610 TURF ESTABLISHMENT

610. 01 SEEDING

(A) DESCRIPTION. This work shall consist of soil preparation, fertilizing, liming as required, seeding, mulching, and mowing all areas designated for turf establishment as specified in the Contract Documents or as directed by the Chief Engineer.

(B) MATERIALS.

(1) SEED shall meet the requirements of 823.03.

(2) TOPSOIL shall meet the requirements of 823.01.

(3) FERTILIZER shall meet the requirements of 823.02.

(4) LIME shall meet the requirements of 823.02(E).

(5) MULCH shall meet the requirements of 823.04.

(C) CONSTRUCTION REQUIREMENTS. Unless otherwise specified, seeding operations shall be during the periods from March 1 to April 30 and from August 15 to October 31. Seed shall be mixture No. 1, mixture No. 2, or mixture No. 3 as specified for in the Contract Documents or as directed by the Chief Engineer. Seeding at other than the above dates may be allowed upon written approval of the Chief Engineer. Seeding operations shall not be performed when the ground is frozen or when soil or weather conditions would prevent proper soil preparation and subsequent operations. When hydroseeding is performed, nozzles or sprays shall not be directed toward the ground in a manner that will cause erosion or runoff. The Contractor shall notify the Chief Engineer at least 48 hours prior to beginning seeding operations.

Seed shall be furnished separately or in mixes as required in standard sealed containers. All seed shall be labeled, tagged, or marked per accepted horticultural practice and shall comply with all current state and federal regulations. Seed and mixes shall be furnished with a certification from the seed company stating type of seed, percentages of mixture, purity, germination, and weed seed. Legume seed shall be inoculated with an approved inoculant.

(1) PREPARATION OF SEED BED. The Contractor shall first clear the seeding areas of all stones, clods, and debris. The preparation of the seed bed shall include, under this item, the removal of or the merging into the adjacent area any subsoil material existing back of the roadway curbing so as to permit placement of the required 4 inches of topsoil in the seeding areas. The seeding areas shall be boarded or bladed, as necessary, to eliminate any irregularities and to establish a uniform subsurface prior to placing topsoil. All areas shall be left in a drainable condition, free of pockets or depressions. The Contractor shall harrow, disk, or otherwise loosen the subsoil to a depth of 4 inches. Cultivation of slopes steeper than 3 to 1 shall be confined to horizontal scarification to a depth of 2 inches. Gullies, washes, and disturbed areas that develop subsequent to final dressing shall be repaired before they are seeded.

Following the approved sub grade preparation, the Contractor shall apply topsoil over the areas in accordance with the requirements of the Chief Engineer.

All areas to be seeded shall meet required finish grade.

(2) APPLYING LIME. Lime, if necessary to adjust soil pH for grass renovation, shall be applied at the rate of 3,000 pounds per acre. Lime shall then be thoroughly mixed to a depth of 4 inches.

(3) APPLYING FERTILZER. Fertilizer shall be applied at the rate of 1,000 pounds per acre. Fertilizer shall then be thoroughly mixed to a depth of 4 inches. The area shall be scarified and raked until the surface is smooth, friable, and of uniform fine texture.

(4) USE OF SEWAGE SLUDGE. The use of sewage sludge will not be permitted.

(5) APPLYING SEED. Seed shall only be applied to previously prepared seedbeds.

When seed is applied with hydraulic seeders, all mixtures shall be used within eight hours after mixing.

When seed is sown with mechanical seeders, seed and fertilizer shall be incorporated to a depth not more than 1/4 in.

All leguminous seeds shall be inoculated as specified on the inoculant package label. The inoculant shall be stored at room temperatures, out of direct sunlight and away from heating units.

When leguminous seed is sown by hydraulic seeders, 10 times the quantity of inoculant required for dry leguminous seed application shall be used. Seed not used within one hour shall be re-inoculated.

When leguminous seed is sown by mechanical seeders, the seed shall be dampened with water and mixed with the inoculant. The inoculated seed shall then be mixed with the other seed to be used. Inoculated seed not used within 24 hours shall be re-inoculated.

