

BITUMINOUS CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 1. Base Courses
 2. Leveling Courses
 3. Finish Course

B. General: This work shall consist of one or more courses of bituminous mixture, constructed on a prepared foundation in accordance with these Specifications and the type of surface being placed, and in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the Engineer.

1.02 REFERENCES

A. Vermont Agency of Transportation Standard Specifications, 1990 Edition.

1.03 PROJECT CONDITIONS

A. Bituminous concrete shall not be placed between November 1, and May 1. Material shall not be placed when the air temperature at the paving site in the shade and away from artificial heat is 40 degrees Fahrenheit or below or when the granular subbase is wet.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bituminous materials shall conform to the requirements of the Vermont Agency of Transportation Standard Specifications (VAOT).

| | |
|---|--------|
| VAOT Bituminous Concrete Paving Sections: | |
| 1. Course Aggregate | 704.10 |
| 2. Fine Aggregate | 704.10 |
| 3. Mineral Filler | 704.10 |
| 4. Asphalt Cement | 702.02 |
| 5. Emulsified Asphalt RS-1 | 702.04 |

B. Gradation: Materials shall be combined and graded to meet composition limits specified under Item 406.03, Type II for base course and Type IV for finish course.

C. Thickness of paving shall be a total of 3", consisting of 2" base course and 1" finish course.

2.02 TRAFFIC MARKINGS

A. Traffic marking paint to be factory-mixed, meeting the VAOT requirements, Section 708.08.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with VAOT Standard Specifications, Section 406.

3.02 EXAMINATION

- A. Verify base conditions under provisions of the Earthwork Section.
- B. Verify that compacted granular base is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.

3.03 PREPARATION

A. Matching Surfaces: When a new pavement is to match an existing bituminous pavement for a roadway or trench, the Contractor shall vertically smooth cut the existing pavement, over the existing gravel base. The smooth cut shall be thoroughly cleaned and coated with Emulsified Asphalt, RS-1, just prior to paving.

3.04 PREPARATION - TACK COAT

A. When the bottom course of bituminous concrete pavement is left over the winter, or paving is to be made over an existing bituminous concrete pavement, the existing surface shall be cleaned and Emulsified Asphalt applied before the next course is applied.

B. Also apply to contact surfaces of curbs.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.05 PLACING ASPHALT PAVEMENT

A. Place to compacted thickness identified on the plans.

B. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

C. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06 JOINTS

A. Joints between old and new pavements or between successive day's work shall be made so as to insure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

B. Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline where the pavement has a true surface as determined by the use of a straight-edge. The butt joint shall be thoroughly coated with Emulsified Asphalt, Type RS-1, just prior to depositing the paving mixtures.

C. Longitudinal joints that have become cold shall be coated with Emulsified Asphalt, Type RS-1, before the adjacent mat is placed. If they have been exposed to traffic, they shall be cut back to a clean vertical edge prior to painting with the emulsion.

D. Unless otherwise directed, longitudinal joints shall be offset at least 6" from any joint in the lower courses of pavement. Transverse joints shall not be constructed nearer than one foot from the transverse joints constructed in lower courses.

3.07 TOLERANCES

- A. The surface will be tested by the Engineer using a 16 foot straight-edge at selected locations parallel with the centerline. Any variations exceeding 3/16 of an inch between any two contacts shall be satisfactorily eliminated. A 10 foot straight-edge may be used on a vertical curve. The straight-edges shall be provided by the Contractor.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation from True Elevation: Within 1/2 inch.

3.08 FIELD QUALITY CONTROL

A. Permit no vehicular traffic on surfaces until thoroughly cool and hard.

PERMANENT SEEDING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Furnishing all labor, materials, and equipment to complete all seeding work as shown on the drawings and specified herein.
2. Except where otherwise shown or specified, the Contractor shall seed all areas where new contours are shown on the drawings and all areas where existing ground cover has been disturbed by the Contractor's operations.

1.02 SUBMITTALS

A. Provide the following for approval prior to delivery to the site:

1. Supplier's Certificate of Compliance attesting that lime, fertilizer and seed meet the requirements specified.
2. The Contractor shall provide representative topsoil samples for testing and approval, deliver samples to a public extension service agency testing laboratory, have testing report sent directly to the Landscape Architect and pay all costs. Testing shall report on mechanical and chemical (pH soluble salts) analysis. Report shall be submitted at least one month before any seeding is to be done.

1.03 SEEDING SEASONS

A. Seeding and initial fertilizing shall be done between April 1 and June 1, between August 15 and October 15, or as permitted. Seeding shall not be done during windy weather or when the ground is frozen, excessively wet, or otherwise unworkable. If seeding is done during July or August, additional mulch material may be required by the Engineer.

