

CITY OF BOARDMAN, OREGON

TABLE OF CONTENTS

SECTION 5

ROAD WORK

PART 1 - General	5-1
1.1 Scope	5-1
PART 2 - Materials.....	5-1
2.1 Water for Compaction.....	5-1
2.2 Geotextile Fabric	5-1
2.3 Aggregate Base and Base Rock.....	5-1
2.4 Soil Sterilant	5-2
2.5 Asphalt Tack Coat	5-2
2.6 Asphalt Concrete Pavement	5-3
2.7 Asphalt Fog seal.....	5-4
2.8 Street Monument.....	5-5
2.9 Culverts	5-5
2.10 Drainage Trenches.....	5-5
PART 3 - Execution	5-5
3.1 Earthwork.....	5-5
3.2 Geotextile Fabric	5-8
3.3 Aggregate Base and Base Rock.....	5-8
3.4 Soil Sterilant	5-9
3.5 Pre-paving Conference	5-10
3.6 Asphalt Concrete Pavement	5-10
3.7 Asphalt Fog Seal	5-11
3.8 Construction Staking	5-12
3.9 Street Monument.....	5-12
3.10 Adjustment of Utility Covers to Grade.....	5-12
3.11 Culverts	5-13
3.12 Pavement Striping	5-13
3.13 Restoration, Finishing, and Cleanup	5-14

CITY OF BOARDMAN, OREGON
TECHNICAL SPECIFICATIONS
SECTION 5
ROAD WORK

PART 1 - GENERAL

1.1 Scope

These Specifications cover the construction, reconstruction and overlaying of streets and roads. Work shall include furnishing all equipment, materials, labor, etc., as required to complete the required improvements. Items specified in this Technical Specification are intended to be broad in scope and may not always apply to all items of work to be constructed. All applicable sections, as determined by the City or City Engineer, shall control the work.

PART 2 - MATERIALS

2.1 Water for Compaction

The Contractor shall be responsible for obtaining, transporting, and the application of the water. The City will allow the Contractor to use water from the existing municipal water system for a fee set by the City, provided the Contractor follows the requirements set forth by the City.

2.2 Geotextile Fabric

Geotextile fabric shall be Mirafi 500X, or approved equal.

2.3 Aggregate Base and Base Rock

A. Aggregate Base

The aggregate base shall be a well-graded 4"-0 angular basalt material with the fraction passing the No. 200 sieve not greater than 8 percent of the total aggregate weight. Aggregate base shall meet the durability requirements for base rock. Other materials may be considered by the City; however, samples must be submitted for review.

B. Base Rock

Base rock shall conform to the requirements of Section 02630 - Base Aggregate, "Oregon Standard Specifications for Construction," current edition, for dense graded aggregate as modified hereafter. Acceptable gradation includes 1"-0 or 3/4"-0 as selected by the Contractor.

C. Surface Rock

1. The surface rock shall be crushed stone, slag, or gravel meeting the following requirements:

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

- a. Liquid Limit (AASHTO T 89) 35 Maximum
- b. Plastic Index (AASHTO T 90) 2-9 Maximum
- c. Dust Ratio: $\frac{\% \text{ Passing No. 200}}{\% \text{ Passing No. 30}}$ 2/3 Maximum

Grading Requirements (AASHTO T 11 and T 27):

Sieve	Percent Passing
1"	100
3/4"	70-98
No. 4	36-60
No. 8	25-47
No. 30	12-31
No. 200	8-15

- 2. Surface rock shall have at least 70 percent by weight of the particles retained on the No. 4 sieve and shall have at least two fractured faces.

2.4 Soil Sterilant

The sterilant shall be Pramitol 5SP as manufactured by CIBA-GEIGY, Monobor-chlorate, or approved equal and shall be applied in accordance with the manufacturer's or supplier's recommendations to adequately sterilize the base.

