STANDARD CONSTRUCTION SPECIFICATIONS FOR

MISCELLANEOUS CONSTRUCTION

DIVISION 700

INDEX

SECTION 701 GENERAL

701.1 General

The work covered by these specifications consists of furnishing all plant, labor, equipment, and materials and/or construction of miscellaneous facilities as provided in this division.

701.2 Applicable Standards

The latest revision of the following standards of the American Society for Testing and materials (ASTM), the American Association of State Highway and Transportation Officials (AASHTO), The Alaska Department of Transportation and Public Facilities, Standard Specifications for Highway Construction, 1988 are hereby made a part of these Specifications.

ASTM A-112	Specification for Zinc Coated (Galvanized) Steel Tie Wires
ASTM A-120	Specification for Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses.
ASTM A-121	Specification for Zinc Coated (Galvanized) Steel Barbed Wire
ASTM A-153	Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A-227	Specification for Hard-Drawn Steel Spring Wire
ASTM A-307	Specification for Low-Carbon Steel Externally and Internally Threaded Standard Fasteners
ASTM A-392	Specification for Zinc Coated (Galvanized) Steel Chain Link Fence Fabric
AASHTO M-133	Specification for Preservatives and Pressure Treatment Processes for Timber
AASHTO M-145	Classification of Soils
AASHTO M-180	Specification for Corrugated Sheet Steel Beams for Highway Guard Rail
AASHTO M288-90	Requirements for Protected Drainage, Erosion Control Applications, and Medium Survivability Separations Applications

SECTION 702 GEOTEXTILE SYNTHETIC FABRIC

702.1 General

The placement of synthetic fabric shall be as recommended by the manufacturer and as shown on the plans.

702.2 Material

a. Woven Fabric

The synthetic woven fabric shall, at a minimum, meet the specifications of Amoco Propex 2002, or equal, and as approved by the Engineer.

Synthetic Fabric Minimum Specifications:

Properties	Test Method	Value
• Grab Tensile Strength (lbs)	ASTM D 4632	200
• Elongation (%)	ASTM D 4632	15
• Trapezoid Tear (lbs)	ASTM D 4533	75
• Puncture (lbs)	ASTM D 4833	90
• Mullen Burst (psi)	ASTM D 3786	400
• Ultra Violet Stability (Strength Retained %)	ASTM D 4355	70
• Apparent Opening Size CW02215 (US Sieve Size)	ASTM D 4751	50
• Permittivity (1/sec)	ASTM D 4491	.05
• Vertical Water Flow Rate (GPM / SF)	ASTM D 4491 (Falling Head)	4

b. Non-woven Fabric

The synthetic non-woven fabric shall at a minimum meet the specifications of Amoco Propex 4545, or equal, and as approved by the Engineer.

Synthetic Fabric Minimum Specifications

Properties	Test Method	Value
• Grab Tensile Stregth (lbs)	ASTM-D 4632	90
• Grab Elongation (%)	ASTM-D 4632	50
• Mullen Burst (lbs/square in.)	ASTM-D 3786	185
• Puncture (lbs)	ASTM-D 4833	55
• Trapezoid Tear	ASTM-D 4533	40

• UV Resistance (%@_hr)	ASTM-D 4355	70
• Apparent Opening Size	ASTM-D 4751	70
• Permittivity (sec -1)	ASTM-D 4491	2.1
• Flow Rate (gal/min/sq.ft.)	ASTM-D 4491	155

702.3 Construction

The sub-grade shall be shaped according to the typical section on the plans and shall be free of large rocks, sticks, and deleterious material. Fabric shall be installed full roadway width or as shown on the plans. Fabric shall be joined with adjacent pieces of fabric by overlapping. Sections shall be overlapped a minimum of three feet (3'), or as shown on the plans.

Where fabric passes through a horizontal curve, the practice of back lapping on the inside of the curve will be permitted. Where manholes and valve boxes will protrude through the fabric, the fabric shall be neatly cut in the shape of the manhole or the valve box. A second piece of fabric shall then be cut in the same manner and placed on top of the main fabric. The second piece shall extend at least four feet (4') in all directions from the manhole or valve box. Fill and backfill shall be dumped and spilled over the fabric. No equipment shall operate either directly on the fabric or on less than one foot (1') of classified backfill.

