

RESINPAVE™

Sample Specification Format

PART 1 - GENERAL

1.01 SUMMARY

Section Includes:

1. Stabilized Aggregate Paving Surface Course.
2. Aggregate Base Course
3. Edging Materials -concrete, stone, wood, metal, dirt backfill.

1.02 REFERENCES

- A. ASTM—American Society for Testing and Materials:
 1. ASTM D4-86 (1998) —Test Method for Bitumen Content.
 2. ASTM D1557-00—Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 3. ASTM D2950-91 (1997) — Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
- B. AEMA—Asphalt Emulsion Manufacturers Association (Guidelines)
ASTM D1559-89 — Test Methods for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

1.03 DEFINITIONS

- A. Acceptance: Wherever the terms "acceptance", "accepted" or 'acceptable are used herein, they mean acceptance of General Manager in writing.
- B. Sub grade: The soil surface on which the aggregate base is placed.
- C. Finished Surface: The required final surface grade elevations of aggregate paving indicated on the Drawings.
- D. ROAD OYL® - Resin Modified Emulsion: Binding agent for *RESINPAVE™*.
- E. *RESINPAVE™*: Pavement utilizing ROAD OYL® - Resin Modified Emulsion and specified aggregate.
- F. MIX FORMULA: Mix indicating the percentage of each size of aggregate, percentage of pre-wet water and percentage of the emulsion.

1.04 SUBMITTALS

- A. Design Data: MIX FORMULA for *RESINPAVE™* mix indicating the percentage of each size of aggregate, percentage of pre-wet water, percentage of the emulsion, and total moisture content of the complete mixture as prepared for placement.
- B. Certifications:
Written certification from *RESINPAVE™* mix blender that *RESINPAVE™* mix meets specifications.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over such work.
- B. *RESINPAVE™* Pre-installation:
 1. Coordinate, schedule and conduct a meeting to review the installation requirements with the *RESINPAVE™*. Authorized Blender/Installer.
 2. Require attendance of specific people, which will install the *RESINPAVE™* and the General Manager/Contractor.

1.06 SITE CONDITIONS

Environmental Requirements:

1. Meet *RESINPAVE™* mix Authorized Blender's requirements.
2. Do not install prime coat, emulsion-aggregate mix, or seal coat if the possibility of rain is forecast within two (2) days following installation, because resin is water-dilutable.
3. Install stabilized aggregate when ambient temperature is above 60 degrees Fahrenheit and overnight temperature is above 32 degrees Fahrenheit.

PART 2— PRODUCTS

2.01 ACCEPTABLE MANUFACTURER/SUPPLIER

RESINPAVE™ Mix: Authorized *RESINPAVE™* Distributor (Schommer and Sons, Inc. 6421 NE Colwood Way, Portland OR 97218 (503) 287-4646).

2.02 MATERIALS

- A. Aggregate Base: Meet requirements of Geotechnical Report and accepted by Geotechnical Engineer.
- B. Aggregate for *RESINPAVE™* Mix: Aggregate meeting gradation below and color of specifier's designation:

Nominal Maximum Size of Aggregate

| <i>Sieve</i> | <i>Percent Passing</i> |
|--------------|------------------------|
| 3/8" | 100 |
| #4 | 92-100 |
| #8 | 56—75 |
| #16 | 31—52 |
| #30 | 20—35 |
| #60 | 13—19 |
| #100 | 12—14 |
| #200 | 7—11 |

- C. ROAD OYL® - Resin Modified Emulsion for *RESINPAVE™* Mix: Non-corrosive, water-dilutable, pitch, rosin, proprietary natural additive emulsion with 48-percent minimum solids content: minimum 23-percent rosin content of total solids content: formulated with a non-ionic emulsifying

agent formulated specifically for use as a natural flexible pavement binder with additional applications, including dust control, erosion control, prime coats, seal coats, and prime coats: minimum 1-year shelf life; will cure to a water insoluble binding and cementing agent capable of curing to high strengths, such as those exhibited by hot-mix asphalt concrete when applied to suitable pavement quality aggregates at an addition rate of 10 to 14 percent ROAD OYL® Resin Modified Emulsion by dry weight of the aggregate. Upon request, the supplier must be able to provide independent laboratory test reports from a certified analytical laboratory experienced in environmental acceptability documenting tests performed on product samples of the non-ionic pitch, rosin, proprietary natural additive emulsion. These tests must include the US EPA 7000 Series (TTLC or CAMI7) for metals and the Method 8270 testing which verify that no organic solvents or identifiable EPA 8270 target compounds were detected in amounts which exceed US EPA or State of California regulatory standards as applicable to products whose intended use involves incorporation into compacted aggregate and soil materials during construction operations.

- D. Prime Coat: Same as ROAD OYL® - Resin Modified Emulsion for *RESINPAVE™* mix.
- E. Water: Fresh, clean, potable.
- F. Seal Coat: Same as ROAD OYL® - Resin Modified Emulsion for *RESINPAVE™* mix.