2.5 Asphalt Tack Coat

- A. The material is to be CRS-1 or CSS-1 emulsified asphalt unless otherwise approved.
- B. Furnish emulsified asphalt meeting the requirements of ODOT's publication "Standard Specifications for Asphalt Materials." Copies of the publication are available from the ODOT Pavement Services Engineer. The applicable specifications are those contained in the current publication on the date the project is advertised. The materials may be conditionally accepted at the source or point of loading for transport to the project.
- C. Excessive delay in the use of the emulsified asphalt or excessive pumping of the emulsified asphalt may significantly reduce the viscosity and may make the material unsuitable for tack coat use. For this reason, limit pumping between the bulk storage tank, hauling transportation, field storage tanks, and distributors to an absolute

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

minimum to maintain proper viscosity. Final acceptance of emulsified asphalt will be at the point of application.

- D. Dilution of the tack coat material may be allowed to a maximum 1:1 ratio. Determine the proportion of water to be added to the emulsified asphalt. Do not dilute the emulsified asphalt until the City or City Engineer approves the dilution ratio. Add the water to the emulsified asphalt and mix according to the asphalt supplier.
- E. Obtain samples according to AASHTO T 40 prior to dilution with water, if allowed. Samples will be tested at the ODOT Materials Laboratory or other laboratory as designated by the Engineer. Emulsified asphalt will be tested within 30 calendar days from the date it is sampled.

2.6 Asphalt Concrete Pavement

A. General

- 1. This section is intended for local streets, parking lots, etc. The Project Engineer shall revise these Specifications as required for improvements to collector and arterial roads as required by the City and/or other governing Agency.
- 2. Asphalt concrete pavement (ACP) shall consist of a mixture of asphalt cement, graded aggregate, and additives as required. The use of ACP in this section refers to either hot mix or warm mix asphalt concrete. ACP shall be plant mixed into a uniformly coated mass, hot laid on a prepared foundation, and compacted to the specified density.

B. Asphalt Concrete Pavement

Materials shall be in accordance with "Section 00744 - Asphalt Concrete Pavement" and related sections of the current Oregon Standard Specifications for Construction, supplemented and modified as follows:

- 1. Add the following to subsection **00744.02 Definitions**:

The terms "Agency," "Owner," and "City" may be used interchangeably in this Technical Specification.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

2. Project Mix Requirements

- a. Level 3 ACP
- b. 1/2- or 3/4-inch Dense Graded
- c. Asphalt Cement PG 64-28
- d. Lime Treated Aggregate Required

3. Delete subsection 00744.10 (c) and replace with the following:

00744.10 (c) Recycled Asphalt Shingles - No RAS materials shall be used on the project unless otherwise approved by the City Engineer.

4. Add the following to the end of subsection **00744.11 Asphalt Cement and Additives**:

Testing of the asphalt cement used on this project will be in accordance with the "Quality Control" section of the General Requirements.

5. Add the following to subsection **00744.13 Job Mix Formula Requirements**:

A previously prepared JMF will be allowed, provided adequate test data are available to document the suitability of the mix, the Contractor can document that the same materials are being used, the JMF was prepared within the last 12 months, and the JMF meets the requirements of these Specifications. Copies of the results of tests made on the mix during production on previous projects shall also be submitted if any are available.

Do not begin production on the project until the JMF is reviewed by the City or City Engineer and written consent is provided to proceed. A new JMF is required if the asphalt cement grade, any additives, or the source of the aggregate change during production. Provide a JMF for the project meeting the following criteria:

2.7 Asphalt Fog seal

Asphalt for the asphalt fog seal shall consist of CSS-1, CSS-1h, or HFRS-P1 emulsified asphalt mixed with water at a rate of 1:1.

CITY OF BOARDMAN, OREGON
TECHNICAL SPECIFICATIONS
SECTION 5
ROAD WORK

2.8 Street Monument

The monument boxes shall be equal to Model Number 3680 as cast by EJ, or approved equal, and shall have the letters MON cast in the cover. Precast concrete monuments shall be supplied by Reese Concrete or approved equal.

