catch Basin Type I | WSDOT Standard Plan B-5.20-01 |
| Storm - Catch Basin Type II | WSDOT Standard Plan B-10.20-01 |
| Storm - Concrete Inlet | WSDOT Standard Plan B-25.60-00 |

DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

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 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.

7-05.2(1) TRASH RACKS New Section

Trash racks shall be constructed in accordance with Section 6-02 (Concrete Structures), 6-03 (Steel Structures), and as detailed in the plans.

7-05.3 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 shall 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) in Appendix A of this document. 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.

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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 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 asphalt concrete 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 meet ASTM C494 specification for chemical admixture for concrete.

ting structure.

7-07 CLEANING EXISTING DRAINAGE STRUCTURES

7-07.5 PAYMENT Replacement

Cleaning shall be considered incidental to the cost of the project. See also Section 1-07 (Legal Relations and Responsibilities to the Public) in this document for pollution control requirements.

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

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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:

| | |
|--|---|
| Bedding Materials and Select Trench Backfill | 9-03.9(3) (Crushed Surfacing) |
| Foundation Material | 9-03.17 (Foundation Material, Class A) |
| Imported Pipe Trench Backfill | 9-03.19 (Bank Run Gravel for Trench Backfill) 9-03.14(1) (Gravel Borrow) |
| Controlled Density Fill | 2-09.3(1)E (Backfilling) |

7-08.3 CONSTRUCTION REQUIREMENTS

All pipe shall be installed per the trench detail(s) shown on the plans or in Appendix A.

All references in this section (7-08) to the Standard Plan shall refer to the trenching detail(s) shown on the plans or in Appendix A.

7-08.3(1) EXCAVATION AND PREPARATION OF TRENCH

7-08.3(1)A TRENCHES Revision

The Second Sentence of the Third Paragraph is deleted and replaced with the following:

Above the top of the pipe zone, the Contractor may over excavate for L&I considerations in non-critical, off-street areas. Shoring is required in all street excavations. Shoring is the responsibility of the Contractor and must meet the requirements of Section 2-09.3(3)D (Shoring and Cofferdams).

The First Sentence of the Eighth Paragraph is deleted and replaced with the following:

If any of the excavated (also referred to as native) material meets the specifications of material listed in Section 7-08.2 (Materials), the Engineer may require that such material, in the quantity required, be selectively removed, stockpiled separately, and used as pipe bedding, foundation material, or trench backfill instead of the quantities of pipe bedding, foundation material, or trench backfill respectively.

7-08.3(1)B SHORING Supplement

The requirements of the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act of 1973 (WISHA), Chapter 296-155 WAC, and RCW Chapter 49.17, shall apply to all excavation, trenching and ditching operations on this project. All trenches four (4) feet and over in depth shall be shored in compliance with applicable Federal and State regulations. Extra Excavation Class B will be allowed only with the approval of the Engineer.

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7-08.3(1)C BEDDING THE PIPE Supplement

Delete first sentence of the second paragraph and replace with the following:

Pipe bedding shall be per the trench detail(s) shown on the plans, or shown in Appendix A, 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.

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

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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.

All "Normal Trench Dewatering" work associated with maintaining a trench suitable for pipeline construction will be incidental and included in other items of work. "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.

The Engineer may require "Controlled Density Fill" where uniform compaction around other utilities, foundations or other fixed objects is not possible.

7-08.3(3)A VERTICAL CLEARANCE BETWEEN UTILITY LINES New Section

Where the vertical clearance between adjacent storm drainage lines, water or sanitary sewer lines is 2 inches to 6 inches a pipe mitigation measure is required between the two pipes as directed by the Engineer, which may include a cushion of crushed rock or controlled density fill. All costs necessary to furnish and install the pad shall be considered incidental to pipe laying.

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.

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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(13) HANDLING OF THE PIPE Supplement

Strict adherence to the requirements preventing debris from entering the pipe will be required, including plugging of pipe during transport, storage, and placement. If, in the opinion of the Engineer, any pipe or fitting has been installed with dirt, foreign material, or diesel residue in it, it shall be removed, cleaned, and re-laid at Contractor expense.

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(19)C MECHANICAL JOINT RESTRAINT SYSTEM New Section

Restrainers shall be manufactured of ductile iron and shall meet or exceed all the requirements of ANSI A21.11 (A WW A C 111) and ASTM A536. The restrainer system shall provide anchoring ductile iron pipe and fittings, valves and PVC pipe to mechanical joint pipe or fittings, or bell to spigot PVC pipe joints. The restrainer shall accommodate the

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full working pressure rating of the pipe plus surge allowance. In the assembly of the restraint device, the contractor shall tighten the bolts to the correct torque range as recommended by the restraint manufacturer. The restrainers shall be painted black for ductile iron pipe and painted red for PVC pipe applications. The restraining device shall not damage or lower the working pressure of the pipe installed. Restrainers shall be properly stored to minimize sand and debris build-up. Specifically, the twist-off-screws and associated threads shall be clean (free of sand) prior to installation.

Restrainer specifically for DI pipe may be restrained by utilizing a joint restraint gasket which includes a stainless steel locking segment vulcanized into the rubber gasket. The gasket shall be rated for operating pressures up to 250 psi based on the performance requirements of ANSI/ A WW A C 111/ A21.11.

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](#) in Appendix A of this document.

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 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" Permanent Blowoff Assembly Detail) in Appendix A of this document.

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.

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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. If original test samples prove unsatisfactory, a charge of \$20.00 will be made for processing each additional sample.

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.

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 No. [WATER-04](#) (Temporary Blow Off Detail) in Appendix A of this document 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. The City will measure water consumed for flushing.

The Contractor shall submit a de-chlorination plan per Section 1-06 (Control of Material) indicating how they intend to achieve the chlorine concentration and pH adjustment per this Section. All costs to submit the plan shall be considered incidental to the price per linear foot of pipe.

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) in Appendix A of this document 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 No. [WATER-02](#) (Typical Air and Vacuum Relief Valve Detail) in Appendix A of this document.

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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](#) (Valve Wrench Extension Box) 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).

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) in Appendix A of this document. 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

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Standard Detail No. [WATER-07](#) (5 ¼” M.V.O. Hydrant Setting Detail) in Appendix A of this document.

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) |
| Shutoff Valve Assembly | 9-30.6(8) (Shutoff Valve Assembly) |

All water service materials shall be low lead brass CDA89833 or CDA89520, and shall meet ANSI/AWWA C800 and NSF 61 Annex G maximum lead requirements.

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, [WATER-13A](#) and [WATER-16](#), listed in Appendix A of this document. 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. The shutoff valve as shown in the WATER-13A and WATER-16 Standard Details shall be installed as indicated in the detail. 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). The existing ¾-inch water meter shall be reinstalled to the new meter setter once the new 1-inch service line, meter setter, and tailpiece, have been installed and the new meter box has been adjusted to grade.

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.

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7-17 SANITARY SEWERS

7-17.2 MATERIALS Replacement

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.

7-17.3 CONSTRUCTION REQUIREMENTS

7-17.3(1) PROTECTION OF EXISTING SEWAGE 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(1)A SEWER LINE CONNECTIONS New Section

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).

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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:

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:

$$T = \frac{3.206 (D^2L + d^2l)}{R} \text{ where;}$$

$$R = 0.00925(DL + dl) \text{ when;}$$

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.

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Air Test Times for Air-permeable Sanitary Sewer Pipe

All times are in seconds.

| | | Linear feet of 6 inch Side Sewer | | | | | | | | |
|---------------------------------|-----|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Linear feet of 8" concrete pipe | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| | 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 | | | | | | | | |
|----------------------------------|-----|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Linear feet of 10" concrete pipe | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| | 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 |

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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 DVD 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.

The following television inspection information shall be provided to the City:

DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

1. A clear DVD which encompasses the limits of the inspection area and including all reference data as described herein. The recorded reference time and date for the start of each run shall also be indicated.
2. A written report shall be provided corresponding to the recorded inspection and including all reference data as described herein. The report shall consist of a written narrative of all distinctive pipe conditions including ponding areas in excess of ¼ inch.

7-18 SIDE SEWERS

7-18.3 CONSTRUCTION REQUIREMENTS Supplement

7-18.3(1) GENERAL Supplement

Side sewers shall be connected (where shown on the plans or directed by the Engineer), using approved sewer saddle tees. Quantities of tees will vary depending upon conditions encountered. All joints shall be approved rubber-gasketed joints except the joint between the new and existing pipe that shall be made with approved flexible transition couplings. Side sewers shall be installed to a minimum slope of one percent or as shown on the plans unless otherwise directed by the Engineer and shall be 6-inches diameter from the street sewer to the private property line. The location of side sewers shall be marked at the end of the line inside the property, by a pressure treated 4-foot long 2x4-inch board buried in the ground to a depth of 3-feet. The lower side shall have a 2x4-inch cleat nailed to it to prevent withdrawal of the stake. The exposed one-foot shall be painted traffic-yellow and the depth to the side sewer or tee shall be indicated in black paint on the 2x4-inch board. In addition, a length of 9-gauge galvanized wire shall extend from the plugged end of the side sewer or tee to grade at the property line. The lower end of the wire shall be securely fastened to a 1-foot length of 2x4-inch board placed near the plugged end of the side sewer or tee. The upper end shall emerge at the 4-foot stake but shall not be fastened to it. In addition, the letter "S", 2 inches high, shall be neatly imprinted in the top of the curb before the concrete hardens to designate the side sewer location.

During construction in areas with more than one side sewer per structure, the Contractor shall test each connected structure to verify which side sewer is used by that structure. The test shall involve flushing every toilet or running every sink or tub on each floor of each structure and directly observing which side sewer the effluent discharges from. Only these side sewers shall be connected. All others are to be abandoned in place per Section 7-08.3(4) (Plugging Existing Pipe).

Existing side sewers to be connected shall be trimmed to the limit of the right-of-way except where otherwise shown on the plans and connected to the new sewer with PVC SDR-35 with a diameter to match the existing side sewer or 6 inches, whichever is greater.

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.

DIVISION 7: DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

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

DIVISION 8 MISCELLANEOUS CONSTRUCTION**8-01 EROSION CONTROL AND WATER POLLUTION CONTROL****8-01.1 DESCRIPTION Supplement**

The Contractor shall implement temporary erosion and sediment control (TESC) measures as necessary to prevent erosion and to stop sediment-laden water from leaving the site and entering the storm drain system. Measures shall be in accordance with and conform to the City of Auburn Design Manual and these Special Provisions. The Contractor shall construct all necessary elements and provide other necessary materials, labor, and equipment.

Exposed slopes and excavations shall be protected. The Contractor shall maintain and clean the facilities until final restoration has been placed and accepted. The Contractor shall have adequate materials on the site to respond to weather changes and shall modify the system to accommodate seasonal changes.

8-01.3(1)A SUBMITTALS Supplement/Revision

When a temporary erosion and sediment control (TESC) plan is not included in the contract plans, the Contractor shall prepare a TESC plan and submit it to the Engineer for approval prior to beginning construction. The TESC plan shall cover all areas the Contractor's work may affect both inside and outside the project limits.

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

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

8-01.3(1)B EROSION AND SEDIMENT CONTROL (ESC) LEAD Revision

(May 2012, City of Auburn)

The first sentence of the third paragraph shall be revised to read as follows:

The ESC Lead shall inspect all areas disturbed by construction activities, all on-site erosion and sediment control BMP's and all stormwater discharge points every calendar week and within 24 hours of runoff events in which stormwater discharges from the site or as directed by the Engineer.