2.03 MIX

- A. Aggregate Mix General Content: *RESINPAVE™* mix as supplied by authorized blender with not less than 10 percent emulsion by dry weight of the aggregate.
- B. Test properties of *RESINPAVE™* mixture: Finished mixture shall meet the requirements described below when tested in accordance with the Marshall Stability Test, ASTM D 1559, and where samples are prepared in accordance with ASTM methods for "Preparation of Asphalt Emulsion/Dense-graded Aggregate Specimens" per ASTM D 4 Working Documents issued in 1993, or final documents if published and available at time of project award.

Requirements for Marshall Stability Flow are shown below:

Test Properties

| <i>Property</i> | <i>Value</i> |
|--------------------------|--------------|
| Stability Minimum: | 1800(Lbs.) |
| Flow (1/100-inch units): | 8 -15 |

PART 3— EXECUTION

3.01 INSTALLERS

Installer shall be a certified installer of Authorized *RESINPAVE™* Distributor.

3.02 EXAMINATION

- A. Verification of General Conditions: Examine site and verify that conditions are suitable to receive work and that no defects or errors are present which would cause defective installation of products or cause latent defects in workmanship and function.
- B. Sub grade: Review sub grade to verify that it has been graded to the correct grades and compacted as required for correct installation of the aggregate base.

- C. Unsuitable conditions: Before proceeding with work, notify the General Manager in writing of unsuitable conditions and conflicts.

3.03 PREPARATION

A. Protection of Existing Conditions:

1. Use every possible precaution to prevent damage to existing conditions to remain such as structures, utilities, irrigation systems, plant materials and paving on or adjacent to the site of the work.
2. Provide barricades, fences or other barriers as necessary to protect existing conditions to remain from damage during construction.
3. Do not store materials or equipment, permit burning, or operate or park equipment under the branches of existing plants to remain.
4. Submit written notification of conditions damaged during construction to the General Manager/Contractor immediately.

B. Sub grade Preparation:

1. Refer to Geotechnical Report for sub grade preparation prior to placement of fill or aggregate base.
2. Grade sub grade with uniform slope between points where elevations are given.
3. Use equipment of proper size and appropriate type to achieve grades required.
4. Grade sub grade surface to within 0.05 foot of finish grade minus aggregate base and aggregate paving thickness.
5. Fill and compact any depressions and remove loose material to finish true to line and grade, presenting a smooth, compacted and unyielding surface, except where indicated otherwise.
6. Remove debris, loose dirt and other extraneous materials.
7. **Important:** It is at this time all proper drainage design elements should be in place. Ditches, drains, and drain pipes should be installed to assure protection of the pavement and base from cross flows of water. All water flow should be directed off of and away from the pavement and base.

3.04 SURVEY REQUIREMENTS

- A. Lines and Levels: Establish lines and levels. Locate and lay out by instrumentation and similar appropriate means for aggregate paving finish grades.
- B. Staking: Provide a sufficient quantity of grade stakes as required to provide aggregate paving with smooth finish grades and positive drainage.

3.05 AGGREGATE BASE

- A. Placement and Compaction: Meet placement, compaction, maintenance and finished surface requirements using the same standards as local codes and practices for asphalt paving. **The base must be firm and unyielding.**
- B. Tests will be performed periodically for compliance.

3.06 APPLICATION OF PRIME COAT

Prime Coat Application:

1. Base must be dry before prime coat application.

2. Apply prime coat to aggregate base surface at a rate of 0.1 gallon per square yard.
3. Provide a field-verifiable application method, which will reliably place prime coat material at controlled rates with uniform pressure and with an allowable variation from the specified rate not to exceed 0.02 gallon per square yard.

3.07 INSTALLATION OF STABILIZED AGGREGATE PAVING

A. Placement of *RESINPAVE™* Mix:

1. Place mix after prime coat has been applied.
2. Do not place mix without enough time to complete placement and initial compaction during daylight hours.
3. Place mix via a single, continuous operation using a self-propelled mechanized spreading and finishing machine designed specifically for that purpose, equipped with a screen or strike-off assembly capable of being accurately regulated and adjusted to a uniform depth to provide a structural section of a minimum of 2 inches compacted thickness upon completion of final compaction.
4. If slope of surfaces to be paved exceed 4 percent, place material in an uphill direction unless otherwise approved by the General Manager.

B. Initial Compaction:

1. Begin initial compaction as soon after mix placement as mix will bear roller without undue displacement.
2. If mix will not support compaction equipment due to excess moisture delay initial compaction until mix achieves adequate stability to support compaction equipment.
3. Perform initial breakdown compaction with self-propelled steel drum rollers that can be operated in static or vibratory mode.
4. Whether using static or vibratory rollers when working on grades 4 percent or steeper, operate equipment at slow speeds and with the drive wheel forward to the uphill direction of work progress.
5. Determine the compaction protocol with the assistance of the *RESINPAVE™* mix supplier. Generally, no more than two passes are required for initial compaction. Warning: If the pavement begins to develop stress cracks, the pavement is being over compacted and further compaction should be halted.
6. Test paving surface for slope and smoothness after initial rolling, and correct deficiencies immediately so that finished surface will meet specified tolerances and requirements for smoothness.
7. Furnish and maintain at site clean 10-foot long aluminum straight-edge having blades or box or box-girder section with a flat bottom reinforced to ensure rigidity and accuracy, with handle to facilitate movement on pavement, available for use by the General Manager.

C. Final Compaction:

1. Use a pneumatic roller such as the Leeboy 420 Pneumatic Roller or a 1-ton steel drum roller.
2. Begin final compaction as soon as possible after initial compaction has been completed.

3. The purpose of final compaction is to eliminate roller marks from the initial compaction step and to make the *RESINPAVE™* surface aesthetically appealing. The minimum number of passes possible to achieve these goals is specified.

D. Edging Materials:

1. Edging materials should be in place prior to the beginning of paving placement. The *RESINPAVE™* compacted surface should be as high as but no more than 1/8" above the edging material to assure proper drainage.
2. In the absence of edging materials, the *RESINPAVE* edges should be compacted and backfilled with dirt to grade to assure proper drainage.

3.08 SEAL COAT

A. Application:

1. Surface must be swept or water flushed free from mud, dust, or dirt prior to seal coat application. Caution must be paid to protecting surface from damage during sweeping or water flushing.
2. Protect pavement surface against track on of dirt and mud until seal coat application has been completed.
3. Apply 2 seal coats, each to refusal, with 3 hours between each coat to surface of completed pavement not earlier than 24 hours and not later than 7 days following final compaction.
4. Apply each seal coat at rate of 0.005-0.05 gallon of *RESINPAVE™* - Resin Modified Emulsion per square yard. Dilute ROAD OYL® - Resin Modified Emulsion 1:1 to 5:1 with water prior to application.
5. Provide verifiable application method, which will reliably place the product at controlled rates with uniform pressure and with an allowable variation from specified rate not to exceed 0.02 gallon per square yard.
6. Make applications in multiple passes as necessary to avoid loss of the material from run-off.

B. Curing:

1. Allow seal-coated surface to dry for 48 hours prior to allowing traffic on pavement.
2. Verify seal coat is adequately cured before allowing traffic on seal-coated surface. Wind, temperature, humidity, and pavement surface absorbency affect drying and curing rates.

3.09 TOLERANCES

A. In-Place Compacted Thickness:

1. Aggregate Base Course: Maximum 1/2 inch plus, minus 0 inch.
2. Aggregate Paving Surface Course: Maximum 3/16 inch plus, minus 0 inch.

B. Finished Surface Smoothness:

1. Sub grade: Plus or minus 0.08 foot.
2. Aggregate Base Course: Maximum 3/8 inch in 10 feet 0 inch.
3. Aggregate Paving Surface Course: Maximum 3/16 inch in 10 feet 0 inch any direction.

3.10 REPLACEMENT OF DEFECTIVE PAVEMENT

A. Areas to Be Replaced:

1. Replace full depth of paving thickness in paving mixes that are contaminated or pavement that is defective.
 2. Skin patching will not be permitted.
- B. Edges of Replaced Pavement:
1. Cut edges of pavement to be removed so that sides are vertical and oriented perpendicular and parallel to direction of traffic.
 2. Spray edges with a prime coat of *RESINPAVE™* - Resin Modified Emulsion
- C. Installation:
1. After applying prime coat, place *RESINPAVE™* mix in areas where paving was removed in sufficient quantity that will allow finished surface to conform to elevation and tolerance requirements.
 2. Thoroughly compact *RESINPAVE™* mix so that cured patch meets requirements specified herein.
 3. Skin patching of an area that has been rolled will not be permitted.

3.11 FIELD QUALITY CONTROL

- A. Density Tests:
1. Perform tests in accordance with ASTM D 2950.
 2. Perform tests at least three days after final compaction.
 3. Perform one test per 2,000 square feet of *RESINPAVE* installed.
- B. *RESINPAVE™* Finished Surface Smoothness:
1. Test pavement continuously following initial compaction for smoothness and correct profile by laying a 10-foot straightedge on the paving finished surface parallel to road or path centerline.
 2. Surface shall not vary more than 3/16 inch, except at intersections or changes of grade.
 3. Correct areas not meeting specified surface tolerance immediately after initial compaction.
- C. *RESINPAVE™* Course Thickness:
- Correct areas not meeting specifications immediately after initial compaction.

3.12 PROTECTION

- A. Traffic Restriction:
1. Protect pavement surface against equipment and traffic until pavement has cured sufficiently to support traffic without marring, rutting, tearing, distressing, or damaging the pavement in any way.
 2. Utilize warning signs, barricades, and protection fencing to protect pavement from traffic.
- B. Drainage: Provide drainage during construction to prevent water from collecting or standing on areas to be paved or areas of freshly placed pavement
- C. Stabilized Aggregate: Protect surface and edges from traffic for minimum 48 hours by using barricades, fencing or other accepted methods.

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