

Exhibit 1**Grantor:**

Tualatin Hills Park and Recreation District
 15707 SW Walker Road
 Beaverton, Oregon 97006

Grantee:

City of Portland
 Bureau of Environmental Services
 1120 SW 5th Avenue, Suite 1000
 Portland, OR 97204

ACCESS EASEMENT

KNOW ALL PERSONS BY THESE PRESENTS, that **Tualatin Hills Park & Recreation District** (Grantor), in consideration of the sum of One Thousand Nine Hundred and Fifty Dollars and no/100 Dollars (\$1,950.00), and other good and valuable consideration including the commitments specified in the attached Exhibit C Obligations Agreement, to it paid and provided by the City of Portland, a municipal corporation of the State of Oregon (Grantee), does hereby grant unto said City of Portland, a perpetual, non-exclusive easement for the purpose of ingress and egress through, over and across the following;

As described on Exhibit A and depicted on Exhibit B attached hereto and by this reference made a part hereof:

Said easement area contains 11,814 square feet.

IT IS UNDERSTOOD:

- A. Grantor shall keep the traveled portions of the easement free of obstructions. No structures shall be erected within the easement area without the prior written consent of the Director of the Bureau of Environmental Services, City of Portland.
- B. In the event that Grantor's property is redeveloped and an alternative easement location is desired, Grantor may request relocation of the easement area. Grantor shall pay all costs associated with the relocation of the easement area, and relocation shall be subject to the written approval of and acceptance by Grantee.

R/W # 7161-3

BES # E09051

SID # 1S123AD 3701

After Recording Return to:

John Deyo, City of Portland

1120 SW 5th Avenue, 8th Floor

Portland, Oregon 97204

Tax Statement shall be sent to: No Change

- C. Grantor represents and warrants that it has the authority to grant the easement and that the easement area is free from all liens and encumbrances that would materially affect the easement grant, except as set forth herein, and that it will defend Grantee against the lawful claims and demands of all persons whomsoever with respect to any liens or encumbrances that would materially affect the easement grant, except as set forth herein.
- D. Grantor agrees that the consideration recited herein is just compensation for the property or property rights conveyed, which includes damages to Grantor's remaining property, if any, resulting from the acquisition or use of said property or property rights.
- E. Subject to the limits of the Oregon Constitution and the Oregon Tort Claims Act, Grantee shall hold harmless, indemnify and defend Grantor and its officers, employees and agents from and against all claims, demands, penalties, and causes of action of any kind or character (including the cost of defense thereof, including attorney fees) in favor of any person on account of personal injury, death, damage to property, or violation of law, which arises out of, or results from, the acts or omissions of the Grantee, its officers, employees, or agents within the easement area. Grantor shall hold harmless, indemnify and defend Grantee and its officers, employees and agents from and against all claims, demands, penalties, and causes of action of any kind or character (including the cost of defense thereof, including attorney fees) in favor of any person on account of personal injury, death, damage to property, or violation of law, which arises out of, or results from, the acts or omissions of the Grantor, its officers, employees, agents, or contractors within the easement area.

The remainder of this page is intentionally left blank.

IN WITNESS WHEREOF, Tualatin Hills Park and Recreation District, pursuant to an authorization of its Board of Directors, duly and legally adopted, has caused these presents to be signed by Doug Menke as General Manager this _____ day of _____, 2014.

TUALATIN HILLS PARK AND RECREATION DISTRICT,
AN OREGON PARK AND RECREATION DISTRICT

By: _____
Doug Menke, General Manager

STATE OF OREGON
County of _____

This instrument was acknowledged before me on _____,
by Doug Menke as General Manager of Tualatin Hills Park and Recreation District, an Oregon Park
and Recreation District.

Notary Public for Oregon
My Commission expires _____

APPROVED AS TO FORM:

City Attorney

APPROVED:

Bureau of Environmental Services Director
or designee

R/W #7161-3
 SW 86th AVENUE PUMP STATION & APPURTENANCES PROJECT
 1S1W23AD 3701
 ACCESS EASEMENT

EXHIBIT A

A portion of that certain tract of land conveyed to the Tualatin Hills Park and Recreation District by Document Number 1987-059475, Washington County Deed Records, situated in the Northeast one-quarter of Section 23, Township 1 South, Range 1 West of the Willamette Meridian, more particularly described as follows:

COMMENCING at a found 5/8" inch iron rod with a yellow plastic cap inscribed "HERTEL PLS1896" as shown on SN 27,511, said point being the southwest corner of Lot 12, Block 3, of the duly recorded plat of Schollsdaile;

Thence running South 29°04'50" West along the east line of S.W. 90th Ave. a distance of 24.31 feet to a point that is 6.00 feet northerly, when measured at right angles, to the centerline of the Oregon Electric Railroad (Abandoned), and the POINT OF BEGINNING of the tract herein to be described;

Thence continuing South 29°04'50" West along said east line a distance of 12.15 feet to a point;

Thence South 70°01'27" East, parallel with and 6.00 feet southerly, when measured at right angles, from the centerline of the aforementioned Railroad, a distance of 252.43 feet to a point of curvature;

Thence along said line on the arc of a 2870.93 foot radius curve to the left, thru a central angle of 12°38'28", an arc distance of 633.41 feet (the chord bears South 76°20'37" East 632.12 feet) to a point;

Thence South 06°10'59" East a distance of 24.68 feet to a point in the south line of that certain tract of land conveyed to the Tualatin Hills Park and Recreation District by Document Number 1987-059475;

Thence along said south line on the arc of a 2894.93 foot radius curve to the left, thru a central angle of 00°37'24", an arc distance of 31.49 feet (the chord bears South 83°06'41" East 31.49 feet) to a point;

Thence North 01°55'21" East a distance of 36.11 feet to a point that is 6.00 feet northerly from the centerline of the aforementioned Railroad, when measured radially;

Thence along the arc of a 2858.93 foot radius curve to the right, thru a central angle of 13°19'11", an arc distance of 664.62 feet (the chord bears North 76°40'59" West 663.13 feet) to a point of tangency;

Thence North 70°01'27" West a distance of 250.51 feet to the POINT OF BEGINNING.

Containing 11,814 square feet.

Project 59051
 May 28, 2013

REGISTERED
 PROFESSIONAL
 LAND SURVEYOR

Mark A. Hawkins

OREGON
 JULY 25, 1991
 MARK A. HAWKINS
 2503

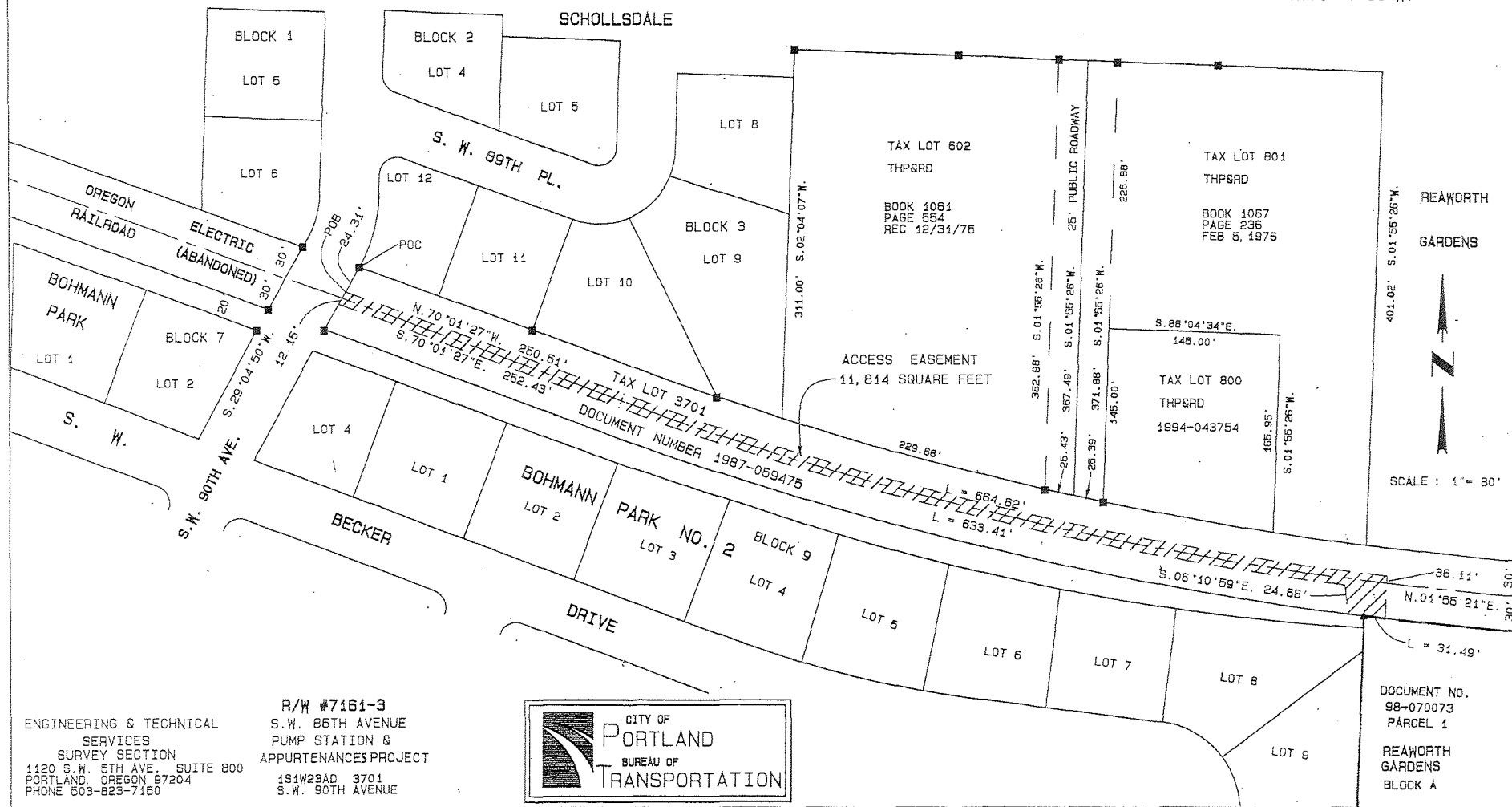
EXPIRES 06/30/13

EXHIBIT B

C 1
R = 2870.93'
 $\Delta = 12^{\circ}38'28''$
L = 633.41'
C = 632.12'
S. 76°20'37"E.