Establishing turf shall be done using mechanical seeding, unless hydro-seeding is specified or directed by the Chief Engineer. Regardless of the method used, the finished surface of any area that is seeded shall not be rougher, more uneven or have more or larger stones, clods, roots, or other foreign materials than the area it adjoins. In built up and residential areas hand raking will be used as required to produce the required smoothness and uniformity, particularly where grading and turf establishment is to be adjacent to lawns.

(a) MECHANICAL SEEDING. Following the approved seed bed preparation the seed shall then be sown. Mixtures No. 1 and No. 2 shall be sown at the rate of 200 pounds per acre or 5 pounds per 1,000 square feet. The seed shall be evenly distributed, preferably with wheelbarrow seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seed sowing equipment when seed and fertilizer are to be applied in dry form.

Fertilizer in dry form and ground limestone, if required, shall be spread separately at specified rates and incorporated in one operation to required depth

on those areas indicated. Seeded areas shall be compacted within 24 hours after seeding has been completed.

Hand-operated seeding devices may be used when seed, fertilizer, and lime are applied in dry form. Generally, hand operated seeders shall be used only on areas which are inaccessible to mechanical seeders.

After the seed has been sown, it shall be covered to an average depth of 1/4 inch by means of a brush harrow, chain harrow, cultipacker, rake, or other approved device. Rolling of seed areas shall be done only as requested by the Chief Engineer.

(b) HYDROSEEDING. The seed and fertilizer, or the seed, fertilizer, and suitable mulch shall be mixed in the needed amount of water to produce slurry and then applied under pressure at the rate indicated on the plans or in the Special Provisions. Hydraulic equipment shall be approved prior to use. When approved, mulch may be applied during or after the seeding operation. When wood cellulose mulch is to be incorporated as an integral part of the slurry mix, it shall be added after the seed and fertilizer have been thoroughly mixed. Lime, when applied hydraulically, shall be a single, separate operation. Wood cellulose mulch shall be applied at the rate of 1,500 pounds per acre or 35 pounds per 1,000 square feet. Any area inadequately covered shall be retreated as directed at no additional cost to the District.

Legume seed, if specified to be used in the seeding mix, shall be inoculated per instructions of inoculant manufacturer. The inoculums used for hydraulic seeding shall be 10 times that recommended for dry seeding. When seeding, or reseeding, fertilizing, and mulching are applied in water, compaction or rolling will not be required.

(6) SEED ESTABLISHMENT PERIOD. The Contractor shall protect and care for seeded areas until final acceptance of the contract. Care shall consist of providing protection against traffic by providing approved warning signs and barricades; and shall consist of repairs to any seeded turf areas damaged by wind, water, fire, traffic or other causes. Grass shall be mowed whenever height reaches 6 inches to maintain a height of 4 inches. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be re-fertilized, re-seeded, and re-mulched as specified herein at the Contractor's expense.

(7) MULCHING. Mulch shall be spread uniformly in a continuous blanket of sufficient thickness, minimum 2 inches, to hide the soil from view, taking care not to over apply. Mulch may be spread by hand or by machinery. Mulch may be spread before seeding turf but not later than 48 hours after seeding turf unless otherwise approved or directed. Anchorage is required unless otherwise specified in the contract documents. Mulch and mulch anchorage shall be applied separately from seeds unless otherwise specified in the contract documents.

Straw mulch material, as specified in 823.04(A), shall be satisfactorily secured by applying the asphalt emulsion binder, making a uniform tacky mat. It shall be applied uniformly at the rate of 0.10 gallon per square yard of mulch surface on

slopes 3 to 1 or flatter areas and 0.15 gallon per square yard of mulch surface on slope or bank areas steeper than 3 to 1 and/or as directed by the Chief Engineer.

Mulch may be blown on grass areas. The use of cutters in the equipment used for this purpose will be permitted to the extent that at least 95 percent of the mulch shall be 6 inches or more in length. When mulch is applied by the blowing method, the loose depth in place shall be no less than 2 inches and a uniform distribution and depth of mulch must be obtained.

Mulching by the "Asphalt Mix" method is also permitted. The mulch material shall be applied by blowing, and the asphalt binder material sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the proportion of approximately 1.7 gallons to 45 pounds of mulch or as required by the Chief Engineer; with a minimum of 1.5 gallons and a maximum of 2 gallons to 45 pounds of mulch, depending on the type of mulch and the effectiveness of the binder in securing it. All mulched surfaces shall be properly applied with asphalt binder material so that the surfaces will have a uniform appearance. Bridges, pavements, curbs, walls, and drainage structures must be adequately protected to prevent any asphalt staining. The Contractor shall take care to prevent asphalt binder from marking or defacing structures, pavements, utilities, or plant growth. Any disfigurement shall be repaired at the Contractor's expenses. Mulching which may become displaced shall be immediately replaced and secured.

