Cohen & Dax, P.C.
ATTORNEYS

Jeffrey C. Cohen
John W. Dax

David M. Allen
Jessica A. Norgrove

1090 State Street, Suite 1030
Albany, New York 12207
www.cdkpc.com

Telephone: (518) 432-1002
Facsimile: (518) 432-1028

Service via facsimile and email not accepted

August 8, 2005

BY HAND DELIVERY

Hon. Jaclyn A. Brilling
Secretary
New York State Public Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

Re: Case 02-T-0036 - NeptuneRTS, LLC
EM&CP II (Upland Cable Route)

Dear Secretary Brilling:

On June 27, 2005, NeptuneRTS filed the second EM&CP for the NeptuneRTS facility, concerning construction work to be done along the upland cable route between Jones Island, the converter station site at 508 Duffy Avenue and the Long Island Power Authority substation on Newbridge Road, including the offshore drilling exit pit ("EM&CP II"). Notice of the filing was provided as required by the Commission's orders in this proceeding and comments were due by July 29, 2005.

Written comments were filed by the Town of Oyster Bay, the Office of Parks, Recreation and Historic Preservation ("OPRHP"), the Department of Transportation ("DOT") and the Department of Environmental Conservation ("DEC"). NeptuneRTS representatives have also consulted with, and received comments informally from, DOT and the Department of Public Service ("DPS").

Enclosed with this letter is "Revision 1" to EM&CP II reflecting changes made to accommodate these comments. Included with the Revision are three volumes of drawings bound in a single package. The drawings are intended to serve both in support of EM&CP II and in support of a highway work permit application prepared pursuant to Part 131 of DOT's regulations. The highway work permit application is being submitted to DOT, pursuant to Certificate Condition 5 of the October 28, 2004 Order Granting Amendment of Certificate of Environmental Compatibility and Public Need.

With respect to the written comments, we note the following:

DEC - Comment 1. The location of the exit pit was specifically chosen in coordination with DEC coastal erosion zone staff as reflected in the February 22, 2005 letter from Mr. Sanza included in Appendix G to the June 27 filing. The location has not been changed from the coordinates given there.

DEC - Comments 2-8. The requested changes and clarifications are reflected on the drawings included with the highway work permit application.

OPRHP - Contractor Parking and Staging Area

A staging area proposed by OPRHP has been reviewed by NeptuneRTS's contractor and found to be satisfactory. It is shown in the attached documents.

OPRHP - Bike Path Disturbance

NeptuneRTS agrees, and will inform and communicate with user groups concerning the timing, duration and location of bike path work.

OPRHP - Vegetation and Restoration Plan

NeptuneRTS agrees to limit vegetation planting to those agreed upon by DOT and OPRHP.

Town of Oyster Bay. Vegetation restoration will be according to plans agreed upon by OPRHP and DOT, which NeptuneRTS is confident will address the concerns expressed by Oyster Bay.

Respectfully submitted,

John W. Dax

JWD:cgw
Enclosure

cc: Active Party List (without/Enclosure)
NYS Public Service Commission (w/Enclosure)
NYS Department of Environmental Conservation (Albany Staff) (w/Enclosure)
NYS Department of Environmental Conservation (Regions 1 & 2) (w/Enclosure)
NYS Department of Transportation (Albany Office) (w/Enclosure)
NYS Department of Transportation (Regional Office) (w/Enclosure)
Town of Hempstead (w/Enclosure)

Town of North Hempstead (w/Enclosure)
Town of Oyster Bay (w/Enclosure)
Commissioner of OPRHP (w/Enclosure)
OPRHP Field Services Bureau (w/Enclosure)
Long Island State Park Regional Director (w/Enclosure)

ENVIRONMENTAL MANAGEMENT AND CONSTRUCTION PLAN
SECOND SEGMENT: UPLAND CABLE ROUTE

PSC CASE 02-T-0036

DRAFT: JUNE 24, 2005
REVISION 1: AUGUST 5, 2005

SUBMITTED BY:

NEPTUNE REGIONAL TRANSMISSION SYSTEM LLC
501 KINGS HIGHWAY EAST SUITE 300
FAIRFIELD CT 06825

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1. INTRODUCTION

Neptune Regional Transmission System, LLC (Neptune) submits this segment of the Environmental Management and Construction Plan (EM&CP, EM&CP II for this segment) for the civil work associated with the Neptune upland cable route from Jones Beach to the Duffy Avenue Converter Station along the Wantagh Parkway, Long Island, New York and land/marine transition pursuant to the Commission's Order Granting Amendment of Certificate of Environmental Compatibility and Public Need issued October 28, 2004. This document presents the standards and procedures that will be used by Neptune as the baseline standards in the construction and management of Neptune's transmission facilities. The standards and procedures set forth herein are designed to minimize or avoid, to the extent practical, adverse impacts to sensitive environmental areas.

1.1. Filing Sequence and Segments

In March 2005, the first EM&CP for the direct current/alternating current converter station located at 508 Duffy Avenue in North Hempstead was submitted. EM&CP II covers all civil work related to the upland cable route along the Wantagh Parkway and horizontal directional drilling (HDD) work including the landfall at Jones Beach, but does not include details concerning, the transportation of the cable drums from the storage area to the installation site, cable pulling, splicing and testing. Neptune expects to file the detailed cable transportation plan after it has been approved by all state and local transportation and public safety agencies in October 2005. The final EM&CP filing (for the marine cable route) will be filed in December 2005.

1.2. General Statement of Compliance with Certificate Conditions

In submitting this EM&CP II filing, Neptune is complying with all applicable conditions of the October 28 Order. We note that several of these conditions require general compliance with applicable laws and regulations and/or are prospective in nature, applicable to Neptune's actions post-construction. As certified by a Neptune officer on November 9, 2004 (forwarded to the Commission on November 22, 2004), Neptune has accepted the Amended Certificate and confirms its acceptance of and intent to comply with all its conditions.

We note also that several conditions are specifically applicable only to other segments of the EM&CP, and are not addressed in this filing. These conditions are identified on the "Reference Guides" (Tables 1-1 and 1-2) included below.

1.3. Organization of Document

In compiling this document, Neptune has followed a sequence that meets the applicable conditions of the October 28 Order. The four detailed sections (1.Public Health and Safety, 2.General Requirements, 3.Work Plan and 4.Compliance Plan) are divided into subsections which correspond to the Certificate Conditions.

The following tables are intended as reference guides that demonstrate how this EM&CP II filing corresponds to the applicable October 28 Order conditions, as well as to the "General Guidelines for Environmental Management and Construction Plan(s)" provided by DPS staff.

Table 1-1: Reference Guide to Environmental Management and Construction Plan II, Upland Cable Construction.

Certificate Condition No.	Description	EM&CP II Section Reference	Note
1- 4	General Compliance		Accepted by Neptune
5	State laws and regulations		Accepted by Neptune
6-15	Submarine Cable Installation		Not applicable to upland construction; will be provided in the third segment of EM&CP
16	Landfall location and HDD	5.6	
17	Compliance with EMF standards	3.1	
18	Apprisal of chemicals and waste storage during construction and operation. Notify Fire Department and EMT	3.2	
19	Fugitive dust and Spill control	5.1	
20	Contractor parking	3.5	
21	Weekly traffic consultation	3.6	
22	Compatibility with existing utilities	3.7	
23	Coordination of utility maintenance	4.5	
24	Protection of underground facilities	3.7	
25	As-Built drawings		Not applicable to upland construction; will be addressed in the first and third segment of the EM&CP.
27 & 28	Cable installation description; Notify DOT and OPRHP of non-intrusive work	4.1	
29	Construction window	4.3	
30 (a-f)	Wetlands construction	4.7	
31	Coordination with OPRHP and DOT for cable delivery	4.4	Cable transportation plan to be submitted for DPS review in September 2005
32 (a-m)	Upland Construction Work Plan	4.0 and 5.0	
33	Vegetation disturbance	5.6	
34	Construction activity time restrictions	4.3	
35	Delivery time restrictions	4.4	

Table 1-1 cont.: Reference Guide to Environmental Management and Construction Plan II, Upland Cable Construction

Certificate Condition No.	Description	EM&CP II Section Reference	Note
36	Coordination with other construction and maintenance activities	4.5	
37	Confine construction & maintenance activities to right-of- way	4.1	
38	Detailed soil handling and erosion control plan	5.2	
39	Plans for minimizing duration and extent of open pits & street work	4.1	
40	Notification of final restoration	5.9	
41	Facilities management plan		Not applicable to this EM&CP submittal
42 - 54	Converter station Design and Construction		Not applicable to this EM&CP submittal
55 (a); (c-m); (o-s)	Work plan and Compliance plan	4.0 and 5.0	
55 (b)	In water final corridor		Not applicable to this EM&CP submittal; to be provided in the third segment of EM&CP
55 (n)	Underwater spill control		Not applicable to this EM&CP submittal; to be provided in the third segment of EM&CP
55 (t)	SPDES permits		Not applicable to this EM&CP submittal; provided in the first segment of EM&CP
56	Changes in EM&CP		Accepted by Neptune
57-66	Notices and Public Complaints		Accepted by Neptune
67-70	Environmental Supervision		Accepted by Neptune
71-73	Cultural Resources		Accepted by Neptune
74-82	Transmission System Reliability		Accepted by Neptune

Table 1-2: Reference Guide to General Guidelines for Environmental Management and Construction Plan(s), Second Segment (EM&CP II) Upland Construction.

Guideline No.	Description	EM&CP II Section Reference	Note
A-1	Facility location		Not applicable to this EM&CP submittal; provided in first segment of EM&CP
A-2	Right-of-way clearing	4.0	
A-3	Building and structure removal		Not applicable
A-4	Waterbodies	4.7	
A-5	Wetlands	4.7	
A-6	Landscaping	5.6	
A-7	Noise sensitive sites	5.4	
A-8	Other environmentally sensitive areas		Generally not applicable other than visual impact
A-9	Recreational areas	5.5	
A-10	Agricultural areas		Not applicable
B-1	Erosion control	5.2	
B-2	Fuel and chemical handling	3.3	
B-3	Environmental supervision	5.10	
B-4	Clean-up and Restoration	3.4 and 5.6	
B-5	Herbicides		Not applicable
B-6	Agricultural impact mitigation		Not applicable
B-7	Access roads	3.5	
B-8	Right-of-way management plans	4.0 and 5.0	
B-9	Organization of document	1.3	

2. GENERAL DESCRIPTION

2.1 Project Overview

Neptune holds a Certificate of Environmental Compatibility and Public Need for the construction and operation of a high-voltage direct-current ("HVDC") transmission line that will extend from Sayreville, New Jersey to the town of North Hempstead, New York, and an associated direct current ("DC") to alternating current ("AC") converter station and high voltage AC cable connecting the converter station to an existing substation in the town of Hempstead, New York (collectively, the "Neptune Project" or "project"). The Neptune Project is nominally rated to carry 600 megawatts ("MW") of electricity at 500 kilovolts ("kV") with an actual rating of 660 MW. Its principal physical features include:

- An interconnection with the regional Pennsylvania-Jersey-Maryland ("PJM") grid and an adjacent converter station, located in Sayreville, New Jersey, that will convert AC electric power to DC power for transmission to New York;

- A submarine portion of the power transmission cable that will extend for a distance of approximately 51 miles (26 miles in New York waters) buried below the sea bottom from the Sayreville converter station on the Raritan River in New Jersey, to a landfall point off Jones Beach;

- An upland portion of the power transmission cable that will extend underground for a distance of approximately 12.3 miles in a northerly direction along the eastern shoulder of the Wantagh State Parkway;

- A second converter station, located at 508 Duffy Avenue in the town of North Hempstead, that will convert DC power back into AC power;

- An underground, 345-kV AC cable that will extend approximately 1.7 miles in a southerly direction, parallel to the HVDC cable, to the LIPA Newbridge Road substation, the interconnection point with the LIPA electricity transmission and distribution system.

In accordance with an agreement between Neptune and LIPA, the project is scheduled to become operational by June 30, 2007. Construction of the converter stations in New York and New Jersey is intended to commence in the late spring/early summer of 2005 and upland cable construction is expected to commence in September 2005.

2.2 Upland Construction Corridor

This second EM&CP filing addresses the civil work (trenching and Horizontal Directional Drilling (HDD) including landfall at Jones Beach) associated with the upland cable installation route along the Wantagh Parkway. Approval of this filing will enable Neptune to proceed with

all HDD and open trench work along the upland corridor, subject to notification and scheduling requirements included in the October 28 Order.

The upland cable route begins at Jones Beach State Park where the submarine cable makes landfall. The upland portion of the route will be located within the developed areas of Jones Beach State Park. The HVDC cable then extends approximately 12 miles along the eastside of the north bound Jones Beach Causeway and Wantagh Parkway and ends at the converter station at 508 Duffy Avenue.

The cable will be installed using open trenching, double open trenching (northern portion of route where HVAC and HVDC cables meet), jacking and HDD. The cable will be horizontally directionally drilled under Jones Beach, tidal wetlands, channels, bridges and on/off ramps of the Wantagh Parkway (Attachment A).

The HVAC cable will extend underground from the switchyard area, remaining within the converter station footprint until it exits on the western boundary, and proceeds back down the shoulder of the Wantagh toward Newbridge Road. The HVAC cable will be installed by open trench and HDD (Attachment A).

2.3. Permits and Authorizations

On October 28, 2004, the New York State Public Service Commission issued an Opinion and Order granting an amended Certificate of Environmental Compatibility and Public Need for the Neptune Project. The Commission had originally granted a Certificate for the project on January 23, 2004.

In addition to the Certificate, the project has received all other major permits and authorizations necessary for construction and operation. These include:

- **New Jersey Department of Environmental Protection** – Waterfront Development Permit, Water Quality Certificate, and Acceptable Use Determination (Application No: 1219-02-0005.2 WFD 040001). This was issued on December 14, 2004, and became effective on January 28, 2005, after a public notice period in which no appeals were filed.

- **U.S. Army Corps of Engineers** – Permit under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. This was issued by the New York District on February 7, 2005.

- **Borough of Sayreville, New Jersey, Planning Board** – Approval of Site Plan and application for subdivision authorizing the use of designated property for construction of a converter station. The Commission unanimously granted its approval on February 16, 2005.

3. PUBLIC HEALTH AND SAFETY

All construction activities associated with the upland cable installation route have been designed to protect the health and safety of the public and construction crew and to comply with the requirements of the Certificate and DOT Standard Specifications (§107-05 Safety and Health Requirements).

The sections below outline the procedures that are to be followed in order to maintain normal traffic patterns and to prevent any safety hazards and interference with existing land uses. There are special conditions where existing land uses will be interrupted for a period of time due to the restricted space and a risk to the health and safety of both the public and construction crews (i.e. construction near the bike path).

3.1. Compliance with EMF Standards

Operation of the Neptune electrical transmission line will comply with the EMF standards established by the New York State Public Service Commission in Opinion No. 78-13 (issued on June 19, 1978) and the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (issued September 11, 1990), respectively.

A summary of these standards is as follows:

(1) Transmission circuits shall be designed, constructed and operated such that that magnetic fields associated with the transmission circuit will not exceed 200-milligaus at the edges of their right-of-way (1 meter aboveground) when the transmission circuit phase currents are equal to the operational current ratings.

(2) Transmission circuits shall be designed, constructed and operated such that electric fields associated with the transmission circuit will not exceed 1.6 kilovolts per meter at the edges of their right-of-way (1 meter aboveground) when the circuit phase voltage are equal to their design rating.

(3) Where there is no well-defined edge of right-of-way, the "deemed" edge of right-of-way shall be 75 feet from the center-line for 345-kV transmission; 60 feet from the centerline for 230-kV transmission; and 50 feet from the centerline for lower voltages.

Electromagnetic fields associated with the design of the HVDC and HVAC cables meet the standards stated above (Tables 3-1 and 3-2). The prior calculations, which demonstrated this, will be confirmed when engineering has been finalized.

Table 3-1: HVDC cable - EMF summary table at 3.3' above soil level

Current (A)	milligauss (mG)
1221	13.24
1345	14.58
1528	16.56

Table 3-2: HVAC cable - EMF summary table at 3.3' above soil level

Current (A)	Pre-installed conduits (mG)	HDD (mG)
1116	121	3.4
1216	132	3.7
1368	148	4.1

3.2. Notifications of Stored Chemicals or Waste

The on site storage of chemicals and waste in above and/or below ground tanks is not anticipated. In the event of a hazardous substance release, the following spill release reporting procedure will be implemented:

- Notify the owner's health and safety officer.
- Contact local police department having jurisdiction in the spill area.
- Contact local fire department having jurisdiction in the spill area.
- Contact local emergency officials having jurisdiction in the spill area.

All vehicles and construction equipment will be inspected to make sure that fluids (oil, hydraulic, lubricants, or brake fluid) are not leaking and that all fuels and fluids are stored in proper, labeled containers. Any observation of spills, leaking fluids or improperly stored fluids may trigger the issuance of a "stop work" notice until the situation is resolved, including the removal of any soil impacted by vehicle fluids. All applicable regulations governing the storage, transport, use, and disposal of fluids and all reporting requirements for spills will be enforced.

A list of all chemicals used or stored at the staging area and their appropriate Material Safety Data Sheet (MSDS) will be kept on site and provided to the local fire department and emergency management team. All employees will be trained in the use, storage, handling, spill control, and first aid measures required for these chemicals in accordance with the Occupational Safety and Health Administration (OSHA) Construction Hazardous Communication Standard (HAZCOM) (29CFR1926.59) (DOT standard specifications §107-05). Details of handling hazardous materials are provided in Appendix A- Hazardous Material Management Procedure and Appendix B- Hazardous Substance, Petroleum and Waste Spill Response Procedure.

The on-site Environmental Health and Safety Manager(s) will be responsible for contacting NYSDEC or other agencies with regard to reportable spills or releases.

Details regarding appropriate spill response actions and required notifications are contained in the Hazardous Substance, Petroleum and Waste Spill Response Procedure (Appendix B). The on-site Environmental Health and Safety Manager(s) will ensure that any non-hazardous material encountered during any activity is properly handled. The on-site Environmental Health and Safety Manager(s) will also ensure that any hazardous materials encountered are handled in accordance with a management and handling plan tailored to such material.

3.3. Hazardous Material Handling and Waste Disposal

Hazardous wastes are those wasters that are specifically "listed wastes" per 6 NYCRR Part 371 and/or those that display hazardous wastes characteristics for ignitability, corrosivity, reactivity and/or toxicity. Petroleum products and chemical substances (generally termed "hazardous materials") will be managed in such a manner as to minimize the potential for threats to human health and the environment. Hazardous waste may be generated during the course of the project. The details regarding the management of hazardous waste on site are contained in the Hazardous Waste Management Procedure (Appendix A) and follow DOT Standard Specifications § 107-16.D.2 Hazardous Waste Requirements.

Hazardous waste resulting from the daily field operations is anticipated to be limited to construction & demolition (C & D) material waste. The owner's environmental health and safety officer will provide all contractors with an approved Hazardous Waste Handling, Storage and Disposal Procedure. Prospective waste hauling/disposal contractors will be required to provide documentation to the Environmental Health and Safety Manager showing that they have all necessary permits/licenses in place prior to being awarded the work.

