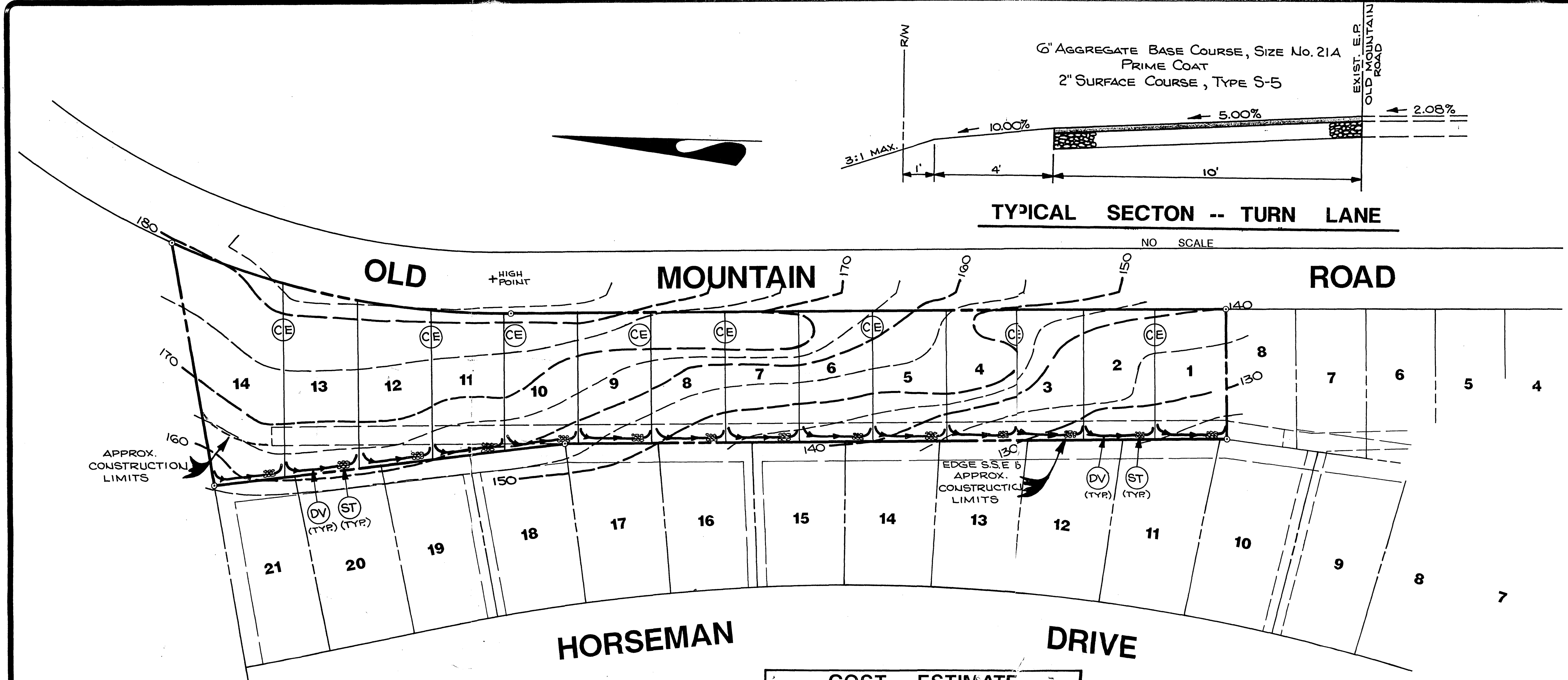


REVISIONS	BY
12/15/89	E.J.
1/9/90	E.J.
3/7/90	E.J.
4/30/90	E.J.
7/11/90	E.J.