C 2
R = 2894.93'
 Δ = 00°37'24"
L = 31.49'
C = 31.49'
S. 83°06'41"E.

C. 3
R = 2858.93'
 $\Delta = 13^{\circ}19'11''$
L = 664.62'
C = 663.13
N. 76°40'59"W.



R/W #7161-3
 SW 86th AVENUE PUMP STATION PROJECT
 1S1W23AD 3701
 TEMPORARY ACCESS
 EASEMENT for CONSTRUCTION

THPRD EXHIBIT F2

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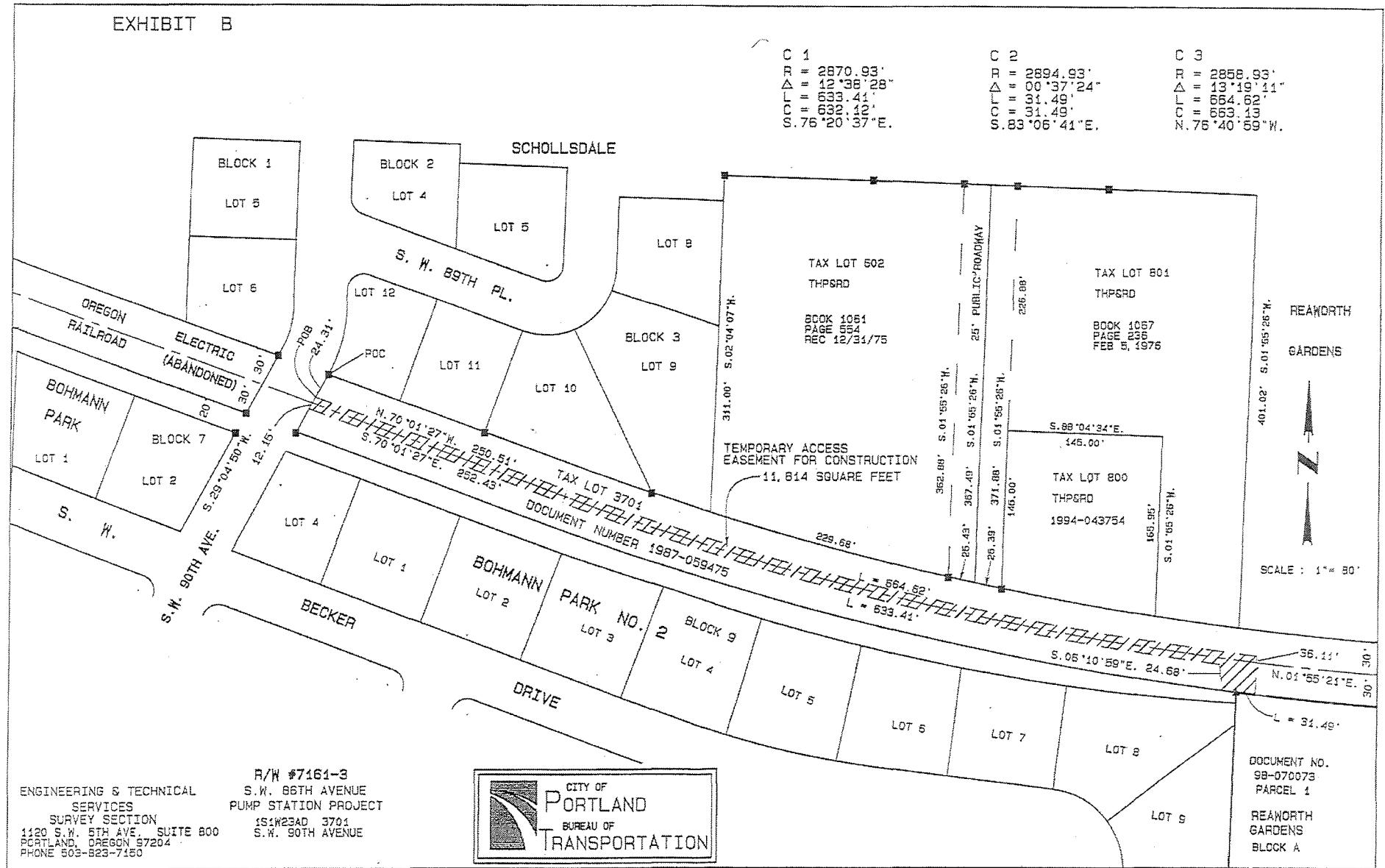
Project 59051
 April 24, 2013

EXHIBIT B

C 1
R = 2870.93'
Δ = 12°38'28"
L = 633.41'
C = 633.41'
S. 76°20'37"E.

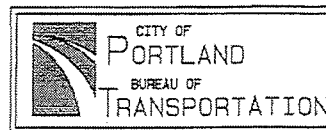
C 2
R = 2894.93'
Δ = 00°37'24"
L = 91.49'
C = 31.49'
S. 83°05'41"E.

C 3
R = 2858.93'
Δ = 13°19'41"
L = 684.62'
C = 683.41'
N. 76°40'59"W.



ENGINEERING & TECHNICAL
SERVICES
SURVEY SECTION
1120 S.W. 5TH AVE. SUITE 800
PORTLAND, OREGON 97204
PHONE 503-823-7150

R/W #7161-3
S.W. 86TH AVENUE
PUMP STATION PROJECT
1S1W23AD 3701
S.W. 90TH AVENUE



DOCUMENT NO.
98-070073
PARCEL 1
REANORTH
GARDENS
BLOCK A

EXHIBIT C**CITY OF PORTLAND, OREGON
OBLIGATIONS AGREEMENT**

File No.: 7161-3
Grantor: Tualatin Hills Park and
Recreation District

As part of the SW 86th Avenue Pump Station & Appurtenances Project E09051 (Project), Tualatin Hills Park & Recreation District (THPRD) and the City of Portland (City), its agents and contractors (Contractor) agree to the following obligations:

1. As part of the consideration for the Temporary Access Easement for Construction and Access Easement granted by THPRD to the City, the City will require the Contractor to restore the Fanno Creek Trail from SW 90th Avenue to the Fanno Creek Bridge. Restoration work shall include but not be limited to: removal of the existing asphalt surface; installation of a root barrier; pruning of intruding tree roots and clean cuts to tree roots that have been disturbed; application of mulch in critical root zones impacted by restoration activities and heat; overlay of a 10-foot wide minimum 4-inch thick asphalt course that meets Oregon Department of Transportation (ODOT) specifications. Asphalt edges shall be beveled and tamped, and mulch added along edges of asphalt (12" run per 1" rise). Trail restoration work shall meet THPRD Trail Plan standards (see Attachment).
2. The City shall install a screen wall and vegetation as appropriate to screen a gate actuator assembly to be installed as part of the Project.
3. The City shall not remove branches or trees on THPRD property without permission. To protect tree canopy, access will be limited to vehicles under eight feet tall and no wider than the width of the paved trail.
4. Under an Owner Controlled Insurance Program (OCIP) the City will provide the following insurance coverage for the project; Statutory Workers Compensation, Employer's Liability, Commercial General Liability, Excess Liability, Builders Risk, and Contractor Pollution Liability. THPRD will be named as an additional insured party on the City provided insurance coverage.
5. The City will require the Contractor to install and maintain construction fencing around active construction areas near the trail. During evening or other non-work hours the active construction zone will be fenced and secured.
6. The City will require the Contractor to provide adequate traffic flaggers to separate construction traffic and recreational trail traffic during any construction activities within the Access Easement and Temporary Access Easement for Construction areas. Aside from times

when construction vehicles are accessing the site, the trail will remain open to the public and free of obstructions.

7. THPRD hereby authorizes the City and the Contractor to access THPRD's remaining property within the Fanno Creek Trail alignment from the eastern terminus of the Access Easement and Temporary Access Easement for Construction areas to the Fanno Creek Bridge for the purpose of performing the trail restoration work authorized under the terms of this agreement. The City will provide THPRD with at least 10 days' written notice prior to commencing said restoration work.
8. It is understood and agreed that City's performance of this agreement is a portion of the consideration for the property rights acquired from THPRD as evidenced by the signed Access Easement and Temporary Access Easement for Construction between THPRD and the City. It is further understood that the City's performance under this agreement shall be at no cost to THPRD. This agreement shall not be effective or binding until THPRD receives notice from the City accepting the easements.