The following waste handling and waste disposal procedure will be implemented:

- Uncontaminated C & D waste materials will be consolidated into roll off dumpsters and disposed of as C & D waste at a facility that is licensed to accept such material.
- Hazardous waste materials such as oily rags used for equipment maintenance will be stored in appropriate 5 gallon to 55 gallon drums.
- Waste shall be properly packaged, with a written description and labeled as hazardous.
- Waste shall be inspected at least weekly while stored on site.
- Hazardous waste materials will be transported via permitted transporters, hazardous waste manifest and permitted TSDR facilities.
- The owner's environmental health and safety officer will be notified of any new wastes that are generated.

3.4. Housekeeping Requirements

All waste generated from construction along the upland cable route will be managed in accordance with applicable federal, state and local laws and regulations. Waste management

activities shall be controlled to prevent odors and other nuisance conditions (Appendix C). The control methods for trash and construction debris generated at the work zone during cable and conduit construction and maintenance will be properly managed according to the DOT standard specifications § 104-06 Site Housekeeping and § 107-16 Non Hazardous Solid Waste.

- Any construction debris, including pipe skids, construction mats, scrap material, etc. shall be removed from the work zone prior to final grading.
- Trash and construction debris shall not be buried or otherwise disposed of at the work zone.
- Proper temporary storage facilities, such as sanitary trash dumpsters, shall be available at all times during active disturbance.
- Trash and construction debris shall be properly disposed of at an approved sanitary or construction debris landfill, respectively.
- The disturbed work zone shall be inspected on a regular basis during active construction.
- Temporary trash and construction debris storage locations shall be inspected on a regular basis.
- The work zone shall be maintained free of trash and construction debris. Trash and construction debris shall be properly stored prior to off-site disposal. Any undesirable situations that are identified during an inspection shall be corrected as soon as possible.
- Regular pickups of trash shall be scheduled.

3.5. Contractor Parking and Staging Areas

Field offices, parking, staging, and storage areas will be located in designated areas within Jones Beach State Park as approved by OPRHP. The following designated areas have been approved by OPRHP:

General Staging Area:

The northeast corner of Jones Beach State Park Parking Lot 3 will be used as a general laydown area during active and non-active construction periods for the duration of the project, beginning in mid-August 2005. This area will be used to provide general construction support, store construction materials, equipment, and supplies; to park vehicles; overnight equipment parking; and may be used to store conduit and cable. This staging area will not be used for storing gasoline or diesel fuel. All equipment will be fueled by a mobile fuel truck

The staging area will consist of an area approximately 200 ft x 400 ft secured using temporary self-supporting chain link fence. Construction crew parking will be available adjacent to the staging area during active construction periods. On a daily basis all employees will park their personal vehicles at this location and be transported to the construction site.

During non-construction periods, the staging area will be reduced to occupy an area approximately 100 ft x 300 ft and secured using temporary self-supporting chain link fence.

Field Offices and Equipment Storage:

The southeast corner of the parking area adjacent to the commercary, located near the Fishing Piers, will be used as a field office location during active and non-active construction periods for the duration of the project, beginning in mid-August 2005.

Field offices will consist of two 10 ft x 60 ft trailers, two 10 ft x 20 ft box containers, and one 2½ yd dumpster for office waste. Electric, phone and sanitary service arrangements will be made by the contractor.

If necessary, other construction staging areas may be applied for through DOT. No other areas within Jones Beach State Park or the Wantagh State Parkway right-of-way will be used for staging equipment or material without prior approval from OPRHP or DOT, respectively.

3.6. Consult with Agencies on Traffic Conditions

Consulting with agencies regarding construction activities will be accomplished through the implementation of regularly scheduled progress meetings. DOT, OPRHP and local transportation agencies will be consulted weekly about traffic conditions near the project site (PSC Certificate Condition 21). Additional meetings may be scheduled when requested to address special events, road closings, or other activities (PSC Certificate Condition 32m).

All agencies having jurisdiction within the construction zone will be notified of the progress meetings and additional meetings as needed. All activities within the construction zone will be coordinated with agencies having jurisdiction within the construction zone.

The weekly or bi-weekly construction progress meetings shall serve as a platform for discussions regarding the planned scope of work within the construction zone and to announce any other or special activities that are planned by other contractors that will impact the project.

All activities within the construction zone will follow a safe work zone maintenance and protection of traffic plan (See section 4.9. Maintenance and Protection of Traffic). This plan provides a safe work area for workers within the roadway, while facilitating the safe and orderly flow of motorists, bicyclists and pedestrians adjacent to the work zone.

3.7. Compatibility with Existing Facilities

The HVDC and HVAC cables are engineered and constructed to be fully compatible with the operation and maintenance of nearby utility cables. The cable installation route along the Wantagh Parkway has been investigated for known utility crossings. Utility information was

compiled from record drawings and field collection. The following utility companies were contacted:

- New York Telephone
- Verizon
- Keyspan (electric and gas)
- NY Water Service
- Westbury Water District
- Hicksville Water District
- Hempstead Water
- Nassau County DPW
- Teleport Telecommunications
- MCI
- AT&T
- Cablevision

The cable will be installed so as not to interfere with the operation and maintenance of adjacent utilities, DOT Standard Specifications §107-07 and PSC Certificate Conditions 22 and 24.

Upland cable installation and construction activities will comply with the requirements for the protection of underground facilities set forth in 16 New York Codes, Rules, and Regulations ("NYCRR") Part 753. The purpose of these rules is to establish procedures for the protection of underground facilities in order to assure public safety and to prevent damage to public and private property, as required by General Business Law Article 36 and Public Service Law Section 119-b (16 NYCRR Part 753-1.1).

As required in 16 NYCRR Part 753, before commencing or engaging in any non-emergency excavation, excavators working along the cable installation route shall provide notice of the location and date of the planned excavation to the one-call notification system serving the vicinity in which the excavation is to take place:

New York City One Call Center & Long Island
36-35 Bell Blvd.
Bayside, NY 11361
Markout requests: 1-800-272-4480
Administration: 1-718-631-6700
Fax: 718-631-6723

Such notice shall be issued a minimum of 2 days and a maximum of 10 working days, not including the date of the call, prior to work. Every notice provided by an excavator to the one-call notification system concerning planned excavation shall contain at least the following information:

(1) Name of the person serving such notice;

(2) Name, address and telephone number of the excavator or excavator's company;

(3) Excavator's field telephone number, if one is available;

(4) Name of the field contact person, if any;

(5) Address and exact location as well as the approximate extent and dimensions of the planned work area;

(6) Means of excavation to be used;

(7) Brief description of the planned excavation; and

(8) Date and time the excavation is planned to commence.

During the length of the project the one call requirements will be adhered to. The one call tickets will be updated every 10 days as required by law. Copies of all utility notification documents will be available in the field office and the site superintendent will maintain current documentation.

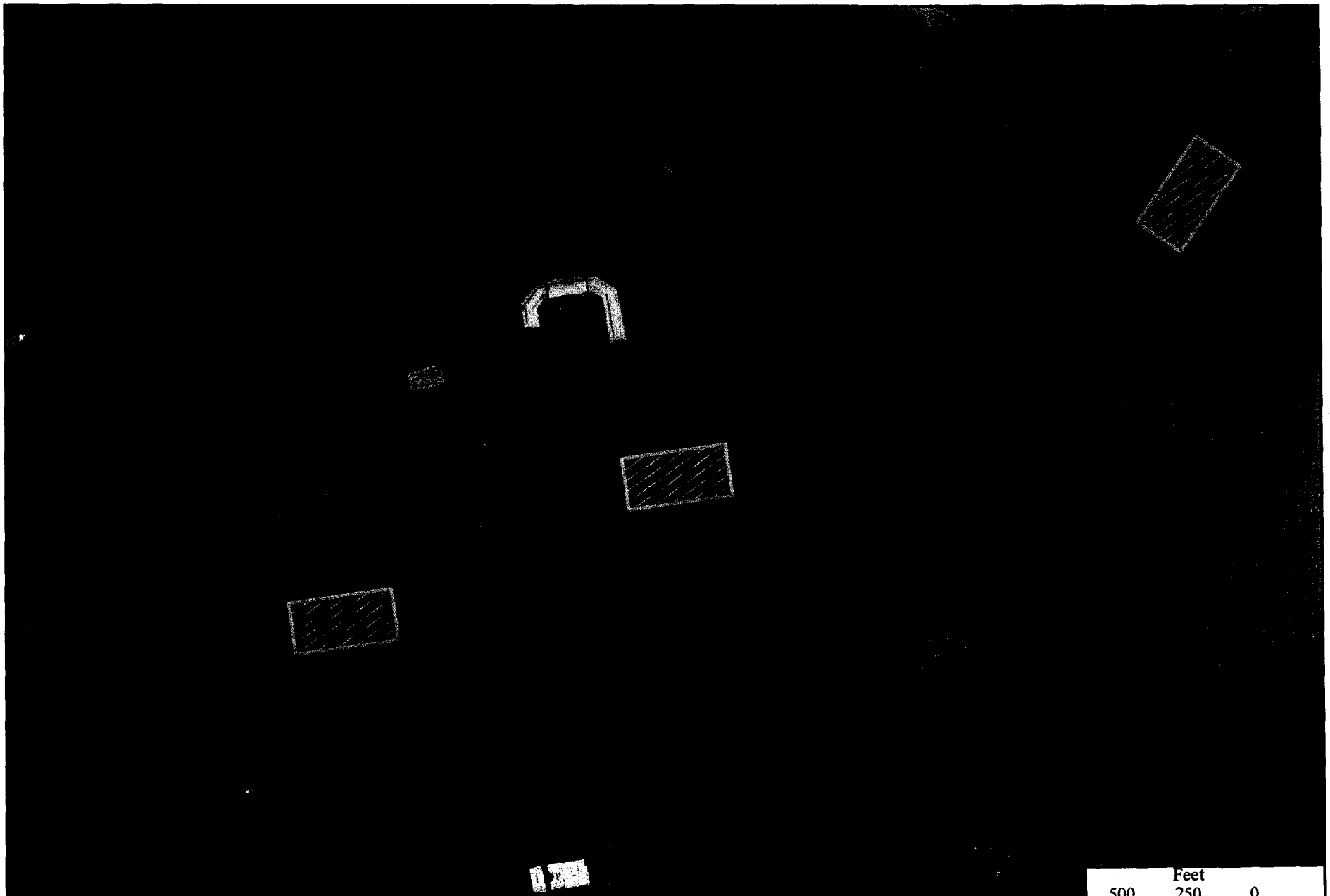
Known potential interferences have been confirmed by test pits. The location and elevations have been logged and will be referenced to avoid conflicts during conduit installation. Additional test pits may be excavated as necessary to re-confirm utility locations. The plan for crossing above or below existing utilities will follow the industry standard which is a minimum of 1 foot clearance from all utilities.

The plan for protection of these underground utilities during construction will be as follows:

- Prior to any excavation being advanced the contract will notify the one call operator to request a utility mark out of the entire route.
- The test hole data will be crossed referenced with the current one call mark outs.

Trench excavation will begin only when all known utilities are verified. In the event that there are utilities that were not previously identified, new test holes will be excavated to confirm the utility mark outs. Local utility companies will be consulted in the event a known utility cannot be field verified.

During the excavation activities, a field crew will hand excavate around each utility so that the protection of underground utilities along the cable installation route is maintained. In the event that the conduit must be installed below any existing utility(ies), the utility(ies) may be temporarily supported. Once the conduit is installed, care will be taken while backfilling around the utility to prevent damage. All identified utility crossings will be noted on the as built drawings.



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NEPTUNE UPLAND CABLE STAGING AREAS

Job No.	Date	Figure No.
1200-001	08/01/05	3-1

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4. UPLAND CABLE SYSTEM INSTALLATION, RESTORATION AND MAINTENANCE – CONSTRUCTION PLAN

Activities associated with the upland cable installation will occur within the Wantagh State Parkway right-of-way, Jones Beach Causeway right-of-way, Jones Beach State Park, and the Long Island Railroad (LIRR) and Long Island Power Authority (LIPA) properties adjoining the Newbridge Road Substation. Concurrent with this EM&CP filing, Neptune is applying for a highway use and construction permit from the New York State Department of Transportation (NYSDOT) for construction activities within the Wantagh State Parkway in compliance with 17 NYCRR Part 131.

Construction activities associated with cable installation will occur within the defined limits of disturbance (Attachment A) and in compliance with the conditions of the highway work permit. Certified for construction drawings will be submitted to the DOT and DPS for review and approval 10 days prior to any work commencing at that location. Conduit in which the cable will be pulled will be installed using open-cut trenching and a combination of jacking and Horizontal Directional Drill (HDD).

4.1. Conduit Installation Description

4.1.1. Conduit Delivery and Connection

Prior to open trenching, HDPE conduit will be delivered and staged along the cable route. Conduit delivery will occur in the Jones Beach Causeway and Wantagh State Parkway right-of-ways requiring short duration lane and shoulder closures (See Section 4.8 Maintenance and Protection of Traffic for short-duration shoulder and lane closure plans). HDPE conduit will be fused (connected) in advance of trenching operations.

Conduit will be delivered in standard lengths (approximately 40-feet) for the HVDC cable and reels for the fiber optic cable. Conduit will be unloaded, staged along the route and then fused together into a continuous segment; each continuous segment will be approximately 1,500 feet in length or shorter as necessary to accommodate conduit staging.

Conduit will be fused in place along the Jones Beach Causeway and Wantagh State Parkway right-of-ways. No lane or shoulder closures are anticipated because all conduit connection work is planned to occur outside of the traffic and shoulder area. If it becomes necessary to perform conduit connection work within the shoulder, an approved DOT maintenance and protection of traffic plan will be implemented for short-duration operations on the roadway shoulder (See Section 4.8 Maintenance and Protection of Traffic for short-duration shoulder closure plans).

Multiple crews may be used during conduit connection work in order to minimize potential closure duration, maintain crew and public safety, and to complete the project in a timely manner. The use of multiple crews may require multiple, single lane closures.

Fused conduit will be placed along the eastern edge of the Wantagh State Parkway right-of-way and in compliance with the conditions of the highway work permit. No conduit will be staged or placed within wetland areas. Fused conduit will be placed so as to maintain the safe movement of roadway and bikeway traffic and to not interfere with other construction activities. See Section 5.3 Plan to Minimize Disturbance to the Bike Path for a complete description of planned construction activities and timing in this area.

4.1.2. Open Trenching - Upland Conduit Installation

Daily trenching operations will consist of trench excavation, conduit installation, backfill and disposal of surplus material. Open trenching will typically be cut by a conventional tire mounted mechanical backhoe or a tracked excavator. Trench excavation will follow DOT Standard Specifications § 206 – Trench, Culvert and Structure Excavation as appropriate.

Trenches will be excavated to the lines and grades necessary for proper conduit clearance, bedding and stabilization. The minimum trench width must accommodate a clear working space of six inches around the maximum outer diameter of the conduit arrangement and be of sufficient width to permit proper joining of conduit and backfilling. Typical trench dimensions will differ for the HVDC and HVAC cable/ conduit arrangements. The HVDC cable/ conduit trench will be approximately 3 feet wide at the trench bottom by 4-6 feet deep. The HVAC cable/ conduit trench will be 3 feet wide at the trench bottom by 6 feet deep. See Attachment A for typical details of the HVDC and HVAC cable arrangements and trench dimensions.

Test pits will be excavated where necessary to re-confirm existing underground utilities or structures prior to trench excavation. Test pits will be excavated in a manner that prevents damage to wrappings, coatings or other protective coverings such as by hand digging, vacuum excavation, or similar non-destructive locating. Trenching near existing structures and utilities (i.e., crossings of existing services) will be done by non-destructive means (e.g., by hand, vacuum) as necessary. Trenching near existing structures (e.g., manholes, lampposts, signposts, etc.) will provide a minimum of 12 inches between the structure's surfaces and the sides of the trench excavation. Fences, markers, culverts, underground structures, utilities, and other appurtenances will be protected accordingly.

The top of the trench shall be confined to the Jones Beach Causeway and Wantagh State Parkway right-of-way and within the limits of disturbance (Attachment A). The top of the trench will not be located within wetland areas. There will be no disturbance to vegetated freshwater or tidal wetlands as a result of construction activity. Any tree root encountered in the trench will be cut back far enough so that the root will not interfere with the conduit. In addition, stumps, roots or other material will be removed from the trench.

Trench length will be kept to a safe working limit (approximately 1,500 feet a day). Lane closures will be required during trenching operations in close proximity to the roadway to accommodate trenching equipment and worker safety. Lane and shoulder closures will follow

approved DOT maintenance and protection of traffic plans in compliance with the conditions of the highway work permit (See Section 4.8 Maintenance and Protection of Traffic).

In order to minimize lane closure duration, maintain crew and public safety and to complete the project in a timely manner, multiple crews will be used during trenching and conduit installation. Multiple crews will likely be working in two different work areas; one crew working at the northern end of the route and the other working at the southern end of the route. Multiple crews and multiple single lane closures will be distributed along the route in accordance with the DOT highway use and construction permit. Weekly construction progress meetings shall serve as a platform for discussions regarding multiple crew locations and maintenance and protection of traffic plan requirements for planned work.

It is anticipated that multiple crews will work a minimum of one mile apart. If multiple crews are working less than one mile apart, a maintenance and protection of traffic plan will be implemented to include an entire lane closure for the multiple crews as per DOT specifications (See Section 4.8 Maintenance and Protection of Traffic) and in accordance with the DOT highway use and construction permit.

Daily trenching and conduit installation will not require long-term stockpiling of trench spoils. Material excavated from within the trench will be classified as common backfill. Common backfill will be free of vegetation and other deleterious material and shall contain no frozen ground. Approximately two thirds of the trench spoils will be directly loaded into trucks and disposed of off-site at a location permitted under license, permit or registration by NYSDEC to accept construction and demolition material. The remaining material will be temporarily side cast and used as common backfill on a daily basis. No surplus material or trench spoils will be side cast or disposed of in or adjacent to wetlands, streams or floodplains.

In areas where soil must be stockpiled for a longer period (e.g., upland trench and HDD transition areas), the stockpile will be covered and contained using a continuous line anchored/ staked silt fence and hay bales to prevent erosion and off-site discharge. See Section 5.2 Soil Erosion and Sediment Control for details on temporary silt fencing and other sediment control fixtures to be implemented near and adjacent to wetland areas and at temporary stockpiles. Soils will be stockpiled a minimum of fifty feet from wetland boundaries.

Trench excavations will be opened with the sides sloped to a stable slope as per DOT Standard Specifications § 206 – Trench, Culvert and Structure Excavation. Trench side slopes will be protected appropriately as required (e.g., trench shields or trench boxes) and maintained until backfilled adequately so as to provide workers with a safe working condition and protect the work, existing property, utilities, and roadway or bikeway.

Backfilling will take place prior to the end of each work day. Backfilling will be done in accordance with DOT Standard Specifications §203-3.15 Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Cable Burials as appropriate. Prior to backfilling, the conduit will be completely encased in concrete to maintain the correct thermal requirements and protect the conduit from damage. The concrete encasement will be approximately one foot thick

(300 mm). The conduit will be encased in concrete in lieu of a concrete cap, which can leave the conduit exposed to potential damage. See Attachment A for typical details of the concrete encasement, trench dimensions and backfill requirements.