8-01.3(2) SEEDING, FERTILIZING, AND MULCHING

8-01.3(2)B SEEDING AND FERTILIZING

Supplement

Seeding:

The following composition, proportion, and quality of grass seed shall be applied at the rate of 5 pounds per 1,000 square feet on all areas requiring roadside seeding (noted “hydroseed” on the Plans) within the project:

| <u>Kind and Variety of Seed in Mixture</u> | <u>Percent by Weight</u> | <u>Minimum Percent Pure Seed</u> | <u>Minimum Percent Germination</u> |
|--|--------------------------|----------------------------------|------------------------------------|
| Colonial Bentgrass (Highland or Astoria) | 10% | 9.8% | 85% |
| Red Fescue (Illahee, Rainier, or Pennlawn) | 40% | 39.20% | 90% |
| English Perennial Rye | 50% | 29.40% | 90% |
| Weed Seed (maximum %) | | 0.50% | |
| Inert and Other Crops (minimum %) | | 1.50% | |
| | TOTAL 100.00% | | |

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-3 1.5 pound per 1,000 square feet;

Available Phosphoric Acid as P2O5-1 20 pounds per 1,000 square feet;

Soluble Potash as K2O-2 20 pounds per 1,000 square feet;

1 pound 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)E SOIL BINDERS AND TACKING AGENTS

Supplement

The moderate-term mulch soil binder for hydroseeding shall be a bonded fiber matrix with integral tackifier specifically manufactured for hydroseeding applications and erosion control. The moderate-term mulch shall be dyed an appropriate color to facilitate visual metering of application of the materials. The moderate-term mulch shall be ‘ECO-AEGIS’ as manufactured by Canfor, or approved alternate.

8-02 ROADSIDE RESTORATION

8-02.1 DESCRIPTION Supplement

This work also involves any minor repair or replacement work to restore roadside features the Engineer discovers during construction.

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.

Cleaning by flushing into sewers will not be allowed. The Contractor shall remove surplus soils, materials, and debris from the construction site and shall leave the project in a clean condition at the conclusion of the work.

8-02.3(4) TOPSOIL Supplement

Topsoil shall be used to restore any landscape beds or planter areas disturbed by the Work.

8-02.3(4)A TOPSOIL TYPE A Supplement

Topsoil Type A is to be used for all planting and seeding areas and shall be tested in an independent, certified soil testing lab to determine need for fertilizers, or amendments, or both, based on its intended use. The topsoil shall be modified according to the soil testing laboratory recommendations at no additional cost to the City.

8-02.3(4)C TOPSOIL TYPE C Replacement

Topsoil Type C shall meet the requirements of Section 8-02.3(4)B, (Topsoil Type B), and Section 9-14.1(3), (Topsoil Type C). Native as used in this context shall mean naturally occurring material.

8-02.3(5) PLANTING AREA PREPARATION Supplement

Upon approval of the subgrades by the engineer, topsoil shall be placed to required depths for all seeded, sod, tree, shrub and groundcover areas. Topsoil and subgrade material shall be cultivated to a depth of 12 inches. Cultivation of the soil shall be done by a method approved by the Engineer. This operation should be done at right angles to the natural flow

of water on slopes unless otherwise directed by the Engineer. Remove rocks, roots, clods, stumps and debris over 2 inches in diameter. Lightly compact soil and establish a smooth and uniform finished grade that protects against obstruction to surface drainage and ponding. For bark mulched shrub and groundcover beds, finish grade prior to placement of bark shall be 2 inches below top of adjacent finish grade.

Any exposed tree roots in cut slopes shall be neatly pruned at the finish grade and the cuts treated with an approved sealer.

During sidewalk construction, any exposed tree or shrub roots shall be neatly pruned at least 6 inches away from the proposed sidewalk and the cuts treated with an approved sealer. Costs for pruning and treating exposed roots shall be considered incidental to the Contract.

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

Root control material shall be CP-Series Root Barrier Panels as manufactured by Century Root Barrier, Universal Guide as manufactured by Deep Root, or Dual Purpose Panels as manufactured by Villa Root Barriers or approved alternate.

Install continuous section of root control material in all tree planting areas as shown on the plans or as directed by the Engineer. Backfill with topsoil material being careful not to damage or displace root control material.

8-02.3(6) SOIL AMENDMENTS Supplement

GroCo (GroCo Inc. tel. 206-622-5141), Tagro (City of Tacoma Tel. 253-502-2150), or Cedar Grove Compost shall be mixed with native topsoil to produce a 75/25 mix ratio (topsoil 75 percent and amendment 25 percent).

8-02.3(7) LAYOUT OF PLANTING Supplement

The Contractor is responsible for determining required quantities of plant material to complete the landscape plan as shown.

It is anticipated that some minor arranging of plant material will be necessary during the progress of work.

The Contractor shall place the plant(s) as illustrated in the plans starting from the perimeter of the bed area and progressing to the center, and adjust odd dimensions at the center of any planting bed.

Plant shrubs and ground covers as indicated on the plans using an on-center triangular spacing pattern.

From the centerline of the first row of shrubs or ground covers to the edge of the planting bed shall be ½ the typical dimension shown on the plans and details.

Plant trees a minimum of 3 feet from curbs and sidewalks when the space is available; otherwise they shall be centered in the available space. Trees in tree wells shall be centered within the tree grate and frame.

8-02.3(8) PLANTING Supplement

The following shall supplement the entire section:

Plant trees and shrubs in planting pits as detailed on plans.

When performing the following work do not injure the root system. Do not over excavate planting pit depth, however, over excavation of planting pit width is desirable.

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

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. The Engineer will provide the Contractor with written notification when the initial planting is accepted; at which time the plant establishment period shall begin.

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 Revision/Supplement

The Contractor shall maintain all plant materials covered under this Contract for a period of 365 days. During this 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 1st to April 30th and at least once a week from May 1st to September 30th and maintenance performed promptly. Dead or impaired plants shall be promptly replaced during the planting season specified in Section 8-02.3(8) and all soil ridges shall be removed from around the watering basins, as directed by the Engineer, before the end of the maintenance period. At the determination of the Engineer, replacement plants may require an additional acceptance and establishment period.

After completion of the landscape establishment period, the Contractor shall request an inspection by the Engineer. The Contractor shall correct all conditions unsatisfactory to the Engineer within a 10-day period, weather permitting, immediately following the inspection.

Correctable work shall include the removal and disposal of all dead plant material. The Engineer shall certify final acceptance of work in writing.

All costs associated with the plant establishment period shall be considered incidental to the Contract.

8-02.3(14) PLANT REPLACEMENT Supplement

Final acceptance of project planting will be certified, in writing, by the Engineer.

8-02.3(16) LAWN INSTALLATION**8-02.3(16)A LAWN INSTALLATION**

Revision/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 accepted by the engineer and shall continue for a period of 12 weeks.

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.

After completion of the lawn establishment period, the Contractor shall request an inspection by the Engineer. The Contractor shall correct all conditions unsatisfactory to the Engineer within a 10-day period, weather permitting, immediately following the inspection.

All costs associated with the lawn establishment period shall be considered incidental to the Contract.

8-02.3(16)C LAWN MOWING

Supplement

Lawn mowing shall begin immediately after the lawn planting has been accepted by the Engineer and shall extend for 12 weeks after physical completion. The Contractor shall mow lawn areas to a height of 2 inches whenever the average height of grass reaches 3 inches.

All costs associated with lawn mowing shall be considered incidental to the Contract.

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 also consists of the replacement and/or repair of existing irrigation systems.

8-03.2 MATERIALS

Supplement

Washed sand shall meet the requirements of Section 9-03.8(4).

8-03.3 CONSTRUCTION REQUIREMENTS

Supplement

This section is supplemented as follows:

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

Revision/Supplement

(January 2010, City of Auburn)

This section is revised to read:

All water lines shall be a minimum of 18-inches below finished grade measured from the top of the pipe or as shown in the Plans and shall be separated horizontally and vertically by a minimum of 3-inches. All irrigation lines will be bedded with sand to 3-inches below and on each side of the pipe. All live water mains to be constructed under existing pavement shall be placed in steel casing jacked under pavement as shown in the Plans. All PVC or polyethylene pipe installed under areas to be paved shall be placed in irrigation sleeves. Irrigation sleeves shall extend a minimum of 2-feet beyond the limits of pavement. All jacking operations shall be performed in accordance with an approved jacking plan. Where possible; mains and laterals or section piping shall be placed in the same trench. All lines shall be placed a minimum of 3-feet from the edge of concrete sidewalks, curbs, guardrail, walls, fences, or traffic barriers. Pipe pulling will not be allowed for installation and placement of irrigation pipe.

Mainlines and lateral lines shall be defined as follows:

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

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

This section is supplemented as follows:

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 treads. When painting is done before assembly, the paint should be touched up after assembly.

8-03.3(5) INSTALLATION

Supplement

This section is supplemented as follows:

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

This section is supplemented as follows:

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. Bedding for irrigation lines shall be washed sand from a minimum of 3-inches below to 3-inches above all irrigation lines. Native material may be used as backfill for the remainder of the trench when not in paved areas. Rocks larger than 3-inches in diameter shall be removed from any native material used as backfill.

8-03.3(11) **SYSTEM OPERATION** Revision/Supplement

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

Potable water shall not flow through the cross-connection control device to any downstream component until tested and approved for use by the City in accordance with Section 8-03.3(12).

This section is supplemented as follows:

The Contractor shall perform sprinkler coverage tests to determine if coverage and operation of the system is complete and satisfactory before the sprinkler system will be accepted. If any part of the system is inadequate because of Contractor workmanship or material, repairs or replacement shall be made at Contractor expense and the test repeated until accepted by the Engineer.

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

This section is supplemented as follows:

Backflow preventer assembly shall be installed at location(s) shown on the plans.

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

Water meter(s) will be installed at location(s) shown on the plans in accordance with Section 7-15 (Service Connections).

8-03.3(14) IRRIGATION ELECTRICAL SERVICE Replacement

Electrical service and or wires will be installed at location(s) shown on the plans in accordance with Section 8-20.3(10) (Services transformer, Intelligent Transportation System Cabinet).

8-04 CURBS, GUTTERS AND SPILLWAYS**8-04.3(1) CEMENT CONCRETE CURBS, GUTTERS, AND SPILLWAYS Supplement**

“Cement Concrete Traffic Curb and Gutter” shall be constructed in accordance with WSDOT [Standard Plan No. F-10.12-00](#). Reinforcing at catch basins shall conform to Standard Detail No. [STORM-11](#) (Curb & Gutter Reinforcing Detail) in Appendix A of this document. The top of the curb shall have a 6 inch rise above the gutter line, except the curb shall have a ½ inch lip at wheelchair ramps and a 1 inch lip at driveways. Driveways and wheelchair ramps shall be per Standard Details in Appendix A of this document. Curb cuts for wheelchair ramps and driveways shall be considered incidental to the unit bid price for “Cement Concrete Traffic Curb and Gutter” per linear foot. “Bumper Curb” shall be constructed in accordance with Standard Detail No. [TRAFFIC-01](#) (Bumper Curb Detail) in Appendix A of this document.

When slip-form equipment is used to place the curb and gutter, the concrete mix design may be modified as follows: The Grade No. 2 coarse aggregate (1½ inch minus) may be replaced by Grade No. 5 coarse aggregate (1 inch minus) when required to accommodate the equipment.

The fourth paragraph of Section 8-04.3(1) (Cement Concrete Curbs, Gutters, And Spillways) shall be deleted and replaced with the following:

Joints in the curb and gutter shall be spaced to match joints in the abutting driveways and sidewalks or cement concrete pavement. All expansion/through joints shall extend entirely through the curb and gutter section. Maximum joint spacing shall be as follows:

- A. ¾ inch expansion/through joints at 20-foot maximum spacing, or 3/8-inch expansion/through joints at 10-foot maximum spacing;
- B. 1/8 inch x 1 inch deep saw cut or scored joints per Standard Specification 8-04.3(1) (Cement Concrete Curbs, Gutters, and Spillways) at intervening 10-foot maximum spacing.

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

“Extruded Cement Concrete Curb” shall be type 6 in accordance with WSDOT [Standard Plan No. 10-42-00](#).

8-05 TRENCH DEWATERING**New Section****8-05.1 GENERAL**

The Contractor shall design and provide a dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom and/or sides. The Contractor shall design the system to prevent differential hydrostatic head that would result in floating out soil particles in a manner termed as a “quick” or “boiling” condition. The system shall not be dependent solely upon sumps or pumping water from within the excavation where differential head would result in a quick condition, which would continue to worsen the integrity of the excavation’s stability.