(D) MEASURE AND PAYMENT. The unit of measure for Seeding will be the square yard. The actual number of square yards of surface area seeded will be paid for at the contract unit price per square yard, which payment will include furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work as specified herein.

610.02 SODDING

(A) DESCRIPTION. Work consists of preparation of sod bed, liming, fertilizing, watering, and furnishing and placing sod as specified in the contract documents or as directed by the Chief Engineer.

(B) MATERIALS.

(1) SOD shall meet the requirements of 823.05.

(2) TOPSOIL shall meet the requirements of 823.01.

(3) FERTILIZER shall meet the requirements of 823.02.

(4) LIME shall meet the requirements of 823.02(E).

(C) CONSTRUCTION REQUIREMENTS.

Sodding shall not be done during freezing weather, or when the ground is excessively wet, frozen, or otherwise unsuitable. The Contractor shall notify the Chief Engineer at least 48 hours prior to beginning sodding operations.

(1) PROCURING SOD. The Contractor shall exercise maximum care to retain the soil existing on the roots of the sod during transporting, handling and transplanting operations. Dumping or dropping of sod from vehicles will not be permitted. Sod shall be planted within twenty-four hours from the time of harvesting, unless it is

tightly rolled, or stored roots-to-roots. All sod in stacks shall be kept moist and protected from exposure to the sun and from freezing. The maximum period of time from harvesting to planting shall not exceed forty-eight hours.

(2) PREPARATION OF SOD BED. Areas to be sodded shall be boarded or bladed as needed to eliminate irregularities resulting from soil erosion and to establish an even uniform grade as required. All areas to be sodded except those with slopes steeper than 3 to 1 shall be cultivated to a depth of 4 inches to provide a reasonably firm but friable sod bed. Cultivation on slopes steeper than 3 to 1 shall be confined to horizontal scarification to a depth of 2 inches.

Areas to be sodded shall be free of any plant growth, stones 2 inches in any dimension and larger or other debris. There shall be a minimum of 3 inches of topsoil under all sod unless otherwise specified. Apply topsoil in accordance with the requirements of the Chief Engineer.

(3) APPLYING LIME. Lime, if necessary to adjust soil pH for grass renovation, shall be applied at the rate of 3,000 pounds per acre. Lime shall then be thoroughly mixed to a depth of 4 inches on slopes 3 to 1 and flatter and 2 inches on slopes steeper than 3 to 1 either during or following sod bed preparation.

(4) APPLYING FERTILZER. Fertilizer shall be applied at the rate of 1,000 pounds per acre. Fertilizer shall then be thoroughly mixed to a depth of 4 inches on slopes 3 to 1 and flatter and 2 inches on slopes steeper than 3 to 1 either during or following sod bed preparation. The area shall be scarified and raked until the surface is smooth, friable, and of uniform fine texture.

(5) FINISH GRADE FOR SOD. When laid in strips adjacent to paths, pavements, drain inlets and other structures, the finished sod surface shall be flush with surface of the adjacent soil and the adjacent structures. Sod laid in drainage ways, and areas to be continuously or solidly sodded shall meet the finished grades as shown in the contract documents. Grades shall be formed with special care at the junction of drainage ways.

(6) PLACING SOD. Sod shall be mowed in the field to a height of not more than 3 inches within 5 days prior to lifting. All sod shall be in place within 36 hours after lifting from the source. The soil on which the sod will be laid shall be moist. The soil shall be watered prior to sodding, if so directed by the Chief Engineer. Sod shall be placed in successive strips neatly matched with staggered joints tightly butted and all openings shall be plugged with sod. In drainage ways and where continuous or solid sodding is indicated and/or specified in the contract documents, the sod shall be laid with the longest dimension parallel to the contours.

Gaps or openings which occur at paved or wall areas shall be plugged tight with sod. Sod which is small, irregular, broken, torn or has lost any soil will be rejected. After placing sod it shall be watered thoroughly and rolled with approved equipment.