The required backfill will be measured from the top of the conduit to the original ground or graded right-of-way profile, excluding trench crown. Underground marking tape shall be placed in the excavation above the conduit. The underground marking tape will be a 6-inch wide red tape imprinted with the following or similar text: CAUTION CAUTION CAUTION BURIED ELECTRIC CABLE. The trench will be backfilled with material excavated from the trench prior to the conduit installation. The backfill will be free of vegetation and other deleterious material and shall contain no frozen ground.

One end of the trench, approximately 4-feet in length, will remain open at the end of each work day to facilitate the next day's trenching operation. Open trench ends will be protected using roadway plates and temporary construction barricades (DOT Specifications §107-05F) to maintain the safe movement of roadway and bikeway traffic and to not interfere with other construction activities.

Once backfilled, trenched areas will be restored to their prior condition. Bicycle paths will be restored as per DOT Standard Specifications (See NYSDOT §608-Sidewalks, Driveways and Bicycle Paths) to their existing extent. Excavations which extend into pavement subgrade, subbase or shoulder courses will be replaced in kind. No excavation is planned within the Wantagh State Parkway roadway. See Section 5.7 Restoration of Areas Disturbed during Construction Activities for a description of restoration activities associated with trench excavation and conduit installation.

4.1.3. HDD Upland Conduit Installation

Horizontal Directional Drilling (HDD) for the installation of HDPE conduit and appurtenances will occur daily along the upland construction route. Two HDD operations will be undertaken simultaneously at two locations (i.e., crossings) along the cable route.

Each HDD crossing will typically require three individual work sites; a rig site near the entry point, a site at the exit pit and a fabrication site. The pipe (i.e., conduit) fabrications site will accommodate the individual sections of conduit and the subsequent fusion and testing sites.

The rig site will be cleared, if necessary, prior to mobilization of the HDD equipment. No grading to level or clear the HDD set-up areas is planned. Care will be taken to minimize the disturbance needed for clearing at each rig site. Any clearing required will be conducted in accordance with DOT Standard Specification §201 - Clearing and Grubbing.

HDD equipment will be delivered to the site via truck. Lane and shoulder closures required for HDD equipment delivery and set-up will follow approved DOT maintenance and protection of traffic plans (See Section 4.8 Maintenance and Protection of Traffic). The drilling rig will be

positioned relative to the entry point. The mud mixing/cleaning tank will be positioned in close proximity to facilitate safe and easy access, and plumbed to the rig, mud pump, and contingency frac tanks. Other peripheral equipment, such as a tool van and smaller pumps will be located in excess space within the limits of disturbance. The mud storage area will be designated from within the remaining limits of disturbance, in close proximity to the mixing unit.

A self contained, tracked DD-140B HDD drilling rig is planned for use during the drilling program in the work zone of the upland cable installation route. This rig has a push/pull capacity of 140,000 pounds, a rotary capacity of 25,000 foot-lbs, and is approximately 50 feet long and 9 feet wide. Similar size and capacity drilling rigs may be used depending on contractor preference and equipment availability.

Typically, a MCS-500 mud mixing and cleaning plant will be used to makeup and process the required bentonite-water drilling fluids. This unit is capable of pumping up to 612 gallons per minute (gpm) using onboard triplex positive displacement mud pumps. The MCS-500 uses centrifugal cleaning elements with eight 5-inch desilter cones, one 10-inch desander cone and primary and secondary screen shakers to separate solids from the mud. The unit is capable of holding 5,000 gallons of fluid.

Two or three portable 500 barrel frac tanks will be used to store fresh drilling water when necessary and to contain excess drilling fluids. These containers will be clearly marked to differentiate between the two types of fluids, as necessary.

A list of additional equipment and their use at the HDD site is as follows:

- Two excavators and one smaller backhoe to lift drill pipe, and manipulate product pipe;
- Several portable centrifugal pumps;
- Forklift to transfer dry fluid sacks to the mixing unit;
- HDPE conduits fabricated on site with a fusion machine; and a
- Mobile tool van.

Heavy equipment will be brought to the site on large trucks. The haul trucks will also be used to periodically transfer drill pipe between sites and bring product pipe to the conduit fusion location.

Typically, the HDD equipment setup area will require a space 200-300 feet long x 20-30 feet wide. In areas with limited space, shorter working lengths are possible; however, one or two prefabricated product pipe sections would need to be fused during the pullback operation. The HDD operation requires a minimum clearance of five feet from the road or restricted area. The necessary field adjustments will be made on site. All normal operations will be confined to the limits of disturbance with the exception of periodic truck movements. See Attachment A for drawings depicting the typical HDD equipment setup area for the planned HDD locations. See Section 4.8 Maintenance and Protection of Traffic for shoulder closure plans to be implemented during HDD operations.

In areas where the HDD equipment setup area is in close proximity to wetland areas, the equipment area and near or adjacent wetland area will be contained using a continuous line anchored/ staked silt fence and hay bales (Attachment A). See Section 5.2 Soil Erosion and Sediment Control for details on temporary silt fencing and other sediment control fixtures to be implemented near and adjacent to wetland areas.

Typically, a pilot hole will be drilled with a 9-7/8 inch drill "jet" bit, beginning at the designed angles, and will continue under each crossing along a design profile made up of straight tangents and arcs. The drill path will be monitored by an electronic steering tool. Also the TruTacker (system accuracy rated to ± 2% of the vertical depth up to 200 feet) will also be used as much as possible to provide independent verification of the drill location. Once the pilot hole is complete, the hole is enlarged to a suitable diameter for insertion of the product pipe.

Typically, the reaming plan is to "forward" ream as much as possible in order to concentrate the bulk of the returning drill fluids at the rig entry location. Forward reaming consists of attaching the reamer to the drill string at the rig and pushing it into the pilot hole. Since pushing on the drill string can impart potentially excessive and eccentric columnar loading, a trackhoe will be used to provide axial tension by simultaneously pulling on the string from the opposite side of the crossing. Joints of the drill pipe will be continuously added behind the reamer to ensure that the entire borehole is always completely occupied from end to end. Prior to pullback there will be a "swab" pass to make sure the drill path is clear of obstructions. Once the drilled hole is widened to the specified side, cleaned and filled with new mud the conduit will be pulled through.

HDD operations may occur during off-hours (6:00 PM – 7:00 AM) when work efforts require continuous operation once started (PSC Certificate Condition 34). Care will be taken to minimize off-hour operations by scheduling HDD start-up activities accordingly. Construction noise and lighting during off-hours will be minimized to the extent practical while maintaining crew safety. See Section 5.5 Plan to Minimize Construction Noise and Lighting Impacts. DOT, DPS and OPRHP will be notified when construction activities may be required during off-hours during regularly scheduled project construction meetings. Off-hour construction activities will also be publicly noticed to nearby residents.

4.2. Construction Sequencing and Installation Schedule

Construction sequencing and the anticipated conduit delivery, trenching, HDD and installation schedule is summarized in Table 4-1. The week-to-week actual conduit delivery and installation schedule will be coordinated with other construction activities occurring along the Jones Beach Causeway and Wantagh State Parkway right-of-ways, and within Jones Beach State Park and LIRR and LIPA properties adjoining the Newbridge Road substation with DOT, OPRHP, DPS and other involved agencies on a weekly basis at regularly scheduled project construction meetings. See Section 4.5 Coordination with Other Construction and Maintenance Activities and Highway Projects.

Planned construction sequencing is intended to maintain the safe movement of roadway and bikeway traffic along the right-of-way and to minimize the disturbance and impact due to lane, shoulder and bikeway closures. Construction activities are planned to avoid to the extent practical trenching and HDD activities along the southern portion of the cable route, south of Merrick Road to Jones Beach State Park, until the winter months (December through February) in order to limit the temporary closure of the bike path in this area to the period of least use. See Section 5.3 Plan to Minimize Disturbance to the Bike Path for a complete description of planned construction activities and timing in this area.

4.3. Construction Window and Construction Activity Time Restrictions

Construction activities associated with the upland cable installation will be conducted starting the weekday following Labor Day and ending just prior to Memorial Day (PSC Certificate Condition 29). The planned work hours for trenching operations are as follows:

- South of Southern State Parkway to Ocean Parkway Monday - Friday 7:00 AM-6:00 PM.
- North of Southern State Parkway to Old Country Road Monday - Friday 8:30 AM-6:00 PM

The work hours for the horizontal directional drilling operation will be Monday – Saturday 7:00 AM-7:00 PM. HDD work hours are different than those planned for trenching operations because, except for equipment setup, there will be no lane closures associated with HDD operations.

The hours and days planned for trenching and directional drilling are based on normal day to day operations. In the event of unforeseen situations during either type of work additional hours may be required on a case by case basis. DOT, OPRHP, DPS and other involved agencies will be notified when/if these situations arise. Construction activities will not occur outside of planned work hours without prior notification.

4.4. Coordination of Material Delivery and Time Restrictions

Material deliveries during trenching and directional drilling activities will occur in accordance with the conditions of the highway work permit to maintain the safe movement of roadway and bikeway traffic, and to not interfere with other construction activities. The control methods for the safe and expeditious delivery of material to the work zone in a properly managed manner are as follows:

- Consult with DOT to obtain a permit for all aspects of material delivery;
- Conduct weekly or bi-weekly construction progress meetings to discuss planned delivery of material to the work zone;
- Consult with DOT, OPRHP and local transportation agencies weekly about traffic conditions near the project site (PSC Certificate Condition 21); and

- Return small transportable miscellaneous materials, hand tools and debris to the staging area at the end of each work day.

Deliveries related to cable installation and associated construction activities will take place between 7:00 A.M. and 6:00 P.M. with the possible exception of oversized deliveries (PSC Certificate Condition 35). Off-hour deliveries to facilitate compliance with DOT restriction, highway work permit conditions, and accommodate construction activities which require a continuous work effort once started will be coordinated with DOT, OPRHP, DPS and other involved agencies.

4.5. Coordination with Other Construction and Maintenance Activities and Highway Projects

Consulting with agencies regarding construction activities will be accomplished through the implementation of regularly scheduled progress meetings. DOT, OPRHP and local transportation agencies will be consulted weekly about traffic conditions near the project site (PSC Certificate Condition 21). Additional meetings may be scheduled when requested to address special events, road closings, or other activities (PSC Certificate Condition 32m).

All agencies having jurisdiction within the construction zone will be notified of the progress meetings and additional meetings as needed. All activities within the construction zone will be coordinated with agencies having jurisdiction within the construction zone.

The weekly or bi-weekly construction progress meetings shall serve as a platform for discussions regarding the planned scope of work within the construction zone and to announce any other or special activities that are planned by other contractors that will impact the project.

Other on-going or scheduled major construction activities along the Wantagh Parkway expected to occur during 2005-2006 include the replacement of the Sloop Creek and Goose Creek bridges. Both projects are currently on-going, with temporary bridges in-place east of the planned permanent bridge alignment.

At least five business days before construction activities begin within the Jones Beach Causeway or Wantagh State Parkway right-of-way limits, DOT, OPRHP, DPS and other jurisdictional agencies will be notified of the approximate date work will begin (PSC Certificate Conditions 62 and 63).

DPS, DEC, OPRHP and DOT will be provided with weekly status reports summarizing the previous week's construction and indicating construction activities and locations scheduled for the next two weeks (PSC Certificate Condition 64). DPS will also be provided a monthly report on the progress of construction and an update of the construction schedule once construction activities begin (PSC Certificate Condition 65).

4.6. Cultural Resource Plan

It is not anticipated that construction activities associated with the upland cable route will affect any known cultural resources. However, if during the course of construction activities, resources of apparent archeological significance are unexpectedly discovered (e.g. artifacts or human remains), all work that could affect the resource will be stopped and Neptune will notify the proper authority. Work will resume only after a proper disposition of the encountered resource has been agreed upon.

4.7. Construction Activities near Regulated Wetlands

Regulated wetland areas along the upland cable route and in the vicinity of equipment and/or material staging areas will be marked (i.e., flagged) prior to the start of construction activities in the area. Wetland boundaries where adjacent to planned construction activity are shown on Attachment A, as delineated by the New York State department of environmental conservation (NYSDEC) November 2004. No construction activity will occur within regulated wetland areas (PSC Certificate Condition 30). Soil erosion and sediment control measures will be implemented to reduce the likelihood of construction activities affecting regulated wetland buffers and adjacent areas.

4.7.1 Storage of Equipment and Material Away from Wetlands

Equipment will not be stored in the immediate vicinity of wetland areas. Construction material staging areas will be located a minimum of 50 linear feet from wetland boundaries (PSC Certificate Condition 30d). All mobile equipment, hand tools and debris will be returned to the staging area at the end of each work day. Construction equipment will not be washed near any body of water or wetland, nor will runoff resulting from washing operations be permitted to directly enter any water body or wetland. All vehicles and equipment will be monitored daily for leaks and will be equipped with spill kits containing absorbent materials approved for petroleum products.

HDD equipment that must stay at each drill location until the drill is complete will not be moved at the end of each work day. In areas where the HDD equipment setup area is in close proximity to wetland areas or within wetland buffer/ adjacent areas, the equipment area and near or adjacent wetland area will be contained using a continuous line anchored/ staked silt fence and hay bales (Attachment A). See Section 5.2 Soil Erosion and Sediment Control for details on temporary silt fencing and other sediment control fixtures to be implemented near and adjacent to wetland areas.

HDD equipment that will be temporarily stored at the site will be equipped with spill kits containing absorbent materials approved for petroleum products. All equipment will be monitored daily for leaks prior to beginning work in an environmental sensitive area. Leaks will be repaired or the equipment will be removed from service, if necessary.

4.7.2 Prevention of Material to be Discharged into Wetlands

Sediment control techniques that will be used at HDD wetland crossings will comply with DOT standard specifications §209- Temporary Erosion and Sediment Control (Appendix D). The specific methods that are acceptable for a wetland crossing may vary at each crossing depending on wetland type and characteristics (e.g. soil, hydrology and vegetation), and the length of the crossing.

Trenching procedures have been established to install the cable conduit safely and efficiently while minimizing the extent and duration of sedimentation from construction activities. However, it may be necessary to remove water from the trench during conduit installation. When trench dewatering is necessary in environmentally sensitive areas (i.e. wetlands); water will be discharged in a manner that minimizes sedimentation, off-site erosion and bottom scouring of adjacent areas. The following general erosion and sediment control methods will be used during construction near wetland areas:

- Confine work to the right-of-way and temporary work zone;
- Minimize disturbance of slopes by controlling downslope runoff;
- Implement sediment control structures utilizing hay bales, silt fences or a combination thereof or other appropriate measures;
- Confine trench dewatering to the extent practical using sediment filtering devices (e.g., straw/hay bale containment structure) and direct dewatering to well-vegetated upland areas;
- Monitor and maintain sediment filtering devices and amend sediment controls as necessary during dewatering operations;
- Dispose of accumulated sediment from erosion control devices to an approved upland area; and
- Remove any sediment, debris or excess construction material from the work zone and adjacent areas.

4.7.3 Construction Activities within Wetland Adjacent Areas

Construction activities within the adjacent area of wetlands will not involve the removal of trees. Some pruning of trees within the adjacent area may be required to accommodate overhead clearance requirements of HDD equipment.

Vegetation removal within the adjacent areas will be limited to those areas currently maintained or mowed as parkway right-of-way. Vegetation removal will be limited to those areas needed for HDD entry and exit pits, and limited trenching between the Wantagh Museum and Island Road HDD exit pits (Attachment A, STA 337+00 to 339+00).

4.8. Maintenance and Protection of Traffic

Traffic shall be maintained over a reasonably smooth traveled way which will be marked by signs, guiding devices (i.e. signs and traffic cones), and other methods that will allow for safe

travel and minimizes inconveniences to the public. All work will conform to DOT specifications as required in DOT Standard Specifications §619, Maintenance and Protection of Traffic.

During construction there will be temporary right lane and shoulder closings on the north bound side of the Wantagh Parkway. Maintenance and protection of traffic (MPT) details are specified in Attachment A. Right shoulder closures are specified as necessary for HDD operations. Right travel lane closures are specified as necessary for material and equipment delivery (e.g., HDD equipment delivery) and trenching.

4.9. Dredging Plan

The marine portion of the Neptune HVDC transmission cable will make landfall at Jones Beach State Park. To avoid adverse environmental impacts in sensitive shoreline areas, horizontal direct drilling (HDD) will be used to install the cable. An HDD pit will be installed at the landfall site to provide access to the HDD pipe for entry and pull through of the cable at landfall. The HDD entrance pit at the landfall location will be within the existing golf course area of Jones Beach State Park. All equipment associated with HDD will be onshore except for the dredging barge and scow.

Offshore work associated with the cable installation will also include installation of an 85 foot long by 10 foot wide and 10 foot high HDD exit pit in the Atlantic Ocean off of Jones Beach, buried 6 feet below the seabed. The HDD exit pit will be outside the nearshore area approved by OPRHP and DEC (See Appendix E for letters of approval and exit pit location coordinates). Additional details of the exit pit location and transition to the marine portion of the cable route will be provided in the final EM&CP filing.

To facilitate the construction of the HDD exit pit, approximately 315 cubic yards of sediment will be dredged. Barge overflow during dredging is not authorized by the Department of the Army Permit # 2002-00134-2. However, the decanting of excess water after settling is authorized. Dredging activities will take place between September 30 and December 31.

The dredged material will be tested to assess its physical and chemical properties in accordance with NYSDEC guidance (In-Water and Riparian Management of Sediment and Dredged Material, Technical & Operational Guidance Series 5.1.9, November 2004). Sediment testing results will evaluate the material's suitability for disposal at various upland locations. An exception to the testing requirement is made for dredged sediment that is greater than 90% sand. In accordance with the protocols established in the guidance, these sediments are considered to be clean fill and will only be analyzed for TOC, % moisture and grain size. Material dredged from the Atlantic Ocean HDD exit pit may meet this standard based on previous sediment sampling.

Dredged material will be transported to processing sites using dredge scows towed by tug boats. Subsequent to treatment by dredged material processors, the material will be taken by truck to the selected disposal site. Potential treatment sites for amended dredged material are Clean Earth

Dredging Technologies, Inc. in Jersey City, NJ and Don Jon Marine in Port Newark, NJ. Material that qualifies for testing exclusion (i.e. greater than 90% sand) may be provided to Amboy Aggregates or a similar facility for beneficial use as aggregate.

The United States Coast Guard Waterways Oversight Branch will be notified and provided the following information:

- The start and completion dates for dredging
- The hours of the day the work will be performed
- The name and description of work vessels
- VHF radio channels the vessels will be monitoring
- Company point of contact
- Names, date of birth and social security numbers of all personnel involved in dredging

The information will be faxed to USCG at (718) 354-4190.

Local waterway users and commercial fishermen will also be notified of the project, using the "Local Notice to Mariners". Information to be provided in the local notice to mariners will be obtained from http://222.navcen.uscg.mil. The information will be faxed to (617) 223-8073.

