

PART 3 – EXECUTION

3.1 CLOSE OUT PROCEDURE: In addition to the requirements contained in sections elsewhere within the project specifications and drawings, prior to acceptance of substantial completion, complete the following. Submit all record documents in PART 1, originals and 2 copies. Review with owner on assembly of documents. The following format is provided as a minimum but shall not be limited to;

A. **All documents submitted under PART 1 of this specification shall be 3-ring bounded, submitted in triplicate, and assembled as follows:**

1. Submittal Register: This shall be used as the table-of-contents.
2. Divisions: A tab labeled by each division shall be included. Each tab shall have the following documents;
 - a. Record Specifications
 - b. Record Product Data Submittals
 - c. Operations & Maintenance Manuals
 - d. List of Manufactures & Suppliers

B. Operations & Maintenance Instructions:

Arrange for each installer of equipment that requires regular maintenance to meet with the owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representative if installers are not experienced in the operation and maintenance procedures.

Include a detailed review of the following but not limited to; Maintenance manual, Record documents, spare parts & materials, tools, lubricants, fuels, identifications systems, control sequences, hazards, cleaning, warranty, and preventive maintenance procedures. As part of the instructions on operating the equipment, demonstrate procedures for Start-up, Shutdown, Emergency operations, Safety procedures, Economy, Efficiency and Effective energy utilization.

LAMBERTS POINT 26th STREET IMPROVEMENTS NORFOLK, VIRGINIA

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

<u>TECHNICAL SPECIFICATIONS</u>	<u>SECTION</u>
General Statements_____	2.1
Traffic Control_____	2.2
Erosion and Sediment Control_____	2.3
Demolition_____	2.4
Earthwork_____	2.5
Storm Drainage_____	2.6
Asphalt Concrete Paving_____	2.7
Portland Cement Concrete_____	2.8
Wastewater Collection and Water Distribution Systems_____	2.9
Seeding_____	2.10
Topsoil_____	2.11
Stormwater Pollution Prevention Plan_____	2.12

SECTION 2.1 - GENERAL STATEMENTS

GENERAL

The following sections, as listed in the "Table of Contents", shall comprise the Technical Specifications for this contract. The General and Special Provisions set forth heretofore in the specifications shall be made a part of these technical specifications and shall govern wherever applicable.

SCOPE OF WORK

The Contractor shall provide all labor, equipment, and materials required to construct Right-of-Way improvements to 26th Street (between Hampton Boulevard and Bowdens Ferry Road), Bowdens Ferry Road (between 25th Street and 26th Street), and Hampton Blvd. (between 25th Street and 27th Street) as shown on the plans and described in the specifications. The project includes, but is not limited to pavement construction, asphalt milling and overlay, curbing, sidewalks, accessible ramps, driveway apron reconstruction, storm drainage, water and sewer, and all incidental demolition and construction required to complete the work, as set forth in the construction documents. The contractor shall obtain and pay for all permits required for completion of the work.

REFERENCE SPECIFICATIONS

Standards and specifications from the following may be referred to in the Technical Specifications, which follow and form a part of this specification to the extent indicated by the references hereinafter:

A.A.S.H.T.O.	American Association of State Highway and Transportation Officials
A.N.S.I.	American National Standards Institute
A.S.T.M.	American Society for Testing Materials
A.W.W.A.	American Water Works Association
O.S.H.A.	Occupational Safety and Health Administration
V.D.H.	Virginia Department of Health
D.C.R.	Department of Conservation and Recreation
V.E.S.C.H	Virginia Erosion and Sediment Control Handbook, Third Edition 1992.
V.D.O.T	Virginia Department of Transportation
	City of Norfolk Department of Utilities Modifications to HRPDC Regional Standards

Unless otherwise noted, reference is to the latest dated publication of the specification or standard including any amendments or addenda.

DOCUMENTATION OF EXISTING SITE CONDITIONS

It shall be the responsibility of the contractor to fully document the conditions of the project area prior to the start of construction. This documentation shall be provided through the use of digital photography and shall include all existing improvements and infrastructure within the existing rights-of-way as well as abutting properties. Copies of the photography shall be submitted to the Owner for record purposes prior to construction commencement.

INDICATED ITEMS

Items not directly outlined in these specifications shall be constructed in accordance with the above referenced specifications. Measurement and payment for these items will be as set forth in the Bid Proposal. If not set forth in the Bid Proposal, the cost of these items shall be included in the price bid for other items which may include this work, and no additional compensation will be considered.

CONFLICT

In case of any conflict between the plans and the technical specifications and/or other references, the specifications shall govern.

UTILITIES

- A. Within the limits of this project there are existing above ground and underground utilities. It shall be the responsibility of the Contractor to determine the location and to carry out his work carefully and skillfully so as to avoid damage to them. Test pits required to locate existing underground facilities shall be at the sole expense of the Contractor, unless otherwise indicated.
- B. Where existing public utilities are located within the contract limits, the Contractor will be required to give the proper agencies of the City and the various owning companies at least 48 hours notice before doing any work within the vicinity of the utility and shall obtain from said agencies and companies the exact location of utility lines.
- C. The Contractor will not be permitted to shut off any water mains or sewer force mains but shall request the City to do so if needed.
- D. The cost of all work connected with the maintaining, protecting and disposing of all utilities which will be affected by the work under this contract shall be included in the bid for the related items in the Contract and no other compensation will be allowed.
- E. The Contractor shall coordinate his operations with any planned utility adjustments and take all necessary precautions to prevent disturbance to the utility facilities. The

Contractor shall report in writing to the Owner any failure on the part of the utility owner to cooperate or proceed with the planned utility adjustments.

- F. All utility adjustments or new utility installations included in the contract to be performed by the Contractor shall be completed in accordance with the plans and specifications to cause the least inconvenience to the Owner or those being served by the Owner.
- G. Any existing, adjusted or new utility facilities which are to remain within the right-of-way shall be properly protected by the Contractor to prevent disturbance or damage resulting from construction operations. In the event an existing utility is encountered by the Contractor which requires adjustment, the Contractor shall not interfere with said utility, but shall take the proper precautions to protect the facility and promptly notify the Owner.
- H. The Contractor shall contact all known utility owners prior to the preparation of his bid to determine the nature, extent and location of all existing, adjusted or new utility facilities and shall reflect any additional cost resulting therefrom in his unit price bid for other items of the contract.
- I. Should the Contractor desire the temporary or permanent adjustment of utilities for his own benefit, he shall conduct all negotiations with the utility owners and pay all costs in connection with such adjustment.
- J. Notify "Miss Utility", 811, to locate utilities before beginning any work.
- K. It is the Contractor's responsibility to review prior to bidding and starting the construction, and to directly coordinate with the private utility companies on any private utility conflicts during construction. This includes but is not limited to coordination with Dominion Virginia Power, Virginia Natural Gas, Verizon, Cox Communications, and any other private utility companies.

GEOTECHNICAL INVESTIGATIONS

- A. The Geotechnical Engineering Services Report prepared by Engineering & Testing Services, Inc. and dated August 7, 2009 is included as Appendix A to these specifications. This report is provided for informational purposes only for the contractor's use in preparing their bid and for use during construction. The contractor shall not rely solely on the findings in this report and shall perform any and all additional investigations as necessary to construct the project in conformance with the plans and specifications.

CONTRACT TIME

Contract time and liquidated damages shall be in accordance with Division One of the contract documents.

TESTING

- A. The Owner may, at any time, require testing to ensure compliance with the specifications of this contract.
- B. All tests will be performed by a recognized testing laboratory approved by the Owner, qualified in the field of materials to be tested.
- C. Payment for all tests performed will be in accordance with the following, unless specified as a contract requirement:
 1. The cost of all tests failing to meet minimum requirements will be borne by the Contractor.
 2. The cost of all tests that either meet or exceed minimum requirements will be borne by the Owner.

CLEANUP DURING CONSTRUCTION OF PROJECT

The Contractor shall on a continuous basis throughout the course of the Project, provide clean up and restoration of lawns, streets, drainage facilities, and adjacent properties within the project limits. Trash, debris, and other foreign matter shall be disposed of as directed by the Owner in accordance with the specifications herein. A haul permit will be required and may be obtained from the Public Works Department, 2nd Floor, City Hall, 664-7300.

CLEANUP ON COMPLETION OF PROJECT

Upon completion of any of the work for this Project, the Contractor shall clean up entire premises occupied by his operations, and this area shall be left neat and clean of trash, debris, piles of earth, waste materials, and other foreign matter which shall be disposed of off site.

GUARANTEE

The Contractor shall deliver the work to the Owner complete and in first-class condition in every respect, and shall guarantee the material and workmanship for a period of twelve (12) months from the time the Contract is completed and accepted by the Owner. If during this time, any defects show up due to defective material, negligence, or want of proper care on the part of the Contractor, the Contractor shall furnish such new materials as necessary and repair such defects and put the work in proper order at his own expense upon receipt of notice from the Owner.

END OF SECTION 2.1

SECTION 2.2 - TRAFFIC CONTROL

PART 1 - GENERAL

The Contractor shall maintain traffic throughout the entire project site in accordance with all rules and regulations stipulated in the Specifications and under the direction of the City Transportation Engineer. All traffic controls shall be in conformance with the latest editions or revisions to the federal Manual on Uniform Traffic Control Devices (M.U.T.C.D) and the Virginia Work Area Protection Manual.

The Contractor shall maintain access to private property and businesses and a minimum of one lane of traffic on each street unless otherwise approved by the City Transportation Engineer.

PART 2 - PRODUCTS

The use of reflective sheeting shall be in conformance with the following:

1. Encapsulated lens sheeting shall be used on signs (except logo sign business panels and orange construction/maintenance activity signs), barricades, vertical panels (group 2 channelizing devices), standard road edge delineators and special road edge delineators.
2. Reboundable sheeting shall be used on all cones, tubular delineators and drums.
3. Prismatic lens sheeting shall be used on barrier delineators, guardrail delineators, and interstate road edge delineators which utilize reflective sheeting.
4. Fluorescent prismatic lens sheeting shall be used on orange construction and maintenance activity signs, and barrier vertical panels installed on concrete traffic barrier service. Flexible sign base material (mesh signs) is permitted for daytime use.

PART 3 - EXECUTION

3.01 TRAFFIC CONTROL PLANS

- A. Where work will interfere with the normal flow of traffic, the Contractor shall submit to the Department of Public Works, Division of Transportation, for approval, a plan for the maintenance of traffic through the construction area. This plan shall show the type of warning signs, barricades, traffic cones, etc., and their placement and where flagmen, if necessary, will be stationed. This plan shall be submitted at least ten (10) working days prior to the time the Contractor intends to begin work. The Contractor shall not begin any work, which will interfere with any traffic until the plan is approved by the City. The Contractor may be required by the City to modify the plan as work progresses.

3.02 TRAFFIC CONTROL

Unless otherwise directed, there shall be no operations on residential streets between the hours of **5:00 P.M. and 7:30 A.M.** All traffic control signage shall be removed during the non-operational hours specified herein with the exception of any signage necessary to maintain traffic flow. Residential streets shall have one lane of traffic open at all times with flagmen maintaining traffic in each direction. For any multi-lane closure or detour of traffic, a detailed traffic control plan must be submitted to, and approved in writing by the City Transportation Engineer. There are no work hour restrictions for work along Hampton Boulevard.

3.03 MAINTENANCE DURING CONSTRUCTION

The Contractor shall maintain the work from the beginning of the construction operations until final acceptance of this project. This maintenance shall constitute continuous and effective work executed day by day with adequate equipment and forces to ensure that the roadway is kept in satisfactory condition at all times, and access to all abutting properties is maintained, including barricades and warning signs. Unless otherwise specified, the Contractor shall keep all streets and highways open to all traffic. The Contractor shall keep the portion of the road being used by public traffic, whether it be through or local traffic, in such condition that traffic will be adequately accommodated.

3.04 FLAGGING TRAFFIC

- A. Competent, courteous, and neat flagmen shall be provided in sufficient numbers to provide orderly control, and if necessary, to stop traffic, advise the public concerning delays, and the manner in which they should proceed, and to keep traffic in their respective lanes along the project. The flagmen shall use either flags or sign paddles to regulate traffic; however, the use of both flags and sign paddles on the same project will not be allowed.
- B. Flags should be red, at least 24 by 24 inches in size, made of good grade of bright red material secured to a staff approximately 36 inches in length. The free edge shall be weighted to insure that the flag will hang vertically, even in high wind. Sign paddles bearing the regulatory message "STOP" or "SLOW" shall be fabricated from sheet metal or other light, semi-rigid material. They shall be at least 10 inches long. The lettering on the paddles shall be 6-inch Series C letters (in accordance with the Manual on Uniform Traffic Control Devices - MUTCD). The background of the "STOP" face of the combination sign paddle shall be red and octagon shaped with white letters and border. The background of the "Slow" face shall be orange and diamond shaped with black letters and border. When used at night, the "Stop" face shall be reflectorized orange with black letters.

3.05 BARRICADES AND WARNING SIGNS

- A. The Contractor shall provide any and all required signs and/or barricades as required by the City Transportation Engineer and in accordance the MUTCD and Virginia Work Area Protection Manual. The Contractor shall take all necessary precautions for

the protection of the work and the safety of the public as described in Section 104.04 of the VDOT Specifications. Streets closed to traffic shall be protected by effective barricades, and obstructions shall be illuminated during hours of darkness. Suitable warning signs shall be provided by the Contractor to properly control and direct traffic.