Where the Engineer determines that the Contractor cannot sufficiently dewater the trench using the “Normal Trench Dewatering” described in Section 7-08.3(2)L (Dewatering Trenches) of these Special Provisions, the Contractor shall provide a dewatering system of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow all work to be installed in a dry condition.

The Contractor shall control, by acceptable means, all water regardless of source and be fully responsible for disposal of the water.

The Contractor shall confine discharge piping and/or ditches to available easements or to additional easements obtained by Contractor and provide necessary permits and/or additional easements at no additional cost to the City.

The Contractor shall control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in 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.

No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.

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 without cost to the City 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 at no additional cost to City.

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](#) (Alternative Residential Driveway), [TRAFFIC-09](#) (Commercial/Industrial Driveway), and [TRAFFIC -10](#) (Alternative commercial/Industrial Driveway Retrofit) and to the size shown on the plans or as directed by the Engineer.

Driveway approaches shall be considered to be that portion of the private driveways, which require removal and replacement to transition between the new cement concrete driveway aprons and the existing private driveway. "Cement Concrete Driveway Approaches" shall be constructed and finished as specified for driveways, except they shall be 4-inch thick slabs and not reinforced.

8-06.2 MATERIALS Supplement

Materials shall meet the requirements of the following sections:

| | |
|--|--------|
| Wire Mesh (Welded Wire Fabric) | 9-07.7 |
| 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).

8-09 RAISED PAVEMENT MARKERS

8-09.3 CONSTRUCTION REQUIREMENTS Replacement

8-09.3(2) SURFACE PREPARATION Supplement

The Contractor shall pre-mark the layout of all channelization in accordance with the plans and Standard Detail No. [TRAFFIC-43](#) [Pavement Markings (Raised Pavement Marker (RPM), Gore, Center, Skip & Turn Lane Stripe)] in Appendix A of this document and receive approval from the Engineer before installing “Raised Pavement Markers” (RPM’s). Pre-marks shall consist of painted spot markings or other approved methods. The Contractor shall request the Engineer’s approval of the pre-mark for channelization at least 2 full working days prior to installation of the RPMs.

8-13 MONUMENT CASES

8-13.1 DESCRIPTION Supplement

This work consists of constructing, or adjusting, monuments, to proper grade, and the furnishing and placing of materials and other related work in accordance with Standard Detail Nos. [TRAFFIC-20](#) (Poured in Place Monument, Type A Modified), [TRAFFIC-21](#) (Poured in Place Monument, Type B Modified), and [TRAFFIC-22](#) (Monument Case and Cover) in Appendix A of this document.

8-13.2 MATERIALS Supplement

Monument cases and covers shall conform to Standard Detail [TRAFFIC-22](#) (Monument Case and Cover) included in Appendix A of this document. Concrete used for setting the monuments shall be Class 3000. Bronze plug markers will be furnished by the City to the Contractor.

8-13.3 CONSTRUCTION REQUIREMENTS**8-13.3(1) REFERENCE POINTS**

New Section

The Engineer shall reference all monuments in advance of construction and shall reset the points and grades at the proper time.

It shall be the responsibility of the Contractor to furnish materials and install required castings in accordance with the plans and where directed by the Engineer. The Contractor shall carefully protect all reference points to the monuments and shall give the Engineer reasonable notice of the schedule for monument work in order to avoid destruction of the points.

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) in Appendix A of this document. The bronze plug marker shall be inserted in the concrete mix to the required line and grade. 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 Class B asphalt concrete pavement 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 curb ramps with detectable warning strips in accordance with these Specifications, the Contract Plans and the Standard Details in Appendix A of this document, 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 curb ramps shall be air entrained concrete Class 3000 in accordance with the requirements of Section 6-02 (Concrete Structures).

8-14.3 CONSTRUCTION REQUIREMENTS

8-14.3(1) EXCAVATION Supplement

Excavation for sidewalk and for curb ramps 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

This section is supplemented as follows:

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) in Appendix A of this document.

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.

The surface of the sidewalks shall be brushed with a fiber hair brush of an approved type in a transverse direction except that at driveway and alley crossings it shall be brushed longitudinally.

The fourth paragraph is revised to read:

Curb Ramps shall be constructed in accordance with WSDOT Standard Plan F-40.12-01(Parallel Curb Ramp), F-40.15-01 (Perpendicular Curb Ramps) in Appendix A of this document and shall include detectable warning surface. **If any slope exceeds a maximum slope specified on the Standard Plans or Contract Plans or if any dimension is less than a minimum dimension specified on the Standard Plans or Contract Plans, the**

Contractor shall replace the curb ramp or a portion of the curb ramp as necessary and approved by the Engineer to bring the curb ramp into compliance. No additional payment will be made for this corrective work.

8-14.3(3)B SPECIAL SIDEWALK

New Section

(Main Street – Boardwalk)

Finishing of the “Special Boardwalk Cement Concrete Sidewalk” shall include 3/8 inch "V" grooves at random spacing of 12 inches to 24 inches on center with a rough broom surface finish as approved by the Engineer. A color additive shall be mixed with the concrete so that after curing, the “Special Boardwalk Cement Concrete Sidewalk” closely matches the color of the existing sidewalk on East Main Street from Auburn Avenue to Auburn Way. A “Special Boardwalk Cement Concrete Sidewalk” sample pour of a size designated by the Engineer shall be approved by the Engineer before placing the same mix at the location(s) shown on the plans. The finished “Special Boardwalk Cement Concrete Sidewalk” shall match the approved sample panel throughout its entire area. The color admixture shall be **CHROMIX brand color C-25 (Sombrero Buff)** or approved equivalent.

(Downtown Sidewalk – 2x2 Scoring)

The “Special 2x2 Scored Cement Concrete Sidewalk” shall be concrete with 2 ft. x 2 ft. scoring pattern with a light broom finish.

(Downtown Street Corner Sidewalk - Brick)

The “Special Brick Sidewalk” at street corners as specified on the Plans shall be constructed of brick pavers in a rectangular pattern. The patterns shall extend from the back of curb to the building face or property line and minimum of 10 feet in either direction from the corner of the property lines. The brick pavers shall be Mutual Materials “Holland” 8cm, or approved equal and the color shall be per Plans or as directed by the Engineer.

8-14.3(4) CURING

Replacement

Concrete sidewalks 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).

8-14.3(5) **DETECTABLE WARNING SURFACE** Revision

The first paragraph is deleted and replaced with the following:

The detectable warning surface shall be located as shown in the plans and in accordance with WSDOT Standard Plan F-45.10-00 (Detectable Warning Surface) in Appendix A of this document. Installation of the detectable warning surface shall be in accordance with the manufacturer's recommendation for placement in fresh concrete, before the concrete has reached its initial set. Detectable warning surface for installation on hardened cement concrete surfaces or asphalt concrete surfaces will not be used in this contract.

8-18 MAILBOX SUPPORTS

8-18.2 **MATERIALS** Supplement

Anchor Bolts, Nuts, and Washers for the Neighborhood Delivery and Collection Box Unit shall be in accordance with Section 9-06.5 (Bolts) and Section 9-06.22 (Bolts, Washers, and Other Hardware).

8-18.3 **CONSTRUCTION REQUIREMENTS** Supplement

Type I, Type II, and Type III Mailbox Supports shall be installed per Standard Detail [TRAFFIC-16](#) (Mailbox Mounting Curb Type Location) in Appendix A. A Type I Mailbox Support shall be a one-post installation for 1 or 2 mailboxes. A Type II Mailbox Support shall be a two-post installation to accommodate 3 to 8 mailboxes.

Neighborhood Delivery and Collection Box Units (NDCBU) shall be relocated wherever indicated on the plans and in accordance with Standard Details [TRAFFIC-17](#) (Neighborhood Delivery and Collection Box Unit (N.D.C.B.U.) Installation), [TRAFFIC-18](#) (Neighborhood Delivery and Collection Box Unit (N.D.C.B.U.) Single Unit), and [TRAFFIC-19](#) (Neighborhood Delivery and Collection Box Unit (N.D.C.B.U.), Multiple Units).

8-20 ILLUMINATION, TRAFFIC SIGNAL SYSTEMS, AND ELECTRICAL

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

The fourth paragraph is deleted and replaced with the following:

The Contractor shall obtain an electrical permit from Washington State Department of Labor and Industries. Electrical Service inspection will be performed by Labor and Industries. Obtaining the permit and request for inspections is the responsibility of the Contractor. The Contractor is advised that safe-wiring labels required by Labor and Industries shall apply on this project.

The Contractor shall provide and install service wire and PVC conduit between the proposed service cabinet and the PSE point of service location as shown in the Plans or as directed by the Engineer.

8-20.2(1) EQUIPMENT LIST AND DRAWINGS Replacement

(March 2013, City of Auburn)

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

Supplemental data for pole equipment, luminaries, splice kits, vehicle signal heads, pedestrian signal heads, pedestrian push button assemblies, video detectors, PTZ camera(s), junction boxes, conduit, conduit fittings, wiring, service/battery back-up cabinet, controller cabinet (including controller and all other associated equipment in the cabinet), preemption detectors and discriminators, and all other electrical materials to be used on this project shall be submitted for approval before being incorporated into the work. Quantity, pole height, davit arm length, and mast arm length shall be indicated and consistent with the plans.

The Contractor shall submit supplemental data and material shop drawings for all structural items. The shop drawings shall clearly identify the type of equipment to be used and shall be stamped by a professional engineer registered in the State of Washington. Shop drawings shall conform to the contract plans.

All material to be reviewed for the signal system shall be submitted in a single package.

The City of Auburn reserves the right to inspect the manufacturing process of all materials. Final inspection and acceptance of the installed materials will not be given until final installation and testing has been completed on the system. Approval to install materials and equipment must be obtained from the Engineer at the job site, before installation.

The Contractor shall surrender to the City of Auburn all guarantees or warranties acquired for materials as a normal trade practice in connection with the purchase or as provided by the manufacturer for all materials used. The effective beginning date for all guarantees or warranties shall be the date that activation of the system in which the part(s) are used is complete and operational.

8-20.2(2) SALVAGED EQUIPMENT New Section

The Engineer shall be given three (3) working days notice prior to delivery of any salvaged item.

Following removal of the existing street light poles and luminaires, the Contractor shall protect the fixture and all component parts from loss or damage until such time as all or part of the fixtures or poles are delivered to City of Auburn Maintenance and Operations building. The Contractor shall replace lost, damaged, or destroyed salvageable fixtures and component parts in kind at the Contractor's expense. The Contractor shall coordinate the receiving of equipment by the City and label each salvaged item with the City contract number and location from which it was salvaged. The label shall be a removable weather proof tag that will not damage or mark the salvaged item.

8-20.3 CONSTRUCTION REQUIREMENTS**8-20.3(1) GENERAL** Supplement

The second paragraph is supplemented with the following:

Signal downtime will not be allowed Monday thru Friday between the hours of 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM

8-20.3(1)C TEMPORARY SIGNAGE FOR NEW TRAFFIC SIGNAL New Section

Temporary “New Signal Ahead” (W20-902) signs with two warning flags shall be installed in advance of the intersection on all approaches to the new signal. Signs shall be mounted on 4-inch x 4-inch wooden posts and placed per plan and MUTCD requirements. The Contractor shall remove all temporary signs and posts no earlier than 3 months and no later than 6 months following the initial signal activation. Posthole voids shall be restored with native material.

8-20.3(1)D TEMPORARY SIGNAGE FOR TRAFFIC SIGNAL MODIFICATIONS New Section

Temporary “Traffic Signal Revision” (W20-903) signs with two warning flags shall be installed in advance of each intersection approach with signal modifications. A 12-inch x 12-inch warning placard shall be affixed to the top of each signal head being modified. Advanced warning signs shall be mounted on 4-inch x 4-inch wooden posts or as determined by the Engineer, and placed per plan and MUTCD requirements. The Contractor shall remove all temporary placards, signs and posts no earlier than 3 months and no later than 6 months following completion of the signal modifications. Posthole voids shall be restored with native material.