PART 2 - PRODUCTS

2.01 LIME

A. Lime shall be standard, ground dolomite limestone, agricultural grade, containing a minimum of 95% of calcium and magnesium carbonates. 100% shall pass the 10 mesh sieve; minimum 90% shall pass the 20 mesh sieve; minimum 40% shall pass the 100 mesh sieve.

2.02 FERTILIZER

A. Fertilizer shall be commercial grade granular fertilizer. The fertilizer shall be delivered to the project in new, clean, sealed containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, the brand and the name and address of the manufacturer. The fertilizer and labels shall conform to all existing State and Federal regulations, and shall meet the standards of the Association of Official Agricultural Chemists.

2.03 GRASS SEED

A. Provide fresh, clean, new-crop seed of the grass species, proportions and minimum percentages of purity, germination and maximum percentage of weed seed as follows:

| | | | |
|---------------------|----------------|---------------------|----------|
| | Minimum Purity | Minimum Germination | Lbs/Acre |
| Kind of Seed | | | |
| Creeping Red Fescue | 96% | 85% | 40 |
| Perennial Ryegrass | 98% | 90% | 50 |
| Kentucky Bluegrass | 97% | 85% | 25 |
| Redtop | 95% | 80% | 5 |
| | TOTAL = | | 120 |

2. Slope seed shall normally be used for all slope work, usually 3:1 or steeper and shall conform to the following table:

| | | | |
|---------------------|----------------|---------------------|----------|
| | Minimum Purity | Minimum Germination | Lbs/Acre |
| Kind of Seed | | | |
| Creeping Red Fescue | 96% | 85% | 35 |
| Perennial Ryegrass | 98% | 90% | 30 |
| Redtop | 95% | 80% | 5 |
| Alsike Clover | 97% | 90% | 5 |
| Birdsfoot Trefoil | 98% | 80% | 5 |
| | TOTAL = | | 80 |

B. The seed mixture shall be delivered in new, clean, sealed containers. Labels and contents shall conform to all State and Federal regulations. Seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

C. Seed that has become wet, moldy, or otherwise damaged will be rejected.

2.04 MULCH

A. Mulch must be installed on all seeded areas. The following mulches are acceptable for use.

1. Hay mulch free of weeds and coarse matter at a rate of 90 pounds per 1,000 square feet.
2. Wood fiber applied in a slurry (1/6" or longer) at a rate of 40 pounds per 1,000 square feet.

2.05 WATER

A. All water used shall be obtained from fresh water sources and shall be free from injurious chemical and other toxic substances harmful to plant life. No water which is brackish will be permitted at any time. The Contractor shall identify to the Engineer all sources of water at least two weeks prior to use. The Engineer, at his discretion, may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is disapproved by the Engineer following such tests.

2.06 HERBICIDES

- A. A pre-emergence herbicide, siduron (lupersan), shall be applied to the finished topsoil if seeding is to occur prior to June 1. This type of herbicide is effective against germinating seeds - it kills the plants before they emerge to the soil surface. More importantly, it does not interfere with the germination of cool season grasses such as Kentucky Bluegrass and C-26 Hard Fescue.
- B. Application: Contractor shall use extra care in handling. Siduron, commonly known as "lupersan", shall be applied at the manufacturer's recommended rate.

2.07 FINAL FERTILIZER

A. "Uramite" or "Nitroform" containing 38% nitrogen in a slow release form.

PART 3 - EXECUTION

3.01 PREPARATION

A. Examine finish surfaces and grades. Do not start seeding work until unsatisfactory conditions are corrected. Perform seeding work only after planting and other work affecting ground surface has been completed.

B. Notify Landscape Architect at least seven (7) working days prior to starting seeding.

- C. Prepare areas immediately prior to seeding as follows:
 1. Loosen soil of seed areas to a minimum depth of 4".
 2. Remove stones over 1" in any diameter and sticks, roots, rubbish and extraneous matter.
 3. Remove existing weeds and grasses by pulling or killing under.
 4. Grade areas to be seeded to a smooth, free draining even surface with a loose, moderately coarse texture.
 5. Remove ridges and fill depressions as required to drain.
 6. Restore prepared areas if eroded or disturbed prior to seeding.

3.02 SEEDING CONDITIONS

A. Seeding shall not be done when the ground is frozen, snow covered, muddy, or in any other unsatisfactory condition for planting. No seeding operations shall be conducted under adverse weather conditions or when soil moisture conditions are unfavorable (too wet or too dry) or when winds exceed 5 MPH.

B. Construction methods shall be those established as agronomically acceptable and feasible and which are approved by the Engineer. The Contractor shall keep all equipment and vehicular and pedestrian traffic off areas that have been seeded to prevent excessive compaction and damage to young plants. Where such compaction has occurred, the Contractor shall rework the soil to make a suitable seed bed; then reseed and mulch such areas with the full amounts of the specified materials, at no extra expense to the Owner.

C. Surface and seepage water should be drained or diverted from the site to prevent drowning or winter killing of the plants.

D. All areas and parts of areas which fail to show a uniform stand of grass for any reason whatsoever shall be reseeded, and such areas and parts of areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass.

E. Watering is considered a necessary element for establishment and survival.

F. Where ryegrass has been planted for temporary erosion control and has not been eliminated prior to the completion of the work, such areas shall be disced at least 3 inches deep and seeded to permanent grasses to prevent the ryegrass from reseeding and becoming competitive with and retarding development of the permanent cover.

3.02 SEEDING

A. Lime and fertilizer should be applied prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

Agricultural limestone, 2 tons per acre or 100 lbs. per 1,000 square feet.

Nitrogen (N), 50 lbs. per acre or 1.1 lbs. per 1,000 square feet.

Phosphate (P205), 100 lbs. per acre or 2.2 lbs. per 1,000 square feet.

Potash (K2O), 100 lbs. per acre or 2.2 lbs. per 1,000 square feet.

(Note: This is the equivalent of 500 lbs. per acre of 10-20-20 fertilizer or 1,000 lbs. per acre 5-10-10).

B. Seed should be spread uniformly by the method most appropriate for the site. Methods include broadcasting and hydroseeding as follows:

1. Broadcasting: Sow seed using mechanical spreader at a rate of 4 lbs./1,000 square feet. Distribute seed evenly over entire area by sowing equal quantity in tow directions at right angles to each other. Rake seed lightly into top 1/8" of topsoil, roll lightly and water with a fine spray.
2. Hydroseeding: Mix specified seed, fertilizer and pulverize mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

3.03 MULCHING

A. Mulch materials shall be spread uniformly by hand or machine at a rate of two 50 lb. bales per 1,000 square feet.

B. Organic Mulch Anchoring - Straw or hay mulch must be anchored immediately after spreading to prevent wind blowing.

3.04 MAINTENANCE

A. The maintenance period shall begin immediately after seeding and shall continue until acceptance.

B. All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. Where erosion is observed, additional mulch shall be applied. Net should be inspected after rainstorms for dislocation or failure. If washouts or breakage occur, reinstall net as necessary after repairing damage to the slope. Inspections should take place until grasses are firmly established. Grasses shall not be considered established until a ground cover is achieved which is mature enough to control soil erosion and to survive severe weather conditions. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; repair as needed.

C. Seeding areas shall be protected and maintained by watering, reseeding, mowing, weeding, rolling, insect or disease control measures, re-fertilizing and repair of washouts which are necessary.

C. The Contractor shall maintain all seeded areas until full vegetation is established.

D. The Contractor shall also keep all seeded areas free from weeds and debris, such as stones, cables, baling wire, and he shall mow at his own expense all slopes 4:1 or less (flatter) and level turf established (seeded) in the following manner:

1. When grass reaches a height of 4-6", mow to a height of 3".
2. At least two cuttings shall be made prior to final acceptance.

E. Following mowing, all permanent seeding grass areas (mowed and unmowed) shall receive a uniform application of slow release fertilizer hydraulically placed at the rate of 10 pounds per 100 square feet.

3.05 ACCEPTANCE

A. Inspection to determine acceptance of seeded areas will be made by the Landscape Architect, upon Contractor's written request.

1. Provide notification at least ten (10) working days before requested inspection date.

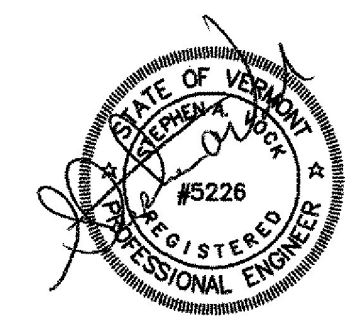
B. Seeded areas will be acceptable provided all installation and maintenance requirements have been complied with and a healthy uniform lawn is established.

C. Upon acceptance, the Owner will assume maintenance.

3.06 WARRANTY

A. All seeded areas will be warranted for a period of twelve months from date of Owner's acceptance. Should any seeded areas fail to maintain full vegetation, failed areas will be refurbished until this specification is achieved at the cost of the Contractor.

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| Date | | Ch'k'd | | Revision | | SHELburne | | VERMONT | |
| Drawn by | ACL | Date | FEB., 2003 | | | | | SHEET | |
| Checked by | SAV | Scale | NONE | | | | | CIVIL ENGINEERING ASSOCIATES, INC. | |
| Approved by | | Project No. | 95160 | | | | | SHELburne, VERMONT | |

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