END OF SECTION 2.2

SECTION 2.3 - EROSION AND SEDIMENT CONTROL

PART 1 -GENERAL

1.01 GENERAL REQUIREMENTS

The Contractor shall furnish all labor, material, and equipment to protect the job site and immediate areas from damage due to erosion and siltation.

1.02 QUALITY CONTROL

All erosion control measures shall be in accordance with the Virginia Erosion and Sediment Control Handbook, the Virginia Stormwater Management Handbook and the VDOT Road & Bridge Specifications.

1.03 INSPECTIONS

Inspections for erosion and sediment control will be performed by the City of Norfolk. Additional inspections may be performed by the Virginia Department of Environmental Quality and the Department of Conservation and Recreation.

PART 2 - PRODUCTS

All materials used for this project for erosion and sediment control shall conform to the applicable requirements of the referenced manuals and specifications.

PART 3 - EXECUTION

3.01 The Contractor shall exercise every reasonable precaution, including application of temporary and permanent environmental measures, throughout the duration of the project to control erosion and prevent eroded materials from leaving project limits in addition to preventing siltation of storm sewer systems, rivers, streams, lakes, and impoundments. Such measures shall include, but are not limited to, the use of berms, dikes, dams, and sediment basins, and fiber mats, brush silt barriers, silt fences, netting, gravel or crushed stone, mulch, stage seeding, slope drains, inlet protection, and other methods.

3.02 Temporary and permanent erosion and siltation control measures shall all be applied to erodible material exposed by an activity associated with the construction including local arterial sources, stockpiles, waste areas, and all haul roads.

3.03 Temporary measures shall be coordinated with the construction of permanent drainage facilities and other contract work to the extent practicable to assure economical, effective and continuous erosion and siltation control. The temporary and permanent drainage facilities shall be installed as soon as practicable. All drainage systems are to be kept free of eroded materials and siltation at all times, including drainage systems being constructed as part of this project. No compensation will be made for removal of eroded materials from drainage systems.

3.04 The Contractor shall inspect all temporary and permanent erosion and siltation control devices and measures for deficiencies prior to and immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor. Failure on the part of the Contractor to adequately maintain all erosion and siltation control devices in a functional condition may result in the City of Norfolk representative notifying the Contractor in writing of the deficiencies. In the event the Contractor fails to correct or to take appropriate actions to remedy the specified deficiencies within 24 hours after receipt of such notification, the City of Norfolk reserves the right to take appropriate actions to require the Contractor to discontinue work in other areas and to concentrate his efforts towards rectifying the specified deficiencies, or the City of Norfolk may proceed with adequate forces, equipment and materials to remedy the specified deficiencies and the entire cost of such work will be deducted from moneys due the Contractor.

END OF SECTION 2.3

SECTION 2.4 - DEMOLITION

PART 1 - GENERAL

ANY WORK INVOLVING IMPACTS TO EXISTING TREES NOT SHOWN ON THE PLANS MUST BE APPROVED BY THE DEPARTMENT OF RECREATION, PARKS AND OPEN SPACE.

This work shall consist of site clearing and demolition and disposal of pavements, curbs, walks, entrances, fences, drainage structures, pipes to include all items which must be removed or abandoned in order to provide for the installation of improvements as shown on the plans.

1.01 PROJECT CONDITIONS

- A. Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
- B. Protection of Existing Structures:
 - 1. Provide necessary protection to prevent damage to existing structures indicated to remain in place.
 - 2. Protect structures on adjoining properties and on City property or right-of-way.
 - 3. Restore damaged structures to their original condition, as acceptable to Owner.
- C. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation not indicated to be removed, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide four feet tall high visibility polyethylene tree protection fencing at the drip line of trees indicated to remain.
 - 1. Water trees and other vegetation to remain within the project limits as required to maintain their health during course of construction operations. Contact the City Forester for specific instructions regarding watering requirements.
 - 2. Provide protection for roots over 1-1/2 inch in diameter that are cut during construction operations. Temporarily cover exposed roots with wet burlap to prevent roots from drying out and cover with earth as soon as possible.
 - 3. Repair or replace trees and vegetation not indicated to be removed which are damaged by construction operations, in a manner acceptable to the City and the

Owner. Employ a licensed "ISA certified" arborist to repair damages to trees and shrubs.

4. Trees not indicated for removal which are damaged or destroyed through the Contractor's negligence will require full remuneration at the appraised value as determined by the City Forester or other ISA certified Arborist following guidelines established by the Council of Tree and Landscape Appraisers, 8th Edition.
 5. Trees specified for removal will require a permit from the Department of Recreation, Parks and Open Space prior to removal.
- D. Improvements on Adjoining Property: Authority for performing removal and alteration work on property adjoining City property or right-of-way shall be obtained by the Owner prior to performing work

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SITE CLEARING

Remove trees, shrubs, grass and other vegetation, improvements, or obstructions as indicated on the plans to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. "Removal" includes digging out and off-site disposing of stumps and roots as well as backfilling of voids with suitable material.

3.02 DEMOLITION

- A. Removal of Structures: Remove existing above-grade and below-grade structures as indicated and as necessary to facilitate new construction, unless specified to remain. The Owner may elect certain pipes to be abandoned in place. Pipes so abandoned shall be plugged in an appropriate manner.
- B. Sawcutting: Sawcut existing pavement, walks, entrance aprons, curb and gutter etc. within the construction limits and those items located outside the construction limits, as indicated, along a smooth, even line at locations indicated. Full depth sawcuts shall be used for removal of pavement and curbing items to ensure items to remain are not damaged.
- C. For road construction and utility excavation work (excluding lateral utility connections) occurring behind the paved road surface within the drip line of trees designated to remain, all roots encountered to a depth of 24 in. shall be severed with a sharp hand tool or pre-cut with Owner-approved power equipment such as a root pruner prior to any excavation or grading with a backhoe, bulldozer, grader or similar piece of equipment which would not result in a clean truncation of the root. Roots with jagged cuts shall be clean cut at a right angle to the root orientation prior to back

- filling in order to promote rapid wound closure and regeneration at the severed root tip. Severed roots three inches in diameter and larger belonging to trees which will remain shall be inspected by the Department of Recreation, Parks and Open Space prior to backfilling in order to assess the degree of damage, hazard potential and need for remedial treatments.
- D. Service laterals for water and sewer shall be routed or tunneled as necessary to avoid severance of roots 1-1/2 inches in diameter and larger. Where this would not be feasible, a Department of Recreation, Parks and Open Space inspection shall be made prior to backfilling.
 - E. Any pruning of trees located on City property or right-of-way not specifically shown on the plans to provide clearance for equipment, vehicles or completion of any improvements (i.e. overhead utilities, adjacent structures, etc) must be approved by the City Forester under separate permit and completed by an ISA Certified Arborist in accordance with applicable National Arborists Association Pruning Standards. Clearance pruning of trees located on private property must be approved by the property owner and completed to the same standard as above.
 - F. Use of explosives is not permitted.

3.02 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Removal from City's Property: Remove all waste materials except for traffic and street signs, or any item belonging to a Utility or Government agency.
- C. Ownership of Demolished or Excavated Items: The Contractor upon demolition or excavation of materials indicated for removal from the site shall be owner of said items. Items such as street signs, utilities, and historical markers shall remain the property of the City and the Contractor shall replace these items to their original condition. The Contractor shall remove all other items from the City's right-of-way and dispose of demolished or excavated items in a responsible manner in accordance with all federal, state, and local regulations.
- D. A haul permit will be required from the City of Norfolk.

END OF SECTION 2.4

SECTION 2.5 - EARTHWORK

PART 1 - GENERAL

1.01 DEFINITIONS

- A. Excavation consists of removal of materials to the subgrade elevations indicated on the plans and subsequent disposal of materials.
- B. Unauthorized excavation consists of removal of materials beyond the indicated subgrade elevations or dimensions without the specific direction of the Engineer or Owner. Unauthorized excavation, as well as remedial work directed by the Owner, shall be at the Contractor's expense.
- C. Additional excavation: When excavation has reached required subgrade elevations, Contractor shall notify the Owner, who will make an inspection of conditions. If the Owner determines that bearing materials at the required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Owner.
- D. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular sub-base, or topsoil materials.
- E. Structures consist of buildings, foundations, slabs, tanks, curbs, or any man made stationary objects occurring above or below the ground surface.

1.02 PROJECT CONDITIONS

- A. Site Information: Additional test borings and other exploratory operations may be performed by the Contractor at his option; however, no change in the Contractor's compensation will be authorized for such operations.
- B. Existing Utilities:
 - 1. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
 - 2. Should uncharted, or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner and Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfy the utility owner.
 - 3. Provide minimum of 48 hours notice to residents and receive written notice from Owner to proceed before interrupting any utility.

4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.

C. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post warning lights.
2. Perform excavation by hand within the drip line of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist conditions for root systems and cover exposed roots with moist burlap.

1.03 SUBMITTALS

- A. Provide gradations and test reports in accordance with AASHTO T27 or ASTM D422 or ASTM C136, as appropriate, for the following materials:
1. Backfill or Fill per ASTM D422.
 2. Field Density Test Reports, as required.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Select Fill: Select fill shall consist of sand or gravel containing less than 25% by weight of fines (SP, SM, SW, GP, GW - with dimensions not to exceed 2 inches in diameter), having a liquid limit less than 20 and plastic limit less than 6, having a soaked C.B.R. greater than or equal to 20, and shall be free of rubble, organics, clay, debris and other unsuitable material.
- B. Satisfactory soils materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.
- C. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Coarse aggregate shall be in accordance with VDOT Sec. 203 for size No. 57, or other size approved by the Engineer.
- E. Backfill or Fill shall be satisfactory soil materials free of clay, rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Classification: Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Stability of excavation:
 - 1. Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
 - 2. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.
 - 3. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

3.02 DEWATERING

- A. Prevent surface water and groundwater from flowing into the excavation and from flooding project site and surrounding area.
- B. Do not allow water to accumulate in the excavations. Remove water to prevent softening of foundation bottoms, and soil changes detrimental to stability of subgrades and foundations.
- C. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.03 STORAGE OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill in appropriate locations. Place, grade, and shape stockpiles for proper drainage. Maintain proper erosion and sediment control for stockpiled excavated materials.
- B. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

- B. Dispose of excess excavated soil material and materials not suitable for use as backfill or fill at an approved site.

3.04 EXCAVATION FOR STRUCTURES

Conform to elevations on the plans. Do not disturb bottom of excavations intended for bearing surfaces.

3.05 EXCAVATION FOR PAVEMENT

Excavate under pavements to comply with profiles, elevations and grades as indicated.

3.06 COLD WEATHER PROTECTION

Protect excavation bottoms against freezing when temperature is less than 35 degrees Fahrenheit.

3.07 PLACEMENT AND COMPACTION OF AGGREGATE MATERIALS, FILL AND BACK FILL

- A. Do not backfill trenches until tests and inspections have been made and backfilling is authorized by the Owner. Use care in backfilling to avoid damage or displacement of pipe system.
- B. Place backfill and fill material in layers not to exceed six inches in loose depth for material compacted by heavy compaction equipment, and not more than four inches for materials compacted by hand-operated tampers. Moisten or aerate each layer as necessary before compaction to provide optimum moisture content.
- C. Percentage of Maximum Density:
 - 1. Compact to 98% under structures and pavement.
 - 2. Compact to 90% under lawns or unpaved areas.

3.08 GRADING

- A. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finish surface.
- B. After grading, compact subgrade surfaces to required depths.
- C. During construction, maintain all lines and grades including crown and cross-slope of subbase course.

3.09 FIELD QUALITY CONTROL

- A. Field density tests may be required at the discretion of the Owner. If required by the Owner, field moisture and density testing shall be performed by an independent

laboratory using ASTM D2922 or other approved method. The contractor shall bear the cost of all testing that has results that do not meet specified requirements.

END OF SECTION 2.5

SECTION 2.6 - STORM DRAINAGE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Excavation and backfill operations shall be performed in conformance with Specification Section 2.5 and VDOT Sec. 302, 303 and 303.04(g).
- B. Concrete work shall conform to the requirements of VDOT Sec. 217 for class A and Sec. 404.
- C. All structures shall be brick or cast-in-place unless otherwise approved by the Owner.

1.02 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Firms regularly engaged in the manufacture of storm system's products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards: Comply with VDOT Road and Bridge Specifications, VDOT Road and Bridge Standards, and City of Norfolk Standards, except as otherwise specified herein.
- C. Pipe trenches shall not be backfilled until inspected and approved by the Owner.

1.03 SUBMITTALS

- A. Submit manufacturer's technical product data for the following storm system materials and products:
 - 1. Drainage Structures
 - 2. Bedding Material
 - 3. Pipe Material
 - 4. Manufactured Stormwater Quality Devices

PART 2 - PRODUCTS

2.01 BEDDING MATERIAL

- A. Bedding material shall conform to the requirements of VDOT Sec. 204 and 205.

2.02 STRUCTURAL CASTINGS

- A. Precast structures shall be City of Norfolk Standard as indicated on the plans, unless otherwise approved by the Owner.

PART 3 - EXECUTION

3.01 INSTALLATION OF STRUCTURES

Backfill operations shall conform to Specification Section 2.5 and VDOT Sec. 303 unless otherwise authorized by the Owner.