702.4 Method of Measurement

Synthetic fabric shall be measured by the net square yard of ground surface covered. No additional measurement will be made for patches required around manholes and valve boxes or for laps required at fabric joints.

702.5 Basis of Payment

Basis of payment for this item shall be in accordance with *Section 10.7* and shall be full payment for work described in this section.

Payment will be made under

ITEM	DESCRIPTION	UNIT
702 (W)	Woven Geotextile Fabric	Square Yard
702 (N)	Non-woven Geotextile Fabric	Square Yard

SECTION 703 GEOGRID BASE REINFORCEMENT

703.1 General

The placement of geogrid base reinforcement shall be in accordance with the recommendation of the manufacturer and as shown on the plans.

703.2 Material

The geogrid base reinforcement material shall be Biaxial Geogrid Reinforcement Matting BX 1100 as manufactured by the Tensar Corporation, 1210 Citizens Parkway, Morrow, Georgia 20260, or equal, and as approved by the Engineer.

The geogrid matting shall be an integrally formed biaxially oriented polymer grid structure with a high tensile modulus. The geogrid matting shall maintain its reinforcement and interlocking capabilities under repeated dynamic loads and shall be resistant to ultraviolet light, and biological and chemical degradation.

The geogrid shall also conform to the property requirements listed below:

Product Properties	Units	MD Values[1]	XMD Values[1]
• Aperture Dimensions[2]	inch	1	1.3
• Minimum Rib Thickness[2]	inch	.03	.03
Load Capacity			
• True Initial Modulus in Use[3]	1b./ft.	17,140	27,420
• True Tensile Strength @2% Strain[3]	1b./ft.	280	450
• True Tensile Strength @5% Strain[3]	1b./ft.	580	920
Structural Integrity			
• Junction Efficiency[4]	%	93	N/A
• Flexural Stiffness[5]	mg-cm	250,000	N/A
• Aperture Stability[6]	kg-/deg	3.2	N/A
Durability			
• Resistance to Installation Damage[7]	%SC/%SW/%GP	90/83/70	N/A
• Resistance to Long Term Degradation[8]	%	100	N/A

Notes

1. Unless indicated otherwise, values sown are minimum average roll values determined in accordance with ASTM-D4759.
2. Nominal Dimensions.
3. True resistance to elongation when initially subjected to a load measured via ASTM D6637 without deforming test materials under load before measuring such resistance or employing “secant” or “offset” tangent methods of measurement so as to overstate tensile properties.
4. Load transfer capability measured via GRI-GG2-87. Expressed as a percentage of ultimate tensile strength.

5. Resistance to bending force measured via ASTMD-5732-95, using specimens of width tow ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a "ladder"), and of length sufficiently long to enable measurement of the overhang dimension. The overall Flexural Stiffness is calculated as the square root of the product of machine-and cross-machine-direction Flexural Stiffness values.
6. Resistance to in-plane rotational movement measured by applying a 20kg-cm moment to the central junction of a 9 inch x 9 inch specimen restrained at its perimeter (US Army Corps of Engineers Methodology of Torsional Rigidity).
7. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The geogrid shall be sampled in accordance with ASTM D5818 and load capacity shall be measured in accordance with ASTM D6637.
8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments measured via EPA 9090 immersion testing.

703.3 Construction

The geogrid shall be installed to the lines and grades shown on the plans. The geogrid shall be lapped a minimum of one and one-half feet (1-1/2') at all joints. The geogrid shall be oriented such that the roll length runs parallel to the street centerline. Overlaps shall be oriented to ensure that the subsequent backfill material does not lift the edge of the geogrid.

Placement of the backfill shall be accomplished by dumping from trucks riding on top of the backfill material. No equipment or vehicles will be permitted to travel directly on the geogrid.

703.4 Method of Measurement

Geogrid base reinforcement shall be measured by the net square yard of ground surface covered.

703.5 Basis of Payment

Basis of payment for this item shall be in accordance with *Section 10.07*, and shall be full payment for work described in this section.

Payment will be made under:

ITEM	DESCRIPTION	PAY UNIT
703	Furnish and Install Geogrid Base Reinforcement	Square Yard

SECTION 704 INSULATION

704.1 General

This work shall consist of furnishing and installing below grade, polystyrene insulation board insulation at the locations shown on the plans.

