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TECHNICAL SPECIFICATIONS

The Contractor shall reference DelDOT Specifications for Road and Bridge Construction, dated August 2001 or the most recent version:

Details:
Pavement Restoration

SCOPE OF WORK

The Harrington Fire Company Parking Lot Paving Project consists of parking lot improvements located at 20 Clark Street in the City of Harrington, Kent County, Delaware. The extent of the work performed shall include all materials, labor, and equipment to perform the necessary layout, demolition, construction, and rehabilitation as described in the specifications and details. The work includes, but is not limited to the following:

1. Engineering layout of all proposed elements of construction to the specified lines and grades including milling of existing road surfaces, repaving of milled surfaces, removal and replacement of failed subgrade. All limits of work shall be marked out and approved by the engineer prior to excavation. All pavement rehabilitation will be laid out to match existing conditions and grade. Any discrepancies in grades shall be brought to the attention of the Engineer so as to allow for design adjustments prior to construction.

2. Maintenance and protection of traffic in accordance with DelDOT requirements.

3. Installation of Inlet Protection, in accordance with the Standard Details of the Delaware Erosion and Sediment Control Handbook, in each inlet located within all work areas to be milled and overlaid.

4. Sawcutting of existing bituminous, stone and concrete surfaces along the established limits of work as incidental to the contract work items. The Contractor shall make every effort to limit sawcutting of concrete sidewalk and curb to existing control joints. Any limits of work established between existing joints shall be brought to the attention of the Engineer and approved prior to sawcutting.

5. Pavement Milling. The contractor shall review the limits of milling with the Engineer prior to milling. The contractor shall mill the existing asphalt surface and restoration areas to a depth of 2". Payment for "Pavement-Milling, Hot-Mix, 2" Depth" shall be made per Square Yard (SY) in accordance with Section 760 of the DelDOT Standard Specifications.

6. Base Repairs. After milling, the contractor shall have a fully loaded tri-axle dump truck perform a test roll for the Engineer to observe. The Engineer will mark out any areas for base repairs. The contractor shall perform base repairs in the locations determined by the Engineer. Payment for base repairs will be made according to the Square Yard (SY) unit price bid for "Base Repair, 6" Depth, If & Where Directed" for the measured area of base repairs actually performed. Payment for base repair shall include sawcutting and excavating unsuitable material, placing graded aggregate base course to a compacted depth of 4" below the surrounding surface grade, preparation of subbase, furnishing, hauling and placing 4" bituminous concrete base course.

7. Surface Course. The contractor shall install surface course pavement. Payment for "Hot-Mix, Hot-Laid Bituminous Concrete Pavement, Type C, 2" Depth" will be made per Ton (TON) of material installed. Payment shall include sealing all joints with asphaltic material.

8. Striping. Prior to milling, the contractor shall inventory all existing pavement striping. After surface course paving is completed, the contractor shall replace all striping according to the inventory of existing striping. Payment for "Striping, Including Inventory of Existing" shall be made as a Lump Sum (LS) once all striping work is completed.

9. Removal of existing features as incidental to the contract work items, including but not limited to: metal plates, pipes, concrete slabs, stone, bricks and all foreign materials encountered during excavation for contract items.

10. Topsoil, Fertilizing, and seeding of all disturbed grassed areas.

ADDITIONAL REQUIREMENTS

1. All work by the Contractor must be 100% complete within the specified calendar day time limit.

2. All related incidental work, dust control, erosion control, cleaning and restoration shall be included in the contract bid price. These activities are not separate pay items and shall be included in the overall cost of the project.

3. All materials, construction procedures, type and use of equipment, measurement and payment shall be in accordance with the Delaware Department of Transportation Specifications, unless otherwise noted and/or added into these specifications.

4. The Contractor is responsible for construction layout of this project. The Contractor shall forward all construction layout survey information to the Engineer for reference including; benchmarks, stationing and elevations.

5. Contractor shall notify "Miss Utility" (1-800-257-7777) at least 48 hours prior to start of excavation.

6. Contractor shall establish contact with an individual from each local utility prior to commencement of excavation for the construction of proposed concrete vertical curb. The Contractor shall notify the Engineer and the Utility Owner immediately should a conflict occur in the limits of construction. The Contractor shall be responsible for coordination of all work to be performed by the Utility Owner with regards to the work included in this contract. Additional payment will not be made for delays incurred or additional work performed due to conflicts with existing utility mains or service lines.

7. All paved and concrete areas disturbed during construction shall be restored to a condition at least equal to that which existing prior to the start of construction.

8. All grassed areas disturbed during construction shall be topsoiled, fertilized and seeded. No additional payment will be made for restoration of grassed areas but the cost shall be included in the various items of the proposal.

9. All fill shall be placed in 12" lifts and thoroughly compacted to the satisfaction of the Engineer. If borrow fill is required, it shall be subject to the approval of the Engineer.

10. The contractor shall be responsible for the location and preservation of underground and surface utilities and structures at or adjacent to the site of construction and it shall be at his own expense to repair or replace anything that is damaged.
11. Payment will not be made for the relocation of existing signs, but shall be included in the various items of the proposal.

END OF SECTION

SECTION 01000

GENERAL REQUIREMENTS

1.01 GENERAL

A. Only major items of work are given in the Bid Form, but it is the intent of the specifications to secure a completely interconnected and functioning system, and if any workmanship or materials should be required which are obviously necessary to carry out the full intent and meaning of the plans and specifications or to be reasonably inferred there from, the cost of such workmanship or materials shall be included in the unit price bid for the major items of work.

B. Reproducible As-built drawings must be furnished by the Contractor to the Engineer prior to final payment

C. Contractor shall notify all utility companies prior to construction of utilities by contacting Miss Utilities at 1-800-257-7777.

D. Prior to any excavation, the Contractor shall have all utilities marked and shall excavate or otherwise determine the exact location and elevations of said utilities. The Contractor shall notify the Engineer of any conflicts. The Contractor shall arrange for any necessary utility relocations or plan changes and shall reschedule his operations appropriately.

E. The Contractor, in the construction of any project, shall not stockpile materials or his equipment on any private property; except areas designated by the drawings as directed by the Engineer. If so required, the Engineer may direct the Contractor to have his equipment removed from any project during weekend hours.

F. All work of refilling sunken ditches, repaving over trenches and keeping streets and sidewalks in passable condition shall be done to the satisfaction of the Engineer during the construction of the above work as well as during the maintenance period. If any work is not done within five (5) days after written notice is given by the Engineer, the work may be done by the Owner and charged to the Contractor.

G. Special care shall be taken to prevent contamination, siltation, or interfering in any way with the stream flows or ponds along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any ponds or other bodies of water.