END OF SECTION 2.6

SECTION 2.7 - ASPHALT CONCRETE PAVING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

The work required under this section includes installation of asphalt concrete pavement and pavement overlaying of existing asphalt pavement.

1.02 SUBMITTALS

- A. Provide copies of job mix formulas and material certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
- B. The Contractor shall submit specifications of alternative materials to verify conformance with the contract documents and specifications. The Owner, prior to installation, shall approve or disapprove the submittals.

1.03 QUALITY ASSURANCE

Codes and Standards: Comply with VDOT Road and Bridge Specifications.

PART 2 - PRODUCTS

2.01 PAVING MATERIALS

- A. Asphalt surface course SM-9.5A shall conform to VDOT specifications.
- B. Asphalt base course Type BM-25.0 shall conform to VDOT specifications.
- C. Aggregate Base Material shall be Type II, 21A or 21B shall conform to VDOT specifications.
- D. Mineral filler shall conform to VDOT specifications.
- E. Prime Coat: No asphaltic primer shall be used. Wet prime only, as directed by the Owner.
- F. Tack Coat in accordance with the emulsion provisions of VDOT specifications.

PART 3 - EXECUTION

3.01 SUBGRADE COMPACTION

- A. Compact sub-grade in accordance with VDOT specifications.
- B. Compact aggregate base material in compliance with VDOT specifications.

- C. Notify Owner of any unsatisfactory conditions. Do not begin paving work until deficient sub-base areas have been corrected and are ready to receive paving.

3.02 SITE CONDITIONS

- A. Weather Limitations: Apply tack coat when ambient temperature is above 50 degrees Fahrenheit (F), and when temperature has not been below 35 deg. F for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct asphalt concrete surface course when atmospheric temperatures are above 40 deg. F, and when base is dry. Base course may be placed when air temperature is above 40 deg. F and rising.
- C. Grade Control: Establish and maintain required lines and elevations.

3.03 TACK COAT

- A. Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Apply at a rate of 0.05 to 0.10 gals. per sq. yd. of surface.
- B. Allow contact surface to cure before paving.
- C. Exercise care in applying tack coat. Avoid smearing of adjacent concrete surfaces and clean damaged surfaces.

3.04 PLACEMENT

- A. Place asphalt concrete mixture on prepared surface, spread and strike-off. The minimum lay down temperature of the asphalt shall be in accordance with VDOT specifications. Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.
- B. Make vertical joints between old and new pavement and between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have the same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.
- C. Begin rolling when mixture will bear roller weight without excess displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
 - 1. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
 - 2. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.05 FIELD QUALITY CONTROL

A. Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by the Owner.

B. Thickness:

In-place compacted thickness will not be acceptable if exceeding the following allowable variation from required thickness:

1. Base Course: 1/2", plus or minus
2. Surface Course: 1/4", plus or minus

C. Surface Smoothness:

Test finished surface of each asphalt concrete course for smoothness, using a 10' straightedge applied parallel with, and at right angles to centerline of paved areas. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:

1. Base Course Surface: 1/4"
2. Wearing Course Surface: 3/16"
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4".
4. Check surface at intervals as directed by the Owner.

END OF SECTION 2.7

SECTION 2.8 – PORTLAND CEMENT CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Extent of concrete work includes curb, gutter, valley gutter, sidewalk, driveway aprons, concrete pavement, and curb ramps. Concrete work shall conform to the requirements of VDOT SECS. 217, 316, 404, 502, and 504. All concrete in the right-of-way shall be class "A-3" air entrained (3000 psi) unless otherwise specified.
- B. Driveway aprons, concrete pavement, and valley gutters that cross lanes of traffic shall be constructed using High Early Strength Concrete to allow the driveway aprons and travel lanes back in service as soon as possible.

1.02 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including forming accessories, admixtures, patching compounds, joint systems and curing compounds.
- B. Concrete mix design.
- C. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test.

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. Virginia Department of Transportation, "Road and Bridge Specifications."
 - 2. City of Norfolk Standards.
- B. Concrete Testing Service: Engage a testing laboratory acceptable to the Owner to perform material evaluation tests and to design concrete mixes.

1.04 PROJECT CONDITIONS

- A. Protect adjacent areas against spatter during concrete placement.
- B. Place barricades as necessary to prohibit pedestrian and vehicular access until concrete has cured.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hydraulic cement concrete shall conform to the requirements of VDOT Sec. 217 & 502.02.
- B. Admixtures shall conform to the requirements of VDOT Section 215. Concrete Bonding Agents shall be Sealtight Intralock as manufactured by W.R. Meadows or approved equal.
- C. Joint material shall conform to the requirements of VDOT Section 212.
- D. Forms shall conform to the requirements of VDOT Sections 502.03 & 316.04.
- E. Water shall be potable (suitable for drinking).
- F. Portland Cement: Shall conform to AASHTO M85 TYPE II for Class-A3 as set forth in VDOT Sections 217 & 214.
- G. Concrete mixture for all concrete surfaces shall be from the same supplier and cement shall be from one source or mill. Mixture and color shall be approved the Owner.
- H. Normal Weight, Coarse & Fine Aggregates: Shall conform to VDOT Sections 202 and 203 and ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.
- I. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Owner.
- J. Aggregates for exposed aggregate walks shall be river washed rounded stone conforming to VDOT Std Size No. 7 and have an orange to reddish-orange color.
- K. Detectable Warning Surfaces shall conform to requirements of VDOT Section 2.12.
- L. Liquid Membrane-Forming Curing Compound: Shall conform to VDOT Sec. 220 with the exception that the compound shall be clear.
- M. Bonding Compound: Polyvinyl acetate or acrylic base.
- N. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to comply with project requirements.

2.02 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is

- used, employ an independent testing facility acceptable to the Owner for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
- B. Submit written reports to the Owner of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by the Owner.
 - C. Design mixes to provide Type A3 Concrete in accordance with the provisions of VDOT Section 217.07.
 - D. Ready mixed concrete shall conform to all requirements of VDOT section 217.09(b); and shall be mixed concrete delivered to the designated point ready for use. The ready-mix plant shall be approved prior to use and in the event satisfactory quality is not produced, such approval will be withdrawn.
 - E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant at no additional cost to Owner and as accepted by the Owner. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Owner before using in work.

PART 3 - EXECUTION

3.01 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.
- B. Herbicide shall be used on prepared surface before any stone or concrete placement, in accordance with VDOT Section 244.02.

3.02 FORMS

- A. Forms shall be straight, free from warp and of sufficient strength to resist the pressure of concrete without springing and shall extend the full depth of the concrete. Forms shall be braced so that they will remain in horizontal and vertical alignment until their removal. Where practical, forms shall be placed at least 100 ft. in advance of concrete placement. Forms shall be cleaned of foreign matter and oiled before concrete is placed. Maintain formwork construction tolerances complying with ACI 347.
- B. Design form work to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in all finished structures.

- D. Slip form pavers shall be designed to consolidate screed and float finish the freshly placed concrete in one complete pass of the machine and in a manner so that a minimum amount of hand finishing will be necessary to provide a dense and homogenous section. The paver shall be equipped to vibrate the concrete thoroughly for the full width and depth of the section.
- E. Forms shall not be removed from freshly placed concrete until it has set for at least 12 hrs. Forms shall be removed carefully to avoid damage. Major honeycombed areas will be considered defective work and shall be removed and replaced.

3.03 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to the Owner. Joints shall be formed around all drainage structures and other abutting concrete surfaces using preformed joint filler 1/4 inch in thickness.

- B. Expansion joints:

Sidewalks: Preformed joint filler shall be placed between concrete sidewalks and any fixed structure. Where sidewalk is constructed in conjunction with adjacent curb, the expansion joints shall, if practicable, coincide. Transverse expansion joints shall be constructed every 50 ft.

Concrete Pavements: Transverse expansion joints shall be constructed in accordance with VDOT Standard Detail PR-2. A type C Silicone Seal shall be used to prevent water and incompressible debris from entering the joint.

- C. Longitudinal contraction joints in concrete pavement shall be constructed in accordance with VDOT Standard Detail PR-2. A Type B Silicone Seal shall be used to prevent water and incompressible debris from entering the joint.
- D. All preformed joint filler shall be securely fastened to prevent displacement.
- E. All preformed joint filler and sealants shall conform to VDOT Section 212. Substitutes which meet all the VDOT requirements may be substituted with the approval of the Owner.

3.04 CONCRETE PLACEMENT

- A. Replacement Inspection: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast-in. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.

- C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- D. Deposit concrete in forms in horizontal layers no deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
- E. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
- F. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- G. Deposit and consolidate concrete aprons in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed. Aprons shall be placed as shown on plans.
- H. Concrete sidewalks shall conform to City of Norfolk standards. Premolded 1/2-in. transverse expansion joints shall be installed at all intersections and at maximum intervals of fifty (50) feet except for closures. Surface of walks shall be wood floated finish free of irregularities and have a medium broom finish. Concrete walks shall be (4) inches thick, except for the area, which coincides with driveway aprons, which shall match the apron thickness. The slope and joints of the sidewalk shall be carried through all driveway aprons except where the sidewalk has been poured to the back of the curb. Transverse control joints shall be formed in 5 ft. sections and align with the 10 ft. curb sections.
- I. Concrete curb cut ramps shall be placed as shown on the plans.
- J. Concrete curbs or curbs and gutter may be slipformed or formed in place. Curb and gutter shall be constructed in uniform lengths of approximately 10 ft. as necessary to form closures. Expansion joints shall be formed at intervals of 50 ft. using 5/8 in. preformed bituminous fiber joint filler. No section shall be less than 6 ft. Expansion joints in the curb and sidewalk shall match where they abut one another.
- K. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

L. Bring surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb surfaces prior to beginning finishing operations.

M. Maintain reinforcing in proper position during concrete placement operations.

3.05 FINAL ACCEPTANCE

A. At the time of final inspection, any cracks or damage to concrete items shall be addressed in the following manner before the concrete work will be accepted:

1. Storm drainage structures: Collars shall be replaced in their entirety.
2. Curb and gutter and curbing: Replacement shall be in ten (10) foot sections, joint to joint.
3. Sidewalks: The entire section shall be replaced.
4. Curb cut ramps: shall be totally replaced.
5. Drive way aprons: Entire apron shall be replaced from curb line to property line.
6. Concrete Pavement: Entire section from joint to joint shall be replaced.

B. Patching of concrete may be accepted for the above referenced items at the discretion of the Owner.

END OF SECTION 2.8

SECTION 2.9 – WASTEWATER COLLECTION AND WATER DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Complete construction and installation of all improvements associated with the wastewater collection and water distribution mains, laterals, manholes and other appurtenances in the City of Norfolk rights-of-way and other private properties within the project limits as shown on the Drawings.

1.02 STANDARDS AND QUALITY ASSURANCE

- A. All Construction, furnished products, submittals, quality assurance, testing and all other requirements for construction shall be in conformance with the Hampton Roads Planning District Commission (HRPDC) Regional Standards, 4th Edition and the City of Norfolk Department of Utilities Modifications to these standards.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 2.9

SECTION 2.10 - SEEDING

PART 1 - GENERAL

1.01 DESCRIPTION

Work covered by this section consists of furnishing all labor, equipment and materials and performing all operations required to complete the work including but not limited to, soil preparation, seeding, mulching, mowing, maintenance and warranty.

1.02 QUALITY ASSURANCE

- A. Seeding shall be performed by a single firm experienced in landscape work.
- B. Ship all materials with certificates of inspection required by governing authorities. Comply with all regulations applicable to landscape materials.
- C. Topsoil Analysis: Provide for the services of a testing agency to perform an analysis of existing topsoil to be utilized on the site. Analysis shall include a comprehensive description of the topsoil and a listing of types and quantities of soil amendments required for the successful establishment of lawns.

1.03 SUBMITTALS

- A. Submit seed vendor's certificate statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination and weed seed for each grass seed species.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver fertilizer, soil amendments and seed in original, unopened containers bearing the manufacturer's guaranteed analysis, name, trade name, trademark and statement of conformance to state and federal laws.
- B. Seed, fertilizer and soil amendments shall be kept in dry storage away from contaminants and shall be protected from the elements during delivery and while on site.

1.05 SITE CONDITIONS

- A. Prior to any construction or excavation activity the Contractor shall assume the responsibility of verifying all utilities, above and below ground, including public and private service lines that may cross through the areas of lawn establishment. If conflicts between utilities and proposed work areas are encountered, the Contractor shall cease seeding activities and notify the Owner immediately. The Contractor shall protect existing structures and utility lines and shall be responsible for their replacement if damaged.

- B. If circumstances detrimental to lawn establishment are encountered, such as rubble, other obstructions or adverse drainage conditions, the Contractor shall cease seeding activities immediately and remedy the adverse situation before resuming work.

1.06 WARRANTY

- A. Provide a uniform stand of grass by watering, mowing and maintaining lawn areas until final acceptance of the project in its entirety. Re-seed with specified material all areas that fail to adequately provide a uniform stand of grass until all affected areas are accepted.

PART 2 - PRODUCTS

2.01 FERTILIZER

- A. Fertilizer shall be granular or pellet form, commercial grade, dry and free flowing. Fertilizer shall be uniform in composition and suitable for application by approved equipment. The fertilizer shall contain a minimum percentage by weight of the following, unless recommended otherwise by soil test:

Nitrogen (50% organic) (n)	5%
Phosphoric acid (po)	10%
Potash (k)	5%

2.02 SEED

- A. State-certified seed of the latest season's crop, labeled in conformance with the U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable state seed laws. Seed that has become wet, moldy or otherwise damaged shall not be acceptable. Seed mixture shall be proportioned by weight as indicated on the plans.

2.03 STRAW MULCH

- A. Straw mulch shall be oat, wheat, rye, barley or rice stalks free from noxious weeds, chemicals, mold or other objectionable materials. Use with mulch tackifier.
- B. Straw mulch shall be delivered in an air-dry condition suitable for placement. Straw supplied for mechanical application shall be chopped.

2.04 WOOD CELLULOSE MULCH

- A. Mulch supplied for use with hydraulic application of grass seed and fertilizer shall consist of wood cellulose with mulch tackifier. Wood cellulose mulch shall not be utilized from June 1 through August 15. During this period straw mulch shall be used.

- B. Processing of wood cellulose mulch shall be in such a manner that it will not contain germination or growth-inhibiting elements.
- C. Wood cellulose mulch shall be dyed an appropriate color to allow visual metering of its application.
- D. Wood cellulose mulch shall have the property of becoming evenly dispersed and suspended when agitated in water.
- E. When sprayed on the prepared soil, the mulch shall consistently form a blotter-like ground cover that readily absorbs water and allows infiltration to the underlying soil.
- F. Weight specification from suppliers shall refer to air dry weight of the fiber, a standard equivalent to ten percent (10%) moisture.

2.05 LIQUID MULCH BINDER

- A. Liquid mulch binder shall not contain an asphaltic tackifier.

2.06 WATER

- A. Water shall be potable and free of substances harmful to lawn growth. Contractor shall furnish water trucks, hoses or other methods to irrigate plant material until final acceptance.

PART 3 - EXECUTION

3.01 GENERAL

- A. Seeding shall not occur when soil is frozen, saturated, or when temperature extremes or wind conditions make success of seeded lawn unlikely.
- B. At the time of bed preparation the topsoil shall be in a loose, friable condition, free from stones, sticks, roots and other extraneous matter. If topsoil is hardened or eroded, it shall be a part of this work to restore the soil to the loose condition described above.

3.02 PROJECT SITE EXAMINATION

- A. Contractor shall examine substrate surfaces to receive new seed and shall not proceed until unsatisfactory conditions have been corrected in a manner complying with the Contract Documents.

3.03 SUPERVISION

- A. Seeding shall be performed only by experienced workers familiar with seeding procedures and under the supervision of a qualified supervisor.

3.04 DRAINAGE

- A. Prior to seeding, Contractor shall examine the site to determine drainage characteristics of the seed bed area. If conditions indicate retention of water in lawn areas, or if other evidence indicating presence of underground water exists, the Contractor shall cease seeding activities immediately and remedy the adverse situation before resuming work.

3.05 WEED CONTROL

- A. Apply post-emergent herbicide according to manufacturer's instructions prior to seeding to destroy existing weed growth.

3.06 SOIL PREPARATION

- A. Spread fertilizer at the rate of twenty-five (25) pounds per thousand (1,000) square feet. Add pH-balancing agents per the recommendations of the soil test to achieve a range of 5.5 to 6.8. Blend additives thoroughly into upper four inches (4") of topsoil. Remove any rock or other debris that surfaces. Till area until soil is loose and friable and all amendments are uniformly distributed.
- B. Work seed bed areas to a smooth and even surface free from irregularities, ridges or depressions. Prepared areas shall drain adequately.
- C. Moisten seed bed area if soil is dry. Water thoroughly then allow surface moisture to evaporate. Do not apply seed under muddy soil conditions.

3.07 DRY SEEDING

- A. Sow grass seed using a spreader or seeding machine as specified on the plans. Do not seed when wind velocity exceeds five (5) miles per hour. Distribute seed evenly over entire area by sowing equal quantity in two (2) directions at right angles to each other.
- B. Immediately after placement rake seed lightly into top one-quarter inch (1/4") of soil, firm entire area with a roller not exceeding ninety (90) pounds per foot of roller width and water with a fine spray.
- C. Immediately protect newly seeded area by spreading mulch to a uniform and continuous depth of one and one-half inch (1 1/2") loose measurement, or one hundred (100) pounds per one thousand (1,000) square feet. Anchor mulch by applying liquid mulch binder per manufacturer's specifications. Mask adjacent areas to prevent damage from over-spray of liquid mulch binder.

3.08 HYDROSEEDING

- A. Prepare slurry and apply at the following rates:
 - Seed: 100 pounds per acre

- Fertilizer: 25 pounds per 1,000 square feet
- Mulch: 35 pounds per 1,000 square feet
- B. Hydroseeded mulch shall be an integral component of the slurry mix. Add mulch after the seed and fertilizer have been thoroughly mixed and apply slurry uniformly to all prepared seedbed areas.
 - C. Lawn areas hydroseeded from June 1 through August 15 shall be mulched with straw. Wood cellulose mulch shall not be used during this period.

3.09 MAINTENANCE DURING ESTABLISHMENT PERIOD

- A. The establishment period for lawns shall be the time from installation until the third cutting of a fully established lawn. An established stand of grass shall be uniform in coverage and of the specified mixture.
- B. The Contractor shall be responsible for maintenance during the establishment period and until final acceptance of the project in its entirety. Maintenance shall include watering, fertilizing, removal of straw mulch, weed eradication, mowing, removal of clippings, reconstruction of all areas that fail to yield vital stands, and the reconstruction of areas damaged by erosion or other occurrences. The Contractor shall also be responsible for appropriate applications of herbicides, fungicides and insecticides as required for the health of the lawn areas.
- C. Water daily to maintain adequate surface soil moisture for proper seed germination. Continue daily watering for not less than thirty (30) days. Thereafter, apply one-half inch (1/2") of water twice weekly until final acceptance.
- D. Stands in lawn areas shall be mowed whenever the average height reaches three and one-half inches (3 1/2"). Mowing height shall be two and one-half inches (2 1/2"). Waste material shall be removed from the site daily.

3.10 CLEANUP AND PROTECTION

- A. During work, keep pavements clean and work area in an orderly condition.
- B. Protect seeded areas from damage by pedestrians and vehicular traffic. Maintain protection during installation and until final acceptance. Treat, repair or replace all damaged lawn areas immediately.

3.11 COMPLETION AND FINAL ACCEPTANCE

- A. The completion of the project will be accepted only when all work is accomplished to the satisfaction of the Owner.

- B. Seeded areas shall be inspected at the Contractor's request upon completion of installation and a "punch list" will be prepared including items necessary to receive final acceptance.
- C. Inspection to determine final acceptance of seeded areas will be made upon Contractor's request. Provide notification at least 10 working days before requested inspection date. Seeded areas will be accepted provided all requirements, including punch list items and all maintenance, have been completed.

END OF SECTION 2.10

SECTION 2.11 – TOPSOIL

PART 1 – GENERAL

1.01 DESCRIPTION

Topsoil shall be a natural, fertile, friable soil constituting the “A” horizon from naturally well-drained areas. It shall not be excessively acidic or alkaline nor contain toxic substances that may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be reasonably free from clay clods, stones, roots, or similar substances one inch or more in diameter, debris, or other objects that may be a hindrance to planting operations.

1.02 SUBMITTALS

Copies of all laboratory test reports documenting that topsoil meets the requirements of these specifications.

PART 2 – PRODUCTS

1.01 TOPSOIL

Topsoil shall meet the following requirements

A. **TEXTURE:** Topsoil shall be a USDA classified Sandy Loam approximating the following particle size distribution:

Approximate Particle Distribution

Gravel	Trace
Coarse to medium sand	40-65%
Fine to very fine sand	10-20%
Silt	10-15%
Clay	10-20%

B. **SOLUBLE SALT LEVEL:** Less than 844 ppm (.67 mmho/cm)

C. **PERCENT ORGANIC MATTER:** 4 – 8%, by weight.

- If Soil is purchased from Isle of Wight, Approved General Topsoil source for 2001-2002, the percent organic will be close to 3.25%. To increase this to 8%, amend the soil at a ratio of 1 part organic to 20 parts topsoil, thereby increasing the percent organic by 4.75%.

D. **SOIL pH:** 5.5-6.5

- If Soil is purchased from Isle of Wight, Approved General Topsoil source for 2001-2002, the pH will be 7 or better. If the pH is 7 and the desired is 6, add elemental sulfur to decrease the pH at a rate of 2.5 pounds of elemental sulfur per cubic yard of topsoil.

2.02 QUALITY ASSURANCE/QUALITY CONTROL

Topsoil from sources other than the Approved General Topsoil Source shall be tested by an independent laboratory to determine the material's suitability for landscape use. The following suggested testing methodology and criteria are recommended:

A. LABORATORY REQUIREMENTS

The laboratory shall have a minimum of 5 years experience with the test protocols of the United States Golf Course Association – Green Section.

B. PARTICLE SIZE ANALYSIS

A particle size analysis from a minimum of three samples obtained randomly from the topsoil source pile shall be conducted to provide the particle size distribution, expressed as a percentage, in each of the following size classes:

<u>DESCRIPTION</u>	<u>AVERAGE DIAMETER (mm)</u>
Gravel	>2.0mm
Very Course Sand	1.0 – 2.0 mm
Course Sand	0.5 – 1.0 mm
Medium Sand	0.25 – 0.5 mm
Fine Sand	0.10 – 0.25 mm
Very Fine Sand	0.05 – 0.10 mm
Silt	0.002 – 0.05 mm
Clay	<0.002 mm

C. PHYSICAL ANALYSIS & CHEMICAL ANALYSIS

A physical analysis shall be conducted to include the following information:

1. Percent organic matter by weight.
2. Bulk density, expressed in g/cm³.

A chemical analysis shall be conducted to include the following information:

1. Soil pH.
 2. Nutrient content of the following nutrients, expressed in unit/area.
 - a. Available Phosphorus
 - b. Potassium
 - c. Calcium
 - d. Magnesium
 - e. Manganese
 3. Soluble Salt Level
- D. Soil sampling procedures and submittal quantities shall meet specific laboratory requirements. All samples shall be clearly labeled to include the location of the source of the material. Copies of all topsoil/ soil mix test result submittals shall be forwarded to the Owner and Norfolk's City Forester for approval.
- E. If the soil test results of any topsoil or planting mix fail to meet the particle size distribution, physical and chemical properties specified, the topsoil or planting mix shall be adjusted and re-tested, or another source secured, tested and submitted for approval.

PART 3 – EXECUTION

3.01 PROCEDURES

- A. All soil mixing shall be performed at the Contractor's yard using appropriate soil mixing and shredding equipment of sufficient capacity to assure proper quality control. No mixing of soils shall occur at the project location unless suitable portable equipment approved by the Owner and City Forester is obtained. All soil testing shall be at the expense of the contractor.
- B. Topsoil from onsite may be utilized in the proposed lawn areas if soil testing indicates that it meets the requirements of Section 2.01 for organic matter and soil pH. In such cases, the entire limits of seeding shall be tilled to a depth of 4 inches after replacement of the existing topsoil. If the existing topsoil does not meet the requirements of this section for organic matter and soil pH, it shall be amended as necessary to comply with the requirements of this section. If existing topsoil is completely unsuitable to sustain turf due to the existence of toxic substances, stones, roots or debris, replace to a depth of 4 inches to meet the requirements of Sections 2.01 and 2.02.

END OF SECTION 2.11

SECTION 2.12 – STORMWATER POLLUTION

PREVENTION PLAN

PART 1 - GENERAL

1.01 DESCRIPTION

- A. It shall be the contractor's responsibility to obtain a Virginia Stormwater Management Program (VSMP) permit and prepare the required Stormwater Pollution Prevention Plan (SWPPP). This Section specifies requirements for preparation and implementation of the SWPPP which shall be provided by the contractor.
- B. The stormwater pollution prevention measures contained in the SWPPP shall be the minimum required by the Virginia Erosion and Sediment Control Handbook. The Contractor shall provide additional measures to prevent pollution from stormwater discharges in compliance with the VSMP and all other local, state and federal requirements.
- C. For construction areas greater than 1-acre in size, the Contractor shall NOT begin construction without submitting evidence to the Owner that a "Virginia Stormwater Management Program" Notice of Intent governing the discharge of storm water from the construction site for the entire construction period has been filed at least two days prior to construction. It is the Contractor's responsibility to complete and file the Notice of Intent, Notice of Termination, and to comply with all of the requirements of the SWPPP.
- D. The Contractor shall conduct the stormwater management practices in accordance with local and governing authorities, the permit requirements, and for any enforcement action taken or imposed by Federal, State, or local agencies. The cost of any fines, construction delays and remedial actions resulting from the Contractor's failure to comply with all provisions of local regulations and VSMP permit requirements shall be paid for by the Contractor at no additional cost to the Owner.
- E. As a requirement of the Department of Conservation's (DCR) permitting program, each Contractor and Subcontractor shall execute a Contractor's Certification form.
- F. Upon completion and final acceptance of the project by the Owner and upon final stabilization of the project, the Contractor shall submit the Notice of Termination as required in the SWPPP.

1.02 REFERENCE STANDARDS

- A. Guidance Manual—"Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA 832-R-005).

- B. Summary of Guidance Manual—"Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA).
- C. Virginia Erosion and Sediment Control Handbook issued by the Virginia Department of Conservation and Recreation, Third Edition, 1992.

1.03 SUBMITTALS

- A. Contractor's certification for Contractor and each subcontractor.
- B. Copies of Contractor's inspection reports.
- C. Names, addresses, and telephone numbers of Contractor's and subcontractor's responsible personnel who can be contacted under emergency conditions.
- D. A construction schedule which indicates specific activities related to the SWPPP.
- E. A Supplemental plan indicating location of laydown, storage, and staging areas.

1.04 INSPECTIONS

- A. The Contractor shall inspect disturbed areas of the site at least once per week and within 24 hours of each rainfall event. Such inspections may be performed in conjunction with the provisions for the maintenance of Erosion Control Measures in Section 2.3.
- B. A maintenance inspection report shall be prepared after each inspection. The Contractor shall identify one individual who will be responsible for conducting inspections and preparing the reports. The Contractor shall also designate a person who will fill in for the inspector during absences. These individuals shall be trained in all maintenance and inspection practices necessary for keeping the erosion and sediment control measures in proper working order.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EROSION CONTROL DEVICES

- A. Erosion control devices shall be constructed as shown on the SWPPP, the plans, and as specified in Section 2.3.

3.02 STORM WATER POLLUTION PREVENTION PLAN PRINCIPLES

- A. The following general principles shall be followed by the Contractor during the construction phase:
 - 1. Protect and maintain existing vegetation wherever possible.

2. Minimize the area of disturbance.
3. To the extent possible, route unpolluted flows around disturbed areas.
4. Install mitigation devices as early as possible.
5. Minimize the time disturbed areas are left unstabilized.
6. Maintain siltation control devices in proper condition.

END OF SECTION 2.12

SECTION 3 APPENDIX

WHAT IS SECTION 3?

It is a means by which HUD fosters local economic development, neighborhood economic improvement, and individual self-sufficiency. Section 3 is the legal basis for providing jobs for residents and awarding contracts to businesses in areas receiving certain types of HUD financial assistance.

Under Section 3 of the HUD Act of 1968, wherever HUD financial assistance is extended for housing or community development, to the greatest extent feasible, economic opportunities will be given to Section 3 residents and businesses in that area.

SECTION 3 POLICY

Congress established the Section 3 policy to guarantee that the employment and other economic opportunities created by Federal financial assistance for housing and community development programs should, if possible, be directed toward low- and very-low income persons, particularly those who are recipients of government assistance for housing.

WHO ARE SECTION 3 RESIDENTS?

Section 3 residents are:

- Public housing residents
- Low and very-low income persons who live in the metropolitan area or non-metropolitan county where a HUD-assisted project for housing or community development is located.

Determining Income Levels:

- Low income is defined as 80% or below the median income of that area
- Median incomes can be found for this area by using the attached FY 2004 Income limits for Norfolk-Virginia Beach-Newport News form
- Very low income is defined as 50% or below of the median income the that area

WHAT IS A SECTION 3 BUSINESS & WHAT TYPES OF ECONOMIC OPPORTUNITIES ARE AVAILABLE UNDER SECTION 3?

A business:

- That is at least 51 percent or more owned by Section 3 residents,
- Whose permanent, full-time employees include persons, at least 30 percent of whom are currently Section 3 residents, or within three years of the date of first employment with the business concern were Section 3 residents, or
- That provides evidence of a commitment to subcontract in excess of 25 percent of the dollar award of all subcontracts to be awarded to a Section 3 business concern

Type of Opportunities:

- Job training
- Employment
- Contracts

Examples include:

Administrative Management	Services	Construction	
Accounting	Appliance repair	Architecture	Fencing
Payroll	Florists	Bricklaying	Heating
Research	Marketing	Carpentry	Iron Works
Bookkeeping	Carpet Installation	Cement	Machine
Purchasing	Janitorial	Masonry	Operation
Word Processing	Photography	Demolition	Painting
	Catering	Drywall	Plastering
	Landscaping	Electrical	Plumbing
	Printing	Construction	Surveying
	Computer Information	Engineering	Tile Setting
	Manufacturing		
	Transportation		

For additional information, refer to the HUD Section 3 Brochure available:

www.hud.gov/offices/fheo/section3/section3brochure.cfm



EXISTING EMPLOYEE LIST

PROJECT NAME: _____

LOCATION: _____

DEVELOPER/CONTRACTOR/APPLICANT: _____

DATE: _____

LIST ALL CURRENT EMPLOYEES:

EMPLOYEE NAME / ADDRESS	HIRE DATE	JOB CATEGORY CODE:

JOB CATEGORY CODES:

1) Professional	4) Construction by Trade (Specify Trade)
2) Technician	5) Laborer
3) Office/Clerical	



CONTRACTOR SUBCONTRACTING PLAN

List Each Subcontractor and Duties and Responsibilities	Approximate Dollar Value	Construction or Non-Construction (NC)	Section 3 Business Concern (Y/N)	Gender / Ethnic / Racial Codes	Woman-Owned Business (Y/N)
1.					
2.					
3.					
4.					
5.					

Gender / Ethnic/ Racial Codes:

- 1. White American
- 2. African American
- 3. Native American
- 4. Hispanic American
- 5. Asian Pacific
- 6. Hasidic Jewish American
- 7. Woman-Owned



SECTION 3 BUSINESS CONCERN CERTIFICATE

The undersigned being duly sworn, on oath, represents, warrants, certifies, deposes, and says, under penalty of law as follows:

BASIC INFORMATION

The following information is true and correct:

1. Name of Company: _____

Company Address: _____

2. Type of Business (corporation, partnership, sole proprietorship, joint venture):

3. Community(s) Name(s) and Address(es)

Name / Type of Contract:



TYPE OF SECTION 3 BUSINESS CONCERN

1. Is the Company a Section 3 Business Concern?
 YES NO

2. Is this business at least 51% or more owned by Section 3 residents?
 YES NO

3. Do 30% of permanent, full-time employees include persons, currently Section 3 residents, or within three years of date of first employment with the business were Section 3 residents:
 YES NO

4. Is this a business that can provide evidence of a commitment to subcontract in excess of 25% of the dollar award of all subcontracts to Section 3 business concerns?
 YES NO



VERIFICATION

The company hereby agrees to provide, upon request, documents verifying the information provided on this form.

Under penalty of perjury, I certify that I am the _____ (Title) of the Company, that I am authorized by the Company to execute this affidavit on its behalf, that I have personal knowledge of the certifications made in this affidavit and that the same are true.

Name (Signature) _____

Name (Printed) _____

State of _____ Virginia _____

City of _____

Subscribed and sworn to before me this _____ day of _____ 20__

Notary Public _____

My Commission Expires _____



SECTION 3 RESIDENT CERTIFICATE For New Hires and/or Current Employees

Please complete the following information and sign your name.

I, _____, the undersigned being duly sworn, on oath, represents, warrants, certifies, deposed and says, under penalty of law, as follows:

1. My current address is (give street address, city, state, and zip code):

2. I do do not reside in public housing. If you do, please give the name of your public housing community, City and State. _____
3. I do do not receive assistance from a Housing Choice voucher (Section 8). If you do, please give the name of the agency that issued you the Housing Choice Voucher. _____
4. The total number of individuals in my family (include all family members currently living in the household) is _____.
5. Find your family size in the box below. Is your family income equal to or less than the income listed below that box? YES NO

1 PERSON	2 PERSON	3 PERSON	4 PERSON	5 PERSON	6 PERSON	7 PERSON	8 PERSON
\$38,000	\$43,450	\$48,850	\$54,300	\$58,650	\$63,000	\$67,350	\$71,700

6. I understand that the information above relating to the size and annual income of my family may require verification. Upon request, I agree to provide documents verifying this information. I also authorize my employer to release this information for the United States Department of Housing and Urban Development, the Norfolk Redevelopment and Housing Authority and the prime and/or sub-contractors to verify my status as a "Section 3 Resident".

Please print your name

Please sign your name (Signature)

Employer's Name

Date

Company's Contracting Compliance Officer's Signature



FY 2009 INCOME LIMITS
FOR
NORFOLK - VIRGINIA BEACH - NEWPORT NEWS
and the surrounding Standard metropolitan Area

NOTE: AREA MEDIAN INCOME FOR 4 PERSON HOUSEHOLD = \$54,300

FAMILY SIZE ADJUSTMENTS:

The only criteria used to determine Section 3 eligibility is household income and family size. The table below provides a quick reference.

Example:

Refer to the table below. Find the family size 4 in row 1. An individual states his annual family income is \$43,000 and he or she has 4 persons in the family. Because the maximum income does not exceed \$54,300 in row 2 for a family of 4, this individual is considered to be a Section 3 resident.

Number of Persons in Family and Maximum Family Income

Number of Persons in Family	1	2	3	4	5	6	7	8
Maximum Income for Number of Family Members	\$38,000	\$43,450	\$48,850	\$54,300	\$58,650	\$63,000	\$67,350	\$71,700

Income limits for families with more than eight persons are not included in the printed lists because of space limitations. Confer with the Department of Procurement and Economic Opportunities if an individual declares more than 8 family members.

SECTION 3 EMPLOYMENT, TRAINING AND CONTRACTING REPORT:



CONTRACTOR:
TELEPHONE:
CONTRACT NO:
PROJECT NAME:
SECTION 3 BUSINESS:

If "YES," submit the "Section 3 Business Concern Affidavit" with initial report only

COMPLIANCE OFFICER'S SIGNATURE:
CONTRACTOR/SUB-CONTRACTOR:

COMPANY NAME	BUSINESS ADDRESS	BUSINESS PHONE AND FAX	GENERAL CONTRACTOR OR TRADE SPECIALTY	SUB-CONTRACTOR YES OR NO	CONTRACT AWARD DATE	CONTRACT AWARD AMOUNT	ETHNIC & GENDER CODE OF OWNER	TOTAL NUMBER OF EMPLOYEES	TOTAL NUMBER OF SECTION 3 EMPLOYEES	HIRING METHODS CODE

EMPLOYEES / NEW HIRES

EMPLOYEE NAME	ADDRESS AND PROJECT NAME	HOME PHONE	SUB-CONTRACTOR YES/NO	EMPLOYEE HIRE AND TERMINATION DATE	TRADE/JOB TITLE	TYPE TRAINING TO BE PROVIDED	ETHNIC & GENDER CODE OF EMPLOYEE	SECTION 3 CODE	REFERRAL SOURCE CODE	HIRING METHODS CODE

ETHNIC & GENDER CODES:

- 1 = White Americans
- 2 = African Americans
- 3 = Native Americans
- 4 = Hispanic Americans
- 5 = Asian/Pacific Americans
- 6 = Hasiatic/Jews
- F = Female
- M = Male

SECTION 3 CODES:

- 1 = Public Housing Project Area Resident
- 2 = Public Housing Non Project Area Resident (includes Section B)
- 3 = Youth Build
- 4 = Empowerment Zone, Norfolk, VA
- 5 = Hampton Roads, VA - Metropolitan Statistical Area

REFERRAL SOURCE CODES:

- 1 = NRHA Resident Services Specialist/ HOPE VI CSS Caseworker
- 2 = Empowerment 2010
- 3 = Other

HIRING METHODS CODES:

- 1 = NRHA Resident Services Specialist/ HOPE VI CSS Caseworker Referrals
- 2 = Newspaper/Fliers
- 3 = Temporary Agency
- 4 = Other

* If other than NRHA Public Housing Resident, please complete Section 3 Resident Certificate when employee is first added to Report.

SECTION 3 CONTRACTOR INTENT TO EMPLOY OPTION FORM



Section 3 Contractor/Employer Information

Mail or Fax this form to
Linda Davenport - Section 3 Coordinator
201 Granby Street, Norfolk, VA 23501
Telephone: 314-2026 FAX (314-2105)

CONTRACTOR/EMPLOYER INFORMATION

Company Name

Address City State Zip

Telephone Number Fax Number Internet address

JOB INFORMATION

Job Title: _____ Number of Openings: _____

Job Duration: Full time or Part time 150 days over 150 days

Shift: 1 2 3 Rotating Split

Work Days: Sun Mon Tues Wed Thurs Fri Sat
(Circle all that apply)

Work Hours: Fm _____ to _____ Age: _____ Typing Speed: _____
AM / PM AM / PM Hours _____ Per _____

Driver's License Required? Yes No Type? Regular Chauff. CDL A B C
Endorsements _____ Need Help Finding Residents: Yes No

Job Details (include essential job duties/functions and any machinery operated/tools used)

Yrs. Experience _____ Reqr/ Desired _____
Level of education _____ Reqr/Desired _____
Salary Range: Min _____ Max _____ Per: Hour/Day/Week/Month/Year

Benefit: (Check all that apply)

<input type="checkbox"/> 401-K	<input type="checkbox"/> Life Insurance	<input type="checkbox"/> Sick/Disability Leave
<input type="checkbox"/> Bonuses	<input type="checkbox"/> Major Medical	<input type="checkbox"/> Uniform Furnished
<input type="checkbox"/> Clothing	<input type="checkbox"/> Mileage Reimbursement	<input type="checkbox"/> Vacation Leave
<input type="checkbox"/> Dental Ins.	<input type="checkbox"/> Prescription Coverage	<input type="checkbox"/> Vehicle Furnished
<input type="checkbox"/> Education	<input type="checkbox"/> Retirement Plan	<input type="checkbox"/> Vision Plan

Pay Benefit Details: _____
Form Completed by: _____ Date: _____

GEOTECHNICAL ENGINEER REPORT

21 pages in total



ENGINEERING & TESTING SERVICES, INC.

August 7, 2009

To: Kimley-Horn and Associates, Inc.
501 Independence Parkway
Suite 300
Chesapeake, Virginia 23320

Attn: Mr. John Holcomb, P.E.

Re: Geotechnical Engineering Services Report
26th Street Improvements
Norfolk, Virginia
ETS Report No.: ETS-09E116-1


Dear Mr. Holcomb:

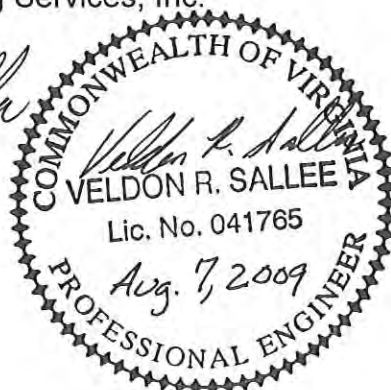
Transmitted herewith is our Geotechnical Engineering report for the above referenced project. This study was authorized by you in accordance with ETS proposal No.: ETS-07P197 dated September 10, 2007.

This report contains the results of our field exploration program and laboratory testing procedures along with an engineering interpretation of these data with respect to the available project characteristics, and our recommendations to aid in the design and construction of pavements and other earth related components of the project. We will store the soil samples for 30 days after which time they will be discarded, unless you request otherwise.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance, such as providing our inspection services during construction, or if you have any questions regarding this report, please contact our office at 757-306-1040.

Respectfully Submitted,
Engineering and Testing Services, Inc.

for 
Charlie T. Nabhan, P.E.
Principal Engineer
VA Reg. No.: 25133



1.0 PURPOSE AND SCOPE OF STUDY

The purpose of this study was to determine the general subsurface conditions by drilling soil test borings and to evaluate the soils with respect to the design and construction of pavements, utility lines, and other earth supported components of the proposed improvements at 26th Street in Norfolk, Virginia.

Also included is an evaluation of the site with respect to potential construction problems and recommendations dealing with the earthwork and quality control during construction. The recommended construction procedures are considered necessary to verify the subsurface conditions and to aid in ascertaining that the soils connected phases are properly performed.

2.0 SITE AND PROJECT CHARACTERISTICS

The project site, designated as 26th Street Improvements, is located between Bowdens Ferry Road and Hampton Boulevard in Norfolk, Virginia. During the time of our field exploration program, the 26th Street project site consists of an existing asphalt roadway serving residential dwellings.

It is our understanding that the proposed improvements at this site will consist of possibly upgrading or replacing the existing pavement of 26th Street to meet the current standards and the installation of sidewalks and curb and gutters.

3.0 FIELD EXPLORATION PROGRAM

In order to explore the general subsurface soil types and to aid in developing associated design parameters for pavements, two 10-foot deep borings, designated as B-1 and B-2, were drilled within the existing roadway areas. The borings were performed manually by ETS Geotechnical Engineers. The borings were located and staked in the field by ETS personnel. The boring logs and profiles are included in Appendix II and III of this report, respectively. Also, the boring locations were cored in order to facilitate the drilling operation. The thickness of the surface materials are noted on the boring logs.

In addition to the borings, two bulk soil samples, designated as B-1 and B-2, were collected from the location of borings B-1 and B-2. The CBR bulk soil samples were collected from a depth of about 12 to 36 inches below grades. The bulk soil samples were collected and returned to our USACE validated Laboratory for California Bearing Ratio (CBR) testing in accordance with ASTM Standards. The boring and CBR locations are included in Appendix I of this report.

4.0 LABORATORY TESTING PROCEDURES

Representative portions of all soil samples collected during drillings were sealed in glass jars, labeled and transferred to our laboratory for classification and analysis. The soil classification was performed by a Geotechnical Engineer in accordance with ASTM D2488.

The CBR bulk soil samples were subjected to natural moisture content (ASTM D2216), - # 200 Sieve testing (ASTM D1140), Moisture-Density Relationship testing (ASTM D698) and California Bearing Ratio (CBR) testing (ASTM D-1883). The Moisture-Density Relationship curves are included in Appendix V of this report. The Summary of CBR Test Data is included in Appendix IV of this report.

5.0 SUBSURFACE SOIL CONDITIONS

The results of our field exploration program indicated the presence of approximately 2.5 inches of asphalt underlain by approximately 2 to 4 inches of gravel subbase materials at the boring locations. The asphalt and stone materials thickness could vary at other locations along the existing 26th Street alignment. Underlying the asphalt and stone materials and extending to the boring termination depths of 10 feet, the subsurface soils predominantly consisted of sand with varying amounts of silt and clay; slightly silty sand (SP-SM), silty sand (SM) and fine to medium cohesionless sand (SP). For specific details concerning the soils conditions at each boring location, the reader is referred to the boring logs attached to this report, Appendix II.

6.0 GROUNDWATER OBSERVATIONS

6.1 Groundwater level:

The groundwater level was measured at each boring location immediately following completion of drilling operations. The groundwater level at the boring locations was measured to be approximately 4.5 feet below the existing grades. It should be noted, however, that the ground water levels tend to fluctuate during periods of prolonged drought and extended rainfall. It is estimated that normal seasonal high groundwater levels may extend approximately 2 feet higher than the measured water levels. In general, high groundwater levels are normally recorded in late winter and early spring. It is recommended that the contractor determine the actual groundwater levels at the time of construction to determine ground water impact on the construction procedures.

6.2 Groundwater concerns:

It is expected that dewatering will be required for excavations, which extend below 4.5 feet from existing grades. Dewatering from depths of 4.5 feet or less could probably be accomplished by pumping from sumps. Dewatering at depths below the groundwater table from existing grades may require well pointing.

7.0 CONSTRUCTION RECOMMENDATIONS

7.1 Clearing and subgrade preparation:

Prior to construction, the location of any existing underground utility lines within the construction area should be established and these utilities relocated to an area that will not be affected or interfere with construction. If underground pipes are not properly integrated, removed or plugged, they may serve as conduits for subsurface erosion, which subsequently may result in excessive settlement of pavements.

The proposed construction areas should be prepared as required per the project Civil Engineering plans prepared by Kimley-Horn & Associates. After the subgrade soils elevations within proposed structural areas have been established, they should be proofrolled and/or evaluated by the Geotechnical Engineer. Any pumping and unstable areas observed during proofrolling should be undercut and/or stabilized at the directions of the Geotechnical Engineer. It is recommended that, within the pavement areas, natural soils at the proposed subgrade elevations should be compacted to a dry density of at least 95 percent of the Standard Proctor maximum dry density (ASTM D698).

7.2 Structural Fill and Placement Requirements:

All structural fill should be compacted to a dry density of at least 95 percent of the Standard Proctor maximum dry density (ASTM D698). Any material to be used for backfill or compacted fill should be tested by the Geotechnical Engineer prior to placement to determine if they are suitable for the intended use. Imported structural fill materials should consist of sand or gravel with less than 20 % passing the No. 200 Sieve (0.074 mm) and classified as SP, SM, SW, GP, and GW.

All structural fill materials should be placed in 10-inch loose lifts and be compacted to a dry density of at least 95 % of the Standard Proctor maximum dry density (ASTM D698). A soils technician working under the direction of a licensed professional Geotechnical Engineer should perform field density tests on each lift as necessary to determine that adequate compaction is achieved.

8.0 PAVEMENTS

Our pavement analyses consisted of evaluating the adequacy of the existing pavement section as well as providing a new pavement section using the current industry standards. In order to evaluate the existing pavement section and design a new one, we have employed the Vaswani Method as published in the Virginia Department of Transportation Pavement Design Guide for Subdivision and Secondary Roads in Virginia. As previously stated in this report, two bulk soil samples were collected from the boring locations from a depth of about 12 to 24 inches below existing grades. The soil samples consisted mainly of fine sand to slightly silty sand. It should be noted that the CBR tests were performed under optimum conditions on compacted samples. Therefore, the CBR values were applied conservatively. The CBR tests results are included in Appendix IV of this report.

The CBR tests (CBR1=13.4; CBR2= 16.2 at 0.1 inch penetration) conducted on the bulk soil samples indicated an average soaked CBR value of 15. The soaked CBR value should be multiplied by two-thirds in accordance with VDOT requirements. The factor of two-thirds in the design CBR computation provides a safety factor to compensate for the non-uniformity of the soils through out the site. Therefore, a design CBR value of CBR= 10 was used in our analyses.

In order to determine the adequacy of the existing pavement section, we have employed the existing asphalt and stone thicknesses in our analyses, and considered anticipated traffic loads generated from adjacent residential homes, commercial/industrial truck traffic, indirect ODU traffic and cross-city traffic between Hampton Boulevard and Tidewater Drive in Norfolk, Virginia. Based on the results of our analyses, the existing pavement section is considered inadequate using the current industry standards. An overlay of at least 2.0 inches of surface asphalt (type SM-9.5A) materials will be sufficient for the pavement section to be considered adequate.

If the owner elected to remove the existing pavement section and reconstruct a new one, the following pavement cross-section is recommended.

- Asphalt Surface: Minimum 1.5 inches of Asphalt Concrete, type SM-9.5A.
- Asphalt Base: Minimum 3.0 inches of Asphalt Concrete, type BM-25.0
- Aggregate Base: Minimum 8.0 inches of Aggregate Base Material, size 21-A or B.
- Subgrade: Stable and approved by the Geotechnical Engineer.

It is recommended that considerations particular to these subgrade soils be made beyond those based solely on CBR values. The following suggestions are therefore made regarding pavements construction.

- Following pavement rough grading operations, the exposed subgrade soils should be proofrolled under the observation of the Geotechnical Engineer. This proofrolling should be accomplished with a fully loaded dump truck or 7 to 10 ton drum roller to check for pockets of soft material hidden beneath a thin crust of better soil. Any unsuitable materials thus exposed should be removed and replaced with a well-compacted structural fill material. The inspection of these phases should be performed by the Geotechnical Engineer.
- If excessively unstable subgrade soils are observed during proofrolling and/or fill placement, it is expected that these weak areas can be stabilized by means of thickening the base course layer and/or the use of a Geotextile fabric (such as Mirafi 500x or equivalent). These alternatives are to be addressed by the Geotechnical Engineer during construction, if necessary, who will recommend the most economical approach at the time.
- The Geotechnical Engineer should be called on to provide a final inspection of the stone surfaces prior to paving. The best indication of what problems could arise during the service life of the pavements is the performance of the stone base after exposure to construction traffic and the elements. It is therefore recommended that this inspection be performed so that observed drainage problems or base or subgrade deterioration problems can be addressed.

9.0 WARRANTY AND LIMITATIONS OF STUDY

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted Geotechnical engineering principles and practices. This warranty is in lieu of all warranties, either express or implied. ETS, Inc. is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration program and laboratory test data presented in this report.

The recommendations were developed from the information obtained from the test borings which only depict subsurface conditions at the specific locations, times and depth shown on the logs. Soils conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soil conditions to change from those described in this report.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the geotechnical engineer or by his representative is therefore considered necessary to verify the subsurface conditions and to check that the soils connected construction phases are properly carried out. If significant variations or changes are in evidence, it may be necessary to re-evaluate the recommendations of this report. Furthermore, if

the project characteristics are altered from those discussed in this report, if the project information contained in this report is incorrect, or if additional information becomes available, a review should be made by this office to determine if any modifications in the recommendations will be required.

The scope of our services does not include any environmental assessment or investigations for the possible presence of hazardous or toxic materials in the soil, groundwater or surface water within or in the general vicinity of the site studied. Any statements made in this report or shown on the test boring logs regarding unusual subsurface conditions, and/or composition, odor, staining, origin or other characteristics of the surface and/or subsurface materials are strictly for the information of our client and may or may not be indicative of an environmental problem. Unless complete environmental information regarding the site is already available, an environmental assessment is recommended prior to the development of this site.

APPENDICES

APPENDIX I – BORING LOCATION PLAN

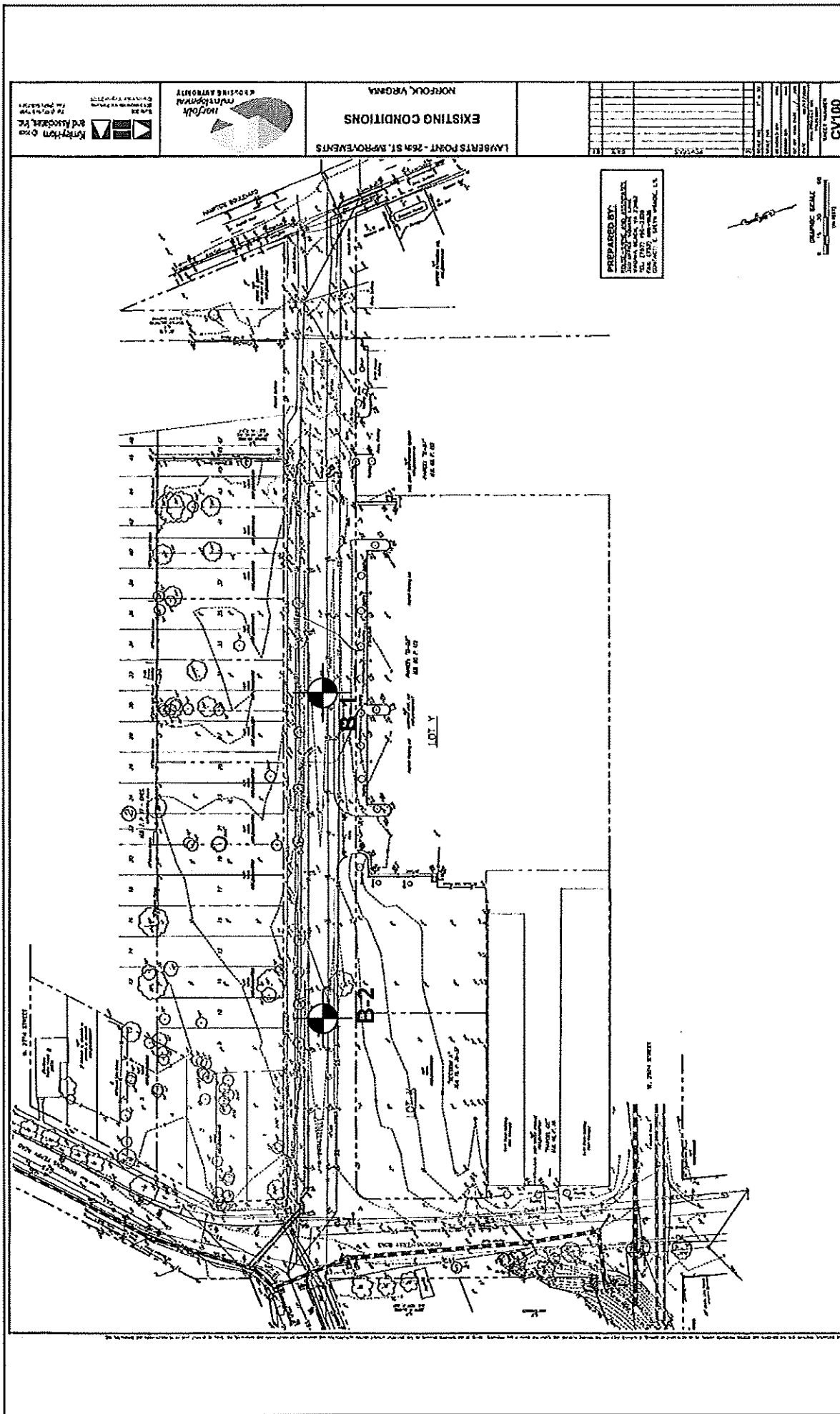
APPENDIX II – SOIL BORING LOGS

APPENDIX III – SOIL BORING PROFILE

APPENDIX IV – SUMMARY OF CBR TEST DATA

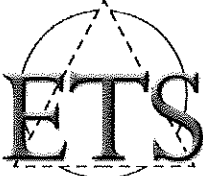
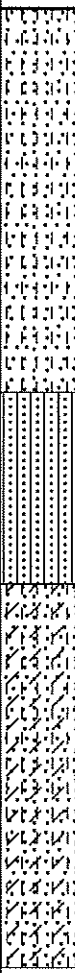

APPENDIX V – MOISTURE-DENSITY RELATIONSHIP CURVES

APPENDIX I – BORING LOCATION PLAN

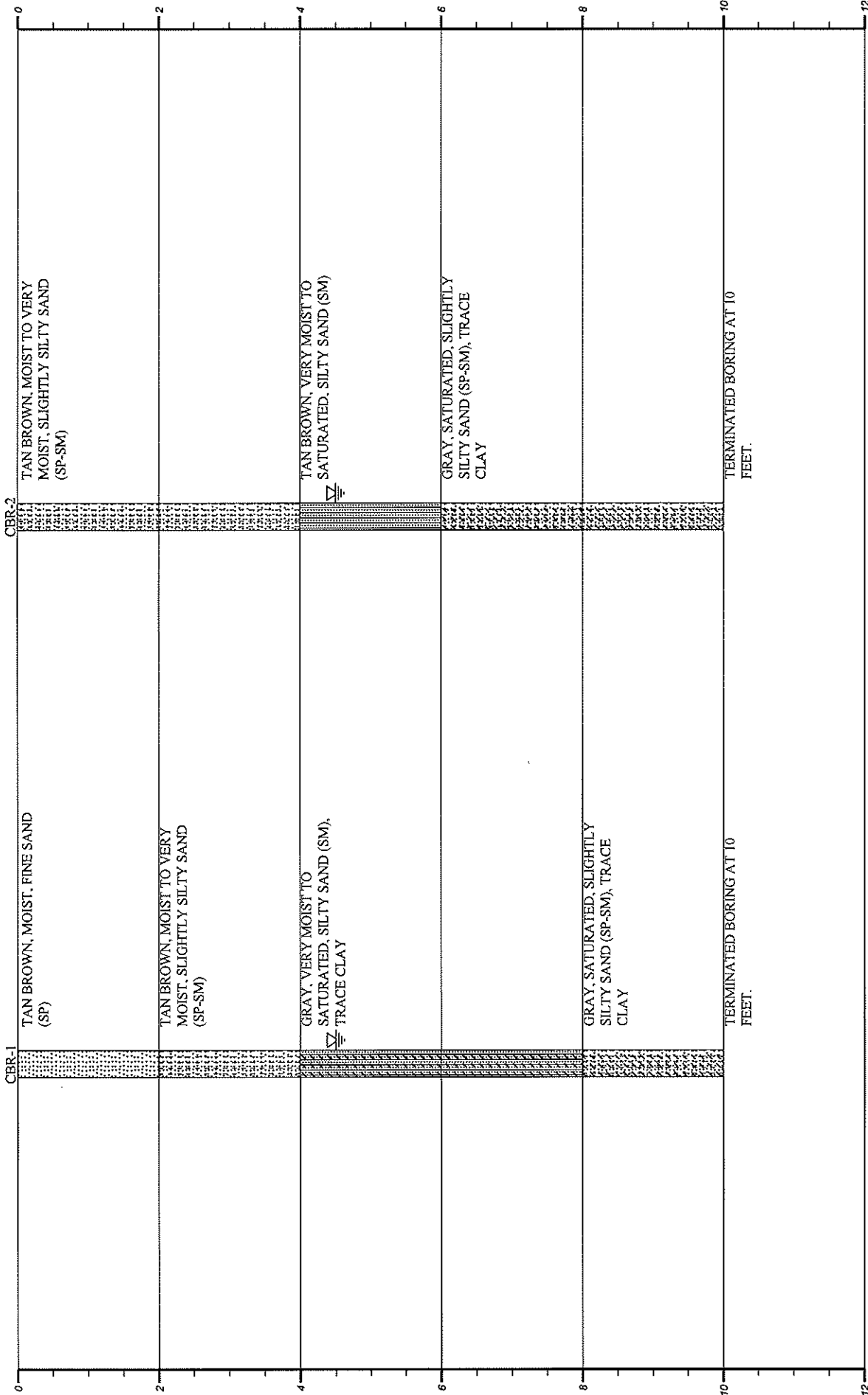


ENGINEERING		BORING LOCATION PLAN		JOB No.: ETS-09E116	DESIGN BY:
& TESTING SERVICES, INC.		APPENDIX I		DATE: 08/07/09	PLAN BY: ETS
5226 INDIAN RIVER ROAD SUITE 102	VIRGINIA BEACH, VA	26 th STREET IMPROVEMENTS		SCALE: NTS	
PHONE: (757) 306-1040	FAX: (757) 306-1042	NORFOLK, VA		PAGE: 1	BORINGS BY: ETS

APPENDIX II – SOIL BORING LOGS

	Project No. ETS-09E116		Date 7/30/2009		Sheet 1 of 1							
	Project 26TH STREET IMPROVEMENTS											
	Client KIMEY-HORN AND ASSOCIATES											
	Boring Location SEE ATTACHED PLAN FOR LOCATION		Ground Elevation N/S		Hole No. CBR-2							
Project Location NORFOLK, VIRGINIA		Drill Method MANUAL	Station N/S		Depth of Hole: (Ft) 10 FEET							
Name of Foreman ETS, INC		Water Level Observations: (all levels noted in feet)	Noted on Rods: (Ft) 4.5		At Completion: (Ft)							
Name of Inspector M.M.		After	Hours		Feet	Cave in at: (Ft)						
Depth (ft.)	Legend	Classification of Material (Description)	Sample No.	Blows/6"	Recovery (inches)	Standard Penetration Test Blows/Ft.					Remarks	
						10	20	30	40	50+		
0		TAN BROWN, MOIST TO VERY MOIST, SLIGHTLY SILTY SAND (SP-SM)	S-1		24						ASPHALT DEPTH = 2.5 IN. AGGR. STONE BASE = 2 IN.	
2			S-2		24							
4			TAN BROWN, VERY MOIST TO SATURATED, SILTY SAND (SM)	S-3		24						
6			GRAY, SATURATED, SLIGHTLY SILTY SAND (SP-SM), TRACE CLAY	S-4		24						
8				S-5		24						
10		TERMINATED BORING AT 10 FEET.										
12												
14												
16												

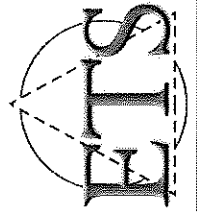
APPENDIX III – SOIL BORING PROFILE



Strata symbols



Silty sand



GENERALIZED SOIL PROFILE

HORIZONTAL SCALE	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=2'		8/10/2009

26TH STREET IMPROVEMENTS

1 OF 1

PROJECT NO. ETS-09E116

FIGURE NUMBER

A-III

APPENDIX IV – SUMMARY OF CBR TEST DATA

Engineering & Testing Services, Inc.

California Bearing Ratio Test Report

8/07/2009

Checked By: V. Sallee, P.E.

8/07/2009

Computed By: M. Maranton

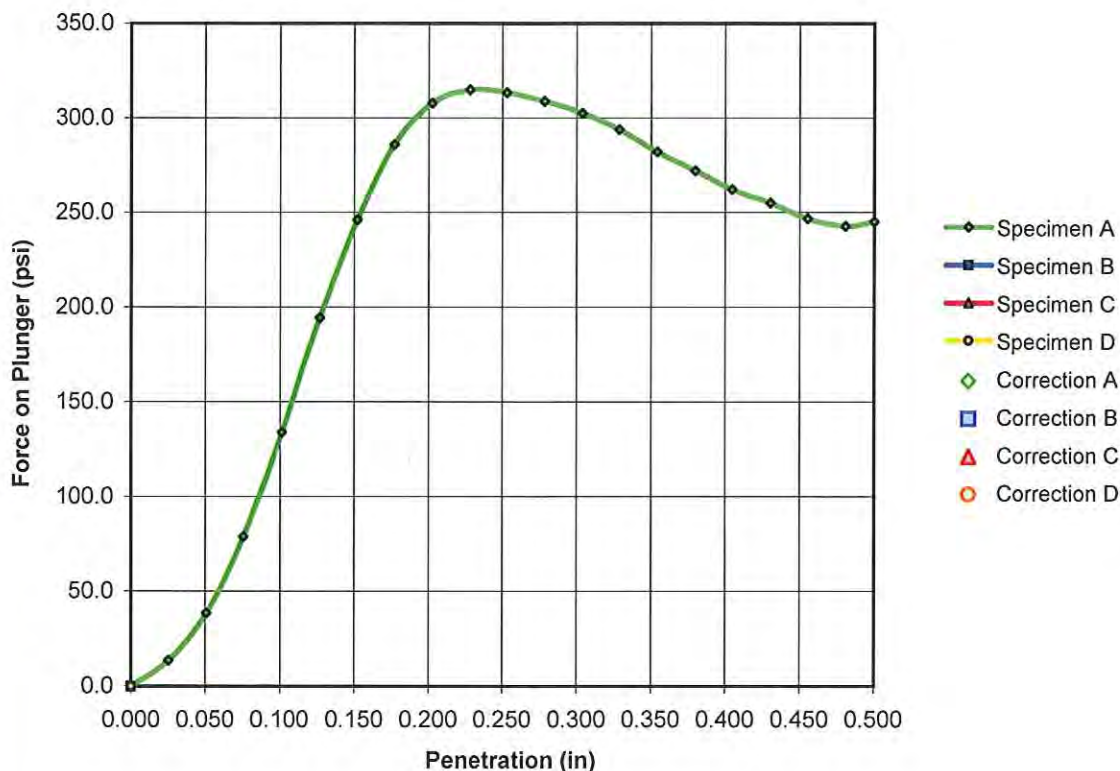
8/07/2009

ETS Soils Lab

8/07/2009

Tested By:

Load Penetration Curve



Project Information

Project Number	ETS-09E116
Project Name	26TH STREET IMPROVEMENTS
Project Location	NORFOLK, VIRGINIA
Test Date	8/07/2009
Client	KIMEY-HORN AND ASSOCIATES

Test Results

Measurements	CBR Results	Density Data	
0.1 in Pen.	13.4	Compaction Type	Standard Effort
0.2 in Pen.	20.5	Test Standard	D698 - Method A
Moisture (%)	12.4	Max Dry Density (PCF)	104
Dry Dens (pcf)	104.5	Optimum Moisture (%)	12.6

Project Data

Test Variables

Sample Depth	1-2'	Liquid Limit:	NP
Sample Number	CBR-1	Plastic Limit:	NP

TAN BROWN, FINE SAND (SP)

Other laboratory tests conducted in accordance with ASTM D422, D698, D1883, D2216, D2487 and D2488.

Engineering & Testing Services, Inc.

California Bearing Ratio Test Report

8/7/2009

Checked By: V. Sallee, P.E.

8/7/2009

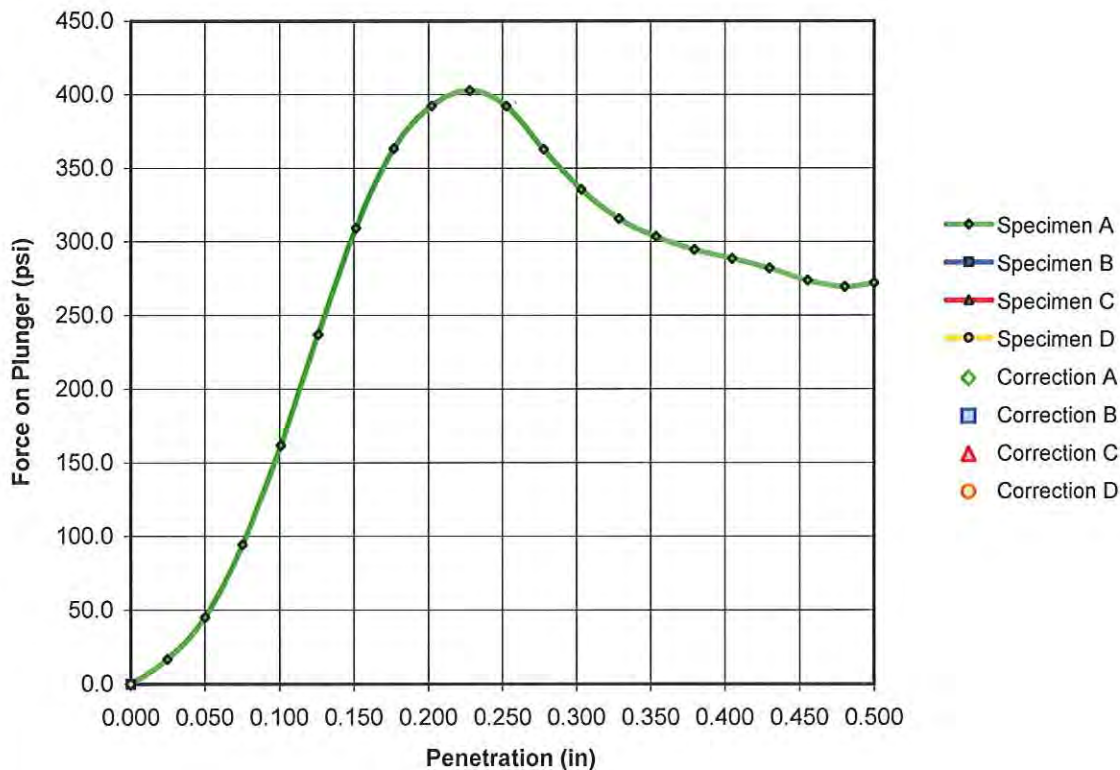
Computed By: M. Marantan

8/3/2009

ETS Soils Lab

Tested By:

Load Penetration Curve



Project Information

Project Number	ET-09E116
Project Name	26TH STREET IMPROVEMENTS
Project Location	NORFOLK, VA
Test Date	8/07/2009
Client	KIMEY-HORN AND ASSOCIATES

Test Results

Measurements	CBR Results	Density Data	
0.1 in Pen.	16.2	Compaction Type	Standard Effort
0.2 in Pen.	26.2	Test Standard	D698 - Method A
Moisture (%)	11.5	Max Dry Density (PCF)	105.7
Dry Dens (pcf)	106.9	Optimum Moisture (%)	12.1

Project Data

Test Variables

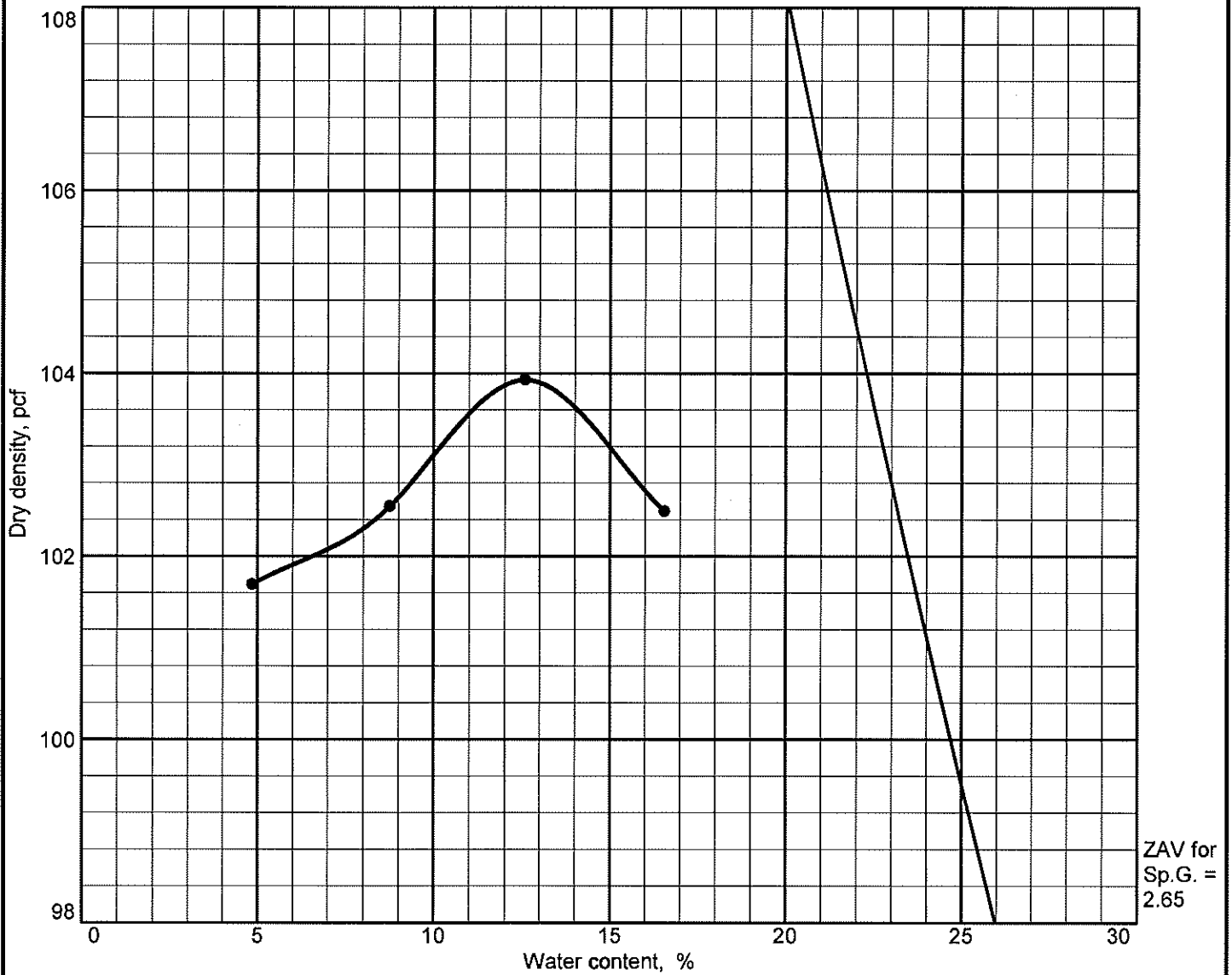
Sample Depth	1-2'	Liquid Limit:	NP
Sample Number	CBR-2	Plastic Limit:	NP

TAN BROWN, SLIGHTLY SILTY SAND (SP-SM)

Other laboratory tests conducted in accordance with ASTM D422, D698, D1883, D2216, D2487 and D2488.

APPENDIX V – MOISTURE DENSITY RELATIONSHIP CURVES

MOISTURE-DENSITY RELATIONSHIP TEST



ZAV for
Sp.G. =
2.65

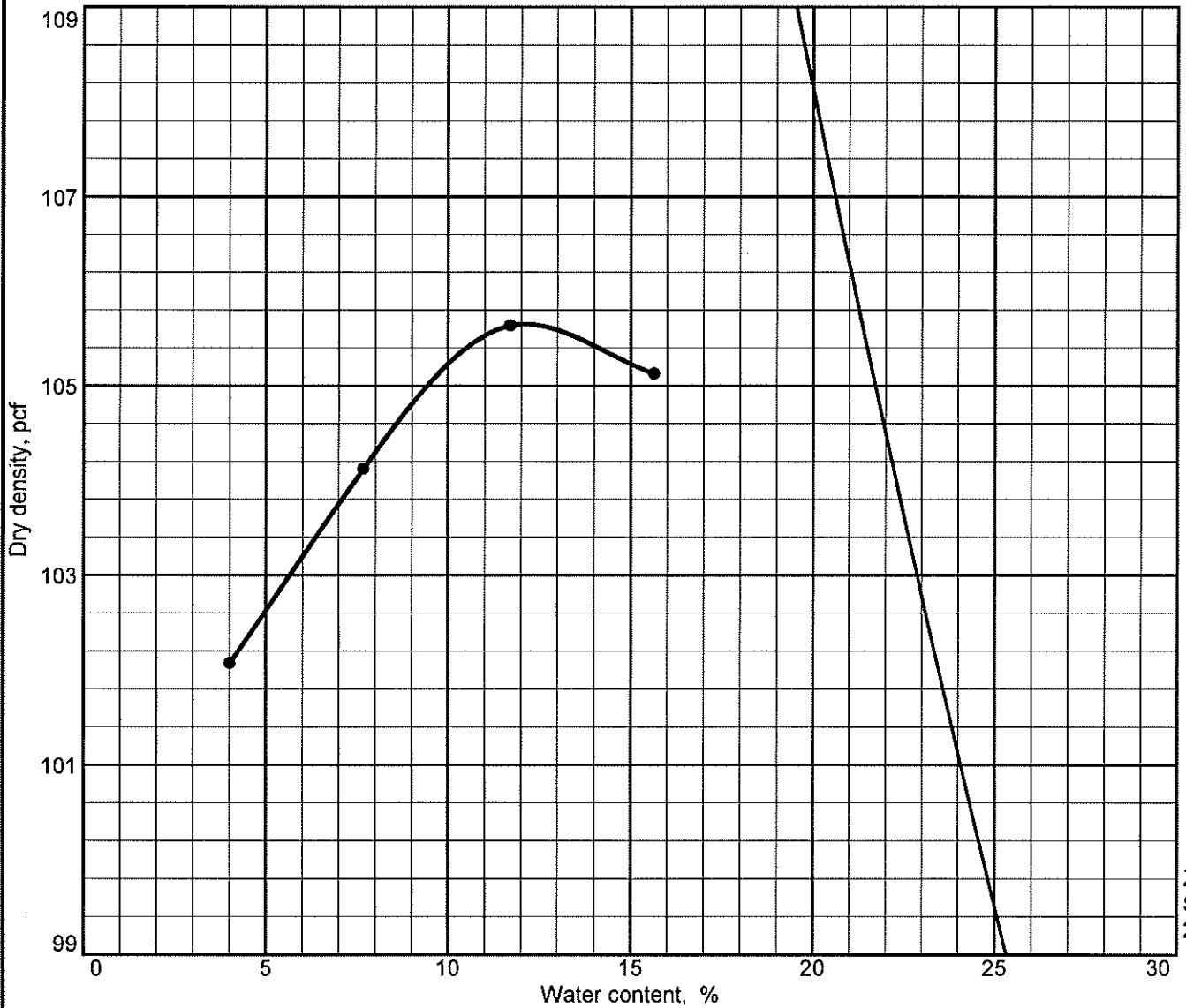
Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
1-2	SP		8.3	2.65	NP	NP	0.0	4.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104 pcf Optimum moisture = 13 %	TAN BROWN, FINE SAND (SP)
Project No. ETS-09E116 Client: KIMEY-HORN AND ASSOCIATES Project: 26TH STREET IMPROVEMENTS Source: Sample No.: CBR-1 Elev./Depth: 1-2	Remarks: ESTIMATED SPECIFIC GRAVITY, $G_s = 2.65$
ENGINEERING AND TESTING SERVICES, INC. Virginia Beach, VA	

Plate

MOISTURE-DENSITY RELATIONSHIP TEST



ZAV for Sp.G. = 2.65

Test specification: ASTM D 698-91 Procedure A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
1-2	SP-SM	A-2	6.9	2.65	NP	NP	0.0	8.8

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106 pcf Optimum moisture = 12 %	TAN BROWN, SLIGHTLY SILTY SAND (SP-SM)
Project No. ETS-09E116 Client: KIMEY-HORN AND ASSOCIATES Project: 26TH STREET IMPROVEMENTS ● Source: Sample No.: CBR-2 Elev./Depth: 1-2	Remarks: ESTIMATED SPECIFIC GRAVITY, G _s = 2.65
ENGINEERING AND TESTING SERVICES, INC. Virginia Beach, VA	

Plate