On slope areas, sod shall be placed parallel to the contour, starting at the bottom of the slope. Vertical joints between sides shall be staggered. On slopes 3 to 1 and steeper, each strip of sod shall be pegged with at least (2) two 1/2 inch by 1/2 inch by 12 inch stakes placed 2 feet apart and driven flush with the top of the grass.

(7) SOD ESTABLISHMENT PERIOD. The Contractor shall protect and care for sodded areas until final acceptance of the contract. Care shall consist of providing protection against traffic by providing approved warning signs and barricades; and shall consist of repairs to any sodded areas damaged by wind, water, fire, traffic or other causes. In locations where mowing is specified, the sod shall be mowed whenever height reaches 5 inches to maintain a height of 3 inches. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be re-fertilized, reseeded, and re-mulched as specified herein at the Contractor's expense.

The sod shall be watered at weekly intervals for a minimum of four weeks following installation unless otherwise specified or directed by the Chief Engineer. Additional watering shall be performed if specified in the contract documents. When watering, sufficient water shall be applied to wet the sod at least 2 inches into the sod bed. Watering shall be done in a manner that will not cause erosion or other damage to the finished surfaces. Any surfaces that have settled, become gullied or otherwise damaged shall be repaired at the Contractor's expense to re-establish the grade and conditions of the soil prior to sodding and shall then be re-fertilized and re-sodded as specified under this work.

(D) MEASURE AND PAYMENT.

The unit of measure for Sodding will be the square yard, with measure taken for actual surface area sodded.

Payment will be made at the contract unit price per square yard, which payment will include furnishing all labor, materials, equipment, tools, water used during planting, and incidentals necessary to complete the work.

610.03 WILDFLOWER SEEDING

(A) DESCRIPTION. This work shall consist of preparing seed bed, furnishing and placing wildflower and companion grass seed, herbicide and mulch as specified in the contract documents or as directed by the Chief Engineer.

(B) MATERIALS.

(1) WILDFLOWER SEED MIX shall be approved for use in the Washington, D.C. area and shall contain at least 20 to 25 different species. The mixture shall be approximately 70 percent perennials, 20 percent biennials and 10 percent annuals. The purity of species shall be 95 percent minimum. Seed germination shall range from 75 to 98 percent.

(2) HERBICIDE. Herbicide shall be an approved United States Environmental Protection Agency chemical to control and prevent re-growth of undesirable vegetation. The herbicide shall be approved for type and rate of application by the Chief Engineer.

(3) MULCH shall meet the requirements of 823.04.

(4) HYDROMULCH shall meet the requirements of 823.04(B).

(5) COMPANION GRASS SEED. Grass seed for stabilizing soil prior to germination of wildflower seeds shall be 100% Hard Fescue (Festuca longifolia) or Sheep Fescue (Festuca ovina). Grass seed shall meet standards for germination in state where seed is purchased, shall have high purity of not less than 95 percent, and shall contain no noxious weed seeds. No bluegrass, annual rye, tall fescue, orchard grass or timothy seeds shall be used.

(C) CONSTRUCTION REQUIREMENTS

The Contractor shall perform all herbicide placement and all seeding, scarifying and mulching operations only at times when local weather and other conditions affecting such work are normal and favorable to the proper prosecution of the work. No work shall be done when the temperature is 32°F or lower. Seeding shall not be done during windy weather, or when the ground is excessively wet, frozen or otherwise untillable.

(1) PREPARATION OF SEED BED. All existing grass, weeds, vegetation, stones and debris shall be removed from the areas to be seeded. Prior to seeding and mulching, the soil shall be hand-raked or mechanically scarified to a maximum depth of 3 inches by power rake, tine-harrow, verti-cutter or rotary tiller set on highest setting.

Two to four weeks prior to sowing seed, the Contractor shall spray a contact herbicide over the scarified seeding area. Precautions in applying herbicide shall be followed in accordance with the manufacturer's instructions and information, and shall be of a type and rate of application approved by the Chief Engineer prior to use. The Contractor shall submit daily herbicide application reports to the Chief Engineer.