H. It is the intent of the regulations for Soil Erosion and Sediment Control to insure that proper measures for erosion control are employed and provide for the early establishment of vegetation that will help avoid erosion problems during and after construction. It is expected that the Contractor will anticipate possible problems and provide timely and adequate control to prevent or minimize adverse effect.

I. The Contractor shall apply and pay for all local permits that may be required for any of the work involved with this project.

J. Contractor is to notify residents by door-hangers at least forty-eight (48) hours in advance before starting construction work on streets.

K. All notes on drawings shall be made a part of the specifications.

L. Contractor shall notify Engineer at least forty-eight (48) hours in advance of any work on Saturdays. There will be no work permitted on Sundays or holidays. This project will receive inspection and the normal working hours for the Inspector are from 7:30 AM to 4:00 PM, Monday through Friday. Any overtime inspection costs which are not specifically mentioned in the drawings and specifications will be reimbursed by the Contractor. Holidays are New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving and Christmas.

M. It shall be the Contractor's responsibility to keep the stone and concrete curb clean of asphaltic tack coat.

1.02 PUBLIC UTILITIES

A. The contract drawings indicate the approximate location of existing overhead and subsurface utilities in the vicinity of the work. The bidder is advised to ascertain for himself all the facts concerning the location of these utilities.

B. The Contractor shall cooperate with the utility owners in the adjustment of their facilities and shall notify the utility owners not less than five (5) days in advance of the time he proposes to perform any work that will endanger or affect their facilities.

C. The Contractor shall permit the owners of utilities, or their agents, access to the site of the work at all times in order to relocate, construct or protect their lines and he shall cooperate with them in performing this work.

D. Separate payments will not be made for the coordination and cooperation of the Contractor with the utility companies, nor for the protection or replacement of utilities for the re-sequencing or delay of work due to a utility company and the bidder shall include all such costs in the prices bid for the various related items of work in the Bid Form.

E. The Contractor is responsible for repairing all located utilities (water, sewer, storm sewer, gas lines, etc.) which are broken or damaged during construction.

1.03 PHOTOGRAPHS & VIDEO TAPES

The Contractor shall record in DVD format the construction site prior to the commencement of construction. Two copies of the DVD shall be forwarded and kept by RV&B Engineers to resolve any disputes arising over the restoration of all curbs, sidewalks, driveways, fences, lawns, landscaped areas, or any other items that may be disturbed during construction.

1.04 MAINTENANCE & PROTECTION OF TRAFFIC

A. The Contractor shall erect or place and maintain in good condition, barricades, warning signs, lights, flares, approved yellow-flashing light units, rubber traffic cones, and other warning and danger signals and devices, appropriate and adequate for the specific needs and subject to the Engineer's approval at working sites, closed roads, intersections, open excavations, locations of material storage, standing equipment and other obstructions, at points where the usable traffic

width of the road is reduced, at points where traffic is deflected from its normal courses or lanes, and at other places of danger to vehicular or pedestrian traffic.

B. The Contractor shall provide sufficient watchmen and traffic directors and shall take all other precautions, including any that may be ordered by the Engineer, which are necessary for the safety of the public and protection of the work.

C. The Contractor shall obtain the approval of the Engineer and consent of all appropriate authorities having jurisdiction, for any detours which may be required. The Contractor shall make all necessary arrangements with such authorities regarding the establishment, maintenance and repair of such detours, the regulations and direction of traffic thereon, and the installation and maintenance of sign and traffic devices.

D. Before beginning work on any phase of the project, the Contractor shall furnish and install all specified warning signals, barricades, wood traffic guides, lights, flares and other devices necessary to protect the public during that phase of his operations.

E. If battery operated flashing warning lights are used, they shall conform to the specifications therefore on file at the office of the Delaware Department of Transportation. These specifications require, in part, that the flashing lights be weatherproof and reasonably tamper-proof and theft proof, be equipped with a seven inch (7") minimum diameter amber plastic lens; shall operate with a flash rate between 55 and 75 flashes per minute with a flash duration of not less than 18% of each flash cycle; and shall be inspected and cleaned daily so as to maintain the lights in proper working condition.

F. Road construction signs shall be placed at each end of the project along with every connecting intersection. At the end of each project, detour signs shall be placed.

SCHEDULE OF TRAFFIC CONTROL DEVICES
FOR EACH SEPARATE PROJECT LOCATION

Type of Device*	Min./Max.
Traffic Cones	20/80
Sign (Construction Ahead)	2/6
Sign G20-2	2/4
Traffic Director	1/4
Drums	20/50
Breakaway Barricades	10/40

*Devices in accordance with Part 6 of "Delaware Manual On Uniform Traffic Control Devices".

G. During the work on this project, the Contractor shall provide and/or be prepared to provide traffic protection devices in accordance with the above Schedule of Traffic Control Devices. The minimum numbers set forth in the Schedule shall be on hand at each separate project site prior to the commencement of any work (or phase of work) and shall be maintained available on the project site throughout the period of the project (or phase). Failure to provide and maintain the minimum number of devices specified shall be sufficient cause for the Engineer to order

cessation of work. When lack of any required safety devices presents an immediate hazard, the Engineer may order that such devices be provided by the Owner or by other Contractors, deducting the cost thereof from any monies due or becoming due the Contractor.

H. Additional devices up to the maximum number set forth in the Schedule shall be provided by the Contractor as required or directed prior to the commencement of any operation or phase of an operation requiring such devices.

I. Flagmen shall be provided whenever alternate two-way traffic is maintained in a single lane, whenever Contractor's operations require closing of a lane or portion of a lane on a multiple lane roadway, whenever the Contractor's equipment or vehicles are entering or leaving active roadways at other than normal street intersections, whenever a Contractor's operations will be contrary to or cause confusion regarding normal traffic control devices (traffic signals, signs, etc.) within a work area and whenever else the Contractor's operations cause such hazards as to require the use of Flagmen.

J. Flagmen shall be responsible and thoroughly familiar with their responsibilities, and, while serving as Flagmen, shall not be required to perform any other duties. Flagmen shall be provided with an orange or red flag, an orange or orange and white traffic safety vest and white or orange hard hat or other appropriate head gear. The Contractor may, at his option, secure the services of uniformed policemen having jurisdiction in the locality within which the project is located. Provision of such uniformed policemen will be deemed sufficient in meeting the requirements of this specification.

K. Traffic must be maintained throughout each separate work area during construction. At least one 12' lane must be maintained for traffic during all actual construction periods and at least two 10' lanes must be maintained for traffic at all other times.