City of Portland
Bureau of Environmental Services

Tualatin Hills Park and Recreation District,
an Oregon Park and Recreation District

By: _____
Scott T. Gibson, Principal Engineer

By: _____
(Name, Title)

Date: _____

Date: _____

By: _____
John Deyo, Right of Way Agent

By: _____
(Name, Title)

Date: _____

Date: _____

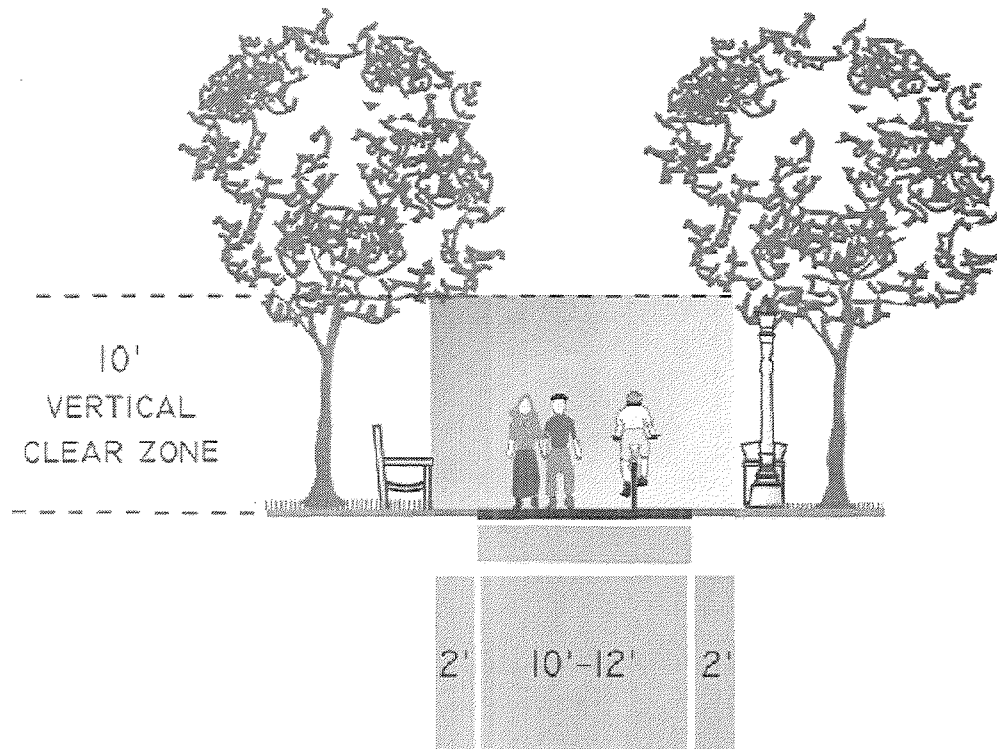


Figure 2. Regional Trail

Regional Trail

Figure 2 illustrates a typical shared-use path design that is appropriate for regional trails and some community trails. This trail is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be a surface that provides a smooth surface, as long as it meets ADA requirements. Wider gravel shoulders should be provided for runners/joggers if space allows.

(wood and rubber surfaces), and deformation.

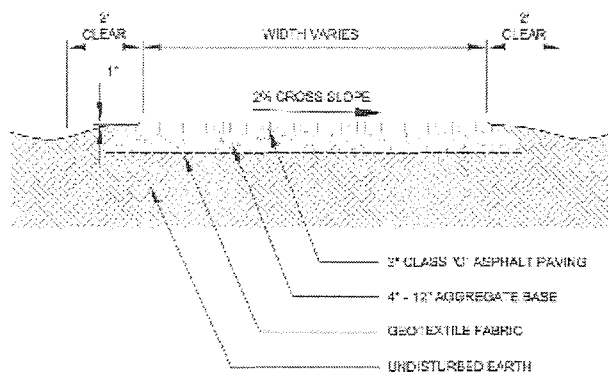
- **Aesthetics**—Each trail surface has varying aesthetic characteristics that should fit with the overall design concept desired for the project.

The trail surfacing matrices in Appendix C provide greater detail regarding potential trail surfacing options.

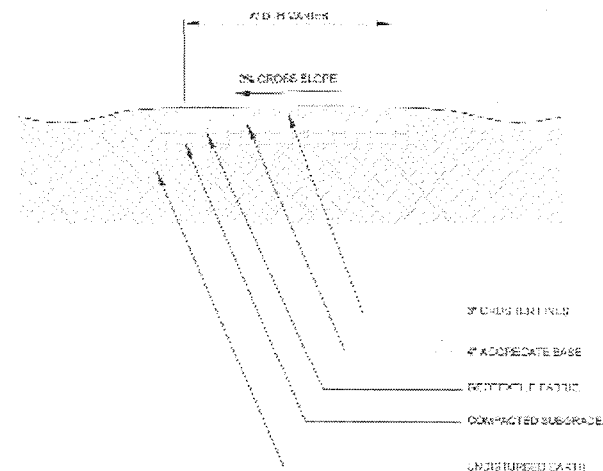
Trail Specifications

The following trail specifications provide construction details on four of the most common types of trail surfacing options chosen for hard and soft surface trails.

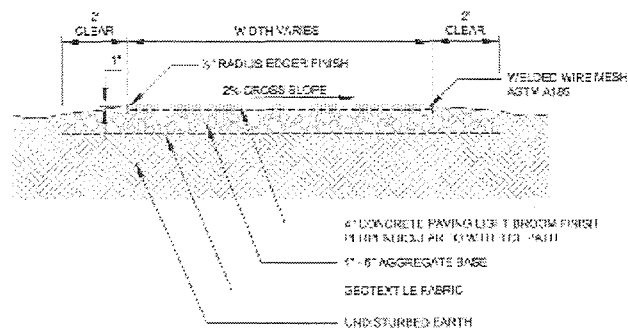
Asphalt Trail



Crusher Fines Trail

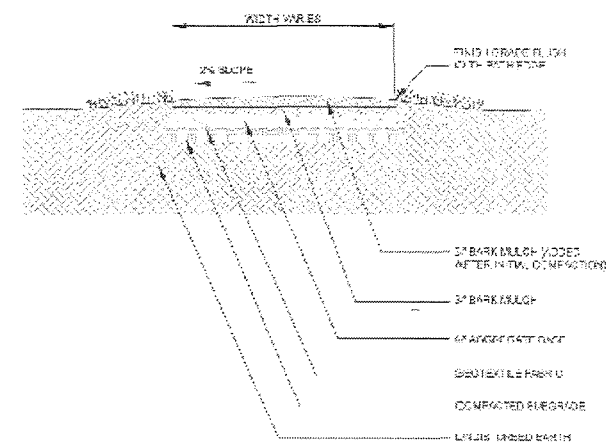


Concrete Trail



NOTES:
1) TRAIL SECTION CONTINGENT ON GEOTECH REPORT
2) PLACE SAW CUT CONTROL JOINTS AS SEEN ON PLAN

Bark Mulch Trail



WATERHOUSE TRAIL

APRIL 2013

SECTION 32 12 16 - HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Hot-mix asphalt paving.
 - 2. Hot-mix asphalt patching.
 - 3. Hot-mix asphalt paving overlay.
 - 4. Asphalt surface treatments.
 - 5. Pavement-marking paint.
- B. Related Sections include the following:
 - 1. Division 31 Section "Earthwork" for asphalt paving aggregate subbase and base courses and for aggregate pavement shoulders.
 - 2. Division 32 Section "Cement Concrete Paving" for joint sealants and fillers at paving terminations.

1.2 DEFINITIONS

- A. ODOT: Oregon Department of Transportation.
- B. ODOT "Standard Specifications for Construction," hereby known as the Standard Specifications.
- C. Hot-Mix Asphalt Paving Terminology: Refer to Standard Specifications for definitions of terms.
- D. HMA: Hot-Mix Asphalt.

1.3 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of the latest edition of "Standard Specifications for Construction" as prepared by the Oregon Department of Transportation, (ODOT).
 - 1. Measurement and payment provisions and safety program submittals included in Standard Specifications do not apply to this Section.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work. At least 10 days prior to producing any of the asphalt mixture for use on the Project, the Contractor shall submit job mix formula to the Owner's Representative for approval.
 - 1. The job mix formula shall indicate the gradation of each of the several constituents to be used in the mixture and shall establish the exact proportions of each constituent to be used to produce a combined gradation of aggregate within the limits stated in the referenced

WATERHOUSE TRAIL

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specifications for dense-graded asphalt. The job mix formula shall also include the ASTM bulk specific gravity of each aggregate content, and any other information pertinent to the design of the mix.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or ODOT.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.
- C. Paving occurring within the public right of way shall conform to all applicable Washington County codes and standards.
- D. Regulatory Requirements: Comply with Divisions 4, 5 and 9 of the Standard Specification for hot-mix asphalt paving work.
- E. Subsurface Conditions: Refer to the geotechnical report, Geotechnical Investigation Report, for Waterhouse Trail prepared by GRI and dated August 3, 2011.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of 60 degrees Fahrenheit.
 - 2. Tack Coat: Minimum surface temperature of 60 degrees Fahrenheit.
 - 3. Slurry Coat: Comply with weather limitations of ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of 55 degrees Fahrenheit and rising at time of placement.
 - 5. Asphalt Wearing Course: Minimum surface temperature of 45 degrees Fahrenheit at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 degrees Fahrenheit for oil-based materials, 50 degrees Fahrenheit for water-based materials, and not exceeding 95 degrees Fahrenheit.