(2) APPLYING SEED. Seeding in the spring, before periods of anticipated rainfall, is the best recommended time for wildflower seeding. In medians and in small areas, seeding shall be applied by hand, or by a drop or cyclone spreader set to dispense seed at the rate of 7 pounds per acre, or 1/4 pound per 1,000 square feet. After seeding, soil shall be firmed with a light-weight roller, cultipacker, or other mechanical means to insure contact between seed and soil. No fertilization of wildflower areas will be required.

Companion grass seed shall be sown separately after the wildflower seeds have been sown. Grass seed shall be planted at the rate of 10 to 15 pounds per acre, or 1/4 pound per 1,000 square feet.

On steep slopes and embankments, the hydroseeding method may be used. The slurry mix of wildflower seed and water shall be applied at the rate of 7 pounds per acre, or 1/4 pound per 1,000 square feet. Wildflower or grass seed should not be immersed in water until immediately before application.

(3) MULCH. The seed bed shall then be covered with mulch to a 1/4-inch thickness, or two to three times the depth of the seed. For areas one acre or larger, a mechanical seed drill may be used to sow the seeds 1/8 to 1/4 inch deep.

Hydromulching shall be applied separately, after the hydroseeding operations are completed, at the rate of 1,200 pounds per acre, or 27-1/2 pounds per 1,000 square feet. The hydromulch shall be applied in two separate passes, or applications. Only 5 to 10 percent of the quantity of hydromulch shall be applied during the first

application, so that the wildflower and grass seed will not hang up in the mulch. A second pass, using the remainder of the hydromulch, will then be applied over the first application.

(4) SEED ESTABLISHMENT PERIOD. The Contractor shall care for the seeded wildflower areas until final acceptance of the contract. Care of wildflowers shall consist of keeping the wildflowers in a healthy growing condition by watering, controlling weeds, and by any other necessary operations. Care shall also consist of providing protection against traffic by providing approved warning signs or barricades, and shall consist of repairs to any seeded wildflower area damaged by wind, water, fire, traffic or other cause. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall be reseeded and re-mulched as specified herein. The Contractor shall mow wildflower establishment areas once a year in the autumn after the seed heads have matured, as approved by the Chief Engineer for the duration of the contract.

The wildflowers shall be watered at weekly intervals for a minimum of four weeks following installation unless otherwise specified or directed by the Chief Engineer. Additional watering shall be performed if specified in the contract documents. Watering shall be done in a manner that will not cause erosion or other damage to the finished surfaces. Any surfaces that have settled, become gullied or otherwise damaged shall be repaired at the Contractor's expense to re-establish the grade and conditions of the soil prior to seeding and shall then be re-fertilized and reseeded as specified under this work.

If the wildflowers have not filled in the planting area completely by the end of the first growing season, the bare areas will be reseeded by the Contractor in the fall, as directed by the Chief Engineer and at no additional cost to the District.

(D) MEASURE AND PAYMENT. The unit of measure for Wildflower Seeding will be the square yard.

Payment will be made at the contract unit price per square yard, complete in place, and will include an acceptable stand of wildflowers and companion grass (at least 75 percent germination) and all labor including scarifying and mowing, materials including seed, mulch and herbicide, water used during planting, tools, equipment and incidentals necessary to complete the work.

610.04 CROWNVETCH HYDROSEEDING

(A) DESCRIPTION. This work shall consist of soil preparation, fertilizing, liming as required, hydroseeding and mulching all slopes greater than 3 to 1 and all areas designated for crownvetch as specified in the contract documents or as directed by the Chief Engineer.

The hydroseed shall be a mixture of crownvetch seed with inoculant added, and grass seed.

(B) MATERIAL

(1) SEED shall meet the requirements of 823.03 – Seed Mix No. 3.

(2) TOPSOIL shall meet the requirements of 823.01.

(3) FERTILIZER shall meet the requirements of 823.02(B).

(4) LIME shall meet the requirements of 823.02(F).

(5) MULCH shall meet the requirements of 823.04(B).

(A) CONSTRUCTION REQUIREMENTS. Hydroseeding operations shall not be performed when the ground is frozen or when soil or weather conditions would prevent proper soil preparation and subsequent operations. When hydroseeding is performed, nozzles or sprays shall not be directed toward the ground in a manner that will cause erosion or runoff. The Contractor shall notify the Chief Engineer at least 48 hours prior to beginning hydroseeding operations.