CJR ESTATES
SITUATE ON OLD MOUNTAIN ROAD
CITY OF ROANOKE, VIRGINIA
GRADING, DRAINAGE & E S C PLAN

SPECTRUM
ENGINEERS, P.C.
 325 Mountain Avenue, Roanoke, Virginia 24016, 703-345-8020

C-2
 OF SHEETS



TYPICAL SECTION -- TURN LANE

SEEDING NOTES
 MATERIALS: Seed shall be the following mixture and application rate:
 Temporary Seeding for Erosion and Sediment Control: Based on seeding date, use species indicated.
 Date Common Name Rate
 May - Aug. German Fescue 25#/ac
 Sept. - Oct. Annual Rye Grass 30#/ac
 Nov. - Feb. Winter Rye 25#/ac
 Mar. - Apr. Annual Rye Grass 30#/ac

Lawns:
 Percentage Common Name Rate
 90% Turf-Type Tall Fescue 215#/ac
 10% Kentucky Bluegrass
 (i.e., Rebel, Rebel 2, Bonanza, Falcon, Mustang, or equivalent)

Soil Amendments shall be the following materials and application rates:

Lime: Natural dolomitic limestone containing not less than 85% of total carbonates with a maximum of 30% magnesium carbonates, ground so that not less than 90% passes a 100-mesh sieve. Apply three (3) tons/acre (140 lbs/1000 sq ft) pulverized agricultural lime.

Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following percentages of available plant nutrients.

- For lawns, provide fertilizer with the percentage of nitrogen required to provide not less than one (1) pound of actual nitrogen per 100 square feet of lawn area and not less than 4% phosphoric acid and 2% potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50% of nitrogen shall be organic form.

SOIL PREPARATION: Loosen subgrade of lawn areas to a minimum depth of 4". Remove stones over 1-1/2" in any dimension and sticks, roots, rubbish and other extraneous matter which may hinder preparation, growth and maintenance operations. Limit preparation to areas which will be planted promptly after preparation.

Spread top soil to a minimum depth required to meet lines, grades and elevations shown, after light rolling and natural settlement shall not be spread if the topsoil is either wet or frozen. Add specified soil amendments and mix thoroughly into upper 4" of topsoil. Excess topsoil shall be removed from the site or stored onsite as directed by the Owner.

Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior planting.

METHOD OF APPLICATION: Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage. Do not seed with in 48 hours of fertilizing. Do not seed when wind velocity exceeds 5 mi. per hr.

Apply seed uniformly on seed bed by sowing equal quantity in two directions at right angles to each other with a cyclone seeder, or drill/cultipacker seeder on a firm, moist seed bed. Maximum seeding depth should be 1/4 inch on clayey soils and 1/2 inch on sandy soils.

Sow not less than the quantity of seed specified or scheduled.

Rake seed lightly into top 1/8" of soil, roll lightly, and water with a fine spray.

MULCHING: Seeding shall be followed with the application of organic mulch conforming in material and application to Specification 1.75 of the ESC Handbook.

HYDROSEEDING: (permitted in lieu of standard seeding) Apply seed uniformly on seed bed on a firm, moist seed bed.

Mix specified seed, fertilizer and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