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

Conduit shall be placed in accordance with Standard Detail No. [TRAFFIC-54](#) (Telecommunication and Luminaire Electrical Conduit Trench Detail). Surface restoration of conduit trenches in existing streets, sidewalks and other native or landscaped areas, shall be to a minimum of the existing adjacent surfaces. Asphalt and cement concrete pavement, sidewalks, and driveways shall be replaced upon a firm unyielding base to match existing surface pavement thickness. The minimum asphalt concrete pavement repair section shall be 2 inches thick.

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

Bedding for conduit trenches in the sidewalk or driveway sections shall consist of native material (provided aggregate is 1 inch minus) or crushed surfacing top course, depending on soil, as approved by the Engineer. Bedding for conduit trenches in roadway sections shall be crushed surfacing top course.

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

Backfill for conduit trenches in the sidewalk or driveway sections shall consist of native material (provided aggregate is 1 inch minus) or crushed surfacing top course, depending on

soil, as approved by the Engineer. Backfill for conduit trenches in roadway sections shall be crushed surfacing top course.

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

Abandoned pole foundations shall be removed completely and disposed of, unless otherwise shown on the plans. When plans show an abandoned pole foundation to remain, the foundation shall be removed to a minimum depth of two feet below finished grade. Abandoned controller cabinet foundations shall be removed completely and disposed of by the contractor. Abandoned conduits shall be cut below grade and plugged, unless otherwise shown on the plans.

8-20.3(4) FOUNDATIONS Supplement

All foundations shall be Class 4000 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-61](#) (Downtown Pedestrian Lighting Standard) and [TRAFFIC-63](#) (Downtown Street Lighting Standard) in Appendix A and shall be constructed per the manufacturer's recommendations. Each concrete base shall have one (1) 2-inch 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](#), [52](#), [52a](#) (Street Lighting or Traffic Signal Control Cabinet Detail) and [TRAFFIC-53](#) (Traffic Signal Controller Foundation Detail) in Appendix A 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 Appendix A. 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 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

Supplement

(February 2016, City of Auburn)

Unless specified on the Plans or directed by the Engineer, metal conduit shall not be used.

Unless specified on the Plans or directed by the Engineer, open cut trenching in accordance with Section 8-20.3(2)A, 8-20.3(B), and 8-20.3(2)C will be allowed for the construction of conduits.

Location wire placed for conduit containing, or that are to contain, fiber optic cable shall be 12 AWG.

Conduit shall be in accordance with all provisions of Section 9-29.1 (Conduit, Innerduct, and Outerduct).

Conduit runs installed entirely under sidewalk, driveways, and landscape areas may be Schedule 40 PVC unless otherwise noted on the plans. The same type and schedule 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 for conduits serving existing or future interconnect and fiber optic cables shall be no less than 4 feet in diameter. All conduit ends shall have bell end PVC bushings.

Stubouts shall be installed as shown on the plan or as directed by the Engineer.

A pull rope shall be installed in all spare conduits for 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 rope shall be doubled back into the conduit at each termination. Conduits without conductors (spare conduits) shall be plugged on both ends with mechanical plugs. Locate wire shall be installed in all empty or spare conduits, not in joint trench with conductors.

Loop 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 loop 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).

8-20.3(6) JUNCTION BOXES, CABLE VAULTS, and PULL
BOXES

Supplement/Revision

ITS Cable vaults and pull boxes shall conform to Standard Detail Nos. [GENERAL-05 and 05a](#) (City Telecommunications Splice Vault Detail), and [GENERAL-06 and 06a](#) (City Telecommunications Pull Box Detail). All lids shall open away from the traveled way. 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 system that are no longer needed. All costs for removal and disposal of junction boxes shall be considered incidental to the various bid items in the contract; no additional payment will be made.

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 Nos. J-40.10.00](#) (Locking Lid Standard Junction Box Types 1 & 2), and [J-40.30-00](#) (Locking Standard Duty Junction Box Type 8). Junction Boxes shall be of the types indicated on the plans. All Junction Boxes shall have slip-resistant surfaces, locking lids, and be equipped with Penta Head tamper resistant bolts as specified and detailed in the Plans.

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.

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, “COA COMM” if used exclusively for City of Auburn communications, “ITS” for traffic signal interconnect and “TS” “LT” if jointly used. The lids and frames shall be hot dipped galvanized after the welded bead legend is intalled.

The last paragraph is revised to read:

Pull boxes, cable vaults, and junction boxes installed in sidewalks, walkways, and shared-use paths shall have slip-resistant surfaces, be flush with the surface, and match the grade of the sidewalk, walkway, and shared-use path. The boxes, vaults, and junction boxes shall not be placed in the traveled way, driveway area, curb ramps, curb ramp landings, or the gutter areas associated with the curb ramps, except where noted on the plans. Standard Duty junction boxes shall not be installed in the sidewalks, walkways, or shared-use paths.

8-20.3(8) WIRING

Supplement

All cable entering cabinets shall be neatly bundled and wrapped.

The Contractor shall pull out and dispose of wire for the existing illumination system that is no longer needed. All costs for removal and disposal of wire shall be considered incidental to the unit contract price for “Illumination System Complete”.

8-20.3(9) BONDING, GROUNDING Supplement

Bonding and Grounding shall be installed in accordance with Standard Details No. [TRAFFIC-50](#) (Uniform Luminaire Wiring Detail), No. [TRAFFIC-51](#) (Street Lighting Control Cabinet Detail) and No. [TRAFFIC-52 and 52a](#) (Traffic Signal Control Cabinet Detail), and as detailed in the plans

The Contractor shall provide junction boxes or other Engineer approved cover 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 8 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) SERVICE, TRANSFORMER, AND INTELLIGENT TRANSPORTATION SYSTEM (ITS) CABINET Replacement

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 shall be per Standard Detail Nos. [TRAFFIC-51, 52, and 52a](#) (Street Lighting or Traffic Signal Control Cabinet Detail) and [TRAFFIC-53](#) (Traffic Signal Controller Foundation Detail) in Appendix A of this Document, 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 25 inch x 28 inch x 9 inch thick concrete with 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.

Power service cabinets need to be labeled with the “City of Auburn” identification, the use of the service, and the site address, per PSE construction meter requirements. PSE requires a permanent engraved phenolic nameplate or die-cut adhesive label at least 1” high. The power meter will not be installed without this permanent label.

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.

8-20.3(11) TESTING Revision/Supplement

For traffic signal turn-on, City personnel will put the signal into operation. The Contractor shall be present during the turn-on with adequate equipment to repair any deficiencies of signal operation.

All newly installed signal and pedestrian heads shall be fully covered with black plastic or yellow nylon cloth that is firmly attached, until the signal turn-on.

The last paragraph is revised to read:

Unless approved by the Engineer, signal turn-on will only be allowed Monday through Thursday (except for holidays or the day before a holiday), between the hours of 9:00 a.m. and 2:00 p.m.

8-20.3(13) ILLUMINATION SYSTEMS

8-20.3(13)A LIGHT STANDARDS

Supplement

All lighting standards shall be aluminum, davit-style units, per Section 9-29.6(1)A (Lighting Standards and Davit Arms), and shall be constructed in conformance with Luminaire Pole Standard Detail No. [TRAFFIC-49](#) (Luminaire Pole) in Appendix A of this document, at locations shown on the plans as directed by the Engineer.

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

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 luminaires 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, at his expense.

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 Long Life LEDs and meet the requirements of Section 9-29.16(2) (Conventional Traffic Signal Heads). Lens sizes shall be as shown in Contract Plans, Signal Head Type Details.

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)B.1 BACKPLATE TAPE

New Section

Reflective backplate tape shall be a 1-inch wide strip of yellow retro-reflective, type IV prismatic sheeting, conforming to the requirements of Section 9-28.12 (Reflective Sheeting).

Prior to installing the tape, the existing backplate shall be cleaned per the tape manufacture's recommendations.

8-20.3(14)C INDUCTION LOOP VEHICLE DETECTORS

Supplement

Loops shall be located and constructed as shown on the plans and in accordance WSDOT [Standard Plan No. J-50.12-00](#) and [J-50.15-00](#).

Saw cuts shall not remain empty for a duration longer than twenty-four hours after the saw cut is completed. New loops shall be terminated and functioning within 72 hours of removing an active loop from service, unless temporary detection is in place.

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-inch wide rubber mastic tape. 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 ½ 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.

The Stop bar loops shall be spliced in series per lane, mid and advance loop wires shall be spliced in parallel. System loops shall be spliced into individual home runs per lane.

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

Supplement

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 completely filled around the conduit(s) with dry pack mortar and neatly troweled. The distance between the foundation and the bottom of pole flange shall be less than 2 inches except for poles located within sloping portion of curb ramps where the distance may be up to 3 inches.

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.

The lower handhole cover shall be fastened with a tamperproof bolt.

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 Contractor 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 (Fiber Optic Cable, Electrical Conductors, and Cable). All cable shall be installed in compliance with the manufacturer's installations and recommendations.

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) and installed per the manufacturer's directions and recommendations.

Pedestrian push button assemblies shall be securely fastened to the signal standard or pedestrian pole using stainless steel fasteners. Signal standards shall be drilled and tapped for mounting push buttons. Push buttons shall be installed 42-inches from the centerline of push buttons above sidewalk or ground level.

Pedestrian push buttons and assemblies shall be installed per WSDOT standard plan J-20.26-01, J-20.10-01 and J-20.11-00.

8-20.3(14)I VIDEO DETECTION SYSTEM

New Section

When video detection is shown in the plans, the Contractor shall install a fully functional Traficon video detection camera system auxiliary equipment, cameras, housings, and mounts, and all required mounting hardware, cables, connectors, and wiring.

For “Traffic Video Detection Camera” the presence detector board shall be Traficon VIP3D.2, which monitors two cameras. The Contractor shall provide a VIP set-up keypad. The camera housings and internal cameras shall be the latest approved models supplied by Traficon. The Video monitor shall be a minimum of a 9-inch LCD. Coaxial cable shall be 5 conductor cable ISDTEC X341667-00.

For “Wide Angle Video Detection Camera” the video detection card shall be a Trafficom 4TI Edge card, 24 volt power supply, and USB/A – USB/B converter and vendor recommended 5 conductor cable.

Cameras shall be installed where indicated on the plans or as directed by the Engineer. Cameras shall be mounted on signal mast arms as shown in the plans utilizing **Extended Tilt & Pan pole mount**, for installation on the signal arm with cable mount and 72-inch tube or approved equal. The cable mount shall be suitable for the mast arm diameter at each camera installation location.

The Contractor shall allow two weeks to schedule a Kar-Gor representative to assist with the system installation and turn on. The representative from Kar-Gor will terminate all video wiring in the traffic cabinet and install and program the VIP units.

Final adjustment of the cameras shall be done by the Contractor in the presence and at the direction of the City of Auburn Traffic Signal Technician.

8-20.3(14)J CLOSED CIRCUIT TELEVISION (CCTV) CAMERA SYSTEM

New Section

8-20.3(14)J.1 DESCRIPTION

This work consists of providing a television surveillance camera system to include provision and installation of camera assemblies (camera, lens, and housing), pan and tilt drives, shelf mount video encoder, ethernet switch, cables, patch cords and other equipment necessary to provide a complete and operable fiber optic-based closed circuit television (CCTV) system.

8-20.3(14)J.2 MATERIALS

CCTV system materials shall be per Section 9-29.27 (**CCTV SYSTEM**). The CCTV camera shall be a **Cohu HD35-7000** and utilize a Cohu power and control cable ordered to length. Connectors for video cable shall be “MS” type. The camera pigtail shall be a custom length

to construct the drip loop in the camera mounting detail. The ethernet switch shall be a **Ruggedcom RS900G Switch**.

Unless otherwise indicated in the plans or specified in the Special Provisions, all materials shall be new.

8-20.3(14)J.2(1) MOUNTING

Mounting of camera on luminaire/signal poles shall utilize **Pelco pole mounts** and equipment and hardware shown in the plans.