(1) PREPARATION OF SEED BED. The Contractor shall first clear the hydroseeding areas of all stones, clods, and debris. The preparation of the seed bed shall include, under this item, the removal of or the merging into the adjacent area any subsoil material existing back of the roadway curbing so as to permit placement of the topsoil in the seeding areas. The seeding areas shall be boarded or bladed, as necessary, to eliminate any irregularities and to establish a uniform subsurface prior to placing topsoil. All areas shall be left in a drainable condition, free of pockets or depressions. The Contractor shall harrow, disk, or otherwise loosen the subsoil to a depth of 4 inches. Cultivation of slopes steeper than 3 to 1 shall be confined to horizontal scarification to a depth of 2 inches. Gullies, washes, and disturbed areas that develop subsequent to final dressing shall be repaired before they are hydroseeded.

Following the approved subgrade preparation, the Contractor shall apply topsoil over the areas in accordance with the requirements of the Chief Engineer.

Other areas designated by the Chief Engineer to be hydroseeded but which are covered with weeds or grass shall have the vegetation mowed or cut down to ground level. All trees and stumps shall be removed, and all clippings and debris shall be cleared from the seedbed area. Prior to hydroseeding, the soil shall be hand raked or mechanically scarified to a depth of at least 4 inches.

All areas to be hydroseeded shall meet required finish grade.

(2) APPLYING HYDROSEED MIX. The mixture of crownvetch seed and companion seed shall be sown at the rate of 100 pounds per acre or 2-1/2 pounds per 1,000 square feet. Fertilizer shall be applied at 500 pounds per acre or 12 pounds per 1,000 square feet. Lime shall be applied at the rate of 2,500 pounds per acre or 60 pounds per 1,000 square feet. The pH of the soil should be 6.5 and above. If the pH is below 6.5, additional lime should be added until this level is reached. Ureaform shall be applied at the rate of 400 pounds per acre or 9 pounds per 1,000 square feet. Inoculant shall be applied at 10 times the normal rate of application for dry seeding.

All leguminous seeds shall be inoculated as specified on the inoculant package label. The inoculant shall be stored at room temperatures, out of direct sunlight and away from heating units. Crownvetch inoculants shall consist of pure-bred cultures of Rhizobia species of bacteria and shall not be used later than the date indicated on the container or as specified. Seed not used within one hour shall be re-inoculated.

Companion seed – For spring and fall seeding, mix into seeding mixture 60 pounds per acre of 50 percent perennial rye grass and 50 percent Kentucky 31 fescue. For summer seeding, add into this mix 4 pounds per acre of weeping love grass.

The ground limestone, fertilizer, seed and inoculant shall be combined and thoroughly mixed in a slurry tank and the specified binder then added to the mix.

(3) APPLYING MULCH. Mulch shall be applied hydraulically immediately after applying the slurry mix. The mulch shall be applied at 1,500 pounds per acre or 35 pounds per 1,000 square feet.

(4) SEED ESTABLISHMENT PERIOD. The Contractor shall protect and care for seeded areas until final acceptance of the contract. Care shall consist of providing protection against traffic by providing approved warning signs and barricades; and shall consist of repairs to any hydroseeded areas damaged by wind, water, fire, traffic or other causes. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to hydroseeding and shall then be re-fertilized, reseeded, and re-mulched as specified herein at the Contractor's expense.

(B) MEASURE AND PAYMENT. The unit of measure for Crownvetch Hydroseeding will be the square yard.

Payment will be made at the contract unit price per square yard, complete in place, and will include an acceptable stand of crownvetch (at least three healthy and flourishing crownvetch plants per square yard), including an acceptable stand of companion ryegrass, all labor, material, tools, equipment, and incidentals necessary to complete the work. Topsoil shall be paid for under a separate item.

610.05 RENOVATING GRASS

(A) DESCRIPTION. This work shall consist of removing all stones, trash, and debris, soil preparation, fertilizing, liming as required, seeding, mulching, and mowing all areas designated for grass renovation as specified in the contract documents or as directed by the Chief Engineer. The Contractor shall provide a uniform acceptable stand of grass as per Seed Establishment Period, 610.01(C) (6). Any unacceptable renovated grass areas shall be re-seeded at the Contractor's expense during the immediate seed sowing period.

(B) MATERIALS.