L. The Contractor is advised that there is heavy commuter traffic during the morning from 7:30 AM to 9:00 AM and the afternoon from 4:00 PM to 5:30 PM. The Contractor shall schedule his construction activity such that he does not interfere or restrict traffic during the above peak hours.

M. Any restriction of traffic at any time shall be subject to the approval of the Engineer and the Municipal Police Department. The Contractor shall submit a schedule of staged construction for approval prior to any restriction of traffic.

N. If detours are proposed by the Contractor, they are subject to the review and approval of the Engineer and the Municipal Police Department. All detour signs shall conform to the requirements of the Delaware Manual on Uniform Traffic Control Devices.

O. Temporary traffic stripes will be necessary to control and guide traffic through individual work areas. The Contractor shall submit a scheme for approval by the Engineer of all temporary traffic stripes prior to removal of any existing traffic stripes.

P. Construction of proposed utility pipe or storm pipes across existing roadways shall be so staged to maintain one lane in each direction. Trenches shall not remain open overnight.

Q. The Contractor shall provide adequate means of access for fire, police and emergency vehicles throughout the length of the project.

1.06 REFERENCE TO THE STANDARD SPECIFICATIONS

A. Portions of the work performed under this contract shall comply with the requirements of the State of Delaware Department of Transportation Specifications for Road and Bridge Construction (DelDOT Specifications), August 2011 or latest, and all requirements modified, as amended or supplemented and whose specifications are made part of these specifications. The Delaware Department of Transportation Standard Construction Details shall govern except insofar as same are modified, amended or changed in detail drawings prepared specifically for this particular project.

B. The DelDOT Specifications are made part of these specifications by this reference as if they were set forth in full. It is the responsibility of the prospective bidder to be familiar with these DelDOT Specifications. Copies may be examined in the Engineer's Office or may be purchased from the Delaware Department of Transportation.

1.07 TESTING MATERIALS

A. Except as may be provided elsewhere, test or analysis of materials which are usually tested after delivery to the site, such as concrete aggregate, mixed and placed concrete, and similar materials; will be performed by the Engineer or test laboratories which will be approved by the Engineer and selected and paid for by the Contractor. The preliminary testing of concrete mixtures and test or analysis of other materials, samples of which are to be submitted prior to delivery, will also be performed by the laboratory and paid for by the Contractor at the Engineer's request.

B. If the Engineer orders sampling and analysis or tests of materials which are usually accepted on Certification of the manufacturer but which appear defective or not conforming to the requirements of the Specifications, the Contractor will bear the reasonable costs of sampling, transportation, test and analysis.

1.08 INITIAL EXPENSE

A. DESCRIPTION: This work consists of all operations necessary for the assembling and setting up of the Project, including the initial movement of personnel and equipment to the Project site, the establishment of the Contractor’s offices, shops, plants, storage areas, and sanitary facilities, any other activities required by the Contract documents and by local or State law and regulation, and all other work and operations which must be performed prior to beginning work on compensable items of work at the Project site. This work also includes obtaining the required insurance and bonds, and all other items required for the start of work.

B. MATERIAL: These material and furnishings will not be considered a part of the other completed contract items.

2.01 QUANTITY AND PAYMENT

A. Quantity of Maintenance and Protection of Traffic will not be measured for this project.

B. Payment for Maintenance and Protection of Traffic will be not be made for this project, but the cost shall be included in the various items of the proposal.

C. Quantity of Initial Expense will not be measured for this project.

D. Payment for Initial Expense will be made as a lump sum (LS), and shall not exceed two and one-half percent (2.5%) of the total amount bid for the project, or a maximum of ten-thousand dollars ($10,000.00). Payment for Initial Expense will be recommended after a Performance Bond has been secured, all submittals have been approved, Notice to Proceed has been issued, and the physical work has commenced. Payment for Initial Expense will only be made once. No additional payment will be made for remobilization.

E. Quantity of all other items covered in the General Requirements will not be measured for this project, but the work shall be performed as incidental to the proposed work.

F. Payment for all other items covered in the General Requirements will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION

SECTION 01710

CLEANING AND RESTORATIONS

1.01 DESCRIPTION

A. Contractor shall provide all equipment, labor & materials required to clean and restore the site to at least the existing condition.

B. Maintain premises and public properties free from accumulations of waste, debris and rubbish caused by work operations.

C. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials; clean all sight exposed surfaces; leave project clean and ready for occupancy.

D. At completion of work, restore or replace, when and as directed by the Engineer, any public or private property disturbed or damaged by Contractor's work operations to a condition at least equal to that existing prior to beginning work, or as otherwise specified. Materials, equipment and methods shall be approved by the Engineer.

2.01 MATERIALS

A. For restorations all materials shall comply with the following Articles of the Delaware Department of Transportation Specifications latest revision and these specifications.

Grass restorations - Unless otherwise determined by the local Conservation District, grass restoration shall be as determined by specification 02115, Landscaping.

B. Pavement restorations: Delaware Department of Transportation Specifications.

C. Restoration of curbs and other concrete structures: See specifications 02509, Concrete Sidewalks & 02528, Concrete Curb.

D. Driveway Restoration: Delaware Department of Transportation Specifications.

E. All other Materials: As approved by the Engineer or authorities having jurisdiction.

3.01 METHODS OF CONDUCTING WORK

A. Requirements of regulatory agencies:

The Contractor shall comply with all Federal, State, and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish. All excess material shall be removed from the site and disposed of by the Contractor. Cost to be included in the unit price bid for all items.

The disposal site shall be in permanently established licensed DNREC landfill or a certified recycling center if applicable.

B. Stockpiling/storage/disposal areas

The requirements with regard to the location and control of stockpile, storage and disposal areas whether provided by the local government or the Contractor, must conform to the following:

1. Only environmentally suitable stockpile sites may be used for the purposes of staging or storing materials, equipment and suitable trench backfill material. Environmentally suitable sites must be level, and devoid of mature stands of natural vegetation. Drainage facilities and features, wetlands and stream corridors are not environmentally suitable sites.

2. The boundary of the stockpile area shall be clearly marked by hay bales, silt fencing or another appropriate method. Where fill is to be stored in excess of 14 days, a suitable means of protecting excavated material from wind and water erosion shall be employed. Erosion control methods may include one or more of the following: mulching, sprinkling, silt fencing, haybaling and stone covering.