8-20.3(14)J.3 CONSTRUCTION REQUIREMENTS

For each new CCTV camera shown in the plans, the Contractor shall furnish, install, setup, and test a CCTV camera system that includes the camera, mounting materials, cables, cable splices, video encoder, ethernet switch, and any additional equipment and hardware required for a complete and operational CCTV camera system, per Section 9-29.27 (CCTV SYSTEM).

8-20.3(14)J.3(1) GENERAL CABLE INSTALLATION

The Contractor shall submit to the Engineer the method that is intended to be used to install the various cables. Any cable runs which have damaged jackets or do not pass the appropriate test will be rejected and shall be replaced by the Contractor at no additional cost to the City of Auburn.

Shielded cables terminated at a cabinet shall have their shields grounded at the cabinet at one end and insulated at the other. Insulated spade type terminals shall be used when connecting wire to terminal blocks.

Cables at the camera end shall be soldered to the connectors provided with the equipment using established techniques.

The rear connection area shall be filled with **RTV silicon rubber compound**. The cables to the camera shall be encased in a flexible sheath to form one cable between the camera and the local control cabinet.

All cables shall be supported so that there is no weight being transferred from the camera cable to the entry points through poles or extrusions. All holes through poles shall be sealed with outdoor rated watertight grips.

All cables shall be tagged with permanent markers of PVC identifying their use. Cables shall be tagged at both ends and at every junction box location.

8-20.3(14)J.3(2) CAMERA CABLE

Camera cables shall extend from the camera control receiver to the camera and pan/ tilt drive unit. These cables shall provide camera power, environmental housing heater power, pan/ tilt drive power and controls, camera lens controls, and additional wires for preset positioning of pan/ tilt and lens. The number and size of wires required in the camera cable is dependent upon the vendor selected for pan/tilt drives. The Contractor shall provide and install camera cables with the proper type and quantity of conductors to enable connection

as recommended by the selected vendors and as required to provide for proper operation of the closed circuit television system.

Camera cables shall be as per the manufacturer's specifications and designed for long life operation under adverse weather conditions. Cable connectors at the camera housing and pan/tilt drive shall be waterproofed in accordance with vendor recommendations. Camera cables shall be terminated on terminals in the camera control cabinet.

8-20.3(14)J.3(3) SYSTEM SETUP

The Contractor shall set the vertical tilting up limit stop to prohibit the camera from tilting above the highest point on the horizon when at full zoom. The Contractor shall set the vertical tilting down limit stop so that the camera movement does not interfere with the pan/tilt/zoom (PTZ) cable.

8-20.3(14)J.3(4) CCTV SYSTEM PERFORMANCE TEST

The Contractor shall provide all required test equipment and shall carry out the test as specified in the plans. The Contractor shall provide all equipment necessary for complete testing of the CCTV system as required in these special provisions.

This test shall be started after all of the following conditions are met:

Installation of the television system is completed as specified.

All field located equipment and hardware checked by the City and found in compliance with the specified requirements.

The Contractor shall notify the Engineer in writing three (3) working days prior to starting the test. The Engineer will inspect the physical system and notify the Contractor, in writing, if the Contractor is to proceed.

8-20.3(14)J.3(5) CCTV SYSTEM TEST

The Contractor shall test the CCTV system using a Contractor-supplied NTSC-compatible video monitor and a Contractor-supplied camera control device. The control device may be an IBM-compatible laptop computer with a suitable EIA-422 converter running Vendor-supplied software. The control device and monitor shall remain the property of the Contractor. All test cables and connections shall be the responsibility of the Contractor.

During each testing phase, the Contractor shall repair, replace, or reconfigure each CCTV camera installation as necessary, at no additional cost to the Contracting Agency.

8-20.3(14)J.3(6) LOCAL CCTV TEST

At each camera control cabinet the Contractor shall connect the video monitor to the coaxial video cable and connect the camera control device to the camera control cable. The Contractor shall demonstrate to the Engineer the following features of the camera installation:

1. Display camera video on the Contractor-provided monitor.
2. Pan and tilt the camera.
3. Zoom and focus the camera in both fast and slow modes.

4. Turn the camera off and on.
5. Change the iris to auto and manual.

**8-20.3(14)K WIRELESS BROADBAND COMMUNICATIONS
SYSTEM**

New Section

8-20.3(14)K.1 DESCRIPTION

The work specified in this section shall include the furnishing and installation of wireless interconnect communication system devices, cables, outdoor hardened ethernet hub or switch, patch cords and associated components in accordance with the plans and specifications.

The Contractor shall provide materials, equipment, labor and the expertise required for the construction of a traffic signal/ITS wireless broadband communication system to interconnect the proposed traffic signal and ITS equipment with the City of Auburn's existing ITS system infrastructure as shown in the plans and in accordance with these Special Provisions. All equipment shall be installed in compliance with the manufacturer's installations and recommendations.

8-20.3(14)K.2 WIRELESS BROADBAND SYSTEM MATERIALS

The Contractor shall provide all products and materials required for the installation and splicing of the specified communications cables and associated interface devices.

8-20.3(14)K.3 TESTING, MOUNTING AND WIRING

Broadband radio/panel antenna units shall be mounted on signal mast-arms or signal poles as indicated in the plans. All units shall be installed utilizing **Pelco Products, Inc. Astro-Brac** or approved equivalent mounts per the wireless equipment manufacturer's recommendations for outdoor pole-mounted applications. All mountings shall have stainless steel hardware and provide a weather-tight cable passage between the wireless unit and the pole.

All wireless AP, and ethernet setup, configurations and testing shall be done in consultation with the City's IT department and the Engineer.

The Contractor shall drill a 1-inch-diameter hole in the pole, deburr and provide rubber grommet prior to pulling cables. Cables shall be routed through traffic signal system conduits and junction boxes as shown in the plans and terminated in the local signal controller cabinet.

Sufficient cable, 10 feet where bending radius permits, shall be left in each cabinet to properly terminate the cables. No splicing of communication cables shall be allowed.

Ethernet cables shall be routed in the cabinet and be plugged into a Contractor-supplied **RUGGEDCOM Ethernet switch**. in the proposed signal cabinet and into the existing RUGGEDCOM rs900 switch in the existing signal cabinet.

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) in Appendix A of this document. 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).

8-21.3(4) SIGN REMOVAL Supplement

Costs for removing existing signs shall be considered incidental to the lump sum contract price for “Permanent Signing”.

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.

8-22.2 MATERIALS Supplement

The preformed marking material shall be **Pave-Mark Hydrocarbon** or approved equal and shall consist of white or yellow films with pigments selected and blended to conform to standard highway colors through the expected life of the film. Glass beads shall be incorporated to provide immediate and continuing retroreflection.

8-22.3 CONSTRUCTION REQUIREMENTS Supplement

Installation of pavement markings shall conform to Standard Detail Nos. [TRAFFIC-35](#) (Lane-Use Pavement Marking Detail), [TRAFFIC-36](#) (34' Wide Roadway, Crosswalk and Stop Bar Detail), [TRAFFIC-37](#) (44' Wide Roadway, Crosswalk and Stop Bar Detail), [TRAFFIC-38](#) (61' Wide Roadway, Crosswalk and Stop Bar Detail), [TRAFFIC-39](#) (2-Way Left Turn Lane to Left Turn Lane), [TRAFFIC-40](#) Pavement Markings (2-Lane 2-Way Traffic, Left Turn Lane, 2-Way Left Lane and Standard Lane Markings), [TRAFFIC-41](#) Pavement Markings (2-Way Left Turn Lane with Left Turn Pocket), [TRAFFIC-42](#)

Pavement Markings(Dual Left Turn Lanes and Dual Right Turn Lanes), [TRAFFIC-43](#) Pavement markings (Raised Pavement Marker (RPM), gore Center, Skip & Turn Lane Stripe), [TRAFFIC-44](#) Bicycle Lane Markings (Right Turn Lane Drop), [TRAFFIC-45](#) Bicycle Lane Markings (Right Turn Pocket), [Traffic-58](#) (50’ wide Roadway, Crosswalk and Stop Bar detail.

8-23 TEMPORARY PAVEMENT MARKINGS

8-23.1 DESCRIPTION Supplement

Temporary Pavement Markings shall only be used when the temporary striping is anticipated to last less than 6 months. Phasing that will require temporary alignment longer than 6 months should install striping per Section 8-22 (Pavement Marking).

8-23.2 MATERIALS Supplement

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.

8-24 ROCK AND GRAVITY BLOCK WALL AND GABION CRIBBINGReplacement

8-24.1 DESCRIPTION

Where shown on the plans or where directed by the Engineer, the Contractor shall construct a “Rockwall” in accordance with Standard Detail No. [GENERAL-04](#) (Rock Wall Detail) in Appendix A of this document, as directed by the Engineer, and as specified in this document.

8-24.2 MATERIALS

Materials shall meet the requirements of the following sections of the Standard Specifications or as noted.

| | |
|--------------------------------|-----------|
| 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) in Appendix A of this document. 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 FIBER OPTIC COMMUNICATIONS**New Section****8-31.1 DESCRIPTION**

The work specified in this section shall include the furnishing and installation of fiber optic cables, splices, splice enclosures, patch panels and associated components in accordance with the Contract Documents.

The Contractor shall provide materials, equipment, labor and the expertise required for the underground installation of fiber optic cables as components of the ITS network. Fiber optic communications materials shall be per Section 9-29.3 (Fiber Optic Cable, Electrical Conductors, and Cable).

8-31.2 CONSTRUCTION REQUIREMENTS**8-31.2(1) CONTRACTOR QUALIFICATIONS**

Installation and testing of fiber optic communications is a specialized trade that requires specific skills that can only be gained by experience. The City has determined that the successful completion of the fiber optic communications work specified in the Contract Documents require that the Contractor or its subcontractor, whichever shall be completing the fiber optic communications work, meet the following minimum qualification requirements: 5-years experience installing fiber optic systems, including cable and splices, and fiber optic systems of similar type and size to those specified in the Contract Documents, ability to provide three (3), non City of Auburn, public agency references that can provide verification of the Contractor's or subcontractor's experience and confirm that the Contractor or subcontractor successfully completed the installation and testing of fiber optic systems of similar type and size to those specified in the Contract Documents. The Contractor or its subcontractor will not be allowed to begin work on fiber optic communications until the City has verified that the Contractor or its subcontractor satisfies these qualifications requirements.

8-31.2(2) QUALITY ASSURANCE

All work described in this section shall meet or exceed the applicable provisions of the following documents:

1. ANSI/EIA/TIA-455, Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Connecting and Terminating Devices, and Other Fiber Optic Components.
2. ANSI/TIA/EIA-526-7, Measurement of Optical Power loss of Installed Single-Mode Fiber Cable Plant.
3. ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Cabling Standard
4. ANSI/TIA/EIA-569-A, Commercial Building Standard for Telecommunication Pathways and Spaces.
5. ANSI/TIA/EIA-598, Optical Fiber Cable Color Coding.
6. ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications.
7. ANSI/TIA/EIA-758, Customer-Owned Outside Plant Telecommunications Cabling Standard.
8. BICSI: BICSI Telecommunications Cabling Installation Manual (TCIM).
9. BICSI: BICSI Telecommunications Distribution Methods Manual.
10. BICSI: BICSI Customer-Owned Outside Plant Design Manual.

8-31.2(3) FIBER OPTIC CABLE INSTALLATION

Fiber optic cables shall be installed in continuous lengths without intermediate splices throughout the entire project, except at the location(s) specified in the plans. The cable installation personnel shall be familiar with the cable manufacturer's recommended procedures including but not limited to the following:

1. Proper attachment to the cable strength elements for pulling during installation.
2. Cable tensile limitations and the tension monitoring procedure.
3. Cable bending radius limitations.

The Contractor shall comply with the cable manufacturer's specifications.

To accommodate long continuous installation lengths, bi-directional pulling of the fiber optic cable is approved and shall be implemented as follows:

From the midpoint, pull the fiber optic cable into the conduit from the shipping reel in the usual fashion. When this portion of the pull is complete, the remainder of the cable must be removed from the reel to make the inside end available for pulling in the opposite direction. This is accomplished by hand pulling the cable from the reel and laying into large figure eight loops on the ground. The purpose of the figure eight pattern is to avoid cable tangling and kinking. The loops must be laid carefully one upon the other (to prevent subsequent tangling) and must be in a protected area. The inside reel end of the cable is then available for installation. In some cases, it may be necessary to set up the winch at an intermediate cable vault. The required length of cable is pulled to that point, and brought out of the cable vault and coiled into a figure eight. The figure eight is then turned over to gain access to the free cable end which can then be reinserted into the duct system for installation into the next section.