704.2 Material

The insulation board shall be high strength, low water absorption, high density expanded polystyrene material as manufactured by Western Insulfoam of Anchorage, Alaska or an approved equal, and which meets or exceeds the following physical properties:

a.	Density	2.0 PFC
b.	Compressive Strength (ASTM D1621)	35 PSI @ 5% Deformation
c.	Water Absorption (ASTM C272)	0.25% Maximum
d.	Thermal Conductivity (AST< C518, Type IX)	0.22 BTU/HR-FT-DEG F @ 75 DEG

704.3 Construction

Prior to placement of the insulation board, the sub-grade shall be leveled and compacted to provide a smooth, firm foundation. The insulation board shall be placed to the lines, grades, and thickness shown on the plans.

Layering of insulation to obtain the required thickness will be allowed as long as all joints are lapped a minimum of six inches (6”).

The insulation board shall be covered with approved material of two inch (2”) maximum size, end dumped in a one foot (1’) lift. This initial lift shall be spread and compacted for the full width of the insulation prior to the placement of subsequent lifts. The Contractor shall insure that the back-filling operations do not break or displace the insulation board. Insulation board that is damaged or displaced by the back-filling operations shall be replaced at no cost to the City.

704.4 Method of Measurement

The accepted quantity of insulation board shall be paid by the board foot in place, whereby one board foot (1bf) equals a volume twelve inches (12”) square by one inch (1”) thick.

704.5 Basis of Payment

Payment shall be made under the following unit:

ITEM	DESCRIPTION	UNIT
704	Furnish & Install 4” Thick Insulation	Board Foot

SECTION 705 SEWER ENCASEMENT

705.1 General

The work under this section consists of providing all operations pertaining to encasing sewer mains with concrete as shown on the drawings or directed by the Engineer.

705.2 Construction

A sewer line that **is not** designed to the same requirements as a potable water pipe (for example: concrete or steel pipe) must be concrete-encased or double-pipe-encased with structural support if:

1. it crosses above a water main;

2. it runs within a closer horizontal distance of ten feet (10') to a water main, or;.

3. the vertical separation is less than eighteen inches (18") edge to edge (outside diameter of a water main;

4. it crosses above or below a water main at any vertical distance where the sewer line joints are less than nine feet (9') from the water line joints;

5. it is required otherwise by local, state, or federal standards/regulations.

A sewer line that **is** designed to the same requirements as a potable water pipe such as ductile iron or a non-shearing equal must be concrete-encased or double-pipe-encased with structural support when:

1. it has a vertical separation distance of less than eighteen inches (18") edge to edge of a water main, or;

2. it crosses above or below a water main and the sewer line joints are less than nine feet (9') from water line joints (measured horizontally from the intersection of the crossing);

3. it cannot withstand a pressure test to ensure watertightness;

4. it is required otherwise by local, state, or federal standards/regulations.

In any case, the Engineer may direct encasement to protect the integrity of the water or sewer system. Design plans, reports, or drawings supporting a request for a lesser vertical or horizontal distance between water and sewer lines must be sealed by a registered Engineer and have approval from ADEC.

Encasement, as required above, shall envelop the sewer line for a distance of ten feet (10') each side of a crossing. The thickness of encasement, including that of the pipe joints, shall not be less than four inches (4"). Where the eighteen inch (18") vertical separation cannot be maintained, the water main shall be relocated (or constructed) as in *Division 700, Section 706 Relocate Water Main*. (Refer to the standard details of these specifications.)

Ductile Iron encasement may be substituted for concrete when approved by the Engineer.

705.3 Measurement

Encasing sewer mains with concrete will be measured by each encasement. Excavation in excess or normal trench excavation required to install the encasement shall be considered incidental

705.4 Basis of Payment

Payment for this work shall be in accordance with *Section 10.07*, and shall be full payment for the work described in this section.

Payment will be made under:

ITEM	DESCRIPTION	PAY UNIT
705	Sewer Encasement	Each

SECTION 706 RELOCATE WATER MAIN

706.1 General

The work under this section consists of providing all operations pertaining to relocating water mains. In the preparation of the drawings, efforts have been made to determine exact elevations of live utilities; however, elevations of utilities shown are not represented as exact and are shown to indicate approximate location only. The Engineer shall have final say as to whether the main is raised or lowered.