3. Excess excavated material which is not considered to be solid waste pursuant to Delaware codes shall be graded on-site only or to the extent needed to achieve pre-construction grade, unless otherwise specifically approved by the DNREC. The Contractor shall remove the remainder from the site and dispose of it at a approved site in accordance with the following:

    a. Disposal sites selected by the Contractor shall be evaluated and approved by the Owner prior to their use. Disposal sites may also be selected by the Owner. The Owner will conduct periodic inspection of disposal sites to ensure compliance with the requirements of this subsection during the off-site disposal operation. .

    b. The disposal of excess excavated material in wetlands, stream corridors and flood plains is strictly prohibited, even if the permission of the property owner is obtained. The Contractor shall be responsible to remove any fill improperly placed by the Contractor at the Contractor's expense and restore the area impacted.

    c. If excess excavated material is placed on private property, a hold harmless release in favor of the Town and the DNREC and shall be obtained from the property owner and;

    d. Prior to approval of a site of excess excavated material disposal, where the site exceeds 5,000 SF, the Owner shall obtain, or shall ensure that the Contractor or property owner has obtained, the appropriate certification of the soil erosion and sediment control plan in accordance with the State's standards for soil conservation. Where the site is less than 5,000 SF, the Town shall advise the property owner of the need for erosion and sediment control and obtain a statement that the property owner accepts complete responsibility for implementation of appropriate methods to prevent erosion and sedimentation.

C. Cleaning during construction:

1. Provide periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

2. Provide on-site containers for the collection of waste materials, debris and rubbish. Maintain containers as required.

D. Dust Control:

1. The Contractor will be required to maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which would cause a hazard or nuisance to others. If approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs. If any dust control is not done within twenty-four (24) hours after written notice is given by the Engineer, the work may be done by Owner and charged to the Contractor.

2. In order to control dust, as often as required during each working day, and particularly prior to the conclusion of each working day, areas under immediate construction (including access roads and other areas affected thereby) shall be swept and wet down with water sufficiently to lay dust. In addition, these areas shall be wet down during non-working hours (including weekends as often as required to keep dust under control. The use of calcium chloride or petroleum products or other chemicals for dust control is prohibited.

E. Prohibited construction procedures, but not limited to, the following:

1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, or at unspecified locations.

2. Indiscriminate, arbitrary or capricious operation of equipment in any stream corridors, wetlands or surface waters.

3. Pumping of silt-laden waters from trenches or other excavations into any surface waters, stream corridors or wetlands.

4. Damaging vegetation adjacent to or outside of the access road or the right-of-way.

5. Disposal of trees, brush and other debris in any stream corridors, wetlands, surface waters or at unspecified locations.

6. Permanent or unspecified alteration of the flow line of any stream.

7. Open burning of project debris.

8. Use of chemicals for dust control.

9. Use of asphaltic mulch binder.

3.02 METHODS OF CONDUCTING WORK

A. General: All existing structures, unpaved areas and paved areas disturbed or damaged during the work under this contract shall be restored or replaced to a condition at least equal to that existing prior to beginning work, or as otherwise specified. The methods of conducting this work shall, as a minimum, conform to the Delaware Department of Transportation Specifications, latest revision and the following:

1. Final restoration shall be undertaken as soon as an area is no longer needed for construction, stockpiling or access. Excavated material unsuitable (see Delaware code) for backfill and considered

to be solid waste shall be removed from the construction site and disposed of at a sanitary landfill approved and licensed by the DNREC. Excess excavated material which is not considered to be solid waste shall be graded or removed in accordance with Section 3.01 B3 of this specification. When access roads are no longer needed, road fill shall be removed and the access area shall be restored to pre-disturbance conditions. Care should be taken to avoid damage to adjacent vegetation and to prevent the formation of depressions that would serve as mosquito pools.

2. Topsoil shall be replaced with adequate amounts of topsoil material to restore the disturbed area to its original, pre-disturbance grade and depth of topsoil.

3. Rates and types of fertilization, liming, and seeding shall be as recommended by the local Soil Conservation District based on soil tests and local conditions. Seed mixtures shall be selected that are best suited for the particular site conditions. Seed selection shall provide for a quickly germinating initial growth, to prevent erosion, and for a secondary growth that will survive without continuing maintenance. Mulching shall occur immediately after seeding, and in no case shall more than five days elapse between seeding and mulching.

4. In landscaped areas, environmental features shall be replaced or restored to pre-disturbance condition or better. This includes sodding, replacement of trees and shrubs, fences, drives, and other landscape features in kind.

B. Construction/Restoration within Wetlands:

1. Before excavation is initiated in the wetlands, a line of hay bales or other siltation control barriers shall be staked in place along the edges of the construction area and shall remain in place until restoration is complete. In addition, marsh mats shall be used for heavy construction equipment.

2. Topsoil shall be stripped and soil layers replaced in the excavated area in the same order that they were removed. Final grade shall match the elevation prior to disturbance.

3. The cleared easement shall be revegetated with a mix and density of species similar to that which was removed. Material for vegetation can be preserved from the areas cleared and replanted or provided from nursery stock.

4. Anti-seep collars shall be installed as needed in the trench to avoid draining the wetland.

5. Coastal wetland areas disturbed during the construction shall be restored to pre-disturbance conditions by an environmentally-oriented concern with documented successful experience in the restoration of wetland areas.

C. <u>Grass Restorations:</u>

See specification 02115, Landscaping.

D. <u>Pavement Restorations:</u>

Delaware Department of Transportation Specifications.

Restoration type and thickness shall be as shown on the contract drawings.

E. Restorations of Curbs and Other Concrete Structures:

1. See specifications 02509, Concrete Sidewalks & 02528, Concrete Curb.

2. Other concrete structures: Restore in accordance with applicable Sections of the Standard Specifications.

F. Fence Restorations:

Contractor shall remove all concrete from existing fence posts and appurtenances before reinstalling fence in kind.

G. All Other Restorations:

Restore in accordance with applicable Sections of the Standard Specifications, or as approved by the Engineer or authorities having jurisdiction.

4.01 QUANTITY AND PAYMENT

No separate payment will be made for Cleaning & Restoration. Include all such costs in with the various items of the proposal.

END OF SECTION

SECTION 02115

LANDSCAPING
TOPSOIL, SEED, SOD, TREE PLANTING

1.01 DESCRIPTION

A. The work under this section shall consist of the furnishing and installation of all landscaping items, as shown on the plans or specified herein. These items shall include, but not be limited to topsoil, seeding, sod and tree and shrub replacement.

B. All grassed or wooded areas disturbed during construction shall be restored in accordance with Section 01710.

C. Weeds: includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Mible Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel and Brome Grass.

2.01 MATERIALS

A. General

1. Topsoil shall be loamy sand, sandy loam, clay loam, loam, silt loam, sandy loam or other soil approved by the Engineer. It shall not have a mixture of subsoil and contain no slag, cinders, stones, lumps of soil, sticks, roots, trash or other extraneous materials. Topsoil must also be free of viable plants or plant parts of bermuda grass, quackgrass, johnson grass, nut sedge, poison ivy, Canada Thistle or others as specified. The contractor shall have all topsoil shall be tested by a reputable laboratory for pH and to a range of 6.0 - 7.0. Soluble salts shall not be higher than 500 parts per million.