2.9 Culverts

- A. Culverts shall be galvanized corrugated steel pipe and shall be 14-gauge with 2-2/3" x 1/2" corrugations. Fabrication of pipe shall conform to AASHTO 218 Specifications. Coating shall be minimum 2-ounce zinc per square foot. Joints shall be made with corrugated steel culvert bands over 3/8-inch neoprene gaskets. Culvert bands shall be 12 inches wide.
- B. Bedding and backfill material, unless otherwise shown on the Drawings, shall consist of select native material free of particle sizes greater than 1-1/2-inch in diameter.

2.10 Drainage Trenches

- A. Geotextile fabric for drainage trenches shall be Mirafi 140N or equal approved by the Engineer.
- B. Drain rock shall be clean washed round river gravel, 1/2-inch to 2-inch size.

PART 3 - EXECUTION

3.1 Earthwork

- A. Clearing and Grubbing
 - 1. Clearing and grubbing shall include the removal and disposal of any obstructions, such as existing curbs, sidewalks, pavement, culverts, fences, etc., and organic material such as trees, tree stumps, brush, hedges, vegetation, roots, rubbish, posts, fences, topsoil, and any other obstacles or materials in the construction area which would prevent completing the project, and which are unsuitable for road work construction.
 - 2. All vegetation and rubbish shall be removed and disposed of by the Contractor in conformance with the requirements of local authorities controlling air pollution and solid waste disposal.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

B. Roadway Excavation

Prior to any excavation, the area to be excavated shall be cleared and grubbed. Roadway excavation shall consist of the excavation, haul, and satisfactory disposal of all materials taken from within the right-of-way for the construction of embankments, subgrade, shoulders, intersections, ditches, waterways, entrances, approaches (including excavation at private entrances outside the right-of-way), curbs, sidewalks, and incidental work, in accordance with the Specifications and the lines, grades, and cross sections provided, and as required by the City or City Engineer.

C. Embankments

1. Prior to construction of any embankment, the area beneath the embankment and the areas from which embankment material will be obtained shall be cleared and grubbed. The existing soil beneath the embankment shall then be compacted to 90 percent of maximum density as determined by ASTM D698 for a minimum of 6 inches below ground surface. Any unsuitable material shall be removed prior to placement of any embankment.
2. Upon completion of the embankment foundation, embankment material shall be placed in horizontal lifts and compacted to 95 percent of ASTM D698. Embankment lift depth shall not exceed the capability of compaction equipment being used to achieve the required compaction for the full depth of each lift. The embankment material shall be native or import free of vegetative or organic matter, boulders 6 inches or larger in diameter, or frozen material and shall be at or below optimum moisture content at the time of placement.
3. The embankment shall be brought to the lines and grade required. Any unsuitable material which may have been used in constructing the embankment shall be removed and replaced with suitable material and compacted.

D. Roadbed Cuts

1. In roadbed cuts, the subgrade material shall be compacted to 95 percent of maximum density as determined by ASTM D698 for a minimum of 6 inches below the top of the subgrade.
2. Depending on the type of material encountered, the Contractor may have to scarify, aerate or water, over-excavate, or take other actions as necessary to achieve the required compaction.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

E. Finishing of Subgrade

1. All roadbeds, ditches, and other excavations and embankments shall be trimmed accurately to the lines, grades, and cross sections, and shall be finished in a thoroughly workmanlike manner to within plus or minus 0.05 foot of the required grade. They shall be in neat and well finished condition at the time the project is completed. The entire right-of-way area shall be cleaned up and made free of debris and foreign matter of all kinds. Accumulations of dirt and/or other materials shall be disposed of in a satisfactory manner.
2. Upon completion of the subgrade and prior to placement of base rock, the Contractor shall load test the finished subgrade surface. The load test shall consist of slowly driving a loaded dump truck over the road surface. The dump truck shall have a minimum capacity of 10 cubic yards. All soft areas shall be noted. City staff and the Contractor shall note any soft areas. The Contractor shall excavate out and either replace unsuitable material or properly compact all soft areas in order to provide a firm base that conforms to the Specifications. Any soft areas that occur as part of the project because of over-watering, improper compaction, weather, etc., shall be replaced.