The National Oceanic and Atmospheric Administration (NOAA) will be advised of the project completion date and specifications so that NOAA may initiate the appropriate chart corrects. This information will be faxed to (301) 713-4516.,

Neptune will notify USACE in writing that the above notifications have been made within five days of making such notice. Verification will be delivered to the USACE at the address below:

New York District U.S. Army Corps of Engineers
Chief, Harbor Supervision and Compliance Section
26 Federal Plaza, Room 1937
New York, NY 10278

Table 4-1. Neptune upland cable construction sequencing and the anticipated conduit delivery, trenching, HDD and installation schedule

Task Name	Start	End
HDD work with Spread 1	**September 2005**	**December2005**
Mobilization	September 2005	September 2005
Parking Lot # 2	January 2006	January 2006
Sloop Channel	December 2005	December 2005
Goose Creek	December 2005	January 2006
Seaman's Creek	January 2006	February 2006
Merrick Rd.	September 2005	September 2005
Park Ave./ Sunrise Highway	October 2005	October 2005
Culvert L-15; L-14; L-13; L-12	October 2005	November 2005
Jerusalem Ave	November 2005	December 2005
HDD work with Spread 2	**September 2005**	**May 2006**
Mobilization	September 2005	September 2005
Southern State Parkway (south)	September 2005	September 2005
Southern State Parkway (north)	September 2005	September 2005
North Jerusalem Road	September 2005	October 2005
Hempstead Turnpike	October 2005	October 2005
Newbridge Road	October 2005	October 2005
Salisbury Park Drive	October 2005	October 2005
Salisbury Park Dr. (AC cable)	October 2005	November 2005
Stewart Ave	November 2005	November 2005
Old Country Road	November 2005	November 2005
Old Country Road (AC cable)	November 2005	November 2005
Combine Jones Beach Landfall	May 2006	May 2006
Trenching	**September 2005**	**January 2006**
Trenching and Conduit Delivery, Fusing and Installation	September 2005	January 2006
Restoration Phase 1	Spring 2006	Spring 2006

5. UPLAND CABLE SYSTEM INSTALLATION ENVIRONMENTAL MANAGEMENT CONTROLS COMPLIANCE PLAN AND RESTORATION

Upland cable system installation will comply with federal, state, and local regulatory and permit requirements. Upland cable installation activities have been designed to minimize disturbance and impact to natural resources (e.g., wetlands), sensitive land-uses (e.g., residences, parkland) and to maintain the safe movement of roadway and bikeway traffic within the Wantagh State Parkway and Jones Beach Causeway right-of-ways. Disturbed areas will be restored to their pre-cable installation or similar conditions according to permit requirements.

Compliance with federal, state, and local regulatory and permit requirements will be monitored through Independent Environmental Inspector(s) (referred to hereafter as the Independent Environmental Inspector[s] or Independent Inspector[s]). Implementation of environmental management controls will also be noted by the on-site Environmental Health and Safety Manager(s) provided by Neptune and/or the contractors/subcontractors. Both the Independent Inspector(s) and the Environmental Health and Safety Manager(s) will be on site at the start-up of each field operation and during environmentally sensitive phases of construction.

Specific environmental management controls and restoration activities are described below.

5.1. Fugitive Dust Control

Construction activities will be conducted in order to minimize impacts to air quality and to prevent hazardous or objectionable air quality conditions within the project limits and in areas adjacent to or affected by the work (DOT standard specifications §107-15, Air Quality Protection). Fugitive dust and airborne debris will be monitored on a daily basis and will be controlled and minimized using the following measures as necessary:

- Use of on-site water trucks and track-out controls during trenching;
- Use of sweeping or vacuum trucks if necessary on off-site public streets; and
- By restricting dust generating activities during periods of high wind.

Hauling and track-out controls will be used to limit dirt and mud from spreading to public streets by trucks entering and leaving the trenching and HDD set-up areas and will include:

- Asphalt paving and/or gravel at access points as necessary;
- Sweeping or spray-cleaning trucks prior to leaving the site; and
- Covering the truck with a tarp and maintaining the required freeboard clearances to keep excessive dust from escaping the truck during hauling operations.

Disturbed areas that can generate dust will be restored with topsoil and seeded as soon as practical behind the trenching operations. During active trenching and earth-moving operations, the following shall apply:

- Apply water by means of trucks, hoses, and/or sprinklers prior to any earth-moving activity as necessary;
- Surround soil stockpiles with silt fencing; wet, cover, and temporarily seed as necessary;
- Wash, vacuum, or sweep trucks before leaving the site to limit track-out of bulk material onto public paved roadways;
- Cover trucks with a tightly secured cover and provide required freeboard clearances to keep excessive dust from escaping the truck during hauling operations;
- Sweep and keep clean public roadways/sidewalks as practical and necessary to remove visible dust tracked-out upon public roadways as a result of active operations; and
- Minimize soil stockpiling by directly loading the excess excavated materials into trucks.

If necessary, possible dust emission from areas outside the main construction area (e.g., laydown areas, storage areas, and accommodation areas) will be controlled by laying geotextile membrane and a crushed stone layer.

5.2. Soil Erosion and Sediment Control

Soil erosion and sediment control devices will be installed as necessary prior to initial cable/ conduit installation and HDD operations. Erosion control devices will be located down-slope of areas that will be cleared, trenched, graded, filled, and/ or excavated and where runoff is likely to occur from surface or subsurface drainage. Erosion control devices will be regularly inspected and maintained according to DOT Standard Specifications; maintenance and inspection will continue until after permanent stabilization measures are in place or the disturbed areas are restored (See Sections 5.7 and 5.8 Restoration and Maintenance Plan). Soil erosion and sediment control devices will include linear silt fences, straw bale/ hay bale dikes and drainage structure pipe/ inlet protection measures as appropriate. See Attachment A for typical plans and sections for soil erosion and sediment control devices.

Silt fences will be installed immediately prior to initial disturbance of the soil (See DOT Standard Specifications §209-3.11). Silt fences and/ or hay bale dikes will be used to reduce runoff velocity and effect deposition of transported sediment load. Silt fences will consist of a heavy duty filter cloth, such as geotextile fabric U.S. Sieve size no. 20, and will be installed perpendicular to the expected overland flow direction. The base of the fabric will be imbedded 6 inches below the surface. When two sections are joined, the filter fabric will be overlapped 4 to 6 inches.

Silt fences will be located across the full construction work zone at all water body and wetland crossings, along the edge of the construction work zone if near a water body or wetland area, and at the base of slopes adjacent to road crossings where vegetation has been disturbed. Silt fences shall not be placed in areas of concentrated flow such as ditches, swales and channels and the formation of concentrated flow from the drainage slope above a silt fence is not permitted. If this occurs, direct slope stabilization measures will be implemented.

All disturbed and restored areas shall be inspected on a regular basis. Accumulated sediment will be removed to keep the silt fence functional (See DOT Standard Specifications §209-3.11B).

All undercutting or erosion of the toe anchor will be repaired immediately with compacted backfill material. Silt fence material shall be disposed of properly.

Daily trenching and conduit installation activities will generally not require overnight stockpiling of excavated trench spoils (See Section 4.1.2. Open Trenching- Upland Cable Installation). In areas where soil must be stockpiled for a longer period (e.g., upland trench and HDD transition areas), the stockpile will be covered and contained using a continuous line anchored/ staked silt fence and hay bales to prevent erosion and off-site discharge (See DOT Standard Specifications § 209, Temporary Soil Erosion and Sediment Control). Soils will be stockpiled a minimum of fifty feet from wetland boundaries.

The following items are the control methods that will be followed for the proper handling of soil and temporary stockpiles in order to control sediment erosion in the work zone:

- All temporary spoil storage areas will be located in the construction work zone, disturbed area or other DOT approved areas.
- Sediment erosion controls will be used to prevent stockpiled material from migrating out of the disturbed area into nearby waterways.
- The location of the temporary spoil storage area will be marked with survey stakes and sediment barriers will be installed and maintained around spoil storage areas.

5.3. Plan to Minimize Disturbance to the Bike Path

Upland cable installation activities have been designed to minimize disturbance and impact to the safe movement of pedestrian and bikeway traffic along the bike path located within the Wantagh State Parkway and Jones Beach Causeway right-of-ways. The existing bike path travels along the northbound margin of the Wantagh State Parkway and Jones Beach Causeway right-of-ways to Jones Beach State Park. Bike path access is provided south of Merrick Road at designated parking areas at Cedar Creek County Park (approximately 2,000 ft south of the Merrick Road and Wantagh State Parkway interchange) and Jones Beach State Park. South of Merrick Road, no other entry or exit points are provided between Cedar Creek County Park and Jones Beach State Park. The bike path is approximately 10-ft wide, accommodating both northbound and southbound pedestrian and cycling traffic.

While much of the bike path north of Merrick Road will remain undisturbed during conduit installation, the cable route does occupy some portion of the bike path and crosses the bike path in several locations south of Merrick Road. The majority of these locations are situated along the southern portion of the cable route, beginning approximately 2600 ft north of Seaman's Island Creek (Attachment A), where the cleared area of the existing right-of-way is relatively narrow. Portions of the bike path are also disturbed as the cable route parallels the Jones Beach Causeway, and near those areas required for HDD operations at Seaman's Island Creek, Goose Creek and Sloop Channel crossings (Attachment A).

While much of the bike path north of Merrick Road will remain undisturbed and partially open for the majority of scheduled construction activities (temporary closures or detours will be

necessary near HDD set-ups), conduit installation activities occurring within and adjacent to the bike path south of Merrick Road will require the entire bike path in this portion of the cable route to be temporarily closed in order to maintain safe conditions for bikeway traffic and construction crews.

Several alternatives were considered to maintain safe movement of pedestrian and bikeway traffic south of Merrick Road during conduit installation, as well as maintain a safe work zone for construction crews and activities. The alternatives included: temporarily relocating the bike path within the existing right-of-way (northbound or southbound margin of the roadway); a series of partial or progressive temporary closures (e.g., north to south openings and closures as trenching progresses); temporarily closing the complete bike path within the project area (i.e., from Cedar Creek County Park to Jones Beach) during both active trenching and HDD operations; and temporarily closing the complete bike path within the project area during trenching operations but relocating the bike path around HDD set-up areas.

Due to the linear nature of the bike path and limited entry and exit points (access is limited to the northern or southern terminus south of Merrick Road) partial or progressive closure of the bike path would require the creation of temporary turnarounds and/or new bike path access points between Cedar Creek County Park and Jones Beach. Partial closures would force pedestrians and bicyclists to turnaround within the existing roadway right-of-way or require that new access points be established along the eastern margin of the existing right-of-way. The eastern margin of the right-of-way is heavily wooded and borders the Cedar Creek Water Pollution Control Plant and open undeveloped parkland until crossing Seaman's Island Creek, affording little or no opportunity to establish temporary entry and exit points to the bike path. South of Seaman's Island Creek the right-of-way is bordered by the barrier islands and waterways of South Oyster Bay. Due to potential safety concerns with establishing new bikeway traffic patterns/ turnarounds within the existing roadway right-of-way and the lack of suitable alternative north/ south access points, partial closure of the bike path would not maintain safe movement of pedestrian and bikeway traffic.

Temporarily relocating the entire bike path within the existing southbound right-of-way would require new impacts associated with construction of the temporary bike path (e.g., clearing, grading, tree pruning and/or removal, land and shoulder closures), essentially doubling the potential impacts and disturbance associated with this portion of the project. Relocating the bike path would also require a new suitable temporary northern and southern terminus be established within Wantagh Park and at Jones Beach. Relocating the bike path along the southbound right-of-way would also require the temporary bike path to cross through existing work zones established for bridge replacement activities at Sloop Channel and Goose Creek.

Relocating the bike path within the existing northbound right-of-way would require additional clearing, grubbing and grading activities due to the relatively narrow width of cleared area along this portion of the right-of-way, and the safe clearance required between the work zone needed for conduit installation (See Section 4.1 Conduit Installation Description) and the temporary bike path. Potential impacts associated with temporarily relocating the bike path in the northbound or southbound right-of-way for the planned period of open-trenching (approximately three to four

weeks for this portion of the cable route) would outweigh potential benefits associated with maintaining pedestrian and bikeway traffic adjacent to the construction work zone, particularly if open-trenching and other construction activities are scheduled during periods of minimal bike path use (e.g., January through March).

Temporarily closing the complete bike path south of Merrick Road during conduit installation activities within the project area (i.e., from Cedar Creek County Park to Jones Beach) would prohibit the use of the bike path during this period (approximately three to four weeks); however, closing the bike path during periods of minimal use (i.e., January, February) would minimize this impact to pedestrian and bikeway traffic while avoiding pedestrian and bicyclist safety concerns and providing a safe work zone for construction activities.

In order to minimize impacts associated with bike path relocation and the period of bike path disturbance, the entire bike path south of Merrick Road to Jones Beach State Park will be temporarily closed during open-trenching activities associated with conduit installation. Conduit installation for this portion of the cable route is scheduled to occur during January and February 2006, in order to minimize the period when the bike path will be unavailable to pedestrians and bicyclists. HDD operations at Seaman's Island Creek, Goose Creek and Sloop Channel crossings are also scheduled to occur during this same period, requiring approximately six to eight weeks.

Bike path closure, construction/ restoration activities and re-opening will be coordinated with DOT, OPRHP, DPS and other involved agencies through the regularly scheduled construction progress meetings (See Section 4.5 Coordination with Other Construction Activities and Highway Projects). A public outreach campaign will be conducted to notify local residents and the public of the scheduled bike path closure, construction/ restoration progress and re-opening through news agencies, public notices and as coordinated with DOT, OPRHP, DPS and local agencies. See Attachment A for details on work zone signage, barricades and postings for bike path closure.

The bike path will be restored to existing conditions following conduit installation. Excavations which extend into bikeway pavement subgrade, subbase or shoulder courses will be replaced in kind. See Section 5.7 Restoration of Areas Disturbed during Construction Activities for a description of restoration activities associated with trench excavation and conduit installation.

Where permanent restoration of the bike path is not possible (e.g., winter weather conditions which do not allow for permanent pavement restoration), the bike path will be temporarily restored as to maintain a reasonably smooth traveled way marked by signs, guiding devices, and other methods that will allow for safe travel of bicycle and pedestrian traffic and minimizes inconveniences to the public. See Attachment A for bike path temporary restoration requirements.

5.4. Plan to Minimize Construction Noise and Lighting Impacts

Visual and auditory impacts that may potentially affect the residents of a community during construction operations associated with the upland cable route will be mitigated as practical (PSC Certificate Conditions 32 k and l). Of particular concern is excessive noise in residential areas at times when people are more likely to be home (nights and weekends).

Engine powered construction equipment will be properly muffled and maintained to avoid producing excessive noise. Such equipment will not be permitted to operate or idle unnecessarily near noise sensitive areas such as houses, schools, hospitals and churches. Every effort shall be made to modify construction schedules to mitigate noise impacts on sensitive sites. Where possible the quietest equipment available and appropriate for the task shall be employed near such sites.

Mechanized equipment for all trenching and pipeline construction operations will be typically utilized during the work week Monday through Friday, between the hours of 7:00 AM to 6:00 PM. For HDD construction, equipment will be utilized Monday through Saturday, between the hours of 7:00 AM to 7:00 PM. In the event of unforeseen situations during either type of work additional hours may be required on a case by case basis. Emergency or extreme circumstances may result in a deviation from the schedule. DOT, OPRHP, DPS and other involved agencies will be notified when/if these situations arise. Construction activities will not occur outside of planned work hours without prior notification. In the event lighting stands are required, the lights will be directed away from residential communities. If construction equipment must continue running into the evening hours, then sound attenuating devices will be employed to lessen the noise.

5.5. Plan to Minimize Impacts during Special Events at Park Facilities

During construction of the upland cable route, the following agencies will be consulted on a regular basis regarding the schedule of special events and activities (PSC Certificate Condition 32m):

- New York State Office of Parks, Recreation and Historic Preservation
- Long Island State Park Region,
- Jones Beach State Park Complex
- Nassau County Parks Department
- Town of Hempstead and North Hempstead Parks Departments

All agencies having jurisdiction within the construction zone will be notified of all regularly scheduled construction progress meetings. All activities within the construction zone will be coordinated with agencies having jurisdiction within the construction zone.

The regularly scheduled construction progress meetings shall serve as a platform for discussions regarding the planned scope of work within the construction zone and to announce any special events that are planned by agencies having jurisdiction within the construction zone.

5.6. Vegetation Protection and Removal

The HVDC and HVAC upland cable routes were cited to avoid disturbance or removal of vegetation to the extent practical, utilizing the mowed and maintained right-of-way whenever practical. Adequate space for HDD operations and open-trenching exists within currently maintained and mowed open areas along most of the cable route. However some clearing and removal of vegetation, shrubs and trees will be necessary during conduit installation.

Clearing and grubbing of grasses, shrubs and trees associated with cable/ conduit installation will be confined within the limits of disturbance (Attachment A) and in compliance with the conditions of the highway work permit and DOT Standard Specifications § 201-3.01 and 201-3.02.

The topographic mapping used to develop the design drawings in Attachment A were compiled from aerial photography obtained with leaf-on conditions. The tree line depicted in the drawings generally reflects overhanging tree canopy. Therefore, limits of disturbance depicted through the tree line do not necessarily indicate tree removal is required. See requirements for tree removal and vegetation restoration in Attachment A.

Construction activities within the adjacent area of wetlands will not involve the removal of trees. Some pruning of trees within the wetland adjacent area may be required to accommodate overhead clearance requirements of HDD equipment.

Vegetation removal within wetland adjacent areas will be limited to those areas currently maintained or mowed as parkway right-of-way. Vegetation removal will be limited to those areas needed for HDD entry and exit pits, and limited trenching between the Wantagh Museum and Island Road HDD exit pits (Attachment A, STA 337+00 to 339+00).

Trees and shrubs that will not be removed during construction will be protected from injury. In areas where construction is immediately adjacent to trees and shrubs and there is a potential for direct tree damage or root damage from compaction by equipment on wet soils, physical barriers (e.g., temporary fencing) will be erected parallel to the trenching and/or HDD operation so as to reduce the possibility of accidental damage to trees and shrubs due to construction equipment. The need and placement for this temporary fencing will be coordinated with the PSC Independent Environmental Inspector (See Section 5.10) and DOT inspector.

Prior to construction, trees that require trimming and clearing will be identified and documented. Photographs of areas in which significant tree trimming and/or clearing will occur will be taken prior to construction activities. The on-site Environmental Manager in coordination with the Independent Environmental Inspector (See Section 5.10) and DOT Inspector will approve any clearing and trimming activities in compliance with the conditions of the highway work permit.

It is anticipated that it will be necessary to clear some small trees (< 2-in. dbh) and shrubs associated with HDD set-ups at Salisbury Road (Attachment A). The HVDC and HVAC cables

meet at the Salisbury Road crossing before entering the substation. The HVDC and HVAC cables require 15 feet of separation; therefore it will be necessary to clear some area to accommodate the HDD set-ups. Clearing and removal of small trees and shrubs will also be necessary along the HVAC cable route near the proposed Duffy Avenue Converter Station (Attachment A). At both sites, the majority of the clearing and grubbing will be limited to widening existing pathways and areas dominated by shrubs and saplings. All trees and vegetation disturbed during construction activities will be restored (See Section 5.7 Restoration of Areas Disturbed during Construction Activities).

At the Sunrise Highway crossing, it is anticipated that several trees will require pruning to accommodate HDD equipment clearances. All trees will be trimmed as provided in DOT Standard Specifications §614,Care, Thinning, and Removal of Trees.

Vegetation (primarily mowed and maintained grasses) will be removed as designated within the work area and all sod, topsoil and organic earth will be removed when open trenching. In excavation areas, any tree roots and embedded wood shall be removed to a depth not less than eight (8) inches below subgrade or slope surface through which excavation is required so as to prevent potential future damage to the conduit and cable.