1.8 PROTECTION

- A. Protect surrounding areas, surfaces, work, trees, and shrubs to preclude damage, excessive compaction of adjacent soil and intrusion of materials into soil during execution.

- B. Protect base rock from intrusion of foreign materials. Protect finished asphalt paving from traffic to provide adequate curing time.

1.9 TRAFFIC CONTROL AND TEMPORARY ACCESS

- A. Provide barricades, cones and signs required for driveway closures and detours. Vehicular access to the site will be required for the duration of the project. Coordinate closures and detours with Owner's Representative.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Aggregates shall be manufactured from ledge rock, talus, or gravel in accordance with the Standard Specifications in accordance with WAQTC FOP for AASHTO T 27 and T 11.
- C. Aggregates for asphalt shall be as specified for each Class of HMA conforming to the applicable sections of the Standard Specifications and as shown in the Special Provisions.
- D. The gradation for the new aggregate used in the production of HMA shall be the responsibility of the Contractor, and when combined with recycled material, the combined material shall meet the gradation specification requirements for the specified Class of HMA as shown on the Drawings.
- E. Coarse Aggregate: Sound, angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.
 - 1. Steel blast-furnace slag content may not exceed 20 percent of the total aggregates by volume.
- F. Blending Sand: Clean, hard, sound material, either natural sand or crusher fines from stone or gravel, which will readily accept an asphalt coating.
 - 1. For hot-mix asphalt, limit natural or uncrushed blending sand to a maximum of 7 percent by weight of the total aggregate mass.
- G. Mineral Filler: When used in HMA mix, shall conform to AASHTO M 17.

2.2 ASPHALT MATERIALS

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Asphalt Tack Coat: Asphalt to be used as a tack coat shall be an emulsified asphalt type CSS-1 or CSS-1h conforming to ASTM D 997 or AASHTO M 140, or cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application conforming to ASTM D 2397 or AASHTO M 208.
- C. Recycled Asphalt Pavement (RAP): The use of RAP material in the production of new HMA is optional. Limit RAP to no more than 20 percent of the total weight of aggregate in the job design mix.

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- D. Asphalt Binder: Asphalt binder conforming to AASHTO M 320, shall be used in the production of asphalt paving grades shown on the Drawings or specified herein. Performance grade asphalt binders not listed in the Standard Specification shall be determined by Table 1 of the Performance Graded Asphalt Binder Specification.
- E. Prime Coat: Asphalt emulsion prime complying with the Standard Specification requirements for each Class of asphalt specified.
- F. Fog Seal: Emulsified asphalt or cationic emulsified asphalt, CSS-1 or CSS-1h, slow setting, factory diluted in water, of suitable grade and consistency for application.
- G. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Sand: AASHTO M 29, Grade Nos. 2 or 3.
- B. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
- C. Crack Sealer:
 - 1. Hot pour crack sealer meeting the requirements of AASHTO M 173 for Concrete Joint Sealer, Hot Poured Elastic Type and be sampled in accordance with ASTM D-5167.
- D. Pavement-Marking Paint: Ready-mixed, waterborne emulsion, with 100 percent acrylic binder ASTM D 3168, lead and chromate free, with drying time between 1-1/2 and 45 minutes.
 - 1. Color: White or as indicated in Drawings.
 - 2. Manufacturer: Select from ODOT Qualified Products List.

2.4 MIXES

- A. Hot-Mix Asphalt: One or more courses of dense, hot-laid, hot mix asphalt plant mixes complying Hot-Mix Asphalt Concrete: Dense-graded, hot-laid, hot-plant mixed, uniformly coated mixture of asphalt cement, graded aggregates and additives as approved by authorities having jurisdiction, conforming to the applicable sections of the Standard Specifications, and complying with the following requirements:
 - 1. Base Course: ODOT 3/4 - inch Dense Graded, Level 2 Hot Mixed Asphaltic Concrete
 - 2. Surface Course: ODOT 1/2 - inch Dense Graded, Level 2 Hot Mixed Asphaltic Concrete

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine subgrade scheduled to receive asphalt paving for conditions that will adversely affect the execution, quality, and performance of Work. Do not start Work until unsatisfactory conditions have been corrected.

3.2 COLD MILLING

- A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.
 - 1. Mill to a depth of 1-1/2 inches.
 - 2. Mill to a uniform finished surface free of gouges, grooves, and ridges.
 - 3. Control rate of milling to prevent tearing of existing asphalt course.
 - 4. Repair or replace curbs, manholes, and other construction damaged during cold milling.
 - 5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
 - 6. Transport milled hot-mix asphalt to asphalt recycling facility.
 - 7. Keep milled pavement surface free of loose material and dust.

3.3 PATCHING

- A. Match paving section and materials of existing paving adjacent to patch. Paving occurring within the public right of way shall conform to all applicable Washington County codes and standards.
- B. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending minimum 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gallons per square yard.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Patching: Fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.

3.4 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
 - 1. Clean cracks and joints in existing hot-mix asphalt pavement and adjoining surfaces 18 inches either side of cracks.
 - 2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
 - 3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.5 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 - 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

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- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gallons per square yard. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.
- C. Tack Coat: Apply uniformly to surfaces of the first lift or new pavement, or existing pavement at a rate specified in the Standard Specification.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
 - 3. The edges of existing pavement to be matched shall receive a tack coat prior to paving.

3.6 PAVING GEOTEXTILE INSTALLATION

- A. Apply asphalt binder uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gallons per square yard.
- B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.
 - 1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

3.7 HOT-MIX ASPHALT PLACING

- A. The asphalt pavement shall be mixed, hauled, placed, compacted and finished in conformance with the Standard Specification except as modified and supplemented herein.
- B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off to the grade and elevation established. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses as indicated in the Drawings. Do not exceed the limitations in the Standard Specifications.
 - 2. Place each hot-mix asphalt course in a single lift unless otherwise specified.
 - 3. Maximum temperature of asphalt concrete at mixer shall not exceed the maximum recommended by the asphalt binder manufacturer.
 - 4. Spread mix at minimum temperature behind paver machine shall not exceed the maximum recommended by the asphalt binder manufacturer.
 - 5. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 6. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- C. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
 - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt wearing course.

- D. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.8 PROTECTION OF STRUCTURES

- A. Provide whatever protective coverings may be necessary to protect the exposed portions of culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within the new pavement area, the surfacing shall be level with the top of the existing finished elevation of these facilities. Utility appurtenances within the existing pavement areas to be overlaid shall be adjusted to the proper elevation prior to the construction of the overlay.

3.9 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 2 inches, and a maximum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 36 inches.
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints in accordance with the Standard Specification.
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.
- B. Where the bituminous pavement is to be connected with an existing roadway surface, or other facility, modify the existing roadway profile in such a manner as to produce a smooth riding connection to the existing facility.
- C. Where it is necessary to remove existing asphalt surfaces or oil mat surfaces to provide proper meet lines and riding surfaces, remove the existing surface so that there will be sufficient depth to provide a minimum of 1 inch of asphalt overlay. Tack existing asphalt with asphalt binder prior to placing the asphalt overlay. Meet lines shall be straight and edges shall be vertical. Paint the edges of meet line cuts with tack coat prior to placing asphalt.

3.10 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
1. Complete compaction before mix temperature cools to 180 degrees Fahrenheit.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

WATERHOUSE TRAIL

APRIL 2013

- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 92 percent of reference maximum theoretical density, but not less than 91 percent or greater than 96 percent. (See "Field Quality Control" Article for determining reference maximum theoretical density.)
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
 - 1. Path Edges: Hand tamp edges at 30 degree angle to form straight and true lines as shown on the Drawings.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.11 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Wearing Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Wearing Course:
 - a. 1/8 inch, parallel to the centerline and;
 - b. 1/4 inch, transverse the centerline
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
- C. Traffic-Calming Devices: Compact and form asphalt to produce the contour indicated and within a tolerance of plus or minus 1/8 inch of height indicated above pavement surface.

3.12 SURFACE TREATMENTS

- A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.18 gallons per square yard to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with a fine sand.
- B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
 - 1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

WATERHOUSE TRAIL

APRIL 2013

3.13 PAVEMENT MARKINGS

- A. Provide lane stripping, and traffic arrows and stop bars as shown on the Drawings.
- B. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Owner's Representative.
- C. Allow paving to age for 30 days before starting pavement marking.
- D. Sweep and clean surface to eliminate loose material and dust.
- E. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Remove and replace asphalt, at the Contractor's expense, where test results or measurement indicate that it does not comply with specified requirements.

3.15 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow milled materials to accumulate on-site.

END OF SECTION 321216

Exhibit 2**Grantor:**

Tualatin Hills Park and Recreation District
 15707 SW Walker Road
 Beaverton, Oregon 97006

Grantee:

City of Portland, Bureau of Environmental Services
 1120 SW 5th Avenue, Suite 1000
 Portland, OR 97204

TEMPORARY ACCESS EASEMENT FOR CONSTRUCTION

KNOW ALL PERSONS BY THESE PRESENTS, that **Tualatin Hills Park and Recreation District** (Grantor) in consideration of the sum of Six Hundred and Fifty Dollars and no/100 Dollars, (\$650.00) and other good and valuable consideration including the commitments specified in the attached Exhibit C Obligations Agreement, to it paid and provided by the City of Portland, a municipal corporation of the State of Oregon (Grantee), does hereby grant unto said City of Portland a temporary easement for the purpose of ingress and egress in support of construction activities associated with the SW 86th Avenue Pump Station and Appurtenances Project, through, under, over and along the following described parcel:

As described on Exhibit A and depicted on Exhibit B attached hereto and by this reference made a part hereof.