2. Planting Soil Mix for use in planting all shrubs and trees shall be the following materials well mixed in the specified portions which are by Volume: 1 part topsoil, 1 part humus or mushroom sort.

3. Mulch, unless otherwise specified, shall be pine bark mulch. It shall be dark in color and consist of a mixture of pine bark ranging in texture from finely ground to coarse bark shreds and shall be applied at a depth of 4".

4. Lime, shall be Agricultural limestone (dolomite) containing not less than 85 percent of calcium carbonate or calcium carbonate equivalent; meeting the following minimum gradations, 100 percent passing a 10 mesh sieve, 98 percent a 20 mesh sieve, 55 percent a 60 mesh sieve, and 40 percent a 100 mesh sieve; delivered in original unopened containers with the identifying marks and analysis meeting specification requirements.

5. Commercial Fertilizer shall be uniform in composition free flowing and suitable for application with approved spreader; granular or pelleted with 50 percent of total nitrogen derived from natural organic material in a slowly available form; delivered in unopened containers with the analysis type and trade name attached to each container. Fertilizer shall be a 10-6-4 formula and applied at the rates shown on the drawings or as otherwise

specified. Also, the fertilizer composition shall comply with all applicable regulatory agencies.

B. MATERIALS FOR STAKING, GUYING AND WRAPPING

1. Notched stakes and deadmen for anchoring guy wires shall be 2"x4"x3" long fir.

2. Stakes for supporting trees shall be 2"x2"x8' long fir stakes, or as approved by the Engineer.

3. Wire guys for fastening trees to stakes, shall be 12 gauge, solid galvanized wire.

4. Hose to protect tree from guy and fastening wires shall be strong, supple hose, one braid, black or green.

5. Wrapping materials for protection of tree trunks shall be a waterproof Duplex Kraft Paper crinkled to 33-1/3% stretch and 4" wide strips of burlap, 8 ounce minimum or an approved equal by the Engineer.

C. SOD AND SEEDING

1. Sod shall be a cultivated sod obtained from a certified sod farm. It shall be a mixture of 80% tall fescue, 10% perennial ryegrass, and 10% Kentucky bluegrass. Sod shall be free of weeds and undesirable coarse weedy grasses. The sod root mat shall be compact and well developed to assure mechanical strength and to assure early and firm anchoring to soil surface. It shall be mowed to a height not to exceed 3 inches before lifting and shall be a uniform thickness with not over 1-1/2" or less than 1" of soil.

2. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.

3. Certified for grass species and location of sod course.

4. Do not deliver more sod than can be installed within 24 hours.

5. Seed Mixes shall be as follows:

Formula B

Kind of Seed	Minimum Purity Percent	Minimum Germination Percent	Percent Total Weight of Mixture
Kentucky Bluegrass Mixture (Poapratensis)	98	80	50
Creeping Red Fescue Or Chewings Fescue	98	85	30
Perennial Ryegrass			

(Lolium)	98	90	20

Formula D

Kind of Seed	Minimum Purity Percent	Minimum Germination Percent	Percent Total Weight of Mixture
Creeping Red Fescue or Chewings Fescue	98	85	30
Tall Fescue	98	85	70

6. The seed shall be delivered to the job site in original, unopened containers bearing the grower's or dealer's guarantee of analysis. Wet, moldy or otherwise contaminated seed shall be rejected.

D. Plants

1. Plant list as shown on the planting plan or attached to it.

2. Plant materials shall mean trees, shrubs, vines, ground covers and plants for all descriptions, required to be furnished for project in accordance with plans and as specified.

3. Substitutions will not be permitted. If proof is submitted that specified plants or sizes are unobtainable, consideration will be given for the use of the nearest equivalent size or variety. No substitutions will be permitted unless otherwise authorized in writing by the Engineer.

4. Type and Quantity

   a. Plant Materials shall conform to American Standard for Nursery Stock ANSI Z-60.1, 1996.

   b. Plants will be subject to inspection for quality and size. Plants lacking compactness or proper proportions and plants which are weak or thin will not be accepted. Plant materials which have been cut back from larger grades to meet certain specified requirements will be rejected. Right is reserved to reject plants considered as unsatisfactory. Rejected plants shall be removed from site.

   c. Plants shall have normal, well developed branches and vigorous fibrous root system. They shall be healthy, vigorous plants, free from defects, decay, disfiguring roots, sun scald, injuries, abrasions of the bark plant diseases, insects, pests, eggs, borers and all forms of infestations or objectionable disfigurements.

   d. All plants shall equal or exceed the measurements specified in the plant list, which are minimum, acceptable sizes. Plants shall also be true to names and quantities specified.

   e. All plants shall be nursery grown unless otherwise specifically permitted.

5. Balled and Burlapped Plants: Plant material marked by B&B in itemized plant list shall be balled and burlapped. They shall have soiled, natural balls of earth, held in place by burlap or similar material and laced with twine or rope. Balls of larger plants may be wrapped with burlap and supported with wire baskets. All balls shall be of sufficient depth and width to include all fibrous and feeding roots necessary for full recovery of the plant.

6. Bare Root Plants: Plant material marked "BR" in the itemized plant list shall be dug when fully dormant with substantially all of the root system intact. Earth shall be carefully removed so as not to injure the fibrous roots necessary for the full recovery of the plant. The roots shall be covered with a thick coating of mud by puddling immediately after plants are dug. Protective coating shall remain on roots until plants are delivered.

7. Protection After Delivery: The balls of B&B plants which cannot be planted immediately upon delivery shall be covered with moist soil or mulch, or other protection from drying winds and sun. Bare-rooted plants shall be planted or heeled-in immediately upon delivery. All plants shall be watered as necessary until planted.

8. All plants shall be subject to approval by the Engineer before planting.

3.01 METHOD OF CONSTRUCTION

A. Planting Procedure

1. Layout: All plant material shall be located where shown on plans, except where obstructions are encountered or otherwise directed by the Engineer. No adjustments to plant locations may be made without approval of the Engineer.

2. Planting Pits:

   a. Planting soil mix should be prepared and plant pits dug prior to moving plants to their respective locations so as to minimize physical damage through excessive moving or exposure to drying elements.

   b. Circular pits with vertical sides shall be excavated for all plants except for plants such as ground cover designated on all plans to be planted in beds.

   c. Diameter of pits for B&B trees shall be at least two feet greater than the spread of the root ball.

   d. Diameter of pits for BR and container shrubs shall be at least one foot greater than the spread of the roots.

   e. Depth of pits for B&B trees and shrubs shall be enough to accommodate the ball when the plant is set to finished grade and allowing for 6" of compacted planting soil mix in bottom of pit.