Installation shall involve the placement of the fiber optic cables in a specified innerduct or conduit as defined in the plans. The Contractor shall ensure that innerducts are secured to prevent movement during the cable installation.

Prior to pulling fiber optic cables through existing conduits, the Contractor shall verify that the conduits are clear of any debris and that the conduits have enough room to accommodate the new fiber and any existing conductors (where present and not specified for removal). Where noted on the plans, the Contractor shall remove the existing copper interconnect cable prior to installing the new fiber optic cable.

The pulling eye/sheath termination hardware on the fiber optic cables shall not be pulled over any sheaves.

When power equipment is used to install the fiber optic cables, it must be designed to be used with fiber optic cable. Low speeds shall be used, not to exceed 100 feet per minute. The equipment must show the rate of pull, tension and automatically shut down if any cable pulling parameters are exceeded. The tensile and bending limitation for fiber optic cables shall not be exceeded under any circumstances. The use of large diameter wheels, pulling sheaves, and cable guides shall be used to maintain the appropriate bending radius. Tension monitoring shall be accomplished using commercial dynamometers or load-cell instruments.

8-31.2(4) FIBER OPTIC CABLE SPLICING

This section describes minimum requirements for splicing and connecting of the specified fiber optic cables. Field splices for mainline to lateral cables and for end-to-end mainline cables shall be located as shown in the plans. No additional splices shall be allowed without the approval of the Engineer

All fusion splicing equipment shall be in good working order, properly calibrated, and meet all industry standards and safety regulations. Cable preparation, closure installation, and splicing shall be accomplished in accordance with accepted and approved industry standards.

Upon completion of the splicing operation, all waste material shall be deposited in suitable containers, removed from the job-site, and disposed of in an environmentally acceptable manner.

The Contractor shall use the fusion method with local injection and detection for all fiber optic splicing.

The average splice loss of each fiber shall be 0.10 dB or less. The average splice loss is defined as the summation of the attenuation as measured in both directions through the fusion splice, divided in half.

No individual splice loss measured in a single direction shall exceed 0.15 dB.

The Contractor shall seal all cables where the cable jacket is removed. The cable shall be sealed per the cable manufacturer's recommendation with an approved blocking material.

All below ground splices shall be contained in re-enterable waterproof splice enclosures.

All splices shall be contained in splice trays utilizing strain relief, such as heat shrink wraps, as recommended by the splice tray manufacturer.

Upon sealing the splice closure, the Contractor shall show that the closure maintains 100 psi of pressure for a 24-hour period.

At all fiber optic splice locations, the Contractor shall neatly coil and secure a slack loop of fiber optic cable in a manner that is consistent with optical fiber specifications, including minimum bend radius.

8-31.2(5) FIBER OPTIC CABLE LABELING

Permanent cable labels shall be used to identify fibers and patch cords at each termination point. The cable labels shall consist of white colored heat shrink wraps with identification showing the cable segment, and the far end of the cable. The cable shall be labeled with non-fading permanent ink.

8-31.2(6) FIBER OPTIC CABLE RACKING IN CABLE VAULTS

After the cables are installed and spliced, cables, and innerducts shall be racked with spare conduits and innerducts sealed. Since there is substantial risk of damage to optical fibers by careless handling of the cables, much care shall be exercised, especially with regard to observing the minimum bending limitations. Cables shall be racked in vertical figure eight loops, which shall permit pulling slack from the vault without introducing twist to the cable.

Lateral cables shall be placed behind the main cables when changing levels. Cables or innerducts shall be secured in racked position with outdoor rated cable ties.

City of Auburn identification/warning tags shall be securely attached to the cables or innerducts in at least two locations in each cable vault or pull box and once in every J-box

passed through. The Identification Tag shall be a custom orange label saying “**COA Fiber Optic Cable, If Damaged Call 911**” and label origin and destination of the fiber identified.

All coiled cable shall be suitably protected to prevent damage to the cable and fibers. Racking shall include securing cables or innerducts to brackets (racking hardware) that extend from the side walls of the cable vault or pull box. The Contractor shall provide all required brackets and other racking hardware required for the fiber optic cable racking operations as specified. All racking hardware shall be stainless steel.

8-31.2(7) FIBER OPTIC PATCH PANELS

A fiber optic patch panel shall be installed in every signal controller cabinet where a new fiber optic connection is shown in the plans per Section 9-29.13 (Traffic Signal Controllers).

The patch panel shall be attached to Contractor supplied ¼-inch aluminum plate attached to the signal side rails with spring nuts.

8-31.2(8) FIBER OPTIC SPLICE CASE

Splice enclosures shall be supplied and installed where shown the plans that specify installation of a new fiber optic connection in a Vault or Pull box per Section 9.29.3(1)A (Singlemode FiberOptic Cable).

The SCF splice closures shall be available in canister (butt) and in-line styles to fit most applications. All end-caps feature two express ports for uncut feeder cables. QUICK-SEAL™ Mechanical Seal drop ports allow for rapid and easy installation during initial build or future expansions.

The Splice Closure Housing shall be non-metallic. It shall be resistant to solvents, stress cracking and creep. The housing materials shall also be compatible with chemicals and other materials to which they might be exposed in normal applications. The optical fiber closure shall be capable of accepting any optical fiber cable commonly used in interoffice, outside plant and building entrance facilities. As an option, the ability to double the cable capacity of an installed canister splice closure by use of a kit shall be available. Such a conversion shall not disturb existing cables or splices.

Encapsulation shall not be required to resist water penetration. The splice closure shall be re-enterable. The closure end-cap shall be capable of accepting additional cables without removal of the sheath retention or strength-member-clamping hardware on previously installed cables or disturbing existing splices. The optical fiber splice closure shall provide a clamping mechanism to prevent pistoning of the central member or strength members and to prevent cable sheath slip or pullout. The splice closure shall have appropriate hardware and installation procedures to facilitate the bonding and grounding of metal components in the closure and the armored cable sheath. The cable bonding hardware shall be able to accommodate a copper conductor equal to or larger than 6 AWG.

8-31.3 FIBER OPTIC CABLE TESTING

The Contractor shall provide certified documentation or test results that demonstrate that all fiber optic cables meet the specified optical and mechanical performance criteria before and after installation.

Upon completion of the fiber optic cable installation (and splicing) the Contractor shall perform testing specified herein. The Contractor shall provide the Engineer with a minimum of seven (7) calendar days prior notice of the start of testing. The installed optical fiber cable shall comply with the transmission requirements of this specification, the cable and hardware manufacturer's specifications, and prescribed industry standards and practices.

All backbone and horizontal cabling, which is terminated by the contractor, shall be tested to applicable EIA/TIA Standards.

Upon completion of the tests all fiber optic cable coils shall be secured with ends capped to prevent intrusion of dirt and water.

8-31.3(1) INSERTION LOSS TESTING

Insertion loss testing shall be used to measure end-to-end attenuation on each new fiber installed between a field device and the TMC.

The insertion loss for each mated fiber optic connector pair shall be ≤ 0.75 dB. Reflectance for single-mode single fiber UPC cable assemblies shall be ≤ -55 dB. Mated connector pair loss testing shall be based on one unidirectional OTDR inspection in accordance with the OTDR operating manual for systems greater than 300 feet.

In addition to connector insertion loss for each mated pair, the contractor shall perform end-to-end insertion loss testing for each multimode fiber at 850 nm and 1300 nm from one direction for each terminated fiber span in accordance with EIA/TIA-526-14A (OFSTP 14) and single-mode fibers at 1310 nm and 1550 nm from one direction for each terminated fiber span in accordance with TIA/EIA-526-7 (OFSTP 7). For spans greater than 300 feet, each tested span must test to a value less than or equal to the value determined by calculating a link loss budget. For horizontal spans less than or equal to 300 feet, each tested span must be < 2.0 dB.

The Contractor shall inspect each terminated multimode fiber span for continuity and anomalies with an OTDR at 1300 nm from one direction in accordance with the OTDR operating manual for systems greater than 300 feet. The Contractor shall inspect each terminated single-mode fiber span for continuity and anomalies with an OTDR at 1550 nm from one direction in accordance with OTDR operating manual for systems greater than 300 feet.

Prior to commencing testing, the Contractor shall submit the manufacturer and model number of the test equipment along with certification that it has been calibrated within 6 months of the proposed test dates.

The following information shall be documented for each fiber test measurement:

- Wavelength
- Fiber type
- Cable, tube and fiber IDs
- Near end and far end test locations
- End-to-End Insertion Loss Data
- Individual Splice Loss Data
- Date, time, and operator

**8-31.3(2) OPTICAL TIME DOMAIN REFLECTOMETER (OTDR)
TESTING**

A recording optical time domain reflectometer (OTDR) shall be utilized to test for end-to-end continuity and attenuation of each optical fiber. The OTDR shall be equipped with a 1,310 nm and 1,550 nm light source for single-mode optical fibers. The OTDR shall have an X-Y plotter to provide a hard copy record of each test measurement.

The OTDR shall be equipped with sufficient internal masking to allow the entire cable section to be tested. This may be achieved by using an optical fiber pigtail of sufficient length to display the required cable section, or by using an OTDR with sufficient normalization to display the required cable section. A hard copy X-Y plot shall be provided for all fiber optic attenuation tests.

Prior to commencing testing, the Contractor shall submit the manufacturer and model number of the OTDR test unit along with certification that it has been calibrated within 6 months of the proposed test dates.

Each new mainline and lateral fiber shall be tested in both directions at the 1310 and 1550 nanometer wavelengths. Existing mainline and lateral fibers that are spliced to or re-spliced as part of this contract shall also be tested in both directions and at both wavelengths. Splices to existing fibers shall also be measured and recorded.

The following information shall be documented for each fiber test measurement:

X-Y plot scaled for fiber length

Wavelength

Refraction index

Fiber type

Averaging time

Pulse width

Cable and fiber IDs

Near end and far end test locations

Date, time, and operator

Event table that includes: event ID, type, location, loss, and reflection.

8-31.3(3) FIBER CABLE TESTING DOCUMENTATION

The Contractor shall submit the fiber test results to the Engineer for approval per Section 1-06.7 (Submittals). One (1) licensed copy of the OTDR manufacturer's software shall be provided to the City of Auburn at the time the fiber test results are provided, for viewing and printing the OTDR results. The Contractor shall take corrective actions on portions of the fiber installation determined to be out of compliance with these specifications.

The following information shall be included in each test result submittal:

1. Contract number, contract name, contractor name and address.
2. Dates of cable manufacture, installation, and testing.
3. Manufacturer's test results of the cable as shipped.
4. Location of all splices.
5. OTDR test results.
6. End-to-End Insertion Loss Data.
7. Individual Splice Loss Data.
8. Connector Insertion Loss Data
9. "As Installed" Diagram

END OF DIVISION 8

DIVISION 9 MATERIALS

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:

| | Nonstatistical Evaluation | Commercial Evaluation |
|-----------------------------------|--------------------------------------|----------------------------------|
| 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.

9-05 DRAINAGE STRUCTURES AND CULVERTS

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" Dia. Manhole Frame and Cover) in Appendix A of this document.

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](#) in Appendix A of this document 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" Dia. Manhole Frame and Cover) in Appendix A of this document.

9-14 EROSION CONTROL AND ROADSIDE PLANTING

9-14.1 SOIL

9-14.1(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

(July 2010, City of Auburn)

The Contractor shall submit sample of the bark or wood chips for approval before delivery to the job site. Bark shall be free from weed seeds, sawdust and splinters, and shall not contain wood fiber or other compounds detrimental to plant life. Source shall be from freshwater mill.

9-14.5(1) POLYACRYLAMIDE (PAM) Supplement

This section is supplemented with the following:

PAM will only be used upon approval of the Engineer.