In areas where trenching operations will be near mature or significant trees, special precautions will be taken so as not to disturb the roots of these trees. Excavations will be kept to the absolute minimum size necessary to safely and efficiently install conduit and cable. Whenever large tree roots are encountered, and excavation by mechanical means could cause significant damage to the roots, further excavation in the root vicinity will be done by hand.

Tree roots will be protected from damage. If roots need to be or accidentally become severed, roots will be cut clean and natural resins will be allowed to seal the cuts. Roots will be exposed for the minimum amount of time required for excavation, conduit installation and backfilling of the trench.

5.7. Restoration of Areas Disturbed during Construction Activities

Vegetation restoration for disturbed areas will include preparation of the soil for subsequent plantings, application of topsoil (if necessary) on unpaved areas, and the seeding of grass and planting of shrubs and trees. Restoration also includes the repair and replacement of sidewalks, curbs, and road/ bike way pavement.

Temporary restoration, including hydroseeding or mulching of grassy areas and temporary paving of disturbed roadway/ bike path will be performed as necessary. Where permanent restoration is not possible (e.g., winter weather conditions), the disturbed area will be temporarily restored until permanent restoration can occur. See Attachment A for temporary restoration requirements. Final restoration will be performed during periods for optimum success.

For optimum growth, deciduous plants will be planted from approximately March to May and/or from approximately October to December. Evergreen plants will be planted from approximately April to May and/or from approximately September to October. No planting shall be conducted in frozen topsoil or when the soil is in an unsatisfactory working condition as determined by the on-site Environmental Manager. Vegetation plantings will be performed by a qualified nursery and supervised by the on-site Environmental Manager.

If grassy areas are approved for seeding, the seeding will be conducted during optimal time periods which are approximately between April and May for spring seeding and approximately August and September for fall seeding. Seeding will not be permitted during high winds or when the ground surface is too wet or too dry for proper working.

Restoration of the disturbed area within the right-of-way will include the following (See DOT Standard Specifications § 107-11):

- The removal of all equipment and parts, junk, rubbish, excess materials and debris of all kind;
- Clean up as required and grading to existing grade and ;
- The repair or removal of damaged trees and the fertilizing, turf establishment and mulching of the areas.

The upland areas that are disturbed during trenching, construction and maintenance will be re-vegetated according to DOT standard specifications, §713- Landscape Development Materials and Application Guide for seed species mix, pounds per acre, and land use applications.

Trees, shrubs and grass removed or damaged as a result of construction activity will be replaced as deemed necessary by the on-site Environmental Manager in coordination with the PSC Independent Environmental Inspector, DOT inspector and in compliance with the conditions of the highway work permit.

Immediately following trenching operations, the soil surface will be prepared and seeded if weather conditions and seasons permit. Grass areas will be seeded to reestablish vegetative cover similar to pre-disturbance conditions. Where necessary, topsoil will be used to restore grass areas. Slopes that are steeper than 3:1 will be seeded immediately after final grading if weather and right-of-way conditions permit. Lime and fertilizer (DOT Standard Specifications §713-02 and 713-03) will be incorporated at the recommended rates of application. Mulch will also be applied to the seeded areas to assist in turf establishment.

Restoration of the golf course area at Jones Beach State Park will follow restoration specifications for mowed and maintained right-of-ways (grassy areas), but will not include restoration of golf course improvements (fairways, tees, greens, bunkers, plantings, etc.) disturbed during construction activities. Access to the golf course will be made through the adjacent parking lot.

Replacement trees and shrubs will be of species typical of the area and in accordance with DOT Standard Specifications. In natural areas, the area will be re-seeded with native grass species and tree seedlings will be planted. In improved areas, the areas will be re-seeded with native grass species and native or non-native trees and shrubs will be planted to replace landscape trees.

5.8. Vegetation and Restoration Maintenance Plan

The following items outline the procedure for the sediment control measures and restoration of upland areas during the upland cable operations.

- Final cleanup and permanent erosion control measures shall be completed within ten days after trench is backfilled; weather and soil conditions permitting.
- All construction debris shall be removed from the right-of-way and disposed of in accordance with DOT standard specifications § 201.
- Timber, brush and stumps shall be disposed of in accordance with DOT standard specifications § 201.
- The right-of –way shall be graded to preconstruction contours except where original contours are excessively steep and unstable and more uniform relief may be preferable to minimize erosion and maximize soil stability. Any areas re-graded to a gentler slope will be discussed during the progress meetings.
- All disturbed areas shall be permanently re-vegetated (including trees and shrubs) in accordance with DOT standard specifications § 610, 611 and 613.
- Temporary erosion controls shall be installed in the event construction is not completed more than 30 days before the seeding season.
- All disturbed and restored areas shall be inspected on a weekly basis and during or after significant (more than 0.5 inches) precipitation events. The frequency of the inspections may be greater for more environmental sensitive areas.
- Maintenance of all tree, shrub and herbaceous vegetation will consist of a thorough inspection of all species following planting (end of second growing season).
- All dead trees and shrubs will be replaced with individuals of the same species during the planting period specified.
- Grass areas will be surveyed to determine degree of success. Unsuccessful, thin and bare patches will be replanted with seed of the same species mix and quality.
- All temporary control measures shall be maintained until replaced by permanent measures.

5.9. Notification of Final Restoration and Acceptance

The effectiveness of the restoration work will be evaluated two to four weeks after initial seeding. If the restoration is not working and it is late in the planting season, reseeding may be delayed until the next planting season.

Agencies will be notified to assess approve that restoration is complete.

5.10. Environmental Inspectors

Name(s) of the proposed Independent Environmental Inspector(s) for construction activities related to the upland construction/installation cable route and a statement of qualifications for each inspector demonstrating sufficient knowledge and experience in environmental matters to complete the inspections and audits are provided in Appendix F. Additional name(s) and qualifications of Independent Environmental Inspector(s) will be provided by Neptune and/or its contractors/subcontractors as necessary.

The Independent Inspector(s) is responsible for conducting field inspections of construction activities to confirm that the site remains in compliance with all applicable statutes, regulations and permit conditions, and the EM&CP. The Independent Inspector(s) and Environmental Health and Safety Manager(s) will be on site at the start-up of each field operation and at all times during environmentally sensitive phases of construction. An Inspection Report (IR) will be completed and filed by the Independent Inspector(s) to document the results of each site walk-down and to note and describe any areas of concern requiring corrective actions. Figure 5-1 shows a copy of the IR used to document inspections.

5.10.1. Confirmation of Inspector Independence

The Independent Inspector(s) will have stop-work capability if they are not satisfied with the level of environmental compliance, consider a situation to be an imminent environmental or safety hazard, and/or require more information before allowing an activity to proceed. Certification confirming the independence of the Inspector(s) from the Certificate Holder and certifying the authority of the Inspectors(s) to "stop work" in cases of noncompliance or imminent environmental or safety hazard will be provided.

The contractor and/or Neptune Construction Site Manager and/or Environmental Health and Safety Manager(s) will be notified immediately of any "stop-work" issuances throughout the course of the construction. Any stop-work issuance, the nature of the stop work issuance and means of resolution, and the involved staff will be documented on an incident report sheet.

5.10.2. Provision for Multiple Inspectors

Multiple Independent Inspector(s) will be provided if warranted in order to inspect more than one operation at a time and to substitute for the Independent Inspector(s) as necessary. Inspector(s) will be assigned to each construction area and no inspector shall be assigned to more than two active construction areas at any one time.

5.10.3. Inspection Checklist

A checklist of equipment, activities and procedures to inspect for compliance including the specific items or locations to be inspected, the inspection to be employed (i.e. visual, auditory,

testing by instrument) and acceptability criteria to be applied by the inspector will be completed for each daily inspection.

In the event that a spill or emergency response occurs at the project site, a Incident Data Sheet will be completed by the Environmental Health and Safety Manager with a copy provided to the Independent Inspector. Figure 5- 2 presents an Incident Data Sheet that is used to record the appropriate information associated with a spill or other emergency response.

5.10.4. Correction Procedures

An Incident Root Cause Analysis Form will be prepared following the completion of the Incident Report. Based on the information presented on this form, corrective actions will be identified to prevent the incident from recurring. Figure 5-3 presents the Incident Root Cause Analysis Form.

Inspectors will record any corrective actions undertaken or to be done to prevent the incident from reoccurring or to indicate any maintenance required on the item inspected. Copies of all IRs with identified corrective actions will be provided to the DPS, Neptune Construction Site Manager and/or on-site Environmental Health and Safety Manager(s). The Independent Inspector(s) is responsible for verifying that the corrective actions are undertaken and completed before formally closing out the IR form. Corrective actions implemented as part of the site walk-downs will be summarized in a Monthly Progress Report prepared by the Independent Inspector(s) which will be provided to the DPS, Neptune Construction Site Manager and/or on-site Environmental Health and Safety Manager(s).

5.10.5. Schedule for Monthly Environmental Audits

An environmental audit will be conducted monthly by a person other than the Independent Inspector(s). The audit will check that the independent inspections are occurring properly, required maintenance is complete, and all paperwork is properly prepared.

FIGURE 5-1 NEPTUNE RTS™ CONVERTER STATION INSPECTION REPORT

Name/Title:

Date of Inspection: Time:

Locations Inspected: Converter Station

Compliance	
Acceptable	Unacceptable

Item Inspected:

Solid Waste Storage Trash Bins Condition

Hazmat Storage

Environmentally Sensitive Areas *I* Wetlands *I* Sensitive Resource Areas *I* Project Site Limits

Duffy Avenue at Site Access Rd.

Vehicle Maintenance Areas/Fugitive Dust Controls

Stormwater Control/Sediment Basins and Outfalls

Erosion Controls and Silt Fencing

Other Items Inspected:

Remarks

Additional Comments:

Signed by_____

Received by_____

Date

FIGURE 5-2 NEPTUNE RTS™ CONVERTER STATION INCIDENT DATA SHEET

(Page 1 of 2)

Incident Description:

Emergency Coordinator(s) Responding:

Date/Time:

Releases/Spills.

Product ID: Time of Release:
Physical State: Total Amount Released (units):

Offsite impact with threat to human health and/or environment?: Yes No
If "yes", New York DEC contacted?:
DatefTime/Case #:
Person Contacted:
Notes:

If "yes" and involving releases resulting in visible sheen on surface waters, exceeding CERCLA RQ, and/or hazardous wastes, was NRC contacted?:
Date/Time/Case #: Notes:

Offsite Emergency Response

Entity:
Time of Arrival: Team Leader:
Notes:

Injuries/Medical Response

Personnel Injuries?:
Describe (name/nature of injury/medical services):

INCIDENT DATA SHEET

(Page 2 of 2)

Clean-Up Activities

Date/Time Started: Date/Time Completed:
Responsible Individual:
Describe Action Taken:

Confirmatory Sampling (if appropriate)

Material Handling/Disposal

Hazardous Waste Generated?: Yes No
Physical State:

Describe waste type/estimated amount/storage actions:

Date Generated:

FIGURE 5-3 NEPTUNE RTS™ CONVERTER STATION INCIDENT ROOT CAUSE ANALYSIS FORM

Name: Date:	Title:
Situation Description Briefly describe the events leading to and including the incident:	
Incident Impacts Briefly describe the impact, or potential impact the incident had, or could have had on personnel, operations, the environment, offsite areas, and the public:	
Root Cause Briefly describe the incident's root cause:	
Corrective Actions Taken Specify actions taken to prevent or minimize the recurrence of a similar incident	

APPENDICES

APPENDIX A

HAZARDOUS WASTE MANAGEMENT PROCEDURE

1. Hazardous wastes will be managed in accordance with the applicable regulations found in 6 NYCRR Parts 370-374 and 376.

2. If necessary, the contractor will be licensed by the U.S. Environmental Protection Agency (EPA) and the New York Department of Environmental Conservation under 6 NYCRR Part 372.2, as a ***Large Quantity Generator*** *(LQG).*

3. The hazardous waste storage area will be designed in accordance with the environmental regulations and built to meet the following requirements at a minimum:
   - The area will be clearly delineated with a visible line or tape and a posted sign indicating HAZARDOUS WASTE in capital letters at least one inch high.
   - Elevated off the ground on a concrete pad and surrounded by concrete curbing (or equivalent) to form a containment area for any spills. Special plastic drum containment products designed for the storage of liquids may also be used.
   - Located away from existing drainage paths to off-site areas (as much as possible).
   - Size of containment area will be sufficient to contain 10% of the volume of all containers or 100% of the largest container (whichever is greater) in the area.
   - Containment areas will be equipped with a manual valve, normally locked/closed (or equivalent means) to allow for the release of clean, uncontaminated storm water.
   - Covered to minimize stormwater accumulation in the storage area.
   - Designed so that containers of non-compatible wastes are separated.
   - There will be sufficient space between drums stored in the area to permit the appropriate level of inspection and to allow for access during emergency response situations.

4. Containers used to store hazardous wastes in the storage area will meet the following criteria:
   - Containers will remain closed during storage, except to add or remove waste.
   - Containers will be in "good" condition with no visible defects that could result in leaking or spilling of wastes.
   - Liquid wastes must be stored in leak-proof sealed containers (e.g., steel drums with fixed lids).

Appendix B

HAZARDOUS SUBSTANCE, PETROLEUM AND WASTE SPILL RESPONSE PROCEDURE

This procedure is intended for use by personnel involved in the construction of the Neptune RTS upland cable route to classify and respond to incidents involving the release of hazardous substances, petroleum products, and/or waste to the environment.

Spill Response

Immediate Actions:

1. If spilled materials are flammable, eliminate sources of ignition near the spill area.

2. If it can be performed safely, stop the source of the spill and contain the spill within as small an area as possible. *Please note that any further mitigation or spill response efforts will require direct NYSDEC approval (oral) if the spill quantity exceeds the Reportable Quantity for the constituent involved, as provided from 6 NYCRR 597. This list will be kept available in the on-site construction trailer.*

3. Contact the on-site manager if any spill occurs on the site. Make other emergency contacts, as appropriate, if the incident results in injuries or the public is affected or involved in the spill. The emergency contact notification list is presented below:

   NOTIFY IN ALL EMERGENCIES:

4. The Environmental Health and Safety Manager will then notify/advise the New York State Department of Public Service (NYSDPS) in the event of a release occurring that triggered a regulatory notification, along with pertinent release information.

5. The Emergency Response Team will be responsible for requesting assistance from off-site emergency response organizations, if necessary.

6. The Environmental Health and Safety Manager will secure the area and establish perimeter control at a safe distance from the spill.

7. Scene management will be the responsibility of the on-site manager until offsite emergency management personnel assume control.

8. If an immediate threat to human health or the environment **DOES NOT EXIST** the Environmental Health and Safety Manager will arrange for safe clean-up of the spill.

9. The Environmental Health and Safety Manager or another Emergency Response Team member will notify the appropriate national, state, and local agencies immediately after a spill event, as outlined in the "Notifications" section below.

Additional Actions:

1. If it can be performed safely, the Environmental Health and Safety Manager will supervise the clean up of spilled material and all contaminated debris/equipment. Clean-up actions specific to diesel fuel/gasoline, hydraulic/lube oil and chemical spills are provided below.

2. The Environmental Health and Safety Manager will complete an Incident Data Sheet (see attached) and ensure that all clean-up activities have been completed.

3. The Environmental Health and Safety Manager will forward a copy of the Incident Data Sheet to the Construction Site Manager as well as the Owner's on-site representatives.

4. The Environmental Health and Safety Manager will complete an Incident Root Cause Analysis Form (see attached) for all emergency spills which required off-site notification and/or off-site emergency response.

Clean-up Actions Specific to Diesel Fuel and Gasoline Spills:

1. SAFETY FIRST
   - Avoid inhalation of vapors by keeping personnel upwind;
   - Use chemical-resistant personal protective equipment during clean-up activities; and
   - Gasoline and gasoline vapors are highly flammable—remove sources of heat, sparks, flame, friction, and electricity. Gasoline vapor may create an explosive atmosphere.

2. Small spills within contained areas will be cleaned up with absorbents.

3. Large spills outside of contained areas will be diked with absorbent or soil to prevent liquid from reaching storm sewers or bodies of water. Cleanup of large amounts of free liquid will be performed by trained off-site personnel.

4. Spill clean-up wastes will be placed in proper waste containers (e.g., 55-gal. drums).

5. Diesel fuel clean-up wastes that do not contain free-flowing liquid may be disposed of as solid waste at a municipal solid waste landfill.

6. Diesel fuel clean-up wastes that do contain free-flowing liquid will be drained to remove as much of the free-flowing product as possible. Diesel wastes drained of any free product may be disposed of as solid waste at a municipal solid waste landfill.

7. The free product removed from the diesel waste and all gasoline spill waste will either be recycled or, if not recyclable, disposed of as a hazardous waste.

Clean-up Actions Specific to Hydraulic Tube Oil Spill

1. SAFETY FIRST
   - Avoid inhalation of vapors by keeping personnel upwind;
   - Use chemical-resistant personal safety equipment during clean-up activities; and
   - Restrict fires or open flames from the spill area.

2. Small spills or equipment leaks will be placed in plastic bags or drums.

3. Large spills outside of contained areas will be diked with absorbent or soil to prevent liquid from reaching storm sewers or bodies of water. Clean-up of large amounts of free liquid should be performed by trained off-site personnel.

4. Spill clean-up wastes will be placed in proper waste containers (e.g., 55-gal. drums).

5. Hydraulic/lube oil clean-up wastes that do not contain free-flowing liquid may be disposed of as solid waste at a municipal solid waste landfill.

6. Hydraulic/lube oil clean-up wastes that do contain free-flowing liquid will be drained to remove as much of the free-flowing product as possible. Wastes drained of any free product may be disposed of as solid waste at a municipal solid waste landfill. The free product removed from the waste must either be recycled or, if not recyclable, disposed of as a hazardous waste.

Clean-up Actions Specific to Chemical Spills

1. SAFETY FIRST
   - Avoid inhalation of any vapors (if present) by keeping personnel upwind;
   - Use chemical-resistant personal protective equipment during clean-up activities; and
   - Restrict fires or open flames from the spill area.

2. Refer to material safety data sheets (MSDSs) for special hazards associated with any spilled chemicals, especially for reactivity with other substances in the spilled area. Copies of all MSDSs are provided in the supervisor's office.

3. Spills within contained areas will be neutralized (if appropriate). Free product that cannot be used must be classified as to whether it is a hazardous waste.

4. Large spills of acids, caustics, or other highly volatile chemicals outside of contained areas will be diked with absorbent or soil to prevent liquid from reaching storm sewers or bodies of water. Clean-up of large amounts of free liquid will be performed by trained off-site personnel.

5. Spill clean-up wastes will be placed in suitable containers.

Notifications

The New York State Department of Environmental Control (NYSDEC) has established a two-hour reporting threshold for releases and/or threats of release of hazardous substances, petroleum products, and hazardous wastes to the environment.

The NYSDEC reporting criteria generally ***includes only releases to the environment.*** Releases to secondary containment, or to impermeable surfaces, which do not impact or threaten state waters (streams, rivers, drainage ditches, ponds, wetlands, and groundwater) or off-site areas, generally are not required to be reported. No reporting is required if the total amount of the spill is known and can be recovered within a 24-hour period using on-site personnel and equipment.