3. Excess Excavated Soil shall be dispersed on the ground around each plant in such a manner so as to maintain an even, natural looking slope in all directions away from the base of plant. Any excess excavation, left after this procedure shall be disposed of as directed by the Engineer.

4. Setting Plants: Unless otherwise specified, plants shall be set in the center of the pit and rest on a 6" (or as specified) layer of planting soil mix. The plant shall be so set that after each settlement, it will stand at approximately the same grade level as that at which the plant was grown. Plant shall be turned and positioned so as to face the plant's best side toward what would be considered the front.

   The plant pit shall then be backfilled with soil mix placed in layers around the roots or ball. Each layer shall be carefully tamped in place in a manner to avoid injury to the roots or ball or disturb the positioning of the plant. When approximately 2/3 of the plant pit has been backfilled, the rope and burlap shall be cut and removed from top 1/4 of root ball. No burlap or rope is to be pulled from under the plant. All exposed roots that are broken or torn shall be cleaned, trimmed and removed. The pit shall then be filled with water and the soil mix allowed to settle around the roots. After the water has been absorbed, the plant pit shall be filled with topsoil to finished grade and a shallow saucer shall be formed around each plant by placing a 2-3" high ridge of topsoil around the edge of each pit. After the ground settles, additional soil shall be filled into the level of the finished grade.

5. Planting Beds: All areas on the plan designed to be planted with ground cover shall be known as planting beds. Beds shall be prepared by applying peat moss at the rate of 4 cubic yards per thousand square feet and 10-6-4 fertilizer and peat moss into the top 3" of the bed area. After incorporation of peat moss and fertilizer, the planting bed shall be fine graded by hand raking to remove all ridges and depressions. The surface shall be cleared of all stones and other debris 2" or more in diameter.

6. Guying, Staking and Wrapping

   a. Trees shall be supported immediately after planting. All trees three (3) inches or over in truck diameter shall be guyed. Smaller trees shall be staked. Wires shall be encased in hose to prevent direct contact with bark of the trees and shall be placed around the trunk in a single hoop. Wires shall be tightened and kept taut by twisting the strands together, or with turn buckles.

   b. Guying shall be done with three (3) guys spaced equally about each tree. Each guy shall consist of two (2) strands of wire attached to the tree trunk at an angle of about 60□ at about two-fifths of the height of the tree and anchored at the ground either to notched stakes, which have been driven into the ground at an angle away from the tree so that the tops of the anchor stakes are below finished grade or to deadman placed at least three (3) feet below finished grade. Lines must be taut. Plants shall stand plumb after staking and guying.

   c. Staking shall be done by equally spaced stakes about each tree driven vertically into the ground to a depth of 2-1/2 to 3 feet in such a manner as not to injure the ball or roots. Trees shall be fastened to each stake at a height of about 5 feet by means of two (2) strands of wire and hose. Stakes shall be uniform in height and placed according to the diameter of the tree trunk as follows:

      3" - 6", 3 stakes

      3" or less, 2 stakes

d. Wrapping shall be done at the time of planting. The trunks of all trees shall be wrapped with wrapping material overlapping one and one-half inches, wound from the ground line to above the lowest main branches. The wrappings shall be securely tied in at least five (5) places, including the top, middle and bottom. Wrapping material shall be as specified and maintained in place for a period of one (1) year.

7. Pruning: All plants shall be pruned after planting and inspected by the Engineer. The amount of pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots as a result of transplanting operations. Pruning shall be done in such a manner as to not change the natural habit or shape of the plant. All cuts shall be made flush, leaving no stubs.

8. Mulching: Within one (1) day after planting, mulch all planting areas (individual tree pits, entire shrub and ground cover beds) with 3" of pine bark mulch unless specified otherwise on the drawings or specifications.

9. Clean-up: During the course of planting, excess waste materials shall be continuously and promptly removed. All work areas are to be kept clear and all reasonable precautions taken to avoid damage to the existing structure, curbs, walks and other paved surfaces. Upon completion of the work, remove all debris and unused materials, and leave the area in a neat, clean and satisfactory condition.

10. Restrictions on Planting: The planting of B&B and container grown material may be performed at any time of the year when the soil and backfill material are not frozen or an unsuitable condition exists as determined by the Engineer. Work during the months of June through August and December through March must have written approval by the Engineer.

B. Lawns

1. Preparation for Lawn Work:

a. All areas designed for lawn shall be clean and free of all weeds and debris. Any debris greater than 3/4" in diameter, such as stones, sticks and construction waste material, shall be removed after tilling and dicing so as to leave the surface smooth, even and free of roots.

b. It shall be the responsibility of the contractor to see that all areas designated for lawn have a minimum of 6" of topsoil. Any areas not meeting this requirement will be brought up to minimum standards by the contractor before proceeding with the work.

c. The subgrade must be loosened to a depth of 6". All debris over 3/4" in diameter brought to the surface by this operation shall be removed before proceeding with the spreading of the topsoil. No heavy equipment will be permitted on the lawn area after this work has been done.

d. If compacted, those areas which already have the required 6" minimum of topsoil shall be loosened to the 6" depth. Any debris 3/4" in diameter or over, brought to the surface by this operation, shall be removed.

e. Soil Improvements: Upon all areas for lawn, apply agricultural limestone uniformly with a mechanical spreader at the rate of 50 lbs. per 1,000 sq. ft. Incorporate these elements into the 6" of topsoil. Then apply complete 10-6-4 fertilizer at the rate of 20 lbs. per 1,000 sq. ft. Take the entire area lightly before sodding and seeding.

2. Hydro-Seeding: Hydro-seeding will be an accepted method of seeding grass and crownvetch seed and may be used in lieu of seeding by other mechanical methods.

   a. Prepare area to be seeded as described above for seeding and sodding.

   b. Immediately following seeding, apply mulch to a thickness of 1/8". Maintain clearance from shrubs and trees.

   c. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4" below soil level.

   d. Combine seed, mulch, binder, with water in seeder tank and apply at the following rates:

Material	Rate of Application
Seed	As specified.
Mulch	1,500 lbs. per acre.
Binder	According to manufacturer's recommendations.

   e. Hydro-seed solution shall be applied in such a manner so as to provide an even coverage of seed on lawn areas.