Said easement area contains 11,814 square feet.

IT IS UNDERSTOOD and agreed that:

- A. This easement is temporary and granted for original construction for a term of 6 months, commencing no earlier than April 1, 2015 and terminating no later than September 30, 2015. However, use of the easement area shall not exceed a total of 4 months during the time this easement is in effect, and Grantor shall be provided reasonable opportunity to make non-conflicting use of the easement area when the area is not being used by Grantee.

R/W # 7161-3

BES # E09051

SID # 1S123AD 3701

After Recording Return to:

John Deyo, City of Portland

1120 SW 5th Avenue, 8th Floor

Portland, Oregon 97204

Tax Statement shall be sent to: No Change

- B. In the event of project delays, the term of this easement may be extended by the Grantor upon request from the Grantee. Grantor's consent will not be unreasonably withheld. Any extension will not exceed the period of delay, and in no event will it be extended beyond midnight September 30, 2016.
- C. Grantee agrees to provide Grantor with at least ten (10) days' written notice prior to commencing work under this easement.
- D. Grantee agrees that it will make every reasonable effort to minimize construction impacts and will maintain access to Grantor's property to the extent practicable.
- E. The Grantee will restore the easement area to a condition that is as good as or better than the condition existing prior to the original construction. Grantee's construction activities shall be consistent with the requirements in the attached Exhibit C Obligations Agreement. Pursuant to the Exhibit C Agreement, Grantee will also make or cause to be made the additional improvements specified therein.
- F. Grantor reserves all other rights not conveyed herein, but will not exercise said rights in any manner that would be inconsistent or interfere with or materially affect rights herein granted.
- G. This easement shall bind the heirs and assigns of Grantor and shall inure to the benefit of the successors in title of Grantee.
- H. Grantor represents and warrants that it has the authority to grant this easement, that the subject property is free from all liens and encumbrances that would materially affect the easement grant, and that it will defend the same to Grantee against the lawful claims and demands of all persons whomsoever.
- I. Grantor represents that to the best of its knowledge, after appropriate inquiry under the circumstances, the subject property is in compliance with all local, State and Federal environmental laws and regulations.
- J. Grantor represents that it has disclosed all knowledge of any release of hazardous substances onto or from the property, and disclosed any known report, investigation, survey or environmental assessment regarding the subject property. "Release" and "hazardous substance" shall have the meaning as defined under Oregon law.
- K. Grantor warrants that there are no underground storage tanks, as defined under Oregon law, presently on or under the subject property.
- L. Grantee, by accepting this easement, is not accepting liability for any preexisting release of hazardous substances onto or from the subject property, and Grantor is not attempting to convey any such liability.
- M. Subject to the limits of the Oregon Constitution and the Oregon Tort Claims Act, Grantee shall hold harmless, indemnify and defend Grantor and its officers, employees and agents from and against all claims, demands, penalties, and causes of action of any kind or character

(including the cost of defense thereof, including attorney fees) in favor of any person on account of personal injury, death, damage to property, or violation of law, which arises out of, or results from, the acts or omissions of the Grantee, its officers, employees, or agents within the easement area. Grantor shall hold harmless, indemnify and defend Grantee and its officers, employees and agents from and against all claims, demands, penalties, and causes of action of any kind or character (including the cost of defense thereof, including attorney fees) in favor of any person on account of personal injury, death, damage to property, or violation of law, which arises out of, or results from, the acts or omissions of the Grantor, its officers, employees, agents, or contractors within the easement area.

IN WITNESS WHEREOF, Tualatin Hills Park and Recreation District, pursuant to an authorization of its Board of Directors, duly and legally adopted, has caused these presents to be signed by Doug Menke as General Manager this _____ day of _____, 2014.

TUALATIN HILLS PARK AND RECREATION DISTRICT,
AN OREGON PARK AND RECREATION DISTRICT

By: _____

Doug Menke, General Manager

STATE OF OREGON

County of _____

This instrument was acknowledged before me on _____,
by Doug Menke as General Manager of Tualatin Hills Park and Recreation District, an Oregon Park and Recreation District.

Notary Public for Oregon

My Commission expires _____

APPROVED AS TO FORM:

City Attorney

APPROVED:

Bureau of Environmental Services Director
or designee

R/W #7161-3
 SW 86th AVENUE PUMP STATION PROJECT
 1S1W23AD 3701
 TEMPORARY ACCESS
 EASEMENT for CONSTRUCTION

EXHIBIT A

A portion of that certain tract of land conveyed to the Tualatin Hills Park and Recreation District by Document Number 1987-059475, Washington County Deed Records, situated in the Northeast one-quarter of Section 23, Township 1 South, Range 1 West of the Willamette Meridian, more particularly described as follows:

COMMENCING at a found 5/8" inch iron rod with a yellow plastic cap inscribed "HERTEL PLS1896" as shown on SN 27,511, said point being the southwest corner of Lot 12, Block 3, of the duly recorded plat of Schollsdaile;

Thence running South 29°04'50" West along the east line of S.W. 90th Ave. a distance of 24.31 feet to a point that is 6.00 feet northerly, when measured at right angles, to the centerline of the Oregon Electric Railroad (Abandoned), and the POINT OF BEGINNING of the tract herein to be described;

Thence continuing South 29°04'50" West along said east line a distance of 12.15 feet to a point;

Thence South 70°01'27" East, parallel with and 6.00 feet southerly, when measured at right angles, from the centerline of the aforementioned Railroad, a distance of 252.43 feet to a point of curvature;

Thence along said line on the arc of a 2870.93 foot radius curve to the left, thru a central angle of 12°38'28", an arc distance of 633.41 feet (the chord bears South 76°20'37" East 632.12 feet) to a point;

Thence South 06°10'59" East a distance of 24.68 feet to a point in the south line of that certain tract of land conveyed to the Tualatin Hills Park and Recreation District by Document Number 1987-059475;

Thence along said south line on the arc of a 2894.93 foot radius curve to the left, thru a central angle of 00°37'24", an arc distance of 31.49 feet (the chord bears South 83°06'41" East 31.49 feet) to a point;

Thence North 01°55'21" East a distance of 36.11 feet to a point that is 6.00 feet northerly from the centerline of the aforementioned Railroad, when measured radially;

Thence along the arc of a 2858.93 foot radius curve to the right, thru a central angle of 13°19'11", an arc distance of 664.62 feet (the chord bears North 76°40'59" West 663.13 feet) to a point of tangency;

Thence North 70°01'27" West a distance of 250.51 feet to the POINT OF BEGINNING.

Containing 11,814 square feet.