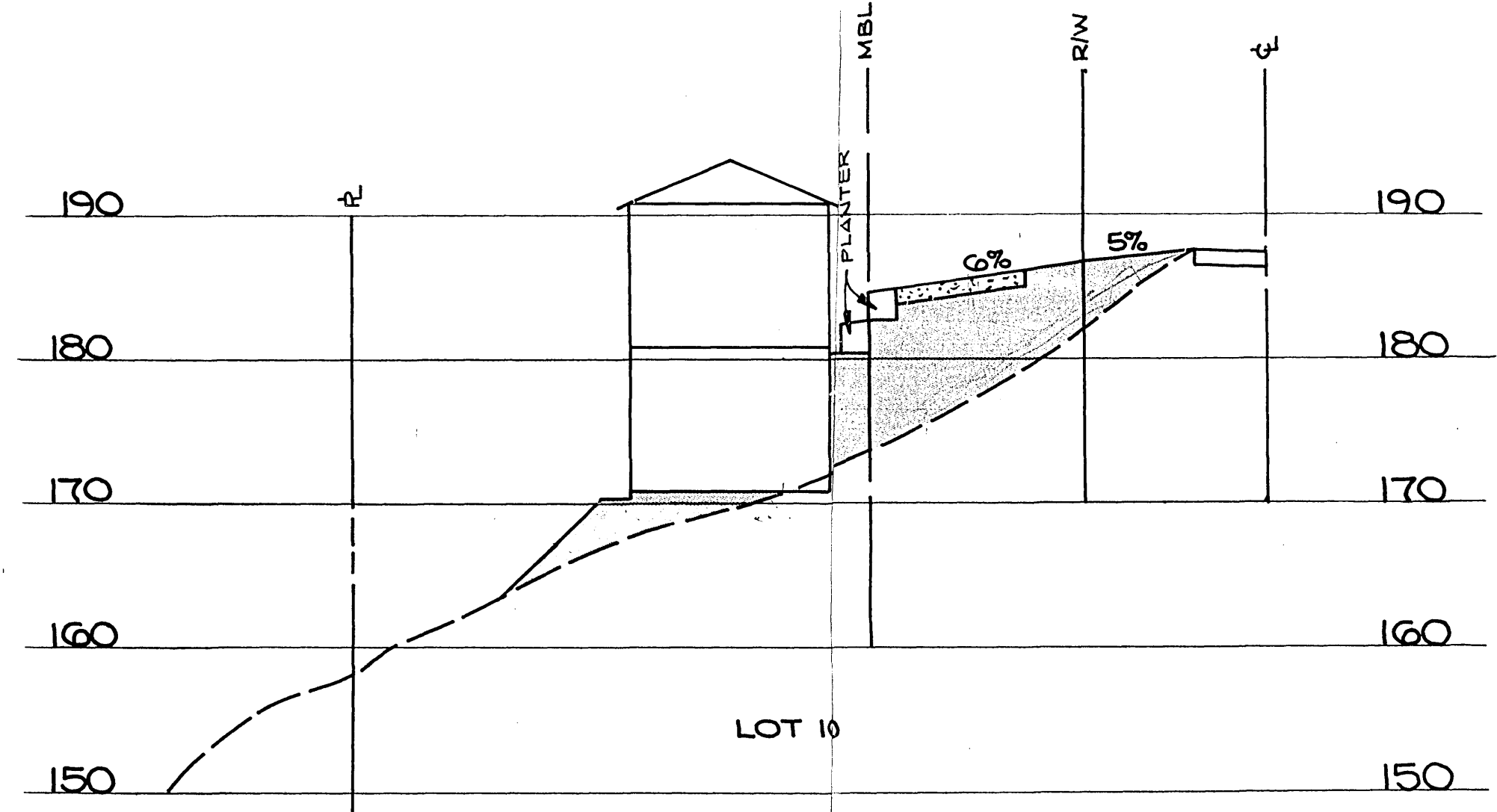
RECONDITIONING EXISTING LAWNS: Recondition existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.

ESTABLISHMENT: The Contractor shall water, low and otherwise maintain all seeded areas until final acceptance of the Project and shall restore/replace any portion of the seeding and/or mulch work that is found defective or which becomes damaged prior to final acceptance. This maintenance period shall extend for 90 days after completion of seeding operation, unless cover is established in a shorter period of time as approved by the Architect/Engineer.

COMMONWEALTH OF VIRGINIA
GEOFFREY A. STRAUGHN
14190
PROFESSIONAL ENGINEER

COST ESTIMATE				
ITEM	UNIT	QUAN.	PRICE	COST
RED OAK OR SUGAR MAPLE (2 1/2")	TREE	14	270	3,780
SEEDING	1000 S.F.	60	40	2,400
DV & ST	LOT	14	400	5,600
DETENTION TRENCH	EA.	14	900	12,600
WATERLINE	L.F.	1,720	5	8,600
FIRE HYDRANT	EA.	1	1,200	1,200
8" SEWER LINE	L.F.	850	10	8,500
MANHOLES	EA.	4	1,075	4,300
LATERALS	EA.	14	15	2,100
CONSTRUCTION ENTR.	EA.	8	30	2,400
TURN LANE	S.Y.	900	11	10,800
SUBTOTAL				67,280
10% CONTINGENCY				6,228
TOTAL				68,508

NOTE:
 SEE DETAILS
 SHEET C-1 & NOTES
 SHEET C-3.