3. Laying Sod

   a. The sod as specified is to be completely laid on the site within 36 hours of cutting at the farm.

   b. If dry, water lightly before laying the sod on the topsoil. Before watering, roll the area to be sodded. Any depressions or mounds shall be raked smooth.

   c. The sod shall be laid tight with no open joints visible and no overlapping, then tamped or rolled and thoroughly watered. the completed sodded surface shall be true to finished grade, even and firm at all points.

   d. Lay smooth. Align with adjoining grass areas.

   e. On slopes six (6) inches per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum of two (2) feet on center. Drive pegs flush with soil portion of sod.

   f. Prior to placing sod, on slopes exceeding eight (8) inches per foot, place an approved mesh over the topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.

g. Water sodded areas immediately after installation. Saturate sod to four (4) inches of soil.

4. Seeding: (Lawn Areas)

a. Seed, as specified, is to be sown as follows:

1. Immediately before any seed is to be sown, the ground shall be scarified six (6) inches deep and shall be raked until the surface is smooth, friable and or a uniformly fine texture.

2. Lawn areas shall be seeded evenly with a mechanical spreader, at the rate of four (4) pounds per 1,000 sq. ft. The total amount of seed required for the area shall be divided in half, with 1/2 of the amount required spread in one direction and the other half spread at right angles to this.

3. Lightly rake the seed in (not more than 1/8" deep), roll with a roller and water with a fine spray.

4. If needed, all new lawn areas shall be mulched with straw after seeding, at the rate of one (1) bale of straw to 2,000 sq. ft. lawn area. Use an approved binder at manufacturer's directions. Keep the area moist until established.

5. The contractor shall not supply water or any additional maintenance until such time as the lawn area is established to the satisfaction of the Engineer.

6. Identify seeded areas with stakes and string around areas periphery. Set string height to six (6) inches. Space stakes at 48" (forty-eight inches).

7. Cover seeded slopes where grade is four (4) inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.

8. Lay fabric smoothly on surface, bury top end of each section in six (6) inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.

9. Secure outside edges and overlaps at 36" (thirty-six inch) intervals with stakes.

10. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.

11. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual.

12. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.

13. Scarify subsoil to a depth of six (6) inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

14. Grade to eliminate rough, low or soft areas, and to ensure positive drainage.

15. Install edging at periphery of seeded areas in straight lines to consistent depth.

16. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

17. At sides of ditches, fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

C. Fertilizing

1. Apply fertilizer in accordance with manufacturer's instructions.

2. Apply after smooth raking of topsoil and prior to roller compaction.

3. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

4. Mix thoroughly into upper two (2) inches of topsoil.

5. Lightly water to aid the dissipation of fertilizer.

6. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

7. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content and pH value.

8. Testing is not required if recent tests are available for imported topsoil. Submit these test results to Engineer for approval. Indicate, by test results, information necessary to determine suitability.

3.02 GUARANTEE, MAINTENANCE, REPLACEMENT AND ACCEPTANCE:

A. Guarantee: The contractor shall guarantee all plants a period of twelve (12) months from the time of installation. This shall be known as the guarantee period. Any trees or shrubbery dead, not healthy, dying or the design of value of which, in the opinion of the Engineer, has been destroyed through loss of branches shall be replaced by the contractor at no cost to the Owner. The removal of the plant materials, the fertilizer and planting soil mixture for the replacement and all labor shall be at the contractor's expense.

B. Lawn Work: The contractor shall be responsible for the proper care of the lawn areas from the moment at which they are installed and continuing through the guarantee period. Washouts, gullies, areas that do not germinate, dead sod areas, or other areas not up to the acceptable standards, shall be repaired immediately or at such times as directed by the Engineer throughout the guarantee period. Watering shall be the responsibility of the contractor for at least two (2) weeks, the cost of which is to be included in the bid prices.

1. At the conclusion of the guarantee period, all lawn areas shall be covered with a reasonable stand of grasses specified to be planted and acceptable to the Engineer. All areas not accepted shall be repaired and re-seeded in the manner with the seed specified in these

specifications. These areas must be then maintained as outlined above for the final acceptance.

2. Recondition existing lawn areas damaged by Contractor's operations including storage of materials or equipment and movement of vehicles. Also, recondition existing lawn areas where minor regrading is required.

3. Recondition other existing lawn areas where indicated.

4. Provide fertilizer, seed or sod and soil amendments as specified for new lawns and as required to provide a satisfactory reconditioned lawn. Provide a new planting soil as required to fill low spots and meet new finish grades.

5. Cultivate bare and compacted area thoroughly to provide a good, deep planting bed.

6. Remove diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign material.

7. Where substantial lawn remains (but is thin), mow, rake, aerate is compacted, fill low spots, remove humps and cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers as required. Apply a seed bed mulch, if required, to maintain moist conditions.

8. Water newly planted area and keep moist until new grass is established.

C. Maintenance

1. Mow grass at regular intervals to maintain a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

2. Neatly trim edges and hand clip where necessary.

3. Immediately remove clippings after mowing and trimming.

4. Water to prevent grass and soil from dying out.

5. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

6. Immediately replace sod and/or re-seed areas which show deterioration or bare spots.

7. Protect sodded and/or seeded areas with warning signs during maintenance period.

8. Include maintenance instructions, cutting method and maximum grass height, types, application frequency and recommended coverage of fertilizer.

C. Planting: The contractor shall be responsible for the proper care of all trees, shrubs and ground covers, including watering and weeding during the guarantee period.

1. All plants shall be kept in a healthy condition during the guarantee period by pruning, spraying, adjusting of guys and by any other necessary operations of maintenance. Plants

which die or become unhealthy shall be promptly removed and replaced as soon as conditions permit. Any plants that settle below or rise above the desired finished grades shall be re-set at the proper grades.

2. All replacements shall be plants of the same kind, size and quality as originally specified in the plant list and they shall be furnished, planted, guyed and maintained as specified at no additional cost.

D. Acceptance: At the conclusion of the guarantee period, a final inspection of all planting included in this contract will be made by the engineer. At that time, any 0plant found to be not in a healthy growing condition, broken, damaged or otherwise in such condition as to impair or destroy the symmetrical or other desired appearance as determined by the Engineer shall be noted. Plants so noted shall be removed and replaced by the contractor as specified above in this section. However, plants that have been physically damaged by persons other than the contractor or his employees, will be replaced. This shall be done at an additional cost to the Owner.

4.01 QUANTITY & PAYMENT

No separate payment will be made for Landscaping Topsoil, Seed, Sod, Tree Planting. Include all such costs in with the various items of the proposal.