(1) SEED shall be Mixture No. 1 listed in Table 823.03 and shall meet the requirements of 823.03.

(2) SEED mix for densely shaded areas will be 20 percent by weight America Kentucky Bluegrass and 80 percent by weight Pennlawn Creeping Red Fescue.

(C) CONSTRUCTION REQUIREMENTS. Unless otherwise specified, seeding operations shall be during the periods from March 1 to April 30 and from August 15 to October 31. Seeding at other than the above dates may be allowed upon written approval of the Chief Engineer. The Contractor shall notify the Chief Engineer at least 48 hours prior to beginning seeding operations.

Seed shall be furnished separately or in mixes as required in standard sealed containers. All seed shall be labeled, tagged, or marked per accepted horticultural practice and shall

comply with all current state and federal regulations. Seed and mixes shall be furnished with a certification from the seed company stating type of seed, percentages of mixture, purity, germination, and weed seed. Legume seed shall be inoculated with an approved inoculant.

(1) PREPARATION OF SEED BED. The Contractor shall first clear the seeding area of all stones, trash and debris; the seeding areas shall be raked to a depth of approximately 1/2 inch.

(2) APPLYING LIME. Lime, if necessary to adjust soil pH for grass renovation, shall be applied at the rate of 3,000 pounds per acre.

(3) APPLYING FERTILIZER. Fertilizer shall be applied at the rate of 1,000 pounds per acre.

(4) APPLYING SEED. Seed shall be spread evenly with a hand-push type, calibrated fertilizer spreader not to exceed 36 inches in width. After seed is in place and approved by the Chief Engineer, the entire area shall be dragged lightly with a metal or bamboo fan rake.

Seed for densely shaded areas shall be sown at the rate of 3 pounds per 1,000 square feet.

(5) SEED ESTABLISHMENT PERIOD. The Contractor shall protect and care for seeded areas until final acceptance of the contract. Care shall consist of providing protection against traffic by providing approved warning signs and barricades; and shall consist of repairs to any seeded turf areas damaged by wind, water, fire, traffic or other causes. The Contractor shall provide water as necessary to insure proper germination and a uniform stand of grass. Grass shall be mowed whenever height reaches 6 inches to maintain a height of 4 inches. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be re-fertilized, reseeded, and re-mulched as specified herein at the Contractor's expense.

(D) MEASURE AND PAYMENT. The unit of measure for Renovating Grass shall be the square yard.

The actual number of square yards of surface area renovated will be paid for at the contract unit price per square yard, which payment will include furnishing all labor, materials, tools, equipment, reseeding if necessary and incidentals necessary to complete the work as specified herein.

610.06 EROSION CONTROL MATTING

(A) DESCRIPTION. This work shall consist of preparing the ground surface, furnishing, placing and caring for erosion control matting specified in the contract documents or as directed by the Chief Engineer.

(B) MATERIALS. All erosion control matting materials shall be made of new material, clean, sound, free of rips or tears.

(1) TYPE A – Burlap shall be of standard weave with a weight of 3.5 to 5.0 ounces per square yard.

(2) TYPE B – Jute matting shall be of a uniform, plain weave with warp and wet yarns of about same size, with a width of 45 to 48 inches ± 1 inch, with 78 warp ends per width and 41 wet ends per yard. Cloth shall weigh 1.80 to 1.22 pounds per running yard ± 5%.

(3) TYPE C – Woven paper or woven sisal mesh matting shall be woven from twisted yarns available in rolls 45 to 48 inches wide. Matting may vary from close to open weave, ranging from 1/8 to 1/4 inch opening. Shrinkage after wetting shall not exceed 20 % of the surface area.

Matting anchor staples shall be made of No. 8 gauge steel wire, bent U-shaped with a throat width of 1 to 2 inches, and an effective driving depth not less than 6 inches.

(C) CONSTRUCTION REQUIREMENTS. The time of placement shall be as specified in the contract documents and/or according to manufacturer's recommendations. No erosion control material shall be placed on frozen ground. Matting shall be placed within 24 hours after seeding operations have been completed.