The Environmental Health and Safety Manager will be notified immediately of any reportable spill event on site. He will then notify/advise New York State Department of Public Service (NYSDPS) with regards to the type and nature of the reportable spill event:

Petroleum Products (engine oils, hydraulic fluids, gasoline and diesel fuels)

In accordance with 6 NYCRR Section 613.8, report all discharges (no de minimus amount), defined as releases/spills to waters of the state or onto lands from which it might flow or drain in state waters, within two hours of discovery:

Report within two hours of such releases to NYSDEC Hotline:
(518) 457-7362 (in New York)
(800) 457-7362 (outside of New York)

and

For such releases which result in a visible sheen upon navigable waters or adjoining shorelines (40 CFR 112.4) (i.e., all surface waters):

- **National Response Center:** **(800) 424-8802 (24-hr)**

Hazardous Substances (not including petroleum products)

In accordance with 6 NYCRR Section 595.3(a)2 report all releases of hazardous substances, within two hours, which exceed the NYSDEC Reportable Quantity (RQ)* or releases in amounts less than the RQ which pose or could pose the following threats:

- Fire with potential off-site impacts explosion;
- Violation of air quality standards;

- Release of vapors, dust and/or gases causing illness/injury to persons off site; and
- Runoff from fire control or dilution waters cause violation of water quality standards.

Report within two hours of such releases to NYSDEC Hotline:
(518) 457-7362 (in New York)
(800) 457-7362 (outside of New York)

Consult 6 NYCRR Part 597, for a full listing of all hazardous substances and their related RQs. The Comprehensive Environmental Response, Compensation and Liability Act 1980 (CERCLA) RQs for these same substances are summarized from 40 CFR Parts 302, Table 302.4. Note that both the NYSDEC and CERCLA RQs relate to the pure form of the substance.

For releases which result in a threat to public health:

- New York State Police (516) 756-3300
- Nassau County Police (516) 573-7000
- Nassau County Sheriff (516) 571-2130

For releases exceeding the CERCLA RQ and/or involving hazardous wastes,

- National Response Center: (800) 424-8802 (24-hr)

The following information will be provided in the telephone report:

- Name and telephone number;
- Name and address of the site (include EPA identification number for releases involving hazardous wastes);
- Date, time and type of incident;
- Type and quantity of material spilled (if known);
- Extent of any injuries;
- Possible hazards to human health and the environment, outside of the site; and
- The quantity and disposition of any recovered materials.

If evacuation of local population is advisable:

- Town of Hempstead 911 (Emergency)
- Town of Oyster Bay 911 (Emergency) (516) 677-5757

NEPTUNE RTS™ UPLAND ROUTE
INCIDENT DATA SHEET

Incident Description:

Emergency Coordinator(s) Responding:

Date/Time:

Releases/Spills.

Product ID: Time of Release:
Physical State: Total Amount Released (units):

Offsite impact with threat to human health and/or environment?: Yes No
If "yes", New York DEC contacted?:
DatefTime/Case #:
Person Contacted:
Notes:

If "yes" and involving releases resulting in visible sheen on surface waters, exceeding CERCLA RQ, and/or hazardous wastes, was NRC contacted?:
Date/Time/Case #: Notes:

Off-site Emergency Response

Entity:
Time of Arrival: Team Leader:
Notes:

Injuries/Medical Response

Personnel Injuries?:
Describe (name/nature of injury/medical services):

INCIDENT DATA SHEET

Clean-up Activities

Date/Time Started: Date/Time Completed:
Responsible Individual:
Describe Action Taken:

Confirmatory Sampling (if appropriate)

Material Handling/Disposal

Hazardous Waste Generated?: Yes No
Physical State:

Describe waste type/estimated amount/storage actions:

Date Generated:

NEPTUNE RTS™ UPLAND CABLE ROUTE
INCIDENT ROOT CAUSE ANALYSIS FORM

Name: Title: Date:
Situation Description Briefly describe the events leading to and including the incident:
Incident Impacts Briefly describe the impact, or potential impact the incident had, or could have had on personnel, operations, the environment, offsite areas, and the public:
Root Cause Briefly describe the incident's root cause:
Corrective Actions Taken Specify actions taken to prevent or minimize the recurrence of a similar incident

APPENDIX C

Solid Waste Management Procedure

1. All solid wastes generated at the site must be classified as either hazardous or nonhazardous. The on-site inspector will periodically review the Contractor's classification to verify that material is properly classified.

2. All waste in the solid waste stream that is identified as hazardous or potentially hazardous must be segregated and managed separately from other nonhazardous wastes. Hazardous wastes must be managed in accordance with all applicable laws and regulations and must follow the specific site procedures as contained in the Hazardous Waste Management Procedure (see Appendix A).

3. There will be no on-site burning or burial of any wastes generated during construction (trash or vegetative).

4. The Contractor will implement and work to actively practice waste minimization/recycling efforts to reduce the volume and toxicity of all wastes generated during construction activities. The Contractor will practice several waste minimization options including:
   - Segregating useable products from the waste stream for reuse, recycling or reclamation (e.g., segregating office paper, plastic, glass, and scrap metal from "trash");
   - Selecting nonhazardous alternatives to hazardous substances; and
   - Procuring and storing on-site only the required amount of materials to perform the task.

5. The Contractor will utilize appropriate storage containers on site for their nonhazardous solid waste, such as, but not limited to:
   - Roll-off boxes;
   - Solid waste dumpsters;
   - Trash cans/barrels;
   - Bins; and
   - Pallets.

   The size, type, and configuration of the containers will be evaluated based upon expected use (i.e., scrap metal collection, office waste, garbage, etc.), anticipated waste quantity, and upon recommendation by the waste hauling contractor. Containers with covers will be used where appropriate (i.e., trash and garbage) and kept closed when not being filled or emptied.

6. The Contractor will select a qualified and licensed waste hauler to be the construction site waste hauling/disposal company. The Contractor will ensure that their solid waste stream meets the criteria established for acceptable wastes at the nonhazardous waste landfill. Each specific waste stream characterization must comply with the license restrictions of the selected waste hauler. Typical acceptable and non-acceptable wastes are presented below.

Typical Acceptable Wastes for Disposal

Household type waste (food waste, plastic, etc.);
Earthen materials (soil, clay, sand, and gravel etc.);
Hardened concrete/cement;
Lumber (treated and untreated)/insulation material; and
Hardened/cured asphalt (no tar sealant).

Typical Unacceptable Wastes for Disposal

Tires;
Propane tanks (must be stockpiled separately); and
Solvents, degreasing agents, batteries.

7. The Contractor will implement and maintain "good housekeeping" practices at the work locations and solid waste storage areas. These include providing the appropriate type, size, and number of containers to store all waste generated and to keep it from scattering due to animals and wind. Containers with covers will be used and kept closed at all times.

8. The Environmental Health and Safety Manager will monitor site compliance with this solid waste management procedure through regular site compliance inspections.

APPENDIX D

REFERENCED NYSDOT STANDARD SPECIFICATIONS

104-02 ALTERATIONS AND OMISSIONS. The specifications of 102-17 Sample Form of Agreement, Article 5, shall apply.

104-03 CONTINGENCIES, EXTRA WORK AND DEDUCTIONS. Whenever the Commissioner of Transportation determines that from any unforeseen cause the terms of any contract should be altered to provide for changes, contingencies or extra work, he/she may issue an order on contract therefor to the Contractor who shall forthwith proceed with the performance of the work and the furnishing of the materials and equipment necessary for its accomplishment in accordance with the pertinent specifications.

No instructions, either written or verbal from any Department employee or agent shall be construed as an order for changes until receipt by the Contractor of written notification that an order-on-contract has been approved by the Department, or written notification from the Engineer that changes in the work are eligible and authorized for payment in accord with Section 697, Interim Payments. The Contractor may proceed with the work in advance of the approved order-on-contract if the Contractor has received an approved Authorization of Additional Work from the Construction Division.

Otherwise, payment for any unforeseen work shall be made only if the contractor complies or has complied with all of the provisions of §105-14, §109-05 and §109-16 as applicable.

104-04 CLOSING OF HIGHWAY. The legal closing of a highway to public travel in the manner provided by 104 of the Highway Law will be done by the Commissioner of Transportation or by the County Superintendent of Highways when requested by the Department. All highways are not so closed during highway construction operations.

When a highway is legally closed and public travel diverted therefrom adequate warning, danger and direction signs and lights shall be erected and maintained by the Contractor to properly protect and direct public travel by day and by night. Suitable barricades shall also be erected at the ends of such closed sections of highways and large signs displayed indicating such closure. All signs, barricades and other traffic control devices used shall conform to the New York State Manual of Uniform Traffic Control Devices.

104-05 RESTRICTED HIGHWAY USE. With the award of a contract the Commissioner of Transportation will, unless otherwise specified, designate the section of highway under contract a "Restricted Highway" pursuant to Section 104A of the Highway Law and Section 1625 of the Vehicle and Traffic Law. Pursuant to these legal sections, the Commissioner has the authority to (1) establish maximum and minimum speed limits at which vehicles may proceed along any such Restricted Highway; (2) establish weight and dimension limits of vehicles; (3) regulate the use of such Restricted Highway by pedestrians, equestrians, and animals; (4) regulate parking, standing, stopping, and backing of vehicles; (5) control persons and equipment engaged in work on such highway. When used on such Restricted Highways, all traffic control devices shall be considered as official traffic control devices and shall conform to the Manual of Uniform Traffic Control Devices.

The Commissioner will therefore cause signs indicating such restrictions to be placed at such points as deemed necessary for the safe use of the Restricted Highway. The traveling public and the Contractor must observe and comply with these restrictions, as posted, except that the Contractor may be allowed greater latitude with respect to size and weight of construction equipment.

Construction equipment or vehicles shall be operated on Restricted Highways as provided under §105-12, Construction Equipment.

104-06 SITE HOUSEKEEPING The project site shall be cleaned up at the close of each work day, and be left in an orderly condition. Waste and debris shall be removed from the work site and surrounding areas cleaned of debris or waste generated from the work site. Containers shall be provided for the collection and separation of waste, and garbage and other waste shall be disposed of at frequent and regular intervals. Any salvaged material not specified to be disposed of otherwise, shall become

the property of the Contractor and shall be removed from the site.

104-07 METHODS AND EQUIPMENT. Where particular methods or equipment are specifically required in these specifications, the Contractor may apply in writing to the Regional Director to use alternate methods and equipment to provide the same results. Such alternates may be used only after favorable recommendation by the Regional Director and the written approval of the Director, Construction Division. When, in the opinion of the Regional Director satisfactory results are not being obtained using the Contractor's alternate methods and equipment the methods and/or equipment shall be immediately modified to produce satisfactory results.

104-08 WARRANTIES AND GUARANTEES. The Contractor shall provide to the Department, or the authority having jurisdiction of the facility, any manufacturer's warranties and guarantees normally given as customary trade practice. Manufacturer's warranty periods shall begin on the date the item is installed and/or incorporated into the work. All warranty documentation, including but not limited to operating instructions, schematics, parts lists and/or repair information shall be turned over to the Engineer. For contracts involving the furnishing and/or installing of electrical and mechanical equipment, the Contractor, in addition to the requirements above, shall guarantee the satisfactory in service operation of mechanical and electrical equipment and related components for a period of 6 months following contract acceptance, at no cost to the State for either parts or labor. The requirements of this subsection do not apply where the mechanical and electrical equipment is furnished by the State.

104-09 RETENTION OF RECORDS. The Contractor shall retain all records for the balance of the calendar year in which they were made and for six (6) additional years thereafter. Required records shall include all accounts, papers, maps, photographs, or other documentary materials, regardless of physical form or characteristics, made or received by the Contractor in connection with the contract. Legible copies including microfilm copies, are acceptable, provided they are so arranged, identified, and indexed that any individual document, or component of the records, can be located with reasonable facility.

104-10 VALUE ENGINEERING CHANGE PROPOSAL (VECP).

A. Purpose and Scope. The purpose of a Value Engineering Change Proposal (VECP) is to encourage the use of the Contractor's ingenuity and experience in arriving at alternative construction designs, methods, and procedures that result in a lower direct cost to accomplish a contract requirement. It is the intent of this provision to share with the Contractor any substantial direct cost savings which may be generated as a result of a VECP offered by the Contractor and approved by the Department. A VECP is a Contractor-initiated change request. If approved, the changes and payments will be authorized through the order-on-contract process (see Section 109, Measurement and Payment). Before a VECP can be implemented, it must pass through three approval processes: conceptual approval, formal approval, and order-on-contract approval. To expedite the review process, the Contractor has the option of jointly submitting the conceptual VECP and the formal VECP for simultaneous review. In addition, if the VECP receives formal approval, as part of the order-on-contract process the Contractor can request that the Department consider granting advanced authorization of additional work.

The VECP should produce direct cost savings to the Department and the public without, in the sole judgement of the Department, impairing essential functions and characteristics of the facility including but not limited to service life, economy of operation, ease of maintenance, desired appearance, and safety. The Contractor when developing a VECP must address the designer's objectives, environmental permit requirements and regulations, commitments made to the public to mitigate the impact of construction, and other such concerns.

The 'direct cost savings' is the difference of the 'construction savings' generated by

produced in the United States in sufficient and reasonably available quantities and of satisfactory quality.

Provided one or more of the above requirements are met, the Contractor may submit a request for a waiver to the Engineer. The request shall include copies of all documentation verifying the unavailability of the material or product, and/or justification of the application for a waiver.

For Federally Aided contracts, final approval of the Buy America Waiver request will be made by the Regional Federal Highway Administration and concurred with by the Director, Construction Division. For non-Federally Aided contracts, upon final approval of the affected Department program areas, notification and approval of the Buy America Waiver request will be made by the Director, Construction Division.

The following is a list of materials or products which are exempt from the Buy America provisions, and do not require submission of a waiver request:

1. Hollow "I" shaped, steel extrusions.

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

107-01 LAWS, PERMITS AND LICENSES. The Contractor shall observe all Federal, State and applicable local laws and regulations. Attention is directed to the regulations of Federal and State Agencies in regard to agricultural insects and diseases. In particular, the Contractor's attention is directed to Federal and State Department of Agriculture regulations for plant pest control which require that equipment operating in infested areas be thoroughly cleaned before moving to non-infested areas. In addition, the Contractor agrees to procure all necessary licenses and permits.

107-02 PATENTED DEVICES, MATERIALS AND PROCESSES. It is mutually understood and agreed that the contract prices are to include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. Whenever the Contractor is required or desires to use any design, device, material or process covered by letters, patent or copyright, the Contractor shall indemnify and save harmless the State from any and all claims for infringement by reason of the use of any such patented design, device, material or process, to be performed under the contract, and shall indemnify the said State for any costs, expenses and damages which it may be obliged to pay, by reason of any such infringement, at any time during the prosecution or after the completion of the work.

107-03 FEDERAL AID. In all contracts in which the Federal Government participates financially, which contracts are designated as Federal-Aid contracts the Contractor shall conform in all respects in accordance with the true intent and meaning of each and all of the requirements contained in the "Required Contract Provisions Federal Aid Construction Contracts," a copy of which will be found incorporated in each proposal for contracts so classified. When any of such Federal Provisions may be in conflict with any other provisions of the contract the Federal Provisions shall prevail and take precedence and be of force over and against any said conflicting provisions of said contract.

107-04 SANITARY CODE. The Contractor shall comply with the provisions of the State Sanitary Code relating to camps and obtain from the local health officers permits for the construction, maintenance and operation of labor camps, if used.

107-05 SAFETY AND HEALTH REQUIREMENTS

A. General. The Contractor shall perform all work in the contract with due regard to the safety and health of the employees and of the public. The Contractor shall comply with 29 CFR 1926, Safety and Health Regulations for Construction, administered by the Federal Occupational Safety and Health Administration (OSHA) regarding the safety and protection of persons employed in construction and demolition work.

All Contractors' employees shall wear protective helmets (hard hats) and high visibility work vests or appropriate distinguishing apparel when working within the contract limits or a highway right-of-way at all times. Helmets are not required for employees within a completely enclosed cab constructed of steel frame and glass, or inside an automobile. Helmets shall meet current OSHA standards for impact, electrical shock and burn protection. Contractors' employees will be considered to include everyone on the Contractor's payroll, subcontractors, material suppliers, and other personnel on the project site under the direction of the Contractor.

The Contractor shall notify the Engineer of any inspections to be conducted on the project by OSHA, NYS Department of Labor (NYSDOL), or other safety and health agencies, of any resulting closing conference, and provide the Engineer with the opportunity to be present at such inspections and closing conference(s). The Contractor shall notify the Department in writing of the results of any safety and health inspections conducted on the project by representatives of OSHA, NYSDOL, or other safety and health agencies, within one business day of the completion of the closing conference resulting from such inspections. If any citations are issued for alleged violations of OSHA Regulations, a copy shall be provided to the Engineer within one business day of their receipt by the Contractor, and a copy of the final disposition of such citations shall also be provided to the Engineer within one business day of their receipt by the Contractor.

B. Project Safety and Health Plan. It shall be the responsibility of the Contractor to perform all necessary planning, supervision, and training activities to ensure that all of the requirements of 29 CFR 1926 are fully met for all workers employed in the construction of the contract. The Contractor shall provide to the Department prior to the start of work satisfactory evidence that all current requirements of 29 CFR 1926 will be adequately addressed. As a minimum, the Contractor shall provide a written Project Safety and Health Plan which documents the Contractor's company policy relative to safety, and which identifies and addresses specific safety and health concerns to be encountered on the project. Before the work begins and periodically throughout the project, the Contractor's project supervision staff shall meet with the Engineer to review and discuss the status of safety issues on the project. An appropriate notice shall be posted on the job site that the Project Safety and Health Plan is available for examination by any worker employed on the project. As a minimum this plan shall include the following items:

- Identification of project and company safety officers.
- Hazardous Materials Communications Plan.
- Employee Safety Training Program.
- Company safety policy.
- Procedures to address project safety and health concerns.
- Procedures for compelling worker compliance with safety and health requirements.

Certain of these items may be submitted in the format of a Company Safety and Health Program, with the Project Safety and Health Plan limited to project-specific issues.

The Contractor shall be responsible to ensure that each subcontractor employed on the project complies with this requirement. The Contractor shall provide to the Department a Project Safety and Health Plan covering all work to be done by the subcontractor prior to starting work. As an alternative, the Contractor may provide a certification that all activities performed by and workers employed by the subcontractor will be subject to the Contractor's Project Safety and Health Plan.

Submission of the required Project Safety and Health Plan by the Contractor and its acceptance by the Department shall not be construed to imply approval of any particular method or sequence for addressing safety and health concerns, or to relieve the Contractor from the responsibility to adequately protect the safety and health of all workers involved in the project as well as any members of the public who are affected by the project.

C. Emergency Contact Person. The Contractor shall designate someone to be available to respond to emergency calls. The name of the person and the telephone number at which he/she can be reached at any time shall be given to the Engineer and all police agencies in the area. Such

person shall have full authority and capability to mobilize forces promptly as required to respond to an emergency and protect the public.

D. Accident Reporting. The Contractor shall notify the Department in writing within 24 hours, with the details relative to any accident or incident occurring within the project limits involving any worker employed on the contract or delivering materials, equipment or supplies to the contract, provided:

- The accident or incident occurs within the confines of the project and ;
- The accident or incident results in the death of the worker, or requires that the worker is hospitalized overnight for treatment of the injury, or:
- The accident otherwise meets the notification requirements of OSHA.

E. Imminent Danger and Emergency Actions. Any action by the Contractor that presents a potentially imminent danger of injury to the public, a worker, or the inspection staff will be halted immediately by the Engineer, and operations stopped in accordance with §105-01. The Contractor's personnel shall have local emergency numbers readily available. These numbers shall include local utility, police/fire and medical assistance. In the event of an emergency, the Contractor shall evacuate all employees and endangered persons from the immediate vicinity to the best of the Contractor's ability.

F. Restricted Areas. The Contractor shall identify, guard and protect restricted areas such as open and unattended excavations, areas subject to falling debris and other potentially hazardous locations in and adjacent to areas lawfully frequented by any person. Such protection shall consist of one, or a combination of, the following:

- A substantial fence or barricade, not less than 1.2m in height and mounted on satisfactory supports spaced at intervals of not more than 3m. Warning signs reading "DANGER-KEEP OUT" shall be mounted on the fence or barricade at no more than 30m intervals. The signs shall be a minimum of 600mm wide by 400mm high. The lower portion of the sign shall be white and shall bear the words "KEEP OUT" in 125mm black letters. The upper portion shall be predominantly red with 125mm white lettering spelling out the word "DANGER." The lettering shall be enclosed by an approximately elliptical, white ring and the entire sign bordered in black. All barricades and warning signs shall be furnished, erected, relocated, maintained, and removed as required.
- A 1.2m (minimum) extension of the trench sheeting above the ground surface adjacent to an excavation.
- A substantial covering over an excavation. Where it is possible that vehicles will move over such covering, the covering shall be of sufficient strength to withstand the loading.

G. Work Site Access. The Contractor shall provide safe access to the work site by workers and inspection staff such that no active traffic lanes are routinely crossed by pedestrian workers or inspection staff reporting to and leaving the work site. Vehicles and equipment used to transport personnel to the work site shall safely enter and depart the work site.

The Contractor shall designate a safe parking area(s) for workers to park private vehicles near the project site acceptable to the Engineer. Contractor personnel shall park in non-designated parking areas within the right-of-way only with the prior approval of the Engineer.

H. Fall Protection. The Contractor shall provide fall protection for all workers, in full compliance with 29 CFR 1926, on all Department contracts. The Contractor shall include the proposed procedures to meet the fall protection requirements in the Project Safety and Health Plan.

The requirements of all applicable regulations notwithstanding, the minimum fall protection requirements on this project shall include the following:

1. Fall protection shall be provided for all workers at or above the height thresholds listed in 29 CFR 1926, Subpart L and Subpart M. All fall protection systems shall meet the

requirements of 29 CFR 1926, Subpart M. For situations where lifelines are interrupted, double lanyards shall be utilized to ensure that workers are continuously protected. One lanyard shall remain connected at all times.

2. Ladders or stairways meeting the requirements of 29 CFR 1926, Subpart X shall be provided at all points of personnel access where there is a change in elevation of 480 mm (19 in) or more, and no ramp, runway, sloped embankment or personnel hoist is provided. Climbing on forms, falsework, or the structure to gain access to work areas is expressly prohibited.

3. Where scaffolds are necessary to provide temporary access to work areas, they shall be in compliance with 29 CFR 1926, Subpart L. Scaffolds shall include a top rail, mid rail, and toe board on all open sides and ends.

4. Suspended scaffolds may be used for bridge painting or other purposes only if personnel lifts, scaffolds, or other means are not practical, and only if they meet the requirements of 29 CFR 1926, Subpart L. Specifically, the scaffold shall be secured to the suspension cables at all times. All personnel working on a suspended scaffold shall be provided fall protection using an independent anchorage.

5. All workers in personnel aerial lifts shall use a personal fall arrest system, with the lanyard attached to the boom or basket. Operation of all aerial lifts shall meet the requirements of 29 CFR 1926, Subpart L.

6. Fall protection shall be provided for all workers making initial connections on bridges at heights above 3.0 m.

7. Attachments or other temporary appurtenances on all beams and other structural elements shall be in place prior to erection or removal to provide fall protection for workers until other means of protection such as deck forms are in place. Fall protection shall consist of personal fall arrest systems, safety nets or other means. During the initial connection or removal of structural elements, workers exposed to moving members shall be required to tie off only if they are not exposed to a greater risk from the moving member. Initial connection is defined as that period during placement or removal of structural members when the member is supported by a lifting device.

8. Where an individual worker must rig the fall protection system, and it cannot be accomplished from an aerial lift or by tying-off to the existing structure, momentary exposure to a fall hazard may be unavoidable. The Contractor shall plan construction procedures to minimize occurrences of unprotected exposure to fall hazards. Fall protection systems utilized shall enhance safety rather than create a secondary hazard.

9. Fall protection shall be provided for impalement hazards, including all locations where there is a risk of a fall onto dangerous equipment, regardless of height.

I. Working Over Water. The danger of drowning shall be considered to exist where water depths exceed 1.5m, or water is subject to sudden fluctuations to a depth exceeding 1.5m. The risk of drowning may also exist where water depths as little as 0.6m are combined with swift currents, or a fall into the water may result in a person being rendered unconscious or otherwise disabled. Working on top of ice shall be considered as working over water. Where over water and passive fall protection (nets, railings, etc) are not supplied, the risk of drowning exists. Where practical, workers should not work alone in situations where a risk of drowning exists.

Any worker who is exposed to the risk of drowning shall wear a U.S. Coast Guard approved personal flotation device at all times. When any personnel are exposed to the risk of drowning, the following shall be in place prior to that exposure:

- A boat or skiff for emergency rescue operations, equipped with paddles or oars, a ring buoy or other life preserver, and a reach extension device. The boat shall be unlocked and available for immediate use at all times.
- One or more ring buoys with a minimum of 30m of line attached, placed at a maximum interval of 60m along the work site shoreline.

J. Electrical Safety. Electrical safety policy and procedures are based on the New York State High Voltage Proximity Act and 29 CFR 1926. They apply to all operations that could cause employees or the vehicles or equipment they are operating to come into contact with ("direct contact") or enter into dangerous proximity to ("indirect contact") energized electrical systems. Electrical systems shall be assumed to be energized high voltage until verified otherwise by the Utility. The Contractor shall identify and reference all potential electrical hazards and document such actions to the Engineer as part of the Project Safety and Health Plan.

Pursuant to the High Voltage Proximity Act, for all electrical systems carrying 600 volts or more, the Contractor shall:

- Notify the Utility at least 5 working days before any work begins which requires the Utility to identify voltages and clearances, or de-energize, insulate or relocate lines.
- Ensure employees are not placed in dangerous proximity to high voltage. Dangerous proximity is defined as within 3.05 m (10ft) for voltages up to 50 kilovolts, and an additional 0.1m for every 10 kilovolts over 50 kilovolts. Dangerous proximity applies to the individual and any conductive object.
- Inform employees of the hazards and corresponding precautions when working near high voltage.
- Post warning decals on equipment regarding 3.05 m (10ft) minimum clearance.
- Ensure that when any equipment operator is unable to assess clearances, a "spotter" observes for clearance and directs the operator.

Prior to the start of work where contact with energized electrical systems is possible, the Contractor shall identify existing facilities and reference their location to prominent physical features. In advance of work, the Utility shall be called upon to identify energized facilities, and to determine the need to de-energize, insulate, or otherwise protect the facilities against accidental contact. The actual work of protecting facilities will be carried out by the Utility. Facility relocation or protection provided at the request of the Department will be as described in the contract documents. Protection provided for the benefit, or at the request, of the Contractor shall be the financial responsibility of the Contractor.

Energized electrical lines or equipment shall be conspicuously marked and workers shall be reminded of their locations and the safeguards and precautions to be taken prior to beginning any nearby work that may cause the workers to approach electrical lines. New employees shall be informed of electrical hazards and proper precautions and procedures.

1. Paving Operations. Prior to the start of each workday high visibility markers or other devices approved by the Engineer shall be placed to mark the location of all overhead wires, including, but not limited to electrical, telephone and cable television. As an alternative, the pavement beneath overhead lines may be marked with spray paint or by other means approved by the Engineer. This requirement shall also apply to off-site areas used for contract purposes. The Contractor shall periodically patrol the worksite to ensure that the markings are in place and shall replace any that are missing and shall maintain all markings in good condition.

2. Aerial Lifts, Lifting Equipment, Boom Devices. Where there is potential for proximity or contact with energized lines or equipment, work shall not begin until a safety meeting is conducted and appropriate steps are taken to identify, mark, and warn against accidental contact.

3. Tree Work. Branches touching wires shall be removed by the Utility before work begins. Limbs and branches shall not be dropped onto overhead wires. If limbs or branches fall across electrical wires, work shall stop immediately and the Utility shall be notified. Workers shall be equipped with appropriate personal protective gear for working near electricity.

4. Building Electrical Work. Employees working on electrical systems for buildings shall be knowledgeable about and shall employ, when appropriate, OSHA Lock-Out/Tag-Out procedures to prevent exposure to unguarded electrical systems.

K. Histoplasmosis. Histoplasmosis is a fungal infection caused by a soil organism found in large masses of bird or bat droppings, and is a potential health hazard in areas where birds or bats have nested for long periods. Such conditions are often found on bridge structures, in barns, farm buildings and cold storage facilities, areas with small amounts of dried droppings pose minimal hazard. Airborne material may enter the body by inhalation or ingestion.

Prior to work in any area where birds or bats nest, the Contractor shall conduct a thorough inspection to determine if, and to what extent there is a build-up of droppings. Workers conducting an inspection shall be equipped with personal protective equipment, which include gloves, rubber boots, rain suit components, goggles and a dust/nuisance respirator. Questions regarding proper equipment for this activity shall be directed to the Engineer.

If substantial material is found, the Contract shall clean the work area using a high powered water hose or by scraping. If the material is to be scraped away, it shall be kept wet during the entire process. Workers engaged in cleaning activity shall wear personal protective equipment specified above. Application of a cleaning agent (bleach, for example), before removal may help dissolve the material, and a disinfectant shall be applied to cleaned surfaces. Compressed air shall not be used to remove pigeon droppings because it produces airborne particles.

When cleaning has been successfully completed, the personal protective equipment specified above is no longer required. Employees engaged in cleaning, or any other activity which involves exposure to pigeon droppings, shall observe a high degree of personal hygiene, even if the exposure is casual. Special care shall be taken to wash hands thoroughly before eating or smoking.

L. Hazardous Materials.

1. Asbestos. Asbestos abatement contractors, workers, and asbestos removal procedures shall be appropriately licensed or certified by the NYS Department of Labor (NYSDOL). The asbestos abatement contractor will perform all removal and disposal of asbestos-containing material. The Contractor shall verify that a disposal site for the asbestos-containing material is available before work starts. Prior to removal and disposal work, the Contractor shall supply the Engineer with proof that:

- The firm performing the work has a valid asbestos-handling license.
- The firm's insurance coverage consists of an asbestos specific-occurrence type policy with no deductible or sunset clause.
- Its abatement project supervisor is a NYSDOL certified asbestos project supervisor.
- All employees engaged in the work are properly certified and have current physical examinations and respirator fit tests.
- Proper notification of work beginning on the asbestos project has been given to NYSDOL and the United States Environmental Protection Agency (USEPA).

After work is completed, the Contractor shall provide the Engineer with:

- Written certification ("Waste Shipment Record") that the material was disposed of in an approved waste disposal site. The certification shall include the name and address of the waste disposal site or sites used.
- Two (2) copies of Daily Logs, Visitor's Logs, OSHA Air Monitoring Records, and NYSDOL compliance air monitoring records.

2. Lead Safety and Health. The Contractor shall provide worker lead protection in accordance with 29 CFR 1926.62. Additional requirements including Hazard Communication (29 CFR 1926.59), Safety Training (29 CFR 1926.21), and other OSHA standards shall be met as applicable.

The Contractor shall provide to the Engineer a written lead compliance program as a component of the Project Safety and Health Plan in full compliance with all aspects of 29 CFR 1926.62. As a minimum, it shall address the specific issues listed in 29 CFR 1926.62 (e)(2), provide detailed information describing the training and experience of the competent person who will supervise the compliance program on site, provide a description of procedures to monitor worker exposures to lead and provide the proposed medical monitoring program. If respirators are to be used to protect workers from lead exposure, a written respirator program shall be provided. In addition, the Contractor's written Hazard Communication program and worker lead training program shall be included.

Specific operations that would likely result in worker exposure to lead include, but are not limited to:

- Removal of lead based paint coatings by abrasive blasting or other procedures.
- Cleanup and removal of paint debris.
- Cleanup, relocation, and dismantling of paint removal containment structures.
- Flame cutting, heating, or welding of steel coated with lead-based paint.
- Removal of bolts or rivets coated with lead-based paint.
- Any other operations that may dislodge existing coatings of lead-based paint, or subject them to abrasion or elevated temperatures.

The Contractor shall identify and implement engineering and work practice controls to reduce worker exposure to lead to a level at or below the Permissible Exposure Level (PEL). The use of respirators and protective clothing shall be used to supplement engineering and work practice controls, if necessary, to protect workers from exposures above the PEL. Sole reliance on respirators or protective clothing to protect workers from exposures above the PEL, without first implementing feasible engineering and work practice controls, shall not be permitted except for initial assessment of exposure levels as described in 29 CFR 1926.62 (d). The removal of lead-based paint from structural steel shall be required prior to heating, welding, or flame cutting to reduce worker exposure below the PEL. In cases where the Contractor can clearly demonstrate through exposure monitoring that other work practices and engineering controls, under the oversight of a certified industrial hygienist, can effectively maintain actual worker exposure below the permissible exposure level, exceptions to this requirement may be granted by the Engineer.

The Contractor shall provide to the Engineer copies of documentation, as they are completed, to demonstrate full compliance with 29 CFR 1926.62. These records shall include, as applicable, the completed worker lead training, completed respirator programs, air monitoring results, exposure monitoring results, worker medical monitoring results, and other such records as are necessary to document compliance with the standard.

3. Equipment Involving Radioactive Materials. The use of equipment involving radioactive materials, including but not limited to nuclear density gauges, shall adhere to all applicable regulations, including U.S. Nuclear Regulatory Commission regulations, related USDOT regulations concerning transportation of radioactive materials, and 12 NYCRR 38. Fourteen (14) days prior to the start of any work involving such equipment, the Contractor shall submit to the Engineer a written Radiation Safety Plan. The plan shall address in detail transportation and storage of the equipment and operating and emergency procedures. It shall provide the name and address of the Contractor's Radiation Safety Officer. A copy of the owner's license to possess the radiation source, issued by the NYSDOL, shall also be provided. All operators of the equipment shall be certified by a gauge manufacturer as to having completed training on the safe use of the equipment. A copy of the certification shall be provided to the Engineer for each operator prior to their work on the project.

M. Demolition of Buildings and Structures. Demolition work shall not be performed by the use of explosives unless approved by the Regional Director.

N. Drilling and Blasting. A project meeting relative to the method, manner and procedure of blasting operations shall be held at the site with the Engineer, the Contractor, the project blaster and representatives of all interested agencies including a Departmental Engineering Geologist, prior to the commencement of drilling and blasting operations.

Whenever explosives are used, they shall be of such character and strength and in such amounts as permitted by state and local laws and ordinances and all respective agencies having jurisdiction over them. The right is reserved for the Engineer and those agencies to specify the maximum size of the charges. Blasting shall be done only at such time as the Engineer and those agencies shall approve and under such restrictions as they may impose.

The Contractor shall employ only experienced supervisors and workers in the handling, loading and firing of the explosives. The Contractor's attention is directed to the requirements of 12 NYCRR 39 and the State Labor Law, which shall provide for the possession, handling, storage and transportation of all explosives used at the site.

O. Equipment Safety Procedures (Vehicle Operations, etc). The following provisions shall apply to all work on the project, including but not limited to, the activities of all subcontractors, Manufacturers, Fabricators, Material Suppliers, independent truckers and owner-operators. The Contractor shall include the proposed equipment safety procedures in the Project Safety and Health Plan.

- A spotter shall guide the backing of any vehicle or equipment with restricted visibility to the rear. This rule applies in any location where workers on foot, pedestrians, private vehicles or similar hazards may be present.
- If the operator loses visual contact, the vehicle shall immediately be brought to a full stop until visual contact with the spotter is reestablished.
- Dump truck boxes may be raised only under the control of a spotter, unless the vehicle is in an area clearly marked to be free of overhead wires and safe for dumping.
- Dump truck boxes shall be lowered prior to moving, except when dumping into a paver or similar operations, under the control of a spotter.
- All excavating, lifting and similar equipment shall comply with electrical safety requirements, and shall operate under the control of a spotter whenever working within 5m of an overhead line. The distance shall be measured as a slope distance perpendicular from the conductor to the nearest point on the vehicle.
- Any operator found in violation of the above rules by the Engineer or his/her representative will be removed from the project immediately, and will not be allowed to work on any Department project for a minimum of one (1) year.

P. Lifting. The following shall apply for all lifting operations with a lift weight exceeding one metric ton (1,000kg) in addition to all provisions required in the Steel Construction Manual and the Prestressed Concrete Construction Manual. This paragraph does not pertain to lifting details covered under Section 585-Structural Lifting Operations.

1. Competent Person. The Contractor shall designate one person, who is competent in lifting operations and is approved by the Engineer, to be completely in charge of a lifting operation. In general, Competent Person shall mean one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. The Competent Person shall have the authority to take an unsafe piece of equipment out of service until the hazard is eliminated. The Competent Person shall be knowledgeable about lifting equipment and equipment operations, Manufacturer's specifications and recommendations, and have a thorough knowledge of the requirements, regulations and standards governing his/her duties.

The Competent Person shall inspect all lift equipment prior to and during usage to make

sure the equipment is in a safe operating condition. The Competent Person shall be on site during all lift operations.

2. Lifting Equipment. Lift equipment having a maximum rated lifting capacity exceeding one metric ton shall have Manufacturer's durable load rating charts with legible letters and figures and they shall be attached to the equipment in a location accessible to the operator while at the controls. The charts shall contain a full range of load ratings at all stated operating radii. The charts shall also note conditions such as outriggers, counter weights, and work area, i.e., over side, over front, or over rear of equipment. If the Manufacturer's charts are not available, charts stamped and signed by a currently registered New York State licensed Professional Engineer may be utilized.

The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii, shall be established at 85 percent of the tipping load. Where structural competence governs lifting performance, the load will be limited such that no structural member is over stressed.

Lift equipment shall have the following safety devices:

a. Load and radius measuring device pre-programmed to continuously relate the measured data to the load radius chart as a direct reading of load or percentage of the rated load, and connected to a warning light and an acoustical signal located at the operator's position or in the cab to indicate overload.

b. Where electrically powered, a deadman control on control levers in the cab or operator's station.

c. An effective audible warning and operating signal on the outside of the cab to warn of backing or swinging operations.

d. Boom stops and boom hoist safety shutoffs, however boom stops shall not be required for telescoping booms.

e. An indicator for leveling the crane.

Lift equipment with non-operational safety devices, no safety devices, and all equipment lifting over a railroad shall be operated at a level not to exceed 78 percent of the Manufacturer's load charts. This results in the operational capacity limited to sixty-six and two-thirds percent (66 2/3 %) of the tipping load or a minimum lifting capacity of one hundred-fifty percent (150%) of the lift weight. This equipment shall have a separate load chart prepared and stamped by a currently registered New York State licensed Professional Engineer. The load chart shall be labeled "78% of Manufacturer's Load Chart" and it shall be attached to the equipment.