9-14.6 PLANT MATERIALS

9-14.6(4) TAGGING Replacement

This section is deleted in it's entirety and replaced with the following:

All plant material except groundcover shall be legibly tagged. Tagging may be by species 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.

9-14.6(6) SUBSTITUTION OF PLANTS Supplement

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.

9-14.6(7) TEMPORARY STORAGE Revision/Supplement

Temporary storage directly on paved areas without insulation between plants and pavement will not be permitted.

9-15 IRRIGATION SYSTEM Supplement

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 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 **Febco 805Y** or approved equal sized to match the irrigation meter size.

The Double-Check Valve Backflow Assembly Vault for ¾ inch to 2 inch assemblies shall be a **Carson molded box**, or approved equal, and for assemblies larger than 2 inch 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 **direct bury underground 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.

9-22 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) in Appendix A of this document.

9-29 ILLUMINATION, SIGNAL, ELECTRICAL Revision

9-29.1 CONDUIT, INNERDUCT, OUTERDUCT Supplement

Traffic Signal, ITS, and Street light conduit shall be Schedule 80 PVC-ASTM D1785 and as shown on the plans. As allowed in 8-20.3(5), Schedule 40 PVC may be used for conduit runs completely located under sidewalk, driveways, or landscape areas. PVC conduit ends shall have bell end PVC bushings.

9-29.2 JUNCTION BOXES, CABLE VAULTS, AND PULL BOXES Supplement

All junction boxes shall have a galvanized frames and lids with a slip-resistant coating and bonding screws. Both the slip-resistant lid and slip-resistant frame shall be treated with either Mebac#1 as manufactured by Harsco Industrial IKG, or SlipNOT Grade 3-coarse as manufactured by W.S. Molnar Co. Where the exposed portion of the frame is ½ inch wide or less the slip-resistant treatment may be omitted on that portion of the frame. The slip-resistant lid shall be identified with permanent marking on the underside indicating the type of surface treatment (“M1” for Mebac#1; or “S3” for SlipNOT Grade 3-coarse) and the year manufactured. The permanent marking shall be 1/8 inch line thickness formed with a stainless steel weld bead.

J-Boxes shall bear the legend “LT” for illumination systems, “TS” for traffic signals, “ITS” for traffic signal interconnect cable or “COA Comm” for city communication cable, and “TS” and “LT” if jointly used. J-Boxes shall conform to WSDOT [Standard Plan Nos. J-40.10-00 and J-40.30-00](#) in Appendix A of this Document. All J-boxes including Type 1 shall be locking with a penta head bolt.

9-29.3 FIBER OPTIC CABLE, ELECTRICAL CONDUCTORS, AND CABLE Supplement

Illumination

Wire conductors for underground feeder runs and for circuitry from the in-line fuse in the poles to the junction box shall be 600 volts (minimum rated at 75 degree C) # 8 AWG single conductor stranded-copper, U.S.E. insulated, in accordance with the Insulated Power Cable Engineer's Association Specifications. SPEC 2150.

Wire conductors inside the pole from the ballast to the in-line fuse, shall be 600 volt, ROME pole and bracket cable, 2 conductor, stranded-copper No. 10, Type HMW grade or better.

Conductor insulation shall consist of a 45-mil polyvinyl chloride with a 95-mil polyethylene jacket.

Single conductors for street lighting shall be stranded copper with insulation conforming to USE 600 volt minimum rated at 75 degree C and shall be color-coded in a consistent manner throughout the project.

A three-wire electrical service shall be used at 120/240 volts. 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.

Overhead electrical service, when allowed, shall be brought to the load center through a conduit riser with a weather head on the service pole.

Traffic Signals

1. Signal Cable shall have stranded copper conductors and shall conform to IMSA Spec No 20-1.
2. Loop Lead-In Cable shall be #14 AWG and Pedestrian Push Button cable shall be, #14 AWG, two conductor stranded copper, twisted approximately two turns per foot. 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.
3. Pedestrian Push Button cable shall be multiconductor per the manufacturer's recommendation.
4. 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.
5. The detector lead-in cable for Emergency Vehicle Preemption (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.
6. Signal Interconnect 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) or PE-39 for underground. The signal cable shall consist of 12 pair No. 19 AWG conductors. For fiber optic cable, the cable shall be single mode all dielectric gel free loose tube fiber with a minimum of 48 count.
7. Traffic Video Detection Camera Cable shall be a parallel construction of one PVC-jacketed RG 59/U (Coaxial) and one PVC-jacketed five conductor (Power) 18 AWG cable under an oval black flame retardant polyvinyl chloride jacket meeting the requirements of the video detection system manufacturer's recommendations.

Video camera cable shall meet the following requirements, or approved equivalent meeting the requirements of the video detection system manufacturer’s recommendations:

RG 59/U (Coaxial)

- Conductor: 20 AWG solid bare copper 0.032".
- Dielectric: 0.054" wall of gas injected foamed polyethelene to 0.140" nom.
- Braid: 36 AWG bare copper with 95% coverage. Pull in aluminum/polyester tape under braid.
- Jacket: 0.035" wall black 75 degrees C polyvinyl chloride to 0.232" nom.

18 AWG Cable (Power)

- Conductor: 5-18 AWG bare copper 0.048".
- Insulation: 0.012" wall polyvinyl chloride per the color code to 0.072" nom.
- Cabling: Five 18 AWG conductors cabled together in a 3/4" left hand lay to a nom. diameter of 0.194".
- Jacket: 0.025" wall black 75 degrees C polyvinyl chloride to 0.244" nom.
- Color Code: White, Red, Black, Brown, Blue.
- Rating: Multi-conductor leg is rated at 600V.

- 8. Wide Angel Traffic Detection Camera Cable shall be a Kar-Gor 5 conductor cable without coax meeting requirements the vendor.

9-29.3(1)A SINGLEMODE FIBER OPTIC CABLE

Supplement

All fiber optic cable shall be **ALTOS All-Dielectric Gel Free Cables by Corning**, or approved equal, per the following schedule:

| Fiber Count | Nominal Cable Weight | | Minimum Installed Bend Radius (in) |
|-------------|----------------------|-----|---------------------------------------|
| | (lb/1000ft) | | |
| 12 | 49 | 4.1 | |
| 48 | 49 | 4.1 | |
| 288 | 131 | 7.2 | |

All optical fibers shall be identifiable by standard color codes as defined in ANSI/TIA/EIA-598.

Fiber optic cable shall be tested according to Section 8-31.3 (Fiber Optic Cable Testing).

Splice cases shall be **Corning, Tyco** or approved equal.

9-29.6(1)A 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.

Lighting standards shall have 2 through-bolts where the davit arm intersects the pole per Standard Detail No. **TRAFFIC-49** (Luminaire Pole) in Appendix A of this document.

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 90-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. Handhole bolts shall be tamperproof heads.

SPECIALIZED DOWNTOWN LIGHTING

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 60% 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 WSDOT [Standard Plan No. J-20.10-xx \(current version\)](#) and [J-21.10-xx \(current version\)](#) and 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 cabinets 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 with tamper resistant screws 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.

End caps shall be supplied and be weather tight and all unused tenons or holes shall be plugged and sealed.

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.

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.

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

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 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 manufacturers 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 hot dipped galvanized in accordance with ASTM A-123. The anchor bolts shall be capable of resisting at yield strength stress the bending moment of this shaft at its yield strength stress.

Luminaire Attachment

Unless otherwise indicated in the plans all traffic signal poles shall be equipped with davit style luminaire arms 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)B WRAPPING New Section

The aluminum pole 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. Base plates for Type II signal poles shall not exceed 18 ½ inches square.

9-29.6(4) WELDING Supplement

All welds shall be deburred.

9-29.6(5) FOUNDATION HARDWARE Revision

Four high-strength steel anchor bolts, as shown on the Standard Detail No. [TRAFFIC-49](#) (Luminaire Pole) in Appendix A of this Document 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 Replacement

(February 24, 2010, City of Auburn)

This section and sub-sections are deleted and replaced with the following:

Luminaire fusing and electrical connections at light standard bases shall also conform to Standard Detail No. [TRAFFIC-50](#) (Uniform Luminaire Wiring Detail) in Appendix A of this document. 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

(March 19, 2013, City of Auburn)

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 flat-glass 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 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 distribution 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:

9-29.11(2) PHOTOELECTRIC CONTROLS

Supplement

The photoelectric control shall be **SST-IES** or approved equal.

9-29.12(1) ILLUMINATION CIRCUIT SPLICES Supplement
Approved copper splice “C” crimp connectors shall be used to connect bonding wires.

9-29.12(2) TRAFFIC SIGNAL SPLICE MATERIAL Supplement
Loop lead-in wires shall be spliced at the junction box; with a waterproof splice leaving 10 feet each of loop wire and loop lead-in cable for future work. The connection shall be made using compression sleeves sealed with black 50-mm wide, ethylene propylene rubber mastic tape.

9-29.12(3) SEALANTS New Section
Loop detector sealant specifically manufactured for loop wire shall be used to imbed the loop wire into the pavement and fill the sawcut to within 1/16 inch of the top of the pavement. Sealant shall completely cover the foam backer rod.

Loop Sealant shall be:

1. Crafc Loop Detector Sealant 271;
2. Max Cutter Seal No. 3;
3. 3M Black 5000; or
4. Engineer approved equivalent.

Installation shall conform to the manufacturer recommendations.

9-29.13(3) TRAFFIC SIGNAL CONTROLLERS Revised

General

The traffic signal controller shall be the Cobalt model by **Econolite**.

9-29.13(6) 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.

9-29.13(10) NEMA, TYPE 170E, 2070 CONTROLLERS AND CABINETS Revised

Section 9-29.13(10) including title is revised to read:

9-29.13(10) TRAFFIC SIGNAL CONTROLLER CABINET UNIT

Cabinet Enclosure

The signal controller cabinet shall be a NEMA modified, Type “P” cabinet designed to house a battery backup systems (BBS); it shall have room for a vertical BBS and batteries on the right-hand side with a side access door.

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.

At a minimum the cabinets shall meet the following criteria:

1. It shall have nominal dimensions of 56 inches high x 44 inches width x 25.5 inches depth and meet the footprint dimensions as specified in Section 7.3 of NEMA standards for a Type P cabinet. The cabinet base shall have continuously welded interior mounting reinforcement plates with the same anchor bolt hole pattern as the footprint dimensions.
2. Shall be fabricated from 5052-H32 0.125-inch thick aluminum.
3. The cabinet shall be double-flanged where it contacts the cabinet front and side doors.
4. The top of the cabinet shall be sloped down 1 inch towards the rear to facilitate water runoff. The roof shall be sloped at a 90 degree angle at the front of the cabinet. Lesser slope angles are not allowed.
5. The inside of the cabinet shall have (2) separate compartments. The main compartment shall be accessible from the front door and shall house the cabinet load facilities and electronics. The BBS compartment shall be accessible from the side door and shall contain the UPS system batteries. The UPS system inverter and ATS assembly shall be mounted in the BBS compartment but shall be accessible when the front door is open.
6. The inside of the cabinet shall utilize "C" channel rails for mounting. The main compartment shall have (2) welded on the back wall on 25 inches center, and (4) welded on each side wall with (2) pairs on 08 inch center. The side wall C channel rails shall run the entire usable height the cabinet side walls. The BBS compartment shall have (2) C channel rails mounted on the back wall on 6.5 inch center for adding an additional battery shelf
7. All external fasteners shall be stainless steel. Pop rivets shall not be allowed on any external surface.
8. The front door handle shall be $\frac{3}{4}$ round stock stainless steel bar. (An alternate recessed hexagonal socket that accepts an allen wrench can be supplied upon customer request). The side door shall use a recessed hexagonal socket in lieu of a door handle. A $\frac{3}{4}$ inch round stock stainless steel bar can be supplied upon customer request). All door handle mechanisms shall be interchangeable and field replaceable.
9. The front door shall contain (2) flush mount locking recessed compartments. The upper compartment that houses a police door and a lower compartment that houses a generator bypass receptacle. A stiffener plate shall be welded to the inside of the front door to prevent flexing. It shall have a two-position, three-point door stop that accommodates open-angles at 90 degree, 125 degree, and 150 degree. A louvered air entrance located at the bottom of the main door shall satisfy NEMA rod entry test requirements for 3R ventilated enclosures. Bearing rollers shall be applied to ends of door latches to discourage metal-on-metal surfaces from rubbing. The main front