F. Dust and Mud Control

1. The Contractor shall be responsible for controlling dust and mud caused by his operations. This shall include, but not be limited to, street work, trench work, shoulder work, sidewalk work, driveways, connecting streets, etc. The Contractor shall be responsible for controlling dust on the roadway surface until the time asphalt pavement is placed.
2. Dust and mud control performed by the Contractor is considered a normal part of the construction project. If the Contractor fails to properly control the dust and mud, the City may request him to do so in writing. If, after 24 hours from this request, the Contractor has not corrected the dust or mud problem, the City may elect to have the corrective work performed, bill the Contractor for the work, and withhold final acceptance of the project until the bill is paid.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

3.2 Geotextile Fabric

A. Scope

This work consists of furnishing and placing geotextile fabrics in underdrains, under embankments, over roadbed subgrade, and at other locations as specified or directed by the City.

B. Construction

1. Geotextile fabric shall be installed as shown on the City Standard Drawings or as directed by the City or City Engineer.
2. Fabric placed for subgrade stabilization under embankments or over roadbed subgrade shall be placed parallel to the centerline of the roadway, with placement starting at the low side of the super elevation or crown. The fabric shall either be sewn together at all longitudinal and transverse edges or overlapped a minimum of two feet at all edges. Transverse overlaps shall be made in the direction of base material placement.

3.3 Aggregate Base and Base Rock

A. Scope

Aggregate base and base rock shall be placed to the lines, depths, and grades as required. Prior to placement of the materials, each succeeding lift, i.e., subgrade, aggregate base, base, etc., shall be properly constructed and reviewed by the City or City Engineer.

B. Construction

1. The construction procedure here described shall be understood to apply to each of the courses and/or layers of which the road base is to be constructed. The construction of the road base shall not be limited to the construction of the main roadway, but shall include the construction of base on approach roads, driveways, connecting roads and connecting streets.
2. After the subgrade is brought to the proper line, cross section and compaction, the aggregate materials shall be spread and shaped as required. The spreading and shaping of the aggregate materials shall be so performed as to prevent

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

separation of the coarser material from the finer materials including the use of adequate water.

3. The aggregate materials shall be brought to proper moisture content as required for compaction and compacted to 90 percent of maximum density as determined by ASTM D1557, as appropriate.
4. The finished surface when tested with a 10-foot straightedge shall not vary from the testing edge by more than 0.05 foot at any point.
5. Following construction of each lift, the Contractor shall do such blading, brooming, watering, and other work as necessary to prevent raveling and rutting. These operations are to be continued as required until the lift is covered by a following lift or until all work to be done under the Contract is completed. If the required compacted depth of the base exceeds 8 inches, it shall be constructed in two or more lifts, each lift not exceeding 8 inches in depth.
6. Upon completion of the aggregate materials and prior to placement of asphalt concrete pavement, the Contractor shall load test the finished base surface. The load test shall consist of slowly driving a loaded minimum 10 yard dump truck over the road surface. All soft areas shall be noted. The Contractor shall excavate and/or compact all soft areas in order to provide a firm base that conforms to the requirements of the Technical Specifications.
7. Gravel shoulders when required shall be constructed as a part of construction of the base and are not to be added on after completion of asphalt paving. The finished gravel shoulder shall be graded, trimmed and compacted to the required lines, grades and cross sections in a neat manner leaving the gravel shoulder flush with the edge of the asphalt pavement. Coarse segregated aggregate shall not be used in the construction of gravel shoulders. All such non-specification material shall be removed and replaced with specification material.

3.4 Soil Sterilant

- A. Upon completion of the base and prior to placement of asphalt concrete, the Contractor shall apply a soil sterilant to the surface of the base.
- B. The Contractor shall supply the City with a description of the sterilant and the name of the supplier prior to application in order that the suitability of the proposed product may be verified. The applicator shall be licensed by the State of Oregon for the class of

CITY OF BOARDMAN, OREGON
TECHNICAL SPECIFICATIONS
SECTION 5
ROAD WORK

herbicide utilized. Any damage to adjacent areas caused by the sterilant shall be repaired by the Contractor.

3.5 Pre-paving Conference

At least one week before paving is scheduled to begin, the Contractor will set up a pre-paving meeting between the Contractor and the City. If a paving Subcontractor is being used they shall also be present. The intent of the meeting is to allow the City and the Contractor to jointly review the proposed method of operation, equipment, personnel, mix, schedule, etc., along with the project specifications.

3.6 Asphalt Concrete Pavement

A. Scope

After satisfactory completion of the base, the Contractor shall place and compact the asphalt concrete pavement to the lines, grades, thicknesses, and cross-sections required or as established by the Project Engineer.

B. Construction

Construction shall be performed in accordance with "Section 00744 - Asphalt Concrete Pavement" and related sections of the Oregon Standard Specifications for Construction, current edition, supplemented and modified as follows:

1. Delete subsection 00744.16 and replace with the following:

00744.16 Sampling and Testing - Perform sampling and testing according to the "Quality Control" section of the General Requirements.

2. Delete subsection **00744.17 Acceptance**.

3. Replace Section 00744.30 with the following:

00744.30 Paving Crew - Only trained and experienced personnel shall be used as the paving crew performing the Work. The Contractor shall submit to the Engineer, prior to the pre-paving conference, job assignments, experience history, and training background for all members of the paving crew. Untrained and inexperienced personnel may not be used. The Engineer may request personnel be replaced if it cannot be demonstrated that they have the proper training and experience to be a part of an experienced crew. The paving

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

superintendent and paving machine operator shall have at least three years experience, and the roller operators shall have at least one year of experience.

4. Replace Section 00744.40 with the following:

00744.40 Season and Temperature Limitations - Place ACP when the temperature of the surface that is to be paved is not less than the temperature indicated, unless approved by the City or City Engineer:

Nominal Compacted Thickness of Individual Lifts and Courses as shown on the typical section of the plans	All Levels Surface Temperature*
Less than 2 inches	60°F
2 inches - 2 1/2 inches	50°F
Greater than 2 1/2 inches	40°F
Temporary	40°F

* Do not use field burners or other devices to heat the pavement surface to the specified minimum temperature unless approved.

** If placing ACP between March 15 and September 30, temperature requirement may be lowered 5°F.

5. Delete the following subsections:

- a. **00744.80 Measurement**
- b. **00744.90 Payment**

3.7 Asphalt Fog Seal

- A. One year after the construction of the asphalt concrete, the Contractor shall fog seal the asphalt concrete. The Contractor shall apply a fog seal consisting of CSS-1 emulsified asphalt mixed with water at a rate of 1 to 1 and applied at a rate to be determined by the City Engineer. It is anticipated that this rate will be between 0.05 to 0.20 (0.03 to 0.10 residual) gallons per square yard.
- B. The areas to be sealed shall be dry and free of dirt, dust, leaves, or other foreign matter at the time of placement.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

- C. Provide an asphalt distributor designed, equipped, maintained, and operated so the emulsified asphalt material is applied uniformly at even heat. The distributor shall be capable of applying the asphalt on variable surface widths up to 16 feet, at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard, and with uniform pressure. The variation allowed from any specified rate shall not exceed 0.02 gallons per square yard. Provide distributor equipment that includes a tachometer, pressure gauges, accurate volume measuring devices and a thermometer for measuring temperature of tank contents. Provide distributors equipped with a positive power unit for the asphalt pump, and full circulation spray bars adjustable both laterally and vertically. Set the bar height for triple lap coverage.
- D. After application and initial cure of the emulsified asphalt the Contractor shall apply a light coat of clean fine sand. The sand shall be applied evenly and then broomed across the pavement surface. After approximately 5 days the Contractor shall sweep the street and remove the excess loose sand.

3.8 Construction Staking

The Contractor shall provide all construction staking necessary as described in the General Requirements.

3.9 Street Monument

The Contractor shall provide and install cast iron street monument boxes at all points required by the City or County Surveyor. Monument boxes shall be installed per the City Standard Drawings. Monuments within the boxes shall be located by a Registered Professional Land Surveyor.

3.10 Adjustment of Utility Covers to Grade

The Contractor shall adjust the tops of all existing manholes, valve boxes and other utility covers as required to bring the covers or gratings of the structures to the grade required by the improvement involved. The method of adjustment shall be as approved by the City. The Contractor shall repair any of these structures which are damaged during performance of the work.

CITY OF BOARDMAN, OREGON
TECHNICAL SPECIFICATIONS
SECTION 5
ROAD WORK

3.11 Culverts

A. General

Culverts shall be installed in the location and on grade as required and specified herein.

B. Installation

Culverts shall be bedded and backfilled uniformly on both sides of the pipe at the same time to prevent displacement or buckling of the pipe. Bedding material shall be worked carefully under the pipe haunches and then compacted.

C. All culverts to be extended shall be installed at the extended grade and slope of the existing CMP.

3.12 Pavement Striping

A. General

Materials for painted traffic markings and striping shall meet or exceed the requirements for striping paint and glass beads of "Pavement Marking Materials" and "Oregon Standard Specifications for Construction," current edition. The paint color and type of markings shall be as required by the City or City Engineer. The Contractor shall lay out all pavement markings and striping.

B. Materials

Use materials conforming to the requirements of Section 00800 of the "Oregon Standard Specifications for Construction," current edition. Materials and suppliers for traffic paint, film, and reflective beads shall be listed in the ODOT Qualified Products List as approved by the City Engineer for the intended use. Type B-HS: Preformed, Fused Thermoplastic Film High Skid shall be used for all crosswalk, bicycle lane, bicycle railroad crossing, lane reduction arrow, parking lines, and other transverse pavement markings, the use of paint is not acceptable. Paint shall be standard waterborne traffic paint. Beads shall be virgin large reflective traffic beads.

CITY OF BOARDMAN, OREGON

TECHNICAL SPECIFICATIONS

SECTION 5

ROAD WORK

C. Pavement Marking Placement

Pavement striping and markings shall be placed as shown on the Project Drawings according to the Manual on Uniform Traffic Control Devices, and the ODOT Traffic Line Manual. Apply the striping and markings according to the manufacturer's recommendations. Unless otherwise specified, apply pavement striping and markings before public traffic is allowed on the freshly paved surface.

Remove and replace striping and markings not conforming to these Specifications or not properly installed before continuing the operation.

D. Submittal

A detailed of the pavement striping plan, including materials to be utilized, application process, equipment to be used, application rates, placement tolerances, accommodations for public safety, disposal of waste, and repair procedures, shall be provided to the City a minimum of seven days before placing markings.

E. Warranty

The Contractor shall guarantee the paint markings and paint striping for a period of one year from the date of application against deterioration and/or delamination beyond normal wear.

3.13 Restoration, Finishing, and Cleanup

- A. Prior to the final inspection of the work, the Contractor shall restore or replace all paved surfaces, graveled surfaces, curbing, sidewalks, trees and shrubbery, lawns, pastures and fences, or other existing facilities disturbed or damaged by his work.
- B. The Contractor shall clean up and leave in a neat, orderly condition the right-of-way and other property occupied in connection with the work.
- C. The Contractor shall reshape, clean out ditches, retrieve shoulders and slopes, and do all other work required to bring the project to the final lines, grades, and condition called for. The finished project shall be clean and neat in its final appearance.
- D. See Technical Specifications - "Surface Restoration" for additional requirements.

END OF SECTION