END OF SECTION

SECTION 02270

TEMPORARY EROSION & SEDIMENT CONTROL

1.01 DESCRIPTION

A. This work shall consist of temporary control measures ordered by the Engineer during the life of the contract and as shown on plans, to control erosion and sediment through use of silt fence, filter outlets, diversion berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses and other erosion control devices or methods.

B. The primary objective of this specification is to control soil erosion to the maximum extent practicable commensurate with reasonable and economical construction practices.

C. The temporary control provisions contained herein shall be coordinated with the permanent erosion control features (grass, pavement and other restorations) specified elsewhere in the contract to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post-construction period.

D. The erosion control measures described herein shall be continued until the construction is complete and final restorations installed.

E. Wherever construction exposes work which is subject to erosion, the extent of such exposure in advance of the subsequent construction shall be subject to the approval of the Engineer. Erosion control features or other work to be completed within such areas shall follow as soon after exposure as practicable.

F. All materials and methods of construction shall be in accordance with the Delaware Department of Natural Resources & Environmental Control Standards for Soil Erosion and Sediment Control.

G. Erosion and Sediment controls shall conform to the Kent Conservation District policies for design, design review and construction oversight.

2.01 MATERIALS

A. Mulches may be hay, straw, fiber mats, netting, wood cellulose, corn or tobacco stalks, bark, corn cobs, wood chips, or other suitable material acceptable to the Engineer and shall be reasonably clean and free of noxious weeds and deleterious materials.

B. Grass shall be a quick growing species (such as rye grass, Italian rye grass, or cereal grasses) suitable to the area providing a temporary cover.

C. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Engineer.

D. Requirements for silt fence:

1. Fence posts shall be spaced 8 feet center-to-center or closer. They shall extend at least 3 feet into the ground. They shall extend 33 inches above ground.

2. A filter fabric, recommended for such use by the manufacturer, shall be buried at least 8 inches deep in the ground and then shall extend 6" parallel to grade. The filter fabric shall extend at least 33 inches above the ground. Filter fabric may be fastened in place by stake or other accepted means as specified by the Delaware Department of Natural Resources & Environmental Control or Delaware Department of Licenses and Inspections.

3. The barrier shall be constructed so water cannot bypass the barrier around the ends.

4. Inspection shall be frequent and repair or replacement shall be made promptly as needed.

5. The barrier shall be removed when it has served its usefulness so as not to block or impede storm flow or drainage.

E. Other as specified by the Engineer.

3.01 METHODS OF CONSTRUCTION

A. Preconstruction Conference:

1. At the preconstruction conference or prior to the start of the applicable construction, the Contractor shall submit for acceptance his schedules for accomplishment of temporary and permanent erosion control work, as are applicable for excavation work, and any other elements of the project which may contribute to ground erosion or siltation. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Engineer.

B. Construction Requirements:

1. The Engineer has the authority to limit the surface area of erodible earth material exposed by excavation and grading operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams, water courses, or bodies of water. Such work may involve the construction of temporary berms, inlet sediment controls, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods as necessary to control erosion. Cut slopes shall be temporarily seeded and mulched as the excavation proceeds to the extent considered desirable and practicable.

2. The Contractor will be required to incorporate all permanent erosion control features to include the required pavement and grass restorations into the project at the earliest practicable times as outlined in his accepted schedule. Temporary control measures will be used to correct conditions that develop during construction that were not foreseen during the design stages that are needed prior to installation or permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

3. Where erosion is likely to be a problem, excavation and grading operations shall be so scheduled and performed that permanent erosion control features can follow

immediately; otherwise temporary erosion control measures may be required between successive construction stages.

4. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal or state or location agencies, the more restrictive laws, rules or regulations shall apply.

5. The Contractor will be responsible for maintaining all soil erosion and sediment control measures in an acceptable manner. All temporary measures shall be removed by the Contractor as directed by the Engineer.

6. Contractor to ensure they have a responsible person on-site that has completed the DNREC Storm Water Contractor's certification course (Blue Card.)

4.01 QUANTITY AND PAYMENT

A. Quantity of Erosion and Sediment Control will not be measured for this project, but the work shall be performed as incidental to the proposed work. The work shall be performed as described herein and in accordance with the regulations set forth by the Delaware Department of Natural Resources and Environmental Control and the County Conservation District.

B. Payment for Erosion and Sediment Control will not be made for this project, but the cost shall be included in the various items of the proposal.

C. Quantity of Inlet Sediment Control will not be measured for this project, but the work shall be performed as incidental to the proposed work.

D. Payment for Inlet Sediment Control will not be made for this project, but the cost shall be included in the various items of the proposal.

E. In the case of repeated failures on the part of the Contractor to control erosion, pollution, and/or siltation, the Owner reserves the right to employ outside assistance or to use in-house forces to provide the necessary corrective measures. Such incurred costs will be charged to the Contractor.

END OF SECTION

SECTION 02515

BUTT JOINTS

1.01 DESCRIPTION.

A. This work consists of constructing butt joints by saw cutting and removing the existing hot-mix, hot-laid bituminous concrete or Portland cement concrete pavement to provide an area to butt the new hot-mix, hot-laid bituminous concrete pavement against the existing pavement.

1.02 CONSTRUCTION METHODS.

B. Construction methods shall conform to the requirements shown on the Plans. Saw cutting equipment shall conform to the requirements of Subsection 762.02. Any saw cut beyond the limits shown on the Plans shall be filled with approved sealant. Pavement that has been removed in order to construct the butt joint shall be disposed of as specified in Subsection 106.09.

1.03 QUANTITY AND PAYMENT

A. Quantity of Butt Joints – Butt Joints will not be measured for this project, but the work shall be performed as required to provide quality, neat and even joints between existing and proposed surfaces.

B. Payment for Butt Joints – Butt Joints will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION

SECTION 02550

SAW CUTTING

1.01 DESCRIPTION OF WORK

A. When Sawcutting is specified or required for a neat construction joint, sawing equipment shall be provided adequate in number of units and power to complete the sawing to the required dimensions and at the rate necessary to prevent uncontrolled cracking. The saws shall be equipped with water-cooled diamond edge blades or abrasive wheels and alignment guides.

B. Saw shall be of a sufficient size to perform a straight even cut with no irregularities when measured with a ten (10) foot straight edge.

C. This section shall include the full depth sawcutting of the existing concrete or bituminous material.

D. At least one (1) standby saw in working order shall be provided. An ample supply of saw blades shall be maintained at the work site at all times during sawing operation.

2.01 QUANTITY AND PAYMENT

A. Quantity of Saw Cutting – Saw Cutting will not be measured for this project, but the work shall be performed as required to provide quality, neat and even joints between existing and proposed surfaces.

B. Payment for Saw Cutting – Saw Cutting will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION