

SECTION 01 71 - PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division 01 and the Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

- 1. Expansion and contraction joints within portland cement concrete pavements
2. Joints between portland cement concrete and asphalt pavements
B. Related Sections include the following:
1. Division 02 "Asphalt Paving" for contracting joints between concrete and asphalt pavements
2. Division 02 "Concrete Paving" for contracting joints in concrete paving
3. Division 7 "Street Sealants" for sealing manholes and traffic joints in concrete not specified in this Section

1.3 SUBMITTALS

- A. Product Data: For each joint sealant, product literature.
B. Samples for Verification: For each type and color of joint sealant required. Install joint sealant samples in 1-2 wide joints formed between two 6-inch wide strips of material simulating the appearance of prepared surfaces adjacent to joint sealants.
C. Product Certifications: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:
1. Methods for testing joint sealants and joint sealant backer materials have been used for compatibility and adhesion with joint sealants.
2. Interpretations of test results and written recommendations for primers and substrate preparation needed for adhesion.
F. Product Test Reports: From a qualified testing agency indicating joint sealants comply with requirements, based on comprehensive testing of correct product formulations.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint sealant installations with a record of successful in-service performance.
B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency, based on testing correct product formulations within a 90-day period.

- 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM F 1021 to conduct the testing indicated, as documented according to ASTM F 548.
2. Test joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
D. Performance (Compatibility and Adhesion) Testing: Submit to joint sealant manufacturer, for testing indicated below, samples of materials that will contact an adjacent joint sealant.
1. Use manufacturer's standard test methods to determine whether primers and other specific joint preparation techniques are required to obtain rapid, uniform adhesion of joint sealants to joint substrates.
a. Perform tests under environmental conditions replicating those that will exist during installation.
2. Submit test results that show pieces of each type of material, including joint substrates, joint sealant backer materials, sealant, and sealant/substrate material.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials being tested, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of readily identifiable primers.
5. Testing will not be required if joint sealant manufacturer submits test preparation data that are based on previous testing of correct product products for adhesion to, and compatibility with, joint substrate and other materials matching those indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or transfer into labels indicating manufacturer, product name and designation, lot number, expiration date, lot size, curing time, and mixing instructions for multicomponent materials.
B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperatures conditions are outside limits permitted by joint sealant manufacturer.
2. When joint substrates are wet.
B. Moist Weather Conditions: Do not proceed with installation of joint sealants when joint substrates are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until conditions are capable of interfacing with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- C. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry, thereafter, fertilize normally irrigated and watered areas monthly through growing season.
1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq ft (0.5 kg per 100 sq m) of lawn area.

A. Compatibility: Provide joint sealants, backer materials, and other related materials that are compatible with one another and with joint substrates under conditions of use and application, as demonstrated by joint sealant manufacturer based on testing and field experience.

- 2.2 COM-D-APPLIED JOINT SEALANTS
A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonacid silicone sealant complying with ASTM D 5983 or Type NS.
B. Type SI Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-healing silicone sealant complying with ASTM D 5983 for Type SI.
C. Available Products: Subject to compliance with requirements, all-qualified joint sealants that may be incorporated into the Work include, but are not limited to the following:
D. Products: Subject to compliance with requirements, provide one of the following:
1. Type NS Silicone Sealant for Concrete:
a. Borden or Silovac SI, Covulac Inc.
b. 885, Dem Coatings
2. Type SI Silicone Sealant for Concrete and Asphalt:
a. 896-SI, Udo Coatings
2.3 HOT-APPLIED JOINT SEALANTS
A. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 5486.
B. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 5487.
C. Available Products: Subject to compliance with requirements, all-qualified joint sealants that may be incorporated into the Work include, but are not limited to the following:
D. Products: Subject to compliance with requirements, provide one of the following:
1. Elastomeric Sealant for Concrete:
a. Supersol 454 777, Craftco, Inc.
b. POLY-JET 3400, W.R. Meadows, Inc.
2. Sealant for Concrete and Asphalt:
a. ROADMAVER 221, Crusto Inc.
b. Product 9990, Koch Materials Company
c. Product 6930, Koch Materials Company
d. SEALIGHT 80-SPEC, W.R. Meadows, Inc.
2.4 JOINT SEALANT BACKER MATERIALS
A. General: Provide joint sealant backer materials that are nonshrinking, are compatible with joint sealants, sealants, primers, and other joint fillers, and are approved for application indicated by joint sealant manufacturer based on field experience and laboratory testing.
B. Round Backer Rod for Cold and Hot-Applied Sealants: ASTM D 1424, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
C. Round Backer Rods for Cold-Applied Sealants: ASTM D 1249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.5 PRIMERS

- A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from manufacturer's joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with backer present, for compliance with requirements for joint preparation, installation of backer, and other conditions affecting joint sealant performance.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean joint areas immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on manufacturer's joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confirm primer to meet of joint-sealant bond, do not allow spillage or negative areas adjoining surface.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless other instructions apply.
B. Surface Protection: Sealants: Comply with recommendations of ASTM C 1183 for use of joint sealants on applicable materials, applications, and conditions indicated.
C. Joint Backer Materials: If pre-indicated to support sealants during application and/or positions required to produce cross-sectional shape and depth of installed sealants relative to joint width, that allow optimum sealant expansion capability.
1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove shoulder backer materials that have become wet before sealant application and replace them with dry materials.
D. Install sealants by proven techniques to comply with the following and all other joint backings are installed:
1. Seal sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses for each joint configuration.
3. Produce uniform, cross-sectional shape and depth relative to joint width that allow optimum sealant expansion capability.
E. Filling of Narrow Joints: Immediately after sealant application and before skinning or curing begin, joint sealants according to manufacturer's specified backer tool or prior experience. Use of backer tool is recommended, to eliminate air pockets, and to ensure correct seal sealant depth of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joint.

SECTION 01 91 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

- 1. Turf grading and preparing lawn areas.
2. Fertilizing and applying lime top-dress.
3. Fertilizing and applying soil amendments.
4. Fertilizing and applying fertilizers.
5. Seeding new lawns.
B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 01 Section "Earth Moving" for excavating, filling, rough grading, and subsurface aggregate drainage and drainage basins.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for the following:

- 1. Amendments, seed, and fertilizers.

C. Certification of grass seed from seed vendor for each grass seed variety during the historical and custom name and percentage by weight of each variety and percentage of purity, germination, and weed seed. Include the year of packaging.

- 1. Certification of each seed mixture for soil, identifying soil source, including name and telephone number of supplier.

D. Certification by product manufacturer that the following products supplied comply with requirements:

- 1. Limestone.
2. Fertilizers.

E. Installer's Field Supervision: Require installer to maintain an experienced field supervisor responsible for the Project site during times that grass planting is in progress.

F. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted data in conformity to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

C. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency testing percentages of organic content, inorganic matter (silt, clay, and sand), cation exchange capacity, pH, and nutrient and phosphorus content of topsoil.

1. Repeat analyses of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any lime, iron, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and unopened containers.

1.6 COORDINATION AND SCHEDULING

- A. Planting Season: Seed lawn seed during normal planting seasons for type of lawn work required. Coordinate planting with appropriate maintenance periods to provide required maintenance from date of substantial completion.
B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

1.7 MAINTENANCE

- A. Begin maintenance of lawn immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
1. Seeded Lawns: 60 days after date of substantial completion.
a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
B. Mow and establish lawns by watering, fertilizing, weeding, mowing, trimming, reseedling, and other operations. Sift, rake, and replace lawns or seeded areas and reseed to produce a uniformly sown lawn.
1. Mow lawns at least once with some materials specified for lawn.
2. Add new seeds to areas where seeds have been destroyed by mow or maintenance operations sufficiently to refill, as purpose. As fast as required to prevent displacement.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches (100 mm).

- 1. Lay out temporary lawn-watering system and arrange watering schedule to prevent watering, seedling, erosion, and displacement of seed or mulch. Lay out temporary watering system in avoid walking over, treading, or trampling seeded areas.
2. Water lawn at the minimum rate of 1 inch (25 mm) per week.
D. Mow lawns as soon as there is enough turf growth to cut with mower set at specified height for particular species planted. Request mowing or required to maintain specified height without mowing more than 40 percent of the grass height. Mow no more than 40 percent of grass-lawn height in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height:
1. Mow grass from 3 to 3 1/2 inches (75 to 75 mm) high.

E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry, thereafter, fertilize normally irrigated and watered areas monthly through growing season.

- 1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq ft (0.5 kg per 100 sq m) of lawn area.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Shall be Tall Fescue or Creeping Bermuda Grass as specified on plan with a 97% minimum purity and 85% minimum germination, and be free of such as weed seeds, as certified by the North Carolina Crop Improvement Association or its approved equivalent. Seed shall be delivered to the site in sealed, unopened clear containers, showing weight, variety, name of vendor and packaging net. Seed which has become wet, moldy or otherwise damaged will not be accepted. Seed varieties will be considered for review:
1. Seed Type:
a. Tall Fescue - an equal blend of three of the following varieties: Arad, Falcon, Regor II, Rebel II, Winchester, Windsor 3 III.
b. Bermuda Ryegrass
2.2 TOPSOIL
A. Fertilizer: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, but of sizes 1 inch (25 mm) or larger in any dimension, and other excessive materials harmful plant growth.
1. Topsoil Source: Annual exclusive soil to produce topsoil. Surface of soil to be topsoil depth when topsoil. Remove surface soil stockpiled on site. Verify suitability of surface soil to produce topsoil meeting requirements and any other necessary. Contractor shall determine quantities on site and the depth of stockpiled soil and specifications as necessary to provide topsoil to depths indicated on drawings. Soil shall be taken only from free of roots, stones, soil, clay, and other materials that are not suitable for plant growth.

2.3 SOIL AMENDMENTS

- A. Lime: ASTM C 601, Class T, agricultural limestone containing a minimum of 90 percent calcium hydroxide equivalent, with a minimum 80 percent passing a No. 10 sieve and a maximum 75 percent passing a No. 20 sieve.
1. Provide lime in the form of 40-lb (18-kg) bags.
B. Amendment Substrate: Commercial grade, white, unbleached.
C. Seed: Clean, washed, natural or processed, and free of toxic materials.
D. Perlite: Heat-treated, washed, and free of toxic materials.
E. Peat: Peat moss, washed, and free of toxic materials.
F. Peat: Peat moss, washed, and free of toxic materials.
G. Peat: Peat moss, washed, and free of toxic materials.
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O. Peat: Peat moss, washed, and free of toxic materials.
P. Peat: Peat moss, washed, and free of toxic materials.
Q. Peat: Peat moss, washed, and free of toxic materials.
R. Peat: Peat moss, washed, and free of toxic materials.
S. Peat: Peat moss, washed, and free of toxic materials.
T. Peat: Peat moss, washed, and free of toxic materials.
U. Peat: Peat moss, washed, and free of toxic materials.
V. Peat: Peat moss, washed, and free of toxic materials.
W. Peat: Peat moss, washed, and free of toxic materials.
X. Peat: Peat moss, washed, and free of toxic materials.
Y. Peat: Peat moss, washed, and free of toxic materials.
Z. Peat: Peat moss, washed, and free of toxic materials.

G. Mulch: Well-rotted unbleached poultry manure containing not more than 2% percent of lime, straw, or other bedding materials; free of toxic substances, stones, sticks, wood chips, and other materials that will prevent actual nitrogen of at least 1 lb per 1000 sq ft (0.5 kg per 100 sq m) of lawn area.

H. Herbicides: EPA registered and approved, if type recommended by manufacturer.

I. Water: Potable.

2.4 FERTILIZER

- A. Inorganic: Commercial, fast, finely ground, minimum of 4 percent nitrogen and 20 percent phosphoric acid.
B. Superphosphate: Commercial, phosphate material, minimum of 16 percent nitrogen and 20 percent phosphoric acid.
C. Commercial Fertilizer: Commercial, complete fertilizer of equal parts consisting of 50 percent slow-release nitrogen, 10 percent nitrogen, 10 percent phosphorus, and 10 percent potassium, and 10 percent iron.
1. Commercial Fertilizer: Commercial, complete fertilizer of equal parts consisting of 50 percent slow-release nitrogen, 10 percent nitrogen, 10 percent phosphorus, and 10 percent potassium, and 10 percent iron.
2. Commercial Fertilizer: Commercial, complete fertilizer of equal parts consisting of 50 percent slow-release nitrogen, 10 percent nitrogen, 10 percent phosphorus, and 10 percent potassium, and 10 percent iron.

2.5 MULCH

- A. Straw Mulch: Provide clean, dry, clean mulch and weed-free soil by or shredded straw of wheat, rye, rice, or barley.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawn and grass for compliance with requirements and for conditions affecting performance of Work of this Section. Do not proceed with installation until satisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavement, and other facilities, trees, shrubs, and planting from damage caused by planting operations.
B. Provide erosion-control measures to prevent erosion or displacement of soil and discharge of sedimenting water runoff or sediment from site to adjacent streets and walkways.

3.3 PLANTING SOIL PREPARATION

- A. Limit subgrade preparation to areas that will be planted to the immediate future.
B. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rind, and other contaminants causing compaction.

E. Provide joint configurations to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

- 6. Provide removed joint configurations for different sections of masonry depth and as locations indicated.

3.4 CLEANING

- A. Clean off excess sealant or sealant excess adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturer of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes to sealants are written instructions or damage of time or substantial completion. If, despite such protective, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that all other systems water are undisturbable from the original work.

3.6 PROTECTION

- A. Surface Cleaning of Joints: Clean joint areas immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

3.7 JOINT PRIMING

- A. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on manufacturer's joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confirm primer to meet of joint-sealant bond, do not allow spillage or negative areas adjoining surface.

3.8 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless other instructions apply.
B. Surface Protection: Sealants: Comply with recommendations of ASTM C 1183 for use of joint sealants on applicable materials, applications, and conditions indicated.
C. Joint Backer Materials: If pre-indicated to support sealants during application and/or positions required to produce cross-sectional shape and depth of installed sealants relative to joint width, that allow optimum sealant expansion capability.
1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove shoulder backer materials that have become wet before sealant application and replace them with dry materials.
D. Install sealants by proven techniques to comply with the following and all other joint backings are installed:
1. Seal sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses for each joint configuration.
3. Produce uniform, cross-sectional shape and depth relative to joint width that allow optimum sealant expansion capability.
E. Filling of Narrow Joints: Immediately after sealant application and before skinning or curing begin, joint sealants according to manufacturer's specified backer tool or prior experience. Use of backer tool is recommended, to eliminate air pockets, and to ensure correct seal sealant depth of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joint.

E. Product sealed slopes according to 1:6 against erosion, with joint or sub-drain erosion-control mats installed and applied according to manufacturer's recommendations.

- F. Product sealed areas with slopes less than 1:6 against erosion by spreading street mulch after completion of seeding operations. Spread mulch at a minimum rate of 2 tons per acre (143 kg per 100 sq m) to form a continuous blanket 1-1/2 inches (38 mm) above depth over seeded areas. Spread by hand. Mow, or other suitable equipment.

1. Another straw mulch by spreading straw applied by suitable mechanical equipment.

- 2. Another straw mulch by spreading straw applied by suitable mechanical equipment.
a. Straw mulch shall be applied at a rate of 10 to 11 gal per 1000 sq ft (41 to 43 L per 100 sq m). This preparation to prevent damage or staining of structures or other plantings adjacent to seeded areas. Immediately clean drainage or related areas.
3. Water lawn at the minimum rate of 1 inch (25 mm) per week.
D. Mow lawns as soon as there is enough turf growth to cut with mower set at specified height for particular species planted. Request mowing or required to maintain specified height without mowing more than 40 percent of the grass height. Mow no more than 40 percent of grass-lawn height in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height:
1. Mow grass from 3 to 3 1/2 inches (75 to 75 mm) high.

A. Prepare correct soil and delivery of soil to be used in foundation areas. Check grade of surface before laying base, as specified on drawings, with a 1/4-inch (6 mm) tolerance over paved areas.

3.9 PLANTING SOIL AMENDMENTS SECTION

- A. Limes: Provide soil amendments in not less than the following quantities:
1. Weight of lime per 1000 sq ft (110 kg per 100 sq m).
2. Weight of lime per 1000 sq ft (110 kg per 100 sq m).
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100. Weight of lime per 1000 sq ft (110 kg per 100 sq m).

1. Another straw mulch by spreading straw applied by suitable mechanical equipment.

- 2. Another straw mulch by spreading straw applied by suitable mechanical equipment.
a. Straw mulch shall