TYPICAL LOT PROFILE

SCALE: 1" = 20' HORIZONTAL
 1" = 10' VERTICAL

EROSION CONTROL NOTES

- This plan shall be approved and a land disturbing permit obtained prior to any grading operations.
- Erosion control devices shall be in place prior to any grading operations and shall remain in place until all disturbed areas have adequate ground cover.
- Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained in accordance with the minimum standards and specifications of the Virginia Erosion and Sediment Control Handbook, latest edition. References to VDOT refer to the Virginia Department of Transportation "Road and Bridge Standards and Specifications," latest edition.
- Regular maintenance of all ESC practices shall be performed as needed following each rainfall.
- All cut and fill slopes shall be seeded and mulched as soon as possible after grading.
- Upon inspection of the erosion control devices the City Inspector may require that further steps be taken to control silt.

PAVEMENT NOTES

- All construction methods and materials shall be in accordance with the Virginia Department of Transportation (VDOT) "Road & Bridge Standards & Specifications," latest edition.
- Local government approval of plans for improvement within public rights-of-way preclude the right to add additional facilities without repeating the review process.
- All vegetation and overburden shall be removed to the full width of the right-of-way prior to the construction/preparation of the subgrade or to the extent indicated on the grading plan.
- Prior to beginning filling operations the Owner shall employ a qualified Soils Testing Laboratory and Professional Soils Engineer. This Laboratory shall determine the maximum density in accordance with ASTM D-1557 (Modified Proctor) and the California Bearing Ratio (CBR) of material proposed for use beneath pavement, whether cut or fill. The Soils Engineer shall make a site inspection, review governing requirements for this work and the test results and make recommendations on applicable portions of the work. This Laboratory and Soils Engineer shall submit two (2) copies of their findings directly to the Design Engineer. The recommendations of the Soils Engineer shall be followed as part of this Contract.
- All utilities shall be in place prior to laying the base material.
- Paving within the right-of-way shall consist of a six (6) inch base course of #21-A (based upon a CBR = 10), prime coat and two (2) inches of S-5. Subbase fill shall be compacted to 95% of ASTM D-1557 (Modified Proctor).

GRADING NOTES

- Prior to beginning grading operations the Owner shall employ a qualified Soils Testing Laboratory which staffs a Professional Soils Engineer. This Laboratory shall determine the maximum density in accordance with ASTM D-1557 (Modified Proctor) of material proposed for use beneath buildings and future pavement, whether cut or fill. The Soils Engineer shall make a site inspection, review the plans, governing requirements for this work and the test results and make recommendations on applicable portions of the work (store water detention structure, traffic bearing areas and building foundation). The Soils Engineer shall inspect potential existing problems when unearthed by the Excavating Contractor, perform tests as necessary and make recommendations regarding any special condition and/or treatments to be implemented. He shall also perform inspections, supervision and testing of all filling operations. The Laboratory/Soils Engineer shall submit two certified copies of their findings directly to the Design Engineer. The recommendations of the Soils Engineer shall be followed as part of this Contract.
- All vegetation and overburden including topsoil, organic material and any unsatisfactory soil materials, shall be removed to the extent of grading indicated on the grading plan.
- Any existing fill material present on the site shall be removed and replaced with fill as herein specified or tested in place by the Soils Engineer and his recommendations followed.
- Fill material shall be satisfactory soil materials as determined by the Soils Engineer and be free of rock or gravel larger than two (2) inches in any dimension, debris, waste, frozen materials, organics and other deleterious matter.
- Fill material shall be placed in lifts not exceeding eight (8) inches and compacted to ninety-five (95) percent of its maximum density as determined in accordance with ASTM D-1557 (Modified Proctor). Separate Proctors shall be run for each soil type being used. It shall be the Contractor's responsibility to inform the Soils Engineer of sources of fill material other than that obtained on-site.
- Each compacted lift shall be inspected and tested by the Soils Engineer by conducting a minimum of three field density tests per lift. Additional tests per lift may be required if deemed appropriate by the Soils Engineer.