706.2 Construction

Where a water main crosses the location of a sewer, the water main shall be raised or lowered sufficiently to permit a minimum outside diameter vertical distance of eighteen inches (18") from the sewer line. If the water main elevation is below the sewer line elevation, refer to *Section 705 Sewer Encasement*. The Contractor may employ either of the following methods for raising or lowering a water main.

1. The Contractor may raise or lower lengths of the water main, as necessary, on either side of the proposed sewer to allow the main to pass under or over the sewer, providing the deflection at any joint does not exceed the pipe manufacturer's recommendations.

2. The water main may be raised or lowered using four (4) pipe bends not to exceed 22 ½ degrees. In special cases only, and when approved by the Engineer in advance, 45 degree bends may be used.

Thrust blocks may be required if shown on the plans.

The method of lowering and the materials to be used shall be approved by the Engineer prior to commencing work. The Contractor shall give forty-eight (48) hours notice to the City of Homer, Public Works Department and the Engineer, prior to any planned water shut-down.

706.3 Measurement

Raising or lowering existing water mains will be measured as units complete in place without regard to the diameter of the water main or length required to relocate.

706.4 Basis of Payment

Payment for this item shall be in accordance with *Section 10.07*, and shall be full payment for work described in this section.

Payment will be made under:

ITEM	DESCRIPTION	UNIT
706	Relocate Water Main	Each

SECTION 707 STANDARD SIGNS

707.1 General

This item consists of furnishing and installing standard signs and post assemblies per State of Alaska DOT/PF, Standard Specifications for Highway Construction 2004, Sections 615 and 730. The sign location (s) shall be as shown on the plans or as directed by the Engineer.

707.2 Construction

Construction shall generally conform to DOT-PF, Section 615 and ADOT-PF Standard Drawings S-000.00, S-05.00, S-20.00, and S-30.01. Unless otherwise indicated, sign posts shall be 2"x 2" perforated steel tubing with 2 ½" x 2 ½" soil embedment sleeve. The soil embedment sleeve may be driven, provided the method of driving does not cause damage to the sleeve.

If the soil embedment sleeve is installed by excavating, the space around the posts shall be backfilled to finish ground with selected earth of sand, free of rocks or deleterious material, placed in layers approximately 6" to 12" thick, and thoroughly compacted.

All surplus excavated material shall be disposed of along the adjacent roadway as directed by the Engineer.

Existing signs that are removed and relocated shall conform to the details shown on the plans or as directed.

707.3 Method of Measurement

The quantity of Standard Regulatory, Warning and Guide signs for permanent installation to be paid for shall be the total of new signs erected in place. Temporary construction and maintenance signs shall not be measured for payment unless called for in the contract bid schedule.

Unless otherwise indicated, temporary removal and relocation of existing signs shall be considered incidental work. No measurement and payment will be made.

707.4 Basis of Payment

Basis of Payment for this item shall be in accordance with *Section 10.07*, and shall be full payment for work described in this section.

Payment will be made under:

ITEM	DESCRIPTION	UNIT
707	Furnish & Install Standard Sign	Each

SECTION 708 SEEDING

708.1 General

This work shall consist of preparing the ground surface, followed by application of seed, fertilizer, lime (if required), and mulch material, all in conformity with these specifications and at locations shown on the plans.

It is the intent of these specifications that a living vegetative cover will be provided in the areas indicated on the plans or established by the Engineer.

All seeded areas shall be maintained for the term of the Contract. Watering of seeded areas, if required, shall be performed at no additional cost to the Owner.

708.2 Materials

		PERCENT OF MIX (by weight)	
TYPE	VARIETY	TYPE I	TYPE II
Red Fescue	Pennlawn	25%	20%
	Boreal		
	Arctared		
Hard Fescue	Durar (Festula Quiana)	25%	
Kentucky Blue	Merion	15%	10%
	Nugget	15%	
Annual Ryegrass		10%	70%
Other		10%	

Application rates shall be at a minimum of two pounds per 1000 square feet (2#/1000 s.f.) or as directed by the Engineer.

Fertilizer shall be of standard commercial types supplied separately or in mixtures and furnished in moisture proof containers. Each container shall be marked with the weight and with the manufacturer's guaranteed analysis of the contents showing the percentage for each ingredient contained therein.

The proportion of chemical ingredients furnished shall be a mixture such as to provide the total available nitrogen, phosphoric acid, and potassium as required by the soil analysis or as specified in the special provisions. The fertilizer shall contain slow release nitrogen and shall be supplied in the form of inorganic chemicals to the amount of at least seventy-five percent (75%) of the nitrogen carrying agents.

Tolerances of the chemical ingredients shall be plus or minus two percent (2%). No cyanamid compounds or hydrated lime will be permitted in mixed fertilizers.

Limestone shall contain not less than eighty-five percent (85%) of calcium and magnesium carbonates. Agricultural ground limestone suitable for application by a fertilizer spreader shall conform to the following gradation:

Sieve Designation	Minimum Percent Passing (by weight)
No. 10	100
No. 20	90
No. 100	50

Fertilizer and limestone for the use in a hydraulic sprayer shall be soluble or ground to a fineness that will permit complete suspension of insoluble particles in water.

Application rates for fertilizer shall be at fifteen (15) to twenty (20) pounds per 1000 square feet or as directed by the Engineer. Application rates for lime, if required, shall be at fifty (50) pounds per 1000 square feet or as directed by the Engineer.

708.3 Soil Preparation

After grading of areas has been completed in conformity with the lines and grades shown on the plans or as staked by the Engineer in the field, and before beginning seeding operations, the areas to be seeded shall be cultivated to provide a reasonably firm but friable seedbed. Cultivation shall be carried to a depth of two inches (2") or as directed by the Engineer. On slopes steeper than 3:1, depth of cultivation may be reduced as directed. All cultivated areas shall be raked or cleared of stones, two inches (2") in diameter and larger, and all weeds, plant growth, sticks, stumps, and other debris or irregularities which might interfere with the seeding operations, growth of grass, or subsequent maintenance of the grass covered areas.

708.4 Seeding Seasons

All seeding and fertilizing shall be performed between May 15 and August 15. Seeding at other than the specified dates shall only be allowed upon written permission of the Engineer.

No seeding shall be done during windy conditions or when climatic conditions or ground conditions would hinder placement or proper growth.

708.5 Application Methods

Seed, fertilizer, ground limestone and mulch material may be placed by the following methods:

a. Hydraulic Method

Seeding by hydraulic methods shall consist of furnishing and placing a slurry made of seed, fertilizer, ground limestone, dried peat moss or cellulose wood fiber, and water.

The dried peat moss or cellulose fiber and limestone shall be added to the water slurry in the hydraulic seeder after the proportionate amounts of seed and fertilizer have been added. The slurry mixture shall then be combined and applied in such a manner that the rate of application will result in an even distribution of all materials.

Hydraulic seeding equipment shall be capable of producing sufficient pressure to maintain a continuous, non-fluctuating spray capable of reaching the extremities of the seeding area with the pump unit located on the roadbed. Sufficient hose shall be provided to reach areas which are not practical to seed from the nozzle unit situated on the roadbed.

b. Dry Methods

Mechanical spreaders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical spreading equipment may be used when seed and fertilizer are to be applied in dry form.

Fertilizer shall be spread separately at the specified rates and then incorporated in one operation to a minimum depth of two inches (2”). Seeded areas shall be compacted within twenty-four (24) hours from the time the seeding is completed, weather and soil conditions permitting, by cultipacker, roller or other equipment satisfactory to the Engineer. Compacting equipment shall be operated at right angles to the slope. Compaction shall not be performed when the soil is in such condition that it will be picked up by the equipment nor shall heavy soils be compacted at all if so directed by the Engineer.

Hand broadcasting may be substituted provided that the rate of application for both seed and nutrient is twice that of dry mechanical methods and that the end result required is attained.

708.6 Maintenance of Seeded Areas

The Contractor shall protect seeded areas against traffic by warning signs or barricades, as approved by the Engineer. Surfaces gullied by water or otherwise damaged following seeding shall be repaired by re-grading, re-seeding and re-mulching, as directed and the Contractor shall otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

The seeded areas shall be watered by the Contractor as required for proper germination and growth. Equipment used in watering shall be capable of reaching all seeded areas from the traveled way.

No extra compensation will be paid to the Contractor for work incurred under maintenance of seeded areas.

708.7 Method of Measurement

The quantity of seeding to be paid for shall be the number of 1000 square foot units, measured to the nearest 0.1 unit on the ground surface.

When hydraulic seeding methods are used, mixing water in the hydraulic application will not be measured for payment.

The quantity of seeding specified shall include all cultivating, seed, limestone, if required, fertilizer, and mulch material of the type specified, completed, and accepted.

708.8 Basis of Payment

Basis of payment for this item shall be in accordance with *Section 10.07*, and shall be full payment for work described in this section.

Payment will be made under:

ITEM	DESCRIPTION	UNIT
708	Seeding (Type I)	1,000 Sq. Ft.

When more than one type of seeding is specified for any pay item, letter suffixes will be included in order to differentiate between the different types.

SECTION 709 SOIL STABILIZATION

709.1 General

This work consists of furnishing, placing, and maintaining soil stabilization matting material on the areas and according to the details shown on the plans or specified herein.

709.2 Material

a. Jute Mesh

Jute mesh shall be cloth of a uniform, open, plain weave of undyed and unbleached single jute yarn. The yarn shall be of a loosely twisted construction and it shall not vary in thickness more than one-half (1/2) its nominal diameter. Jute mesh shall be furnished in rolled strips and shall meet the requirements as follows:

1. Width – forty-eight inches (48”), plus or minus one inch (1”).

2. 78 warp – end per width of cloth (minimum).

3. 41 weft – ends per yard (minimum).

4. Weight to an average 1.22 pounds per linear yard with a tolerance of plus or minus five percent (5%).

Staples shall be U-shaped and shall be approximately six inches (6”) long and one inch (1”) wide. Machine made staples may be of No. 11 gauge or heavier steel wire. Hand made staples shall be made from twelve-inch (12”) lengths of No. 9 gauge or heavier steel wire.

b. Excelsior Blankets

Excelsior blankets shall consist of machine produced mat of curled wood excelsior of eighty percent (80%) six inch (6”) or longer fiber length, with consistent thickness and the fiber evenly distributed over the entire area of the blanket. The topside of each blanket shall be made smolder resistant without the use of chemical additives. Excelsior blankets shall be furnished in rolled strips and shall meet the requirements as follows:

1. Width – forty-eight inches (48”), plus or minus one inch (1”).

2. Length – one hundred eighty feet (180’), average.

3. Weight per roll – seventy-eight (78) pounds, plus or minus ten percent (10%).

Staples shall be made of wire 0.091 inches in diameter or greater, "U" shaped. Size and gauge will vary with soil conditions.

709.3 Construction Requirements

This work shall be accomplished within forty-eight (48) hours after finish grading of the sub-grade or of topsoil completion. If seeding is specified, then the work shall be completed within twenty-four (24) hours after seed has been placed.

Matting material shall not be applied on days when the wind or rain would cause undue erosion or displacement of the material.

The soil shall not be disturbed more than necessary. Use of vehicles and tracked equipment will be permitted by the Engineer only if such use does not cause rutting and displacement of the sub-grade or topsoil.

709.4 Surface Requirements

The surface shall be smoothed and all gullies and potholes backfilled prior to applying the matting. All rocks or clods larger than two inches (2") in size and all sticks and other foreign material which will prevent contact of the matting and the surface shall be removed. If the surface of the sub-grade or topsoil is extremely dry, watering may be required by the Engineer prior to placement of the matting. No additional payment shall be made for such watering.

709.5 Application

The matting shall be spread uniformly at the locations designated by the Engineer in the field and shall be loose enough to allow sunlight to penetrate and air to circulate, but dense enough to shade the ground, reduce the rate of water evaporation and prevent or reduce water or wind erosion.

a. Jute Mesh

Jute matting shall be held in place by approved wire staples, pins, spikes, or wooden stakes driven vertically into the soil. Matting shall be fastened at intervals not more than three feet (3') apart in three (3) rows for each strip of matting with one (1) row along each edge and one (1) row alternately spaced in the middle. All ends of the matting and check slots shall be fastened at six-inch (6") intervals across their width.

Check slots shall be spaced so that one check slot, junction slot, or anchor slot of the jute mesh occurs every seventy-five feet (75') on gradients of less than 4% and every fifty feet (50') on gradients of more than 4%. On slope drains, a check slot or an end slot shall occur every twenty-five feet (25').

Edges of matting shall be buried around the edges of catch basins and other structures as herein described. Matting must be spread evenly and smoothly and in contact with the soil at all points.

b. Excelsior Blankets

Excelsior blankets shall be unrolled with the netting on top and the fibers in contact with the soils over the entire area. In ditches, the blankets shall be applied in the direction of flow, butted at the ends and sides. On open slopes, the blankets shall be applied either horizontally or vertically to the slope. Ends and sides shall be butted. Staples shall be spaced approximately two linear yards apart on each side, and one row in the center alternately spaced between each side. Use a common row of staples on adjoining blankets.

If seeding is specified, the excelsior blankets shall be placed within twenty-four (24) hours after the seed has been placed.

709.6 Maintenance and Repair

The Contractor shall maintain the areas covered by matting until all work on the project has been completed and accepted. Prior to acceptance of the work, the damaged areas shall be re-shaped, re-seeded, and the matting satisfactorily repaired or replaced as herein specified at no additional cost to the City.

709.7 Method of Measurement

The quantity of soil stabilization matting to be paid for shall be the number of 1000 square foot units, measured on the slope of the ground surface to the nearest 0.1 unit.

709.8 Basis of Payment

Basis of payment for this item shall be in accordance with *Section 10.07*, and shall include full payment for all work described in this section and the plans and specifications.

Payment will be made under:

ITEM	DESCRIPTION	UNIT
709	Soil Stabilization Matting	1000 Sq. Ft.

SECTION 710 TOPSOIL

710.1 General

The work under this section consists of providing all operations pertaining to furnishing, transporting, and spreading of topsoil.

710.2 Materials

Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of undesirable subsoil, refuse, or foreign materials. It shall be shredded and reasonably free from roots, hard clay, coarse gravel, stones larger than one inch (1") in any diameter, noxious weeds, tall grass, brush, sticks, stubble, or other litter and shall have indicated by a healthy growth of crops, grasses, trees or other vegetation that it is free draining and non-toxic. Topsoil to contain not more than ten percent (10%) gravel by dry weight of total sample. For the purposes of this specification, gravel is defined per ASTM D-422, modified to include only material passing 1-inch (1") and retained on the No. 4 sieve.

Topsoil shall conform to the following requirements:

TOPSOIL MIX

Organic Material	Not less than 40% nor more than 60% by volume (15-20% by dry weight).
Silt	Not less than 20% by volume (25-45% by dry weight).
Sand	Not less than 20% nor more than 30% by volume (35-55% by dry weight).

The Contractor shall notify the Engineer of the location from which he proposes to furnish topsoil at least thirty (30) calendar days prior to delivery of topsoil to the project from that location. The topsoil and its source will be inspected and tested by the Engineer before approval will be granted for its use.

All topsoil shall be fertilized as follows:

Sufficient fertilizer shall be applied to the topsoil such that the total natural and applied constituents are within the following ranges:

Nitrogen	21-35 PPM
Phosphoric Acid	11-20 PPM
Potassium	76-150 PPM
Limestone	Sufficient to Attain a pH of 6.0 to 7.0

The Contractor shall furnish soil analysis test reports which verify this. Fertilizer shall be applied at the rates indicated by the soil tests and worked into the topsoil to a uniform depth of two inches.

Organic material for incorporation into topsoil, shall be partially decomposed peat moss. Organic material shall be from a source above the water table. Peat Moss may require chopping or shredding to insure thorough mixing with the topsoil.

710.3 Construction

The topsoil shall be evenly spread on the designated areas to a depth of four inches (4") after settlement and compaction unless a different depth is called for on the Plans. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Adjacent roadway surfaces shall be kept clean during hauling and spreading operations.

After spreading has been completed, large clods, stones larger than one inch (1") in any diameter, roots, stumps, and other litter shall be raked and removed.

710.4 Method of Measurement

Measurement shall be the number of 1000 square foot units measured to the nearest 0.1 unit on the ground surface.

710.5 Basis of Payment

Payment for this work shall be in accordance with *Section 10.07 Measurement and Payment* of these specifications, and shall include full payment for all work described in *Section 713*.

Unit cost payment shall be made on the following basis:

ITEM	DESCRIPTION	UNIT
710	Top Soil (depth)	1000 Sq. Ft.