- door lock assembly shall be positioned so the door handle does not cause interference with the key when opening the door.
10. The generator bypass receptacle compartment shall come with a tapered lock using a Best CX series . The door shall have an integrated door slide mechanism that allows the door to be closed and locked after a generator has been connected to the internal receptacle. This compartment is used by maintenance personnel for emergency generator operation in the absence of service power or BBS control.
 11. The side door shall be one piece construction without any recessed compartments. It shall have a three-position, two-point door stop that accommodates open-angles at roughly 80°, 100°, and 120°. A louvered air entrance located at the bottom of the side door shall satisfy NEMA rod entry test requirements for 3R ventilated enclosures. Bearing rollers shall be applied to ends of door latches to discourage metal-on-metal surfaces from rubbing. Lock assembly shall be positioned so handle does not cause interference with key when opening the door.
 12. The gaskets shall cover all areas where the doors contact the double flanged cabinet housing exterior and be thick enough to provide a watertight seal.
 13. A complete set of keys shall be supplied providing access to the cabinet front door, cabinet side door, the police door and the generator receptacle door.
 14. Best CX Series construction cores for all locking compartments except the police lock. The cabinet shall come equipped with Best CX green construction core locks.
 15. All exterior seams shall be manufactured with a neatly formed continuous weld construction. The welds for the police compartment and the generator receptacle compartment shall be done on the outside of the front door. All welds shall be free from burrs, cracks, blowholes or other irregularities.
 16. All cabinet doors shall be mounted with single continuous stainless steel piano hinges that run the length of the door. The hinges shall be attached via stainless steel tamper resistant bolts.

Shelves

The main cabinet shall come with (2) double beveled shelves 10” deep that are reinforced welded with V channel, fabricated from 5052-H32 0.125-inch thick aluminum with double flanged edges rolled front to back. Slotted hole shall be inserted every 7 inches for the purpose of tying off wire bundles. The BBS compartment shall come with (4) 14.45 inch x 8.45 inch flanged shelf designed to hold batteries.

Ventilating Fans

The cabinet shall be provided with two finger safe mounted thermostatically controlled (adjustable between 4-176° Fahrenheit) ventilation fans. The fan shall be installed in the top of the cabinet plenum.

Cables

All wire cable bundles shall be encased in flex or expandable braided sleeving along their entire free length.

All SDLC cables shall be terminated on both ends, securely terminated to the SDLC interface panel and professionally routed in the cabinet interior to easily reach the controller, malfunction management unit and detector racks.

Flashing Operation

All cabinets shall be wired to flash for all channels. Flashing operation shall alternate between the used vehicle phases 1,4,5,8, 9, 12, OLA, OLD and 2,3,6,7, 10, 11, OLB, OLC. Flash programming shall be either red or yellow simply by changing wires on the front of the load-bay.

Detection Panel

The detection panel shall support (32) channels of vehicle detection, (4) channels of emergency vehicle preemption, (8) channels of pedestrian detection and (4) channel of auxiliary preemption detection on a single panel. This panel will be mounted on the left side of the main cabinet compartment below the bottom shelf. The panel shall also include neutral and ground buss bars.

Additional Panels

Sheet metal panels shall be installed in the available space on the upper left and right sides of the main compartment. The left side panel shall be 24 inch x 12 inch. The right side panel shall be 30.5 inch x 12 inch.

Generator Bypass Compartment and Cable

The cabinet front door shall have a locking generator bypass compartment that shall be used to connect a generator to operate the cabinet during extended loss of service line power. The generator compartment shall be capable of being closed and locked while a generator is connected. The mechanism for allowing generator cable access, while the compartment is closed, shall be an integral part of the generator bypass door, via a sliding panel that will normally be in the closed position. Inside the compartment there shall be a silkscreened panel housing a 30A / 125V flanged inlet receptacle capable of accepting a standard generator plug, a cam switch with split AC+ feeds, and (2) LED lamps with sockets. One LED shall be illuminated when the cabinet has service line power available and the other when the cabinet has generator power available. All LED's shall be field replaceable without putting the intersection in flash and shall carry a 5 year manufacturer warranty.

All wiring to the generator bypass compartment shall be contained in a single cable bundle. The cable shall connect to the backside of the electrical components and shall only be accessible from the inside of the cabinet front door. All electrical components on the inside of the front door that carry AC voltage shall be covered by a see-through plexi-glass cover. The generator bypass cable shall terminate at the same power panel location as service line voltage.

Supplemental Loads

All pedestrian phase yellows, overlaps, and the odd numbered vehicle phase RED, YELLOW, and GREEN, shall be loaded with 2.5K-ohm, 10-watt resistors. All load resistors shall be easily accessible from the back of the main panel (load-bay).

Malfunction Management Unit (MMU)

The cabinet shall come with a (MMU) that meets all the requirements of NEMA TS2-2003 while remaining downward compatible with NEMA TS1. It shall have (2) high contrast LCD displays and an internal diagnostic wizard. It shall come with a 10/100 ethernet port. It

shall come with software to run flashing yellow arrow operation. The MMU shall be an Eberle Design, Inc. model MMU2-16LEip Smartmonitor or approved equivalent.

Load Switch

The cabinet shall come with (16) load switches. All load switches shall be cube type and have LED indications for both the input and output side of the load.

Flasher

The cabinet shall come with (1) flasher. The flasher shall be a solid state NEMA model 204 and have LED indications.

Flasher Transfer Relay

The cabinet shall come with (8) heavy duty flash transfer relays.

Bus Interface Unit (BIU)

The cabinet shall come with (3) bus interface units (BIU). These shall meet all the requirements of NEMA TS-2 1988 standards. In addition, all BIUs shall provide separate front panel indicator LED's for DC power status and SDLC Port 1 transmit and receive status. The (BIU)'s shall be Eberle Design, Inc. model BIU700 or approved equivalent.

Power Panel Assembly

Power Supply (PS)

The cabinet shall come with a shelf mounted cabinet power supply meeting at minimum TS 2-2003 standards. It shall be a heavy duty device that provides +12VDC at 5 Amps / +24VDC at 2 Amps / 12VAC at .25 Amp, and line frequency reference at 50 mA. The power supply shall provide a separate front panel indicator LED for each of the four outputs. Front panel banana jack test points for 24VDC and logic ground shall also be provided. The power supply shall provide 5A of power and be able to cover the load of four (4) complete detector racks.

The power panel shall be covered by an easily removable, clear plexiglass cover.

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.

Loop Amplifiers

The cabinet shall come with (16) 2-channel rack mounted loop amplifiers that fit in a traditional (2) channel slot. These devices shall have LCD displays and be capable of monitoring the call strength from (2) channels simultaneously via a pie graph on the front panel. These devices must have the capability to perform directional logic and 3rd car queuing for protected/permissive operation

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.

Emergency Preemption Phase Selector Card

The cabinet shall include a phase selector card that is compatible with the operational requirements of the existing Opticom brand (3M Company) emitters and detectors owned by the City.

BBS System

The cabinet shall accommodate a future uninterruptable power system (BBS)

It shall have nominal dimensions of 5.25 inch x 17.2 inch x 10 inch. The future UPS module is a Dimensions model 24M11-WBE

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 lit with two LED strips with main door switch that will turn on when door is opened and off when closed.

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 by-pass, 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.

Recessed Generator Plug

A flip/lid covered round, 3-lug generator receiver shall be installed near the power assembly and shall be wired into a multi position power switch to isolate the cabinet for generator operation of the signal cabinet.

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.

Fiber Optic Patch Panels

Where fiber optic connections are shown in the plans, the fiber patch panel shall be a pre-terminated **Corning 12 port Single-Panel Housing (SPH-01P)** with a 12 ct pigtail ordered to length or approved equal utilizing SC connectors.

9-29.16 VEHICULAR SIGNAL HEADS, DISPLAYS, AND
 HOUSING

Revision

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

Backplates shall be constructed of 5-inch-wide, .050-inch-thick corrosion-resistant flat black finish, louvered aluminum, attached with stainless steel hardware.

9-29.16(2) CONVENTIONAL TRAFFIC SIGNAL HEADS Supplement

Vehicle signal head housings shall be rigid mount type M.

9-29.16(2)A OPTICAL UNITS Supplement

The LED's shall have a 15 year manufacturer's warranty. The LED shall be **Dialight Light Emitting Diode (LED)**. Part numbers for **Dialight LEDs** are as follows:

| Size | Description | Part Number |
|---------|-------------------|-------------------|
| 12 inch | RED Ball | 433-1210-003XL15 |
| 12 inch | AMBER Ball | 433-3230-901XL15 |
| 12 inch | GREEN Ball | 433-2220-001XL15 |
| 12 inch | RED Arrow | 432-1314-001XOD15 |
| 12 inch | AMBER Arrow | 431-3334-901XOD15 |
| 12 inch | GREEN Arrow | 432-2374-001XOD15 |
| 12 inch | GREEN/AMBER Arrow | 430-6370-001 |

9-29.16(2)E PAINTING SIGNAL HEADS Replacement

This section is deleted in it's entirety and replaced with the following:

Traffic signal heads shall be finished with dark green (Federal Standard 595) oven baked powder coating comprised of resins and pigments. Aluminum end caps shall be painted to match the color of the signal housing.

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 Revision

Replace the first paragraph with the following:

The Pedestrian Push Button Assembly shall be a Advisor AGPS manufactured by H.D. Campbell Company, 1486 NW 70th Street, Seattle, WA 98117 and shall be black in color with a white button.

9-29.20 PEDESTRIAN SIGNALS Supplement

Pedestrian signals shall be a LED, filled hand/walking person countdown display.

All battery backup power units shall utilize the newest 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.

| Manufacturer/Vendor | Model/Type |
|---------------------------------------|--|
| Rhino(Brownfield) Manufacturing, Inc. | BMI-7007-4 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.

9-29.27 CCTV SYSTEM New Section

CCTV cameras shall be **Cohu I-view II series PTZ camera model # 3965** with (MS) Military Style cable connectors and utilize Cohu power and control cables ordered to length. The camera cable pigtail may have to be a custom length to construct the drip loop per the camera mounting details.

Video encoders shall be 120 volt powered shelf mounted **Axis Q7401** video encoders to support one camera and H.264 compression.

The ethernet switches shall be shelf mount **Ruggedcom RS900G** gigabit ethernet switches with SM fiber ports and necessary 120 volt power cords and ethernet cords.

Camera mounting equipment shall be **Pelco** pole mounts and mast arm mounts and other equipment and hardware as shown in the plans and as required for a complete and operational CCTV camera system. The signal pole mount may have to be modified as shown in the plans.

9-30 WATER DISTRIBUTION MATERIALS

9-30.1 PIPE

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 FITTINGS

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.) fittings shall be **Megalug** or Engineer approved alternate. 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 VALVES

9-30.3(1) GATE VALVES (3-INCHES TO 12-INCHES) Replacement

Resilient wedge gate valves shall be used on all 12” and smaller water lines and shall be manufactured by Clow, American Flow Control, Waterous, Dresser, M & H or Mueller with epoxy-coated valve interiors. The valves shall conform to ANSI/AWWA Specifications C509 or C515 with a 200-psi working pressure rating (minimum). 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. 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
(July 2014, City of Auburn)

Supplement

Meter boxes shall be the following:

- A. Boxes for 1 inch service shall be Raven RMB 13"x24"x12" and the AMR port shall be plugged. 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" and the AMR port shall be plugged. 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
(September 2014, City of Auburn)

New Section

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. inch, 1 ½ inch, and 2 inch shut-off valves shall be Mueller B-20200N with B-202989900 short handle, or equal.

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B.

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cut-off valves shall be provided with ADS riser pipe and cap.

9-37 FILTER FABRIC

9-37.1 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

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