Project 59051
 April 24, 2013

REGISTERED
 PROFESSIONAL
 LAND SURVEYOR

Mark A. Hawkins

OREGON
 JULY 25, 1991
 MARK A. HAWKINS
 2503

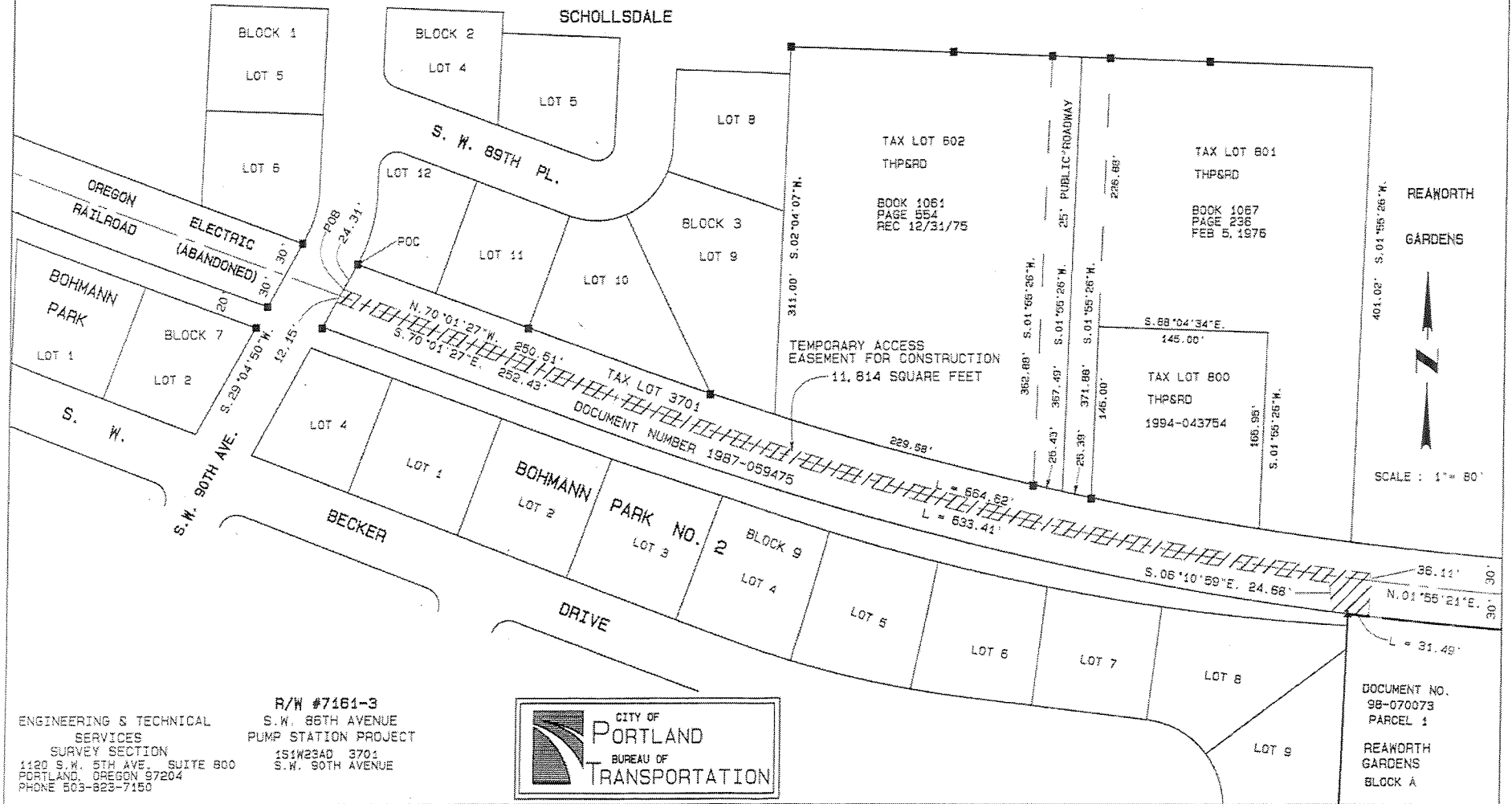
EXPIRES 06/30/13

EXHIBIT B

C 1
R = 2870.93'
Δ = 12°38'28"
L = 633.41'
C = 632.12'
S. 75°20'37"E.

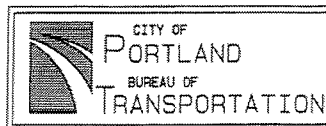
C 2
R = 2894.93'
Δ = 00°37'24"
L = 31.49'
C = 31.49'
S. 83°06'41"E.

C 3
R = 2858.93'
Δ = 13°19'11"
L = 664.62'
C = 663.13'
N. 76°40'59"W.



ENGINEERING & TECHNICAL
SERVICES
SURVEY SECTION
1120 S.W. 5TH AVE., SUITE 800
PORTLAND, OREGON 97204
PHONE 503-823-7150

R/W #7161-3
S.W. 85TH AVENUE
PUMP STATION PROJECT
151W234D, 3701
S.W. 90TH AVENUE



DOCUMENT NO.
98-070073
PARCEL 1
REAWORTH
GARDENS
BLOCK A

186989

R/W #7161-3
SW 86th AVENUE PUMP STATION & APPURTENANCES PROJECT
1S1W23AD 3701
ACCESS EASEMENT

EXHIBIT A

A portion of that certain tract of land conveyed to the Tualatin Hills Park and Recreation District by Document Number 1987-059475, Washington County Deed Records, situated in the Northeast one-quarter of Section 23, Township 1 South, Range 1 West of the Willamette Meridian, more particularly described as follows:

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Thence continuing South 29°04'50" West along said east line a distance of 12.15 feet to a point;

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Thence North 70°01'27" West a distance of 250.51 feet to the POINT OF BEGINNING.

Containing 11,814 square feet.

Project 59051
May 28, 2013

REGISTERED
PROFESSIONAL
LAND SURVEYOR

Mark A. Hawkins

OREGON
JULY 25, 1991
MARK A. HAWKINS
2503

EXPIRES 06/30/13

EXHIBIT B

C 3
R = 2858.93'
 $\Delta = 13^{\circ}19'11''$
L = 664.62'
C = 663.13
N. 76°40'59"W.

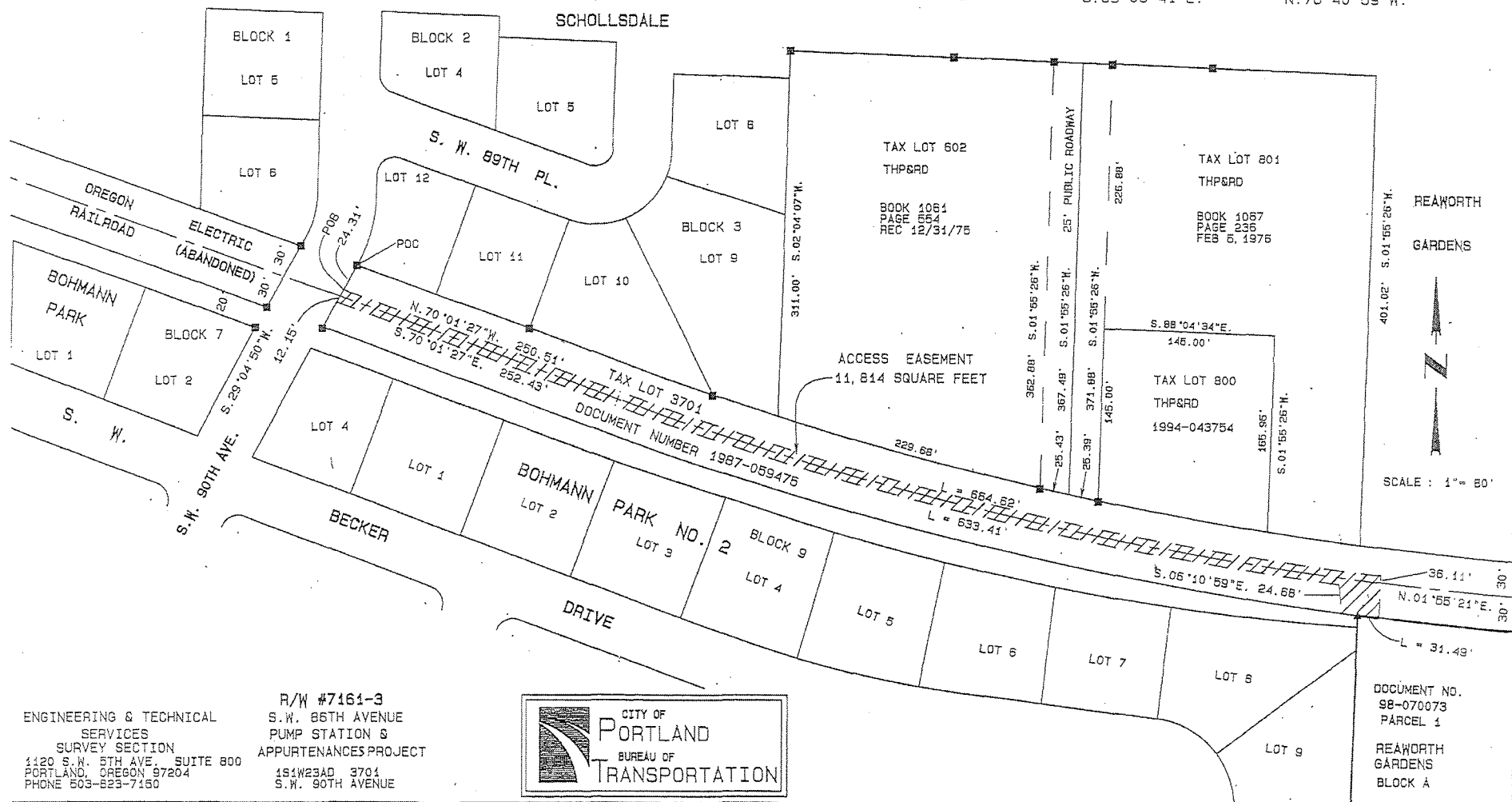


EXHIBIT C**CITY OF PORTLAND, OREGON
OBLIGATIONS AGREEMENT**

File No.: 7161-3
Grantor: Tualatin Hills Park and
Recreation District

As part of the SW 86th Avenue Pump Station & Appurtenances Project E09051 (Project), Tualatin Hills Park & Recreation District (THPRD) and the City of Portland (City), its agents and contractors (Contractor) agree to the following obligations:

1. As part of the consideration for the Temporary Access Easement for Construction and Access Easement granted by THPRD to the City, the City will require the Contractor to restore the Fanno Creek Trail from SW 90th Avenue to the Fanno Creek Bridge. Restoration work shall include but not be limited to: removal of the existing asphalt surface; installation of a root barrier; pruning of intruding tree roots and clean cuts to tree roots that have been disturbed; application of mulch in critical root zones impacted by restoration activities and heat; overlay of a 10-foot wide minimum 4-inch thick asphalt course that meets Oregon Department of Transportation (ODOT) specifications. Asphalt edges shall be beveled and tamped, and mulch added along edges of asphalt (12" run per 1" rise). Trail restoration work shall meet THPRD Trail Plan standards (see Attachment).
2. The City shall install a screen wall and vegetation as appropriate to screen a gate actuator assembly to be installed as part of the Project.
3. The City shall not remove branches or trees on THPRD property without permission. To protect tree canopy, access will be limited to vehicles under eight feet tall and no wider than the width of the paved trail.
4. Under an Owner Controlled Insurance Program (OCIP) the City will provide the following insurance coverage for the project; Statutory Workers Compensation, Employer's Liability, Commercial General Liability, Excess Liability, Builders Risk, and Contractor Pollution Liability. THPRD will be named as an additional insured party on the City provided insurance coverage.
5. The City will require the Contractor to install and maintain construction fencing around active construction areas near the trail. During evening or other non-work hours the active construction zone will be fenced and secured.
6. The City will require the Contractor to provide adequate traffic flaggers to separate construction traffic and recreational trail traffic during any construction activities within the Access Easement and Temporary Access Easement for Construction areas. Aside from times

when construction vehicles are accessing the site, the trail will remain open to the public and free of obstructions.