(1) GROUND PREPARATION AND INSTALLATION. Areas to receive an erosion control material shall be shaped, graded and compacted to the lines and grades shown in the contract documents or as directed by the Chief Engineer. Except on freshly placed topsoil, areas to receive erosion control materials shall be scarified to a minimum depth of 1 inch immediately prior to installation of the erosion control materials. All loose stones, clods, sticks, or other undesirable material over 2 inches in greatest dimension shall be removed and disposed of by the Contractor.

Matting shall be unrolled in the direction of drainage flow without stretching. Each strip of matting shall overlap the long edge of previous strip at least 4 inches. When joining ends of 2 strips, the up-channel end of lower strip shall be turned down and buried 6 inches deep in a trench. Bottom end of upper strip shall be lapped 12 inches over up-channel end of lower strip. The Chief Engineer may require any other edge exposed to more than normal water flow be buried in a similar manner. Matting edges shall be similarly buried around the edges of catch basins and other structures.

Matting shall be in firm contact with the soil in its entirety. Matting shall be securely fastened in place with staples driven vertically into the soil and flush with the surface. Staples shall be placed at 4 feet intervals along the edges and center of the matting. On all overlapping edges, staples shall be placed 12 inches apart. At all ends of matting, staples shall be placed 12 inches apart. Mats constructed of wood and hydromulch shall also be watered immediately after stapling to bond the mat with the soil. Water shall be applied so it falls on the mat like a normal rainfall. At no time shall the water be directed from a water or hydroseeder spray gun in a direct straight line to the mat.

(2) CARE AND REPAIR. The Contractor shall care for the areas where erosion control materials have been placed until a satisfactory turf has developed and approved by the Chief Engineer or final acceptance of the contract. Where necessary, such care shall consist of providing approved warning signs or barricades for protection against traffic. Any surfaces that have settled, become gullied or otherwise damaged, do to the Contractor's operations, shall be repaired at the Contractor's expense to re-establish the grade and soil conditions that existed prior

to placing erosion control materials. Turf shall be re-established as specified in the contract documents.

Staples that become loose or raised, and matting that becomes loose, torn, or undermined shall be repaired promptly at Contractor expense. When directed and as part of work, any portion of matting shall be rolled with a roller weighing not over 65 pounds per foot width of the roller.

(D) MEASURE AND PAYMENT. The unit of measure for Erosion Control Matting will be the square yard in place. The number of square yards as measured in place will be paid for at contract unit price per square yard, which payment will include furnishing all labor, materials, tools, equipment and incidentals necessary to complete and care for the work as specified.

Measure of overlap will not be taken.

610.07 TOPSOIL

(A) DESCRIPTION. This work shall consist of furnishing and placing topsoil in conformance with the grades, limits and depths as shown in the contract documents or as directed by the Chief Engineer.

(B) MATERIALS.

(1) TOPSOIL shall meet the requirements of 823.01.

(C) CONSTRUCTION REQUIREMENTS.

(1) PREPARATION OF TOPSOIL AREAS. Unless otherwise directed by the Chief Engineer, areas designated to receive topsoil shall be graded so that the completed work after topsoil is placed, shall conform to the specified grades and limits. The Contractor shall shape and then scarify or till the surface of the subsoil before the topsoil is placed to permit bonding of the topsoil with the subsoil. Tillage by disking, harrowing, raking or other approved methods shall be accomplished in such a manner that depressions and ridges formed by tillage shall be parallel to the contours. Topsoil shall be applied only when the subsoil is in a loose, friable condition.

Subsoil on slopes that have been horizontally grooved in accordance with the plans shall not be loosened.

(2) PLACING AND SPREADING TOPSOIL. The loose depth of topsoil shall be sufficient to allow the area to conform to the elevations shown on the plans after topsoil settles. After topsoil has been applied, large clods, hard lumps, and stones more than 2 inches in diameter; brush; roots; stumps; litter; and foreign material shall be removed from the area. When the operation is complete, the area shall be in a condition to receive seed, sod, mulch or plants.

(3) RESTORATION. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable to receive seed, sod, mulch or plants. Surplus topsoil shall be placed in other locations approved by the Chief Engineer.

(D) MEASURE AND PAYMENT: Topsoil will be measured in acres of surface area computed to the nearest 1/10 acre and will be paid for at the contract unit price per acre. This price shall include preparing areas to receive topsoil; furnishing, loading, transporting, and applying topsoil; finishing areas; and restoring damaged areas prior to final acceptance.