

**STANDARD SPECIFICATIONS FOR
CONSTRUCTING UTILITY FACILITIES**

DIVISION III - CONSTRUCTION SPECIFICATIONS

**SECTION 11
GENERAL SPECIFICATIONS FOR EROSION CONTROL**

11.01 EROSION AND PROPERTY CONTROL

Contractor shall coordinate with authority having jurisdiction to confirm the following specifications are current. Any existing sod or grass removed shall be replaced with new sod of the same type.

- A. Flow of Drains and Sewer Maintained: Adequate provisions shall be made for the flow of sewers, drains, and water courses encountered during construction and the lines and structures which may have been disturbed shall be immediately restored to their original condition at the expense of the Contractor.
- B. Property Protection: Trees, grass, fences, signboards, poles and all other property shall be protected unless their removal is authorized. Any property damage shall be satisfactorily restored by the Contractor at the expense of the Contractor.
- C. Erosion: The Contractor shall at all times take necessary precautions to prevent erosion or transportation of soil due to natural or induced water flows. Spoil banks and soil stockpiles shall be contained to prevent transportation of soil by run-off waters.
 - 1. Topsoil: As indicated on the plans or specifically required in the specifications, the final top surface (depth as specified) of soil within the specific area shall be a good quality topsoil which shall be material obtained from the striping operation and whatever additional topsoil required at the Contractor's cost from an off-site source. Topsoil shall be workable, friable, loamy soil free from hard lumps, stiff clay, gravel, noxious weeds, brush and other deleterious materials. Lime shall be added to reduce the possibility of odor. Topsoil shall be placed in all areas disturbed by construction, prior to grassing. No direct payment will be made for topsoil unless specifically noted otherwise.
 - a. Grading: The Contractor shall perform grading of every description regardless of the character of material encountered, within the limits and to the lines and grade shown on the plans. Slight changes in grades shown on the plans may be required to allow for final dressing and drainage as the work progresses. Sufficient topsoil shall be stockpiled for final dressing.

- b. Stripping: Stripping shall consist of the removal of a minimum of four inches of grass and topsoil from within the limits of the new construction as shown on the plans. Topsoil obtained from the stripping operation that meets or exceeds topsoil requirements of this section shall be stockpiled on the site in areas approved by the Owner. If any of the stripped material is not suitable for use as topsoil or embankment material, it shall be disposed of away from the construction site by the Contractor at no cost to the Owner.

- 2. Grassing and Mulching: The trench lines and other areas disturbed by construction of utility lines shall be grassed and mulched as required by local authorities (i.e. City of Daphne Right-of-Way Ordinance) as hereinafter specified where indicated on the plans or where directed. These items are to be considered as special erosion control measures to be utilized only where specifically required and payment will be made only when these items are shown on the proposal or where Engineer authorization is granted. In all other areas, the provisions of paragraph entitled "Erosion and Property Control" of this section shall apply with respect to erosion control.
 - a. General: After pipe trenches have been backfilled, the area to be grassed shall be graded to the final grade and roots, stumps, or other materials which might be harmful to grass growth shall be removed and disposed of. Care shall be taken to spread topsoil over the entire area to be grassed to the extent that topsoil along and adjacent to the trench lines is available. Areas that were previously sodded shall be replaced with sod to match.
 - b. Fertilizer: After the surface has been prepared for grassing and before any grass or seeds are planted, the soil shall be loosened by harrowing or other approved methods, and the areas specified to be grassed shall be fertilized at a uniform rate of 1,500 pounds per acre with a standard commercial 8:8:8 fertilizer and 3,000 pounds of agricultural lime per acre.
 - c. Seeding: The areas to be grassed shall be seeded with good sound seed in the following minimum quantities per acre:

Kentucky 31 Fescue	34 pounds
Common Bermuda	10 pounds
White Dutch Clover	10 pounds

In some areas, it may be necessary to vary the concentrations of various seed to suit local conditions and the Owner reserves the right to change proportions of the various seed so long as the total amount of seed does not exceed 74 pounds per acre at no change in contract price.

Seed shall be broadcast with hand operated equipment. When broadcast, seed shall be sown over the areas and raked or dragged and covered to the desired depth. Hydro seeding may, at the Contractor's option, be used in lieu of the above.

Unless specifically noted otherwise, Pensacola Bahia shall not be used.

- d. Mulching: In areas directed by the Owner, the surface of sprigged and overseeded slopes of the roadway or embankments shall be protected by the application of a mulch. The mulch shall be spread uniformly in a continuous blanket by hand or by suitable approved equipment, at a rate of two tons to the acre. Mulching material which, in the opinion of the Engineer, is too coarse or too short for proper securing in the surface soil will be rejected. Mulching shall be started at the windward side of relatively flat areas or at the upper part of a steep slope and continued uniformly over the entire area. The mulch material shall be anchored to the soil by spraying a light coating of emulsified asphalt over the straw or hay after these materials have been placed. The asphalt shall be applied by hand sprayers attached by hoses to an asphalt spreader or other approved methods. The asphalt adhesive shall be applied to the mulch at a rate of 150 gallons of undiluted (straight emulsion) asphalt per ton of straw or hay (300 gallons per acre). If the straight emulsion is further diluted with water in the ratio of 60 (straight emulsion) to 40 (water), the application rate shall be 250 gallons of asphalt emulsion per ton of straw or hay (500 gallons per acre). This will secure the mulch on the ground to form a soil binding mulch and prevent loss or bunching by wind or water.
- e. Solid Sod: Solid sod shall be used in all areas where a well established grass is planted and disturbed by the Contractor. Type of solid sod shall match existing grass.
- f. Maintenance: the Contractor shall maintain all grassed areas until acceptance of the entire contract and for a period of three months thereafter. Areas upon which an established stand of grass is not obtained, the Contractor shall reseed and remulch as hereinafter specified. A satisfactory stand of grass is defined as a cover of living grass in which gaps larger than 12 inches do not occur at the time of acceptance. Maintenance shall consist of watering, preserving, protecting, replacing dead grass, filling washes and generally maintaining the area until final acceptance.

If the grassing operation is accomplished after the month of August or before the month of March, in addition to the seeding as outlined above, the entire grassed areas shall also be over seeded with Italian Rye Grass seed at the uniform rate of 40 pounds per acre at no additional cost to the Owner.

- g. Asphaltic Adhesive: Asphalt shall be a bituminous soil cover suitable for mulching of seeded areas and shall contain no petroleum solvents or other diluents which would be toxic to plant growth. It shall be a homogenous emulsification of especially refined petroleum asphalt suitable for spray application with or without dilution with water. Laykoid Soil Cover, manufactured by American Bitumuls and Asphalt Company, or other commercial types of asphalt specifically designed for mulching of seeded areas for erosion protection against rain or wind, will be acceptable. Cost of this item shall be included in unit price bid for grassing and mulching for erosion control.

D. Erosion Control Netting: Erosion control netting shall be utilized in locations where specifically required by the engineer and installed in accordance with the manufacturers recommendation using 3/4 inch x 2 1/2 inch x 12 inch wedge shaped wooden stakes and/or staples. The netting material shall be Enkamat 7220 or engineer approved equal.

- 1. Construction Requirements: All surfaces to be protected shall be graded, fertilized, limed, and finished so as to be stable and firm.

Synthetic mat used as a ditch liner shall be applied with the length of roll laid parallel to the flow of the water. Where more than one width is required, a multi-width welded mat shall be supplied in multiples of 3 feet. All lap joints and upslope edges shall be staked at intervals of 3 feet or less. Where three-wide mat is required, lap joints to be limited to one every nine feet of width.

All wood stakes shall be driven to within 2 inches of the ground surface.

An anchor slot shall be placed at the upslope and downslope ends of the mat placement. At least 12 inches of the end of the mat shall be buried vertically in a slot dug in the soil. The mat shall be secured in the anchor slot by staples or stakes at intervals of 3 feet or less prior to burying, except when the ditch is located above the synthetic liner, in which case no stakes or staples shall be used in the anchor slot unless 6 inches separation is maintained between the point of the installed stake or staple, and the synthetic liner. The soil shall be firmly tamped against the mat in the slot.

Successive lengths of mat shall be overlapped at least 3 feet, with the upstream length on top. Stake or staple the overlap in 3 places evenly spaced across the end of each of the overlapping lengths and in 3 places across the width of the center of overlap area. Check slots shall be spaced so that a check slot occurs within each 20 feet. Stake or staple the mat in the check slot at each edge overlap and in the center of the mat, except when the ditch is located above the synthetic liner, in which case no stakes or staples shall be used in the check slot, unless 6 inches separation is maintained between the point of the installed stake or staple and the synthetic liner. Beginning and terminal ends to be staked in accordance with installation manual.

Upslope edges of mat used as ditch lining shall terminate on 4-inch wide horizontal shelves running parallel to the axis of the ditch for the full length of the ditch. Edges of the mat shall be staked at 3-foot intervals, backfilled with soil, and tamped to original slope.

After the mat has been placed, the area shall be evenly seeded or sodded, as specified and where shown on the plans.

Synthetic liner damaged by the contractor during mat installation shall be repaired immediately.

The Contractor shall maintain the blanket until all work on the contract has been completed and accepted. Maintenance shall consist of the repair of areas where damaged by any cause.

2. Method of Measurement: Synthetic mat, including stakes and staples, complete in place and accepted, will be measured by the square yard of finished surface. Material placed outside the specified limits will not be measured or paid for and the contractor may be required to remove and dispose of the excess material without cost to the City.

END OF SECTION