7. THPRD hereby authorizes the City and the Contractor to access THPRD's remaining property within the Fanno Creek Trail alignment from the eastern terminus of the Access Easement and Temporary Access Easement for Construction areas to the Fanno Creek Bridge for the purpose of performing the trail restoration work authorized under the terms of this agreement. The City will provide THPRD with at least 10 days' written notice prior to commencing said restoration work.
8. It is understood and agreed that City's performance of this agreement is a portion of the consideration for the property rights acquired from THPRD as evidenced by the signed Access Easement and Temporary Access Easement for Construction between THPRD and the City. It is further understood that the City's performance under this agreement shall be at no cost to THPRD. This agreement shall not be effective or binding until THPRD receives notice from the City accepting the easements.

City of Portland
Bureau of Environmental Services

Tualatin Hills Park and Recreation District,
an Oregon Park and Recreation District

By: _____
Scott T. Gibson, Principal Engineer

By: _____
(Name, Title)

Date: _____

Date: _____

By: _____
John Deyo, Right of Way Agent

By: _____
(Name, Title)

Date: _____

Date: _____

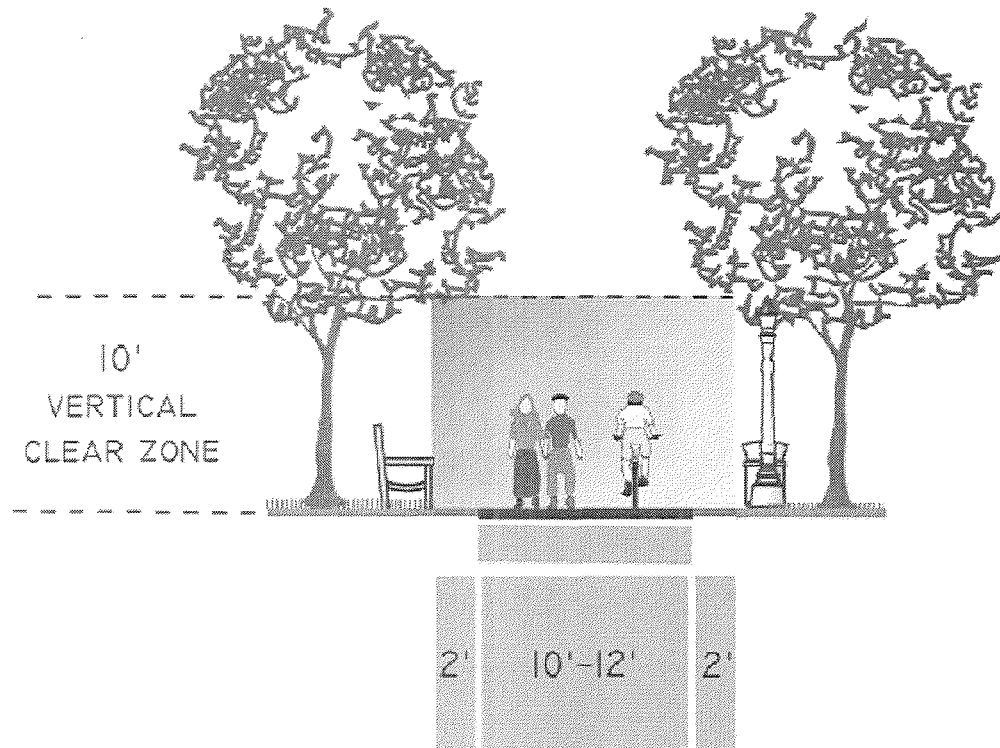


Figure 2. Regional Trail

Regional Trail

Figure 2 illustrates a typical shared-use path design that is appropriate for regional trails and some community trails. This trail is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be a surface that provides a smooth surface, as long as it meets ADA requirements. Wider gravel shoulders should be provided for runners/joggers if space allows.

(wood and rubber surfaces), and deformation.

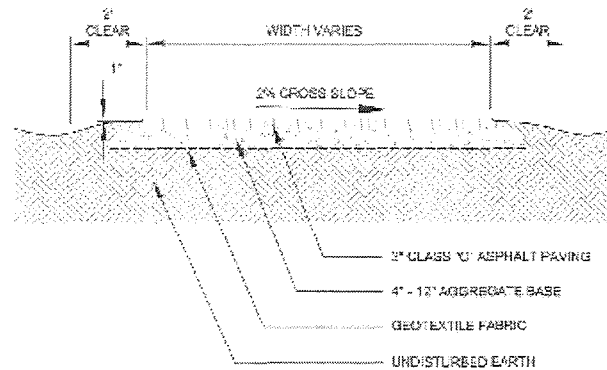
- **Aesthetics**—Each trail surface has varying aesthetic characteristics that should fit with the overall design concept desired for the project.

The trail surfacing matrices in Appendix C provide greater detail regarding potential trail surfacing options.

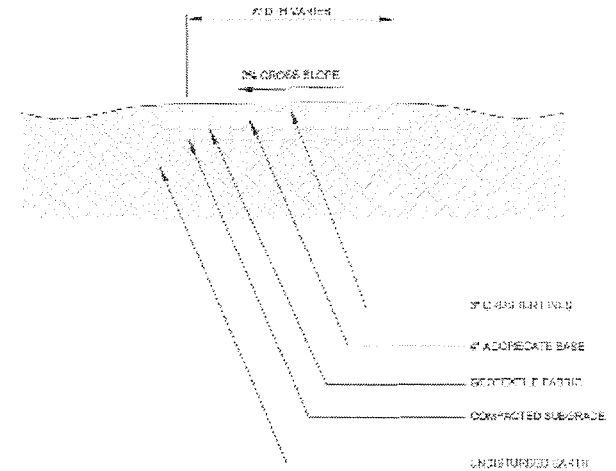
Trail Specifications

The following trail specifications provide construction details on four of the most common types of trail surfacing options chosen for hard and soft surface trails.

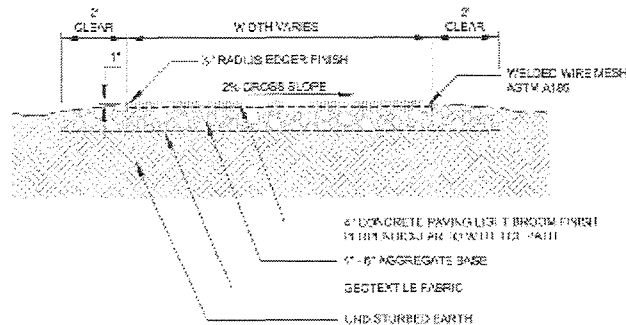
Asphalt Trail



Crusher Fines Trail

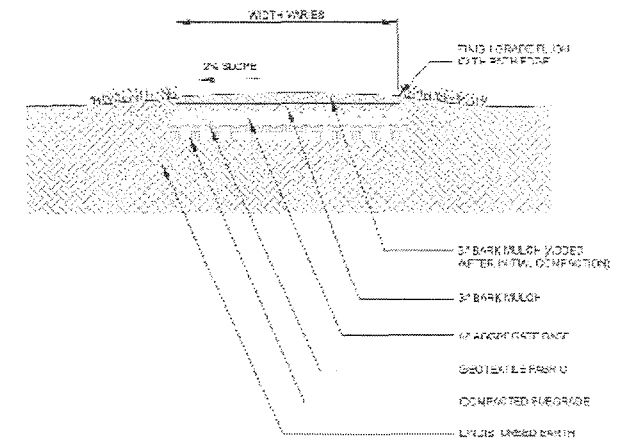


Concrete Trail



NOTES:
1) TRAIL SECTION CONTINGENT ON GEOTECH REPORT
2) PLACE SAW CUT CONTROL JOINTS AS SEEN ON PLAN

Bark Mulch Trail



WATERHOUSE TRAIL

APRIL 2013

SECTION 32 12 16 - HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Hot-mix asphalt paving.
 - 2. Hot-mix asphalt patching.
 - 3. Hot-mix asphalt paving overlay.
 - 4. Asphalt surface treatments.
 - 5. Pavement-marking paint.
- B. Related Sections include the following:
 - 1. Division 31 Section "Earthwork" for asphalt paving aggregate subbase and base courses and for aggregate pavement shoulders.
 - 2. Division 32 Section "Cement Concrete Paving" for joint sealants and fillers at paving terminations.

1.2 DEFINITIONS

- A. ODOT: Oregon Department of Transportation.
- B. ODOT "Standard Specifications for Construction," hereby known as the Standard Specifications.
- C. Hot-Mix Asphalt Paving Terminology: Refer to Standard Specifications for definitions of terms.
- D. HMA: Hot-Mix Asphalt.

1.3 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of the latest edition of "Standard Specifications for Construction" as prepared by the Oregon Department of Transportation, (ODOT).
 - 1. Measurement and payment provisions and safety program submittals included in Standard Specifications do not apply to this Section.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work. At least 10 days prior to producing any of the asphalt mixture for use on the Project, the Contractor shall submit job mix formula to the Owner's Representative for approval.
 - 1. The job mix formula shall indicate the gradation of each of the several constituents to be used in the mixture and shall establish the exact proportions of each constituent to be used to produce a combined gradation of aggregate within the limits stated in the referenced

WATERHOUSE TRAIL

APRIL 2013

specifications for dense-graded asphalt. The job mix formula shall also include the ASTM bulk specific gravity of each aggregate content, and any other information pertinent to the design of the mix.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or ODOT.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.
- C. Paving occurring within the public right of way shall conform to all applicable Washington County codes and standards.
- D. Regulatory Requirements: Comply with Divisions 4, 5 and 9 of the Standard Specification for hot-mix asphalt paving work.
- E. Subsurface Conditions: Refer to the geotechnical report, Geotechnical Investigation Report, for Waterhouse Trail prepared by GRI and dated August 3, 2011.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of 60 degrees Fahrenheit.
 - 2. Tack Coat: Minimum surface temperature of 60 degrees Fahrenheit.
 - 3. Slurry Coat: Comply with weather limitations of ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of 55 degrees Fahrenheit and rising at time of placement.
 - 5. Asphalt Wearing Course: Minimum surface temperature of 45 degrees Fahrenheit at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 degrees Fahrenheit for oil-based materials, 50 degrees Fahrenheit for water-based materials, and not exceeding 95 degrees Fahrenheit.

1.8 PROTECTION

- A. Protect surrounding areas, surfaces, work, trees, and shrubs to preclude damage, excessive compaction of adjacent soil and intrusion of materials into soil during execution.

- B. Protect base rock from intrusion of foreign materials. Protect finished asphalt paving from traffic to provide adequate curing time.

1.9 TRAFFIC CONTROL AND TEMPORARY ACCESS

- A. Provide barricades, cones and signs required for driveway closures and detours. Vehicular access to the site will be required for the duration of the project. Coordinate closures and detours with Owner's Representative.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Aggregates shall be manufactured from ledge rock, talus, or gravel in accordance with the Standard Specifications in accordance with WAQTC FOP for AASHTO T 27 and T 11.
- C. Aggregates for asphalt shall be as specified for each Class of HMA conforming to the applicable sections of the Standard Specifications and as shown in the Special Provisions.
- D. The gradation for the new aggregate used in the production of HMA shall be the responsibility of the Contractor, and when combined with recycled material, the combined material shall meet the gradation specification requirements for the specified Class of HMA as shown on the Drawings.
- E. Coarse Aggregate: Sound, angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.
 - 1. Steel blast-furnace slag content may not exceed 20 percent of the total aggregates by volume.
- F. Blending Sand: Clean, hard, sound material, either natural sand or crusher fines from stone or gravel, which will readily accept an asphalt coating.
 - 1. For hot-mix asphalt, limit natural or uncrushed blending sand to a maximum of 7 percent by weight of the total aggregate mass.
- G. Mineral Filler: When used in HMA mix, shall conform to AASHTO M 17.

2.2 ASPHALT MATERIALS

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Asphalt Tack Coat: Asphalt to be used as a tack coat shall be an emulsified asphalt type CSS-1 or CSS-1h conforming to ASTM D 997 or AASHTO M 140, or cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application conforming to ASTM D 2397 or AASHTO M 208.
- C. Recycled Asphalt Pavement (RAP): The use of RAP material in the production of new HMA is optional. Limit RAP to no more than 20 percent of the total weight of aggregate in the job design mix.

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- D. Asphalt Binder: Asphalt binder conforming to AASHTO M 320, shall be used in the production of asphalt paving grades shown on the Drawings or specified herein. Performance grade asphalt binders not listed in the Standard Specification shall be determined by Table 1 of the Performance Graded Asphalt Binder Specification.
- E. Prime Coat: Asphalt emulsion prime complying with the Standard Specification requirements for each Class of asphalt specified.
- F. Fog Seal: Emulsified asphalt or cationic emulsified asphalt, CSS-1 or CSS-1h, slow setting, factory diluted in water, of suitable grade and consistency for application.
- G. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Sand: AASHTO M 29, Grade Nos. 2 or 3.
- B. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
- C. Crack Sealer:
 - 1. Hot pour crack sealer meeting the requirements of AASHTO M 173 for Concrete Joint Sealer, Hot Poured Elastic Type and be sampled in accordance with ASTM D-5167.
- D. Pavement-Marking Paint: Ready-mixed, waterborne emulsion, with 100 percent acrylic binder ASTM D 3168, lead and chromate free, with drying time between 1-1/2 and 45 minutes.
 - 1. Color: White or as indicated in Drawings.
 - 2. Manufacturer: Select from ODOT Qualified Products List.

2.4 MIXES

- A. Hot-Mix Asphalt: One or more courses of dense, hot-laid, hot mix asphalt plant mixes complying Hot-Mix Asphalt Concrete: Dense-graded, hot-laid, hot-plant mixed, uniformly coated mixture of asphalt cement, graded aggregates and additives as approved by authorities having jurisdiction, conforming to the applicable sections of the Standard Specifications, and complying with the following requirements:
 - 1. Base Course: ODOT 3/4 - inch Dense Graded, Level 2 Hot Mixed Asphaltic Concrete
 - 2. Surface Course: ODOT 1/2 - inch Dense Graded, Level 2 Hot Mixed Asphaltic Concrete

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine subgrade scheduled to receive asphalt paving for conditions that will adversely affect the execution, quality, and performance of Work. Do not start Work until unsatisfactory conditions have been corrected.

3.2 COLD MILLING

- A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.
 - 1. Mill to a depth of 1-1/2 inches.
 - 2. Mill to a uniform finished surface free of gouges, grooves, and ridges.
 - 3. Control rate of milling to prevent tearing of existing asphalt course.
 - 4. Repair or replace curbs, manholes, and other construction damaged during cold milling.
 - 5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
 - 6. Transport milled hot-mix asphalt to asphalt recycling facility.
 - 7. Keep milled pavement surface free of loose material and dust.

3.3 PATCHING

- A. Match paving section and materials of existing paving adjacent to patch. Paving occurring within the public right of way shall conform to all applicable Washington County codes and standards.
- B. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending minimum 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gallons per square yard.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Patching: Fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.

3.4 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
 - 1. Clean cracks and joints in existing hot-mix asphalt pavement and adjoining surfaces 18 inches either side of cracks.
 - 2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
 - 3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.5 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 - 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

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- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gallons per square yard. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.
- C. Tack Coat: Apply uniformly to surfaces of the first lift or new pavement, or existing pavement at a rate specified in the Standard Specification.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
 - 3. The edges of existing pavement to be matched shall receive a tack coat prior to paving.

3.6 PAVING GEOTEXTILE INSTALLATION

- A. Apply asphalt binder uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gallons per square yard.
- B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.
 - 1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

3.7 HOT-MIX ASPHALT PLACING

- A. The asphalt pavement shall be mixed, hauled, placed, compacted and finished in conformance with the Standard Specification except as modified and supplemented herein.
- B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off to the grade and elevation established. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses as indicated in the Drawings. Do not exceed the limitations in the Standard Specifications.
 - 2. Place each hot-mix asphalt course in a single lift unless otherwise specified.
 - 3. Maximum temperature of asphalt concrete at mixer shall not exceed the maximum recommended by the asphalt binder manufacturer.
 - 4. Spread mix at minimum temperature behind paver machine shall not exceed the maximum recommended by the asphalt binder manufacturer.
 - 5. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 6. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- C. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
 - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt wearing course.

- D. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.8 PROTECTION OF STRUCTURES

- A. Provide whatever protective coverings may be necessary to protect the exposed portions of culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within the new pavement area, the surfacing shall be level with the top of the existing finished elevation of these facilities. Utility appurtenances within the existing pavement areas to be overlaid shall be adjusted to the proper elevation prior to the construction of the overlay.

3.9 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
 1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 2 inches, and a maximum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 36 inches.
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints in accordance with the Standard Specification.
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.
- B. Where the bituminous pavement is to be connected with an existing roadway surface, or other facility, modify the existing roadway profile in such a manner as to produce a smooth riding connection to the existing facility.
- C. Where it is necessary to remove existing asphalt surfaces or oil mat surfaces to provide proper meet lines and riding surfaces, remove the existing surface so that there will be sufficient depth to provide a minimum of 1 inch of asphalt overlay. Tack existing asphalt with asphalt binder prior to placing the asphalt overlay. Meet lines shall be straight and edges shall be vertical. Paint the edges of meet line cuts with tack coat prior to placing asphalt.

3.10 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 1. Complete compaction before mix temperature cools to 180 degrees Fahrenheit.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

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- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 92 percent of reference maximum theoretical density, but not less than 91 percent or greater than 96 percent. (See "Field Quality Control" Article for determining reference maximum theoretical density.)
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
 - 1. Path Edges: Hand tamp edges at 30 degree angle to form straight and true lines as shown on the Drawings.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.11 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Wearing Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Wearing Course:
 - a. 1/8 inch, parallel to the centerline and;
 - b. 1/4 inch, transverse the centerline
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
- C. Traffic-Calming Devices: Compact and form asphalt to produce the contour indicated and within a tolerance of plus or minus 1/8 inch of height indicated above pavement surface.

3.12 SURFACE TREATMENTS

- A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.18 gallons per square yard to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with a fine sand.
- B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
 - 1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

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3.13 PAVEMENT MARKINGS

- A. Provide lane stripping, and traffic arrows and stop bars as shown on the Drawings.
- B. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Owner's Representative.
- C. Allow paving to age for 30 days before starting pavement marking.
- D. Sweep and clean surface to eliminate loose material and dust.
- E. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.14 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Remove and replace asphalt, at the Contractor's expense, where test results or measurement indicate that it does not comply with specified requirements.

3.15 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow milled materials to accumulate on-site.

END OF SECTION 321216