Lift Equipment with operational safety devices that is operating from a barge shall utilize Manufacturer's load charts that are established specifically for operating from a barge. Lift Equipment on barges with non-operational safety devices or no safety devices shall operate at 78 percent of the Manufacturer's load chart for working on barges. This equipment shall have a separate load chart prepared and stamped by a currently registered New York State licensed Professional Engineer. The load chart shall be labeled "78% of Manufacturer's Load Chart for Equipment on Barges."

3. Pre-Lift Meeting. A pre-lift meeting will be required for projects that require erection drawings or demolition plans to be submitted. The Competent Person, and other appropriate contractor staff, shall attend the pre-lift meeting with the Engineer, as well as representatives from the utilities and railroads if deemed applicable, one week before lifting operations are to be performed. The meeting shall include but not be limited to: the review of site conditions, erection or demolition plans, lift loads vs lift equipment capacity, obstructions, utilities, traffic concerns, and the roles of Department and Contractor personnel.

4. Lift Plan. Where required by the specifications and in accordance with the Steel Construction Manual and Prestressed Concrete Construction Manual, the contractor shall submit erection drawings or demolition plans to the Engineer, 30 days prior to the commencement of erection or demolition work, for review by the Department and any railroad or public agency affected by the proposed procedure. If the approved lift plan was prepared and signed by a Professional Engineer, any and all alterations or modifications shall be signed and stamped by a currently registered New York State licensed Professional Engineer. Alterations or modifications shall be submitted to the Engineer for approval.

Structural elements shown on shop drawings and erection drawings may have units expressed in both metric and english units, however metric units shall be the controlling units.

As a minimum, the information in the submittal for a lift plan shall include the following:

a. Plan of the work area showing support structures, roads, railroad tracks, canals, streams, utilities and any other information relative to erection.
b. Lift radii and pin locations.
c. Length of boom.
d. Counterweight size and location.
e. Lift configuration(s).
f. Location of trucks for delivery or removal of materials.
g. Restrictions on swing radii.
h. Sectional views of all lifts where electrical facilities are within a 5 meter radius of any part of the lifting equipment or object being lifted.
i. Wind restrictions if they are a requirement of the Manufacturer's lifting notes.
j. All lifting devices shown on the drawing will be accompanied by catalog cuts.
k. All pertinent rigging with dimensions.
l. Equipment such as rigging, beam clamps, jibs, swing-away, super-lifts, additional blocks, cheek plates, headache balls, and additional cables at the time of the lift shall be included as part of the load and shall be indicated as such.
m. Position of outriggers and outrigger supports.
n. The outside dimension of tracks for track mounted lifting equipment.
o. Parts of line for hook block.
p. A comparison of total lift weight vs lifting equipment capacity for the pick radius.
q. Maintenance and protection of traffic provisions specifically required for the lift.

5. Lift Operations. The Competent Person shall be present for all lifting operations.

When the lifting operation imparts loads on a structure, false work or utility, or when there is a two crane lift, or when a slider beam is used, the Contractor shall submit calculations which show that the proposed operation is safe and/or that the operation will not cause an overstress condition. The calculations and any supporting drawings or other information shall be stamped and signed by a currently registered New York State licensed Professional Engineer.

If a crane is utilized in a lifting operation, the operator shall present to the Engineer a valid New York State Certificate of Competence to operate a crane. If there are any other local crane license requirements, they too shall be presented to the Engineer. In addition, a copy of the annual inspection report of the crane shall be readily available and provided upon the Engineer's request.

Any discrepancies between the Lift Plan and the actual lift conditions shall be reported immediately to the Competent Person in charge of the lift operations and to the Engineer. The operation shall not proceed until all issues are resolved to the satisfaction of the Engineer.

Q. Confined Spaces. Confined spaces are defined as any space having limited means of

egress, which is subject to the accumulation of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined spaces include, but are not limited to: sanitary sewers, sanitary manholes and structures, drainage lines and drainage structures, underground utility vaults, enclosed bridge beams and heated enclosures. All personnel required to enter confined spaces shall be instructed as to the nature of the hazards, the necessary precautions and in the use of protective and emergency equipment required.

Fuel-fired heated enclosures are frequently constructed to provide the requirements for winter concrete placement or similar operations. The Contractor shall provide adequate ventilation to maintain acceptable air quality or conduct air quality monitoring when heaters are or have been operating prior to personnel entry. If acceptable air quality cannot be verified, then appropriate respirators shall be worn. No worker shall enter a confined, heated space unless that space can be ventilated or the worker removed from outside the enclosure if the worker is overcome by fumes. Particularly during off-shift hours, no worker shall enter an unventilated, heated enclosure unless another worker is present immediately outside the enclosure. All unnecessary combustibles and debris shall be removed from the enclosure and escape exits shall be provided so workers can escape safely if a fire starts, prior to heating.

R. Fire and Explosion Prevention. The Contractor shall ensure that combustibles do not accumulate. Flammable materials shall be handled and stored as required by OSHA regulations. "No Smoking" signs shall be posted and enforced wherever flammable materials are stored or used. Fire extinguishers shall be provided and maintained throughout the job site, in accordance with the requirements of 29 CFR 1926, Subpart F. Fires will be considered, as a minimum, a near-miss accident, and therefor shall be reported in accordance with existing reporting requirements.

During refueling, all possible sources of ignition, including, but not limited to sparks, open flames and electrical equipment shall be eliminated. Fuel containers shall be grounded to the tank to prevent static electrical sparks. A "No Smoking or Open Flame" sign shall be posted conspicuously in the vicinity of refueling operations.

Cutting and welding equipment shall be stored according to recognized safety standards. Any defective tanks or equipment shall be removed to a safe storage area immediately until repairs are made. When cutting or burning is underway, steps shall be taken to ensure that sparks do not ignite combustibles.

S. Pavement Striping. The Contractor's striping safety procedures shall be spelled out, as appropriate, in the Project Safety and Health Plan. For polyester striping operations, specific procedures for the safe handling and storage of MEKP (organic peroxides) shall be addressed in the Contractor's project safety and health plan. The equipment shall be carefully inspected by a person knowledgeable about striping operations and trained on safe operating and emergency procedures prior to the start of work to ensure safety features are in place. All appropriate Material Safety Data Sheets and safety operations manuals shall be present in the cab of the striper at all times. All required placards and warnings shall be in place and clearly legible at all times.

107-06 INSURANCE. The Contractor shall procure and maintain at its own expense and without expense to the State, until final acceptance by the State, of the work covered by the contract, insurance for liability for damages imposed by law, of the kinds and in the amounts hereinafter provided, with insurance companies authorized to do such business in the State covering all operations under the contract whether performed by it or its subcontractors. Before commencing the work the Contractor shall furnish to the Commissioner a certificate or certificates of insurance in form satisfactory to the Commissioner showing that it has complied with this paragraph, which certificate or certificates shall provide that the policies shall not be changed or canceled until thirty (30) days written notice has been given to the Commissioner. All policies supplied under the provisions of this Section shall be endorsed to provide for the above 30 day written notice of cancellation or change provisions. The types of insurance are as follows:

If the Contractor elects to use the same policy for more than one project, it must provide with the insurance certificate the Aggregate Limits of Insurance (per project) Endorsement indicating the specific project site and contract number;

5. Commercial General Liability (Premises, Existence, Hazard) Insurance (formerly called Owner's, Landlord's and Tenant's Liability Insurance) issued to and covering the liability for damages imposed by law upon The People of the State of New York, the State of New York and the Commissioner of Transportation and all employees of the Commissioner of Transportation both officially and personally, any municipality in which the work is being performed, and/or any public benefit corporation, railroad, or public utility whose property or facilities are affected by the work or any consultant inspecting engineer or inspector working for or on the project, and their agents or employees, with respect to temporarily opening any portion of the State construction project under this agreement, until the construction or reconstruction pursuant to the agreement has been accepted by the State. Specifically, this includes, but is not necessarily limited to the PARTIES LISTED IN THE PROPOSAL.

Failure to list a firm, organization or municipality, etc. does not eliminate the requirement to provide such coverage. This coverage will not be required for contracts involving only turf establishment, landscaping, or traffic signals, which do not involve work on the roadway.

6. Automobile Liability and Property Damage Insurance. A policy covering the use in connection with the work covered by the Contract Documents of all owned, non-owned and hired vehicles bearing, or, under the circumstances under which they are being used, required by the Motor Vehicle Laws of the State of New York to bear license plates.

107-07 PROTECTION OF UNDERGROUND FACILITIES. All costs associated with verification of the location of underground facilities pursuant to 16 NYCRR 753, Protection of Underground Facilities, as amended, shall be included in the prices bid for the respective contract items involved unless separate payment is otherwise provided for in the contract. The Contractor shall provide access to Public Service Commission personnel to examine and inspect excavation and demolition methods used within 4.5m (15 feet) in any direction of any underground facility.

A. One-Call. Pursuant to 16 NYCRR 753, Protection of Underground Facilities, prior to non-emergency excavation, subsurface exploration of any kind, or installation below existing grade, including, but not limited to; digging, auguring, backfilling, boring, drilling, excavation, grading, jackhammering, pipe jacking, pavement milling, pile driving, plowing in, pulling in, sawcutting, tree root removal, trenching, tunneling and the installation of guiderail posts, sign posts, fence posts or underground conduit, the One-Call notification system shall be notified of the date and location of the proposed work. The Contractor shall contact the One-Call notification system serving the area a minimum of 2 days and a maximum of 10 days, not including the date of the call, prior to work. The Contractor shall mark proposed locations of excavation, or other activity listed above, with white paint, white stakes or other indications as agreed to by the Utilities to facilitate the work of underground utility designation. Utilities that do not belong to the One-Call notification system shall be contacted separately. The Town, City or County may be contacted to obtain a list of Utilities. If additional work is required, and staking, marking or other designation has been lost, the Contractor shall contact the One-Call notification system for subsequent designation. If an underground facility has been designated, but the Contractor cannot physically locate the facility, the Utility shall be notified, so that the designation can be verified. If an unmarked or unknown facility is discovered during the course of the Contractor's operations, the Utility or suspected Utility shall be notified. If the owner cannot be determined, the One-Call notification system shall be notified. The Contractor shall support and protect from damage all exposed underground

facilities. The Contractor shall notify the Engineer of any accidental contact with or potential damage to any underground facility, regardless of whether the damage is visible or not.

The Contractor shall provide to the Engineer, in writing, the information provided to the One-Call notification system, or the Utility if it is not a One-Call notification system member, and the control number issued for each call placed to request designation of underground facilities. The Contractor shall protect and preserve designations until no longer required for safe work near the underground facility.

The Contractor shall identify and provide to all work site supervisors and equipment operators, a list of emergency phone numbers for each Utility having facilities within the project limits. Supervisors shall periodically review the location of underground facilities with all workers who are subject to exposure, including new employees. If the Contractor fails to notify the One-Call notification system or a non-member Utility prior to excavation or activity listed above, a Stop Work Order will be issued in accordance with the provisions of §105-01. Prior to lifting the Stop Work Order, the Department will consider convening a show cause meeting, at its convenience, to consider possible worker dismissal in accordance with §105-08 or contract termination in accordance with Article 11 of the Standard Agreement.

B. Verification. Pursuant to 16 NYCRR 753, Protection of Underground Facilities, the Contractor shall verify precise location, size, depth and direction of run of an underground facility or its encasement, by hand shovel or vacuum excavation, prior to the use of powered equipment or the installation of any proposed work, including the projected line of a trenchless installation such as boring or drilling, within the tolerance zone. Powered equipment may be used to remove pavement or masonry within the tolerance zone, but only to the depth of such pavement or masonry. Powered equipment shall not be used within 100 mm of the verified location of an underground facility.

C. Contact or Damage. Pursuant to 16 NYCRR 753, Protection of Underground Facilities, the Contractor shall, in the event of contact or damage to an underground facility, immediately notify the Utility and the Engineer, suspend excavation or demolition in the immediate vicinity of the contacted or damaged facility and take such emergency actions as are warranted to protect all endangered persons to the best of its ability.

D. Pressure Pipes. Pressure pipes shall not be pressurized without being adequately restrained against movement, and no personnel shall be allowed in a trench or area containing a pressure pipe during initial pressurization until the pipe has been fully pressurized. Particular attention shall be paid to fittings and bends that create a thrust, which, if improperly restrained, may cause the pipe joints to separate and injure nearby personnel.

107-08 PRESERVATION OF PROPERTY. It is the intent of this specification that the Contractor protect and preserve all public and private property including all existing vegetation, existing landscape features and monuments within, along and adjacent to the highway right-of-way. The Contractor shall use every precaution necessary and perform the work as specified, in a manner approved by the Engineer, to prevent damage, injury, pollution or destruction; shall protect all trees and other woody plants which are to remain; shall take special care to protect the natural vegetation and surroundings including all natural drainageways, ponds, lakes, swamps, woods and fields, shall store materials in such a manner as to prevent leaching which would be injurious to soils and to plants; shall repair all injuries to woody plants, which are to remain, by approved horticultural methods; and shall scarify the compacted soil and regrade as directed to restore the property to a natural condition.

The Contractor shall also use suitable precaution necessary to prevent damage to pipes, conduits and other underground structures, and protect carefully from disturbance or damage all land monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

the area. In the event the Contractor removes material from such an area without the written approval of the Regional Director, payment will not be made for any item of work in which the material has been used. Grading plans may be required for such areas and due consideration given to the appearance of the areas if they are visible from any highway.

All of this restoration shall be accomplished prior to acceptance of the contract except that work of restoring Contractor's work areas (storage, batching, equipment, shop areas, etc.) may be done after the official acceptance of the contract but must be completed prior to the final release of retained funds.

Since the extent of such areas and the use and treatment during construction is within the discretion of the Contractor, within the limitations and requirements outlined, no payment will be made for any labor, material or equipment necessary for the restoration of these areas. The cost of the work shall be included in the amount bid for other items of work. Any work done shall, in general, be in accordance with the Department's specifications for similar items of work and/or as specified by the Engineer.

In the event the Contractor carries on any operation on the referenced areas without written approval of the Regional Director and/or Engineer no payment will be made for any item in the contract involved in any way with any operation on the unapproved area.

107-11 RESTORATION OF DISTURBED AREAS WITHIN THE RIGHT-OF-WAY. It is the intent of this specification that all disturbed areas within the right-of-way but outside of the work limits be restored to a pleasing and acceptable condition as specified and as satisfactory to the Engineer. For the purposes of this section the work limits shall include the road section plus a reasonable work area at top of cut and toe of fill as determined by the Engineer.

Where a pay item for turf establishment is not included in the contract, disturbed earth areas within the work limits shall be graded in a manner approved by the Engineer and seeded as specified for the standard turf establishment item. The cost of this work shall be included in the prices bid for the various items in the contract and no separate payment shall be made therefor.

The Contractor shall obtain the written permission of the Engineer before beginning the use of any area within the right-of-way, but outside the work limits as noted in the preceding paragraph. Where deemed necessary by the Engineer, the Contractor shall submit, as part of the request for approval, a grading plan showing the proposed final grading of the area. If in the opinion of the Engineer, the area is not adaptable to acceptable restoration or if serious or permanent ecological damage is foreseeable, approval shall not be given. This specification applies to areas such as, but not limited to, borrow pits or areas, spoil or waste areas, haul roads, storage areas, batching areas, water points, equipment storage areas, shop areas and similar areas.

In general, the restoration shall include:

A. The removal of all equipment and parts, junk, rubbish, excess materials and debris of all kind;
B. Clean up as required, grading as shown if a grading plan has been prepared or graded so as to blend into the surrounding ground forms to the satisfaction of the Engineer;
C. Scarification of storage yards, batching sites, haul roads, etc., to the depth of the compaction as determined by the Engineer;
D. The removal of pavement or granular surfacing from temporary roads or areas as required by the Engineer;
E. The repair or removal of damaged trees and the fertilizing, turf establishment and mulching of the areas as provided for in the contract or as directed by the Engineer.

Areas within sight of the finished highway or any other highway will require particular attention insofar as the above features are concerned. It is the intent to have all such areas present a pleasing appearance to travelers on any highway.

All of this restoration shall be accomplished prior to acceptance of the contract except that work of restoring Contractor's work areas (storage, batching, equipment, shop areas, etc.) may be done after the official acceptance of the contract but must be completed prior to the final release of the retained funds.

No payment will be made for any labor, material or equipment necessary for the restoration of disturbed areas which extend beyond the work limits. The cost of such work shall be included in the price bid for the various items of the contract. All work shall be in accordance with the Department's specifications for similar items of work and/or as specified by the Engineer.

107-12 WATER QUALITY PROTECTION. The Contractor shall protect all water resources within the project limits and take measures to maintain water quality of receiving water bodies. The Contractor shall schedule and conduct its work to minimize soil erosion and to prevent turbidity in water bodies and sedimentation on lands adjacent to or affected by the work. Construction of temporary soil erosion and sedimentation control measures, temporary and permanent soil stabilization, construction of drainage facilities and performance of other contract work which will contribute to the control of erosion and sedimentation shall be carried out in conjunction with related construction operations. The area of unprotected soil exposed at any one time by construction operations shall be kept to a minimum and shall not exceed the limits established in the contract documents or applicable permits.

Prior to the start of related construction, the Contractor shall review the erosion and sedimentation control plan included in the contract documents and, if necessary, modify the plan for compatibility with the Contractor's intended sequence of construction operations. The modified erosion and sedimentation control plan shall be submitted to the Engineer for approval , along with a project schedule for accomplishment of temporary and permanent erosion and sedimentation control work in accordance with §108-01. The Contractor shall also submit for approval at the same time a proposed plan of erosion and sedimentation control on material storage areas, haul roads and borrow pits and a plan for disposal of surplus excavated materials. The Contractor's erosion and sedimentation control plan shall be prepared in accordance with the technical requirements contained in the "New York Guidelines for Urban Erosion and Sediment Control", latest edition, printed by the Empire State Chapter, Soil and Water Conservation Society, c/o Cayuga County SWCD, 7413 County House Road, Auburn, New York 13021. No related work shall be started until the erosion and sedimentation control plans and project schedules have been approved by the Engineer. If conditions change during construction or work is not progressed in accordance with the schedule, the Contractor shall submit a project schedule update in accordance with §108-01 and an updated erosion and sedimentation control plan, if necessary, for approval by the Engineer.

The Contractor's operations shall be carried out in accordance with the approved erosion and sedimentation control plans and project schedule, the contract documents and permits. The Contractor shall be guided by, but not limited to, the following:

A. Permits. All applicable statutes, regulations, permits and approvals of the N.Y.S.D.E.C., other water quality management agencies and fish and wildlife agencies shall be complied with in the performance of the contract. Care shall be taken so as not to cause turbidity that will result in a visible contrast to the natural conditions of a waterway or impoundment, cause sedimentation or impair the waters for their best usages.

B. Borrow Spoil or Waste Areas. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be controlled both during and after completion of the work, so that erosion will be minimized and sediment will not enter waterways, impoundments or adjacent properties. Waste or spoil areas and construction roads shall be located, constructed and maintained in a manner that will prevent sediment from entering waterways and impoundments.

The Contractor shall submit grading plans for all borrow pits or areas, spoil or waste areas to the Engineer for approval prior to the start of work on or use of such areas. The grading plans shall indicate the sequence of operations, temporary slopes, and the erosion and sedimentation control plans for each construction operation.

107-14 FURNISHING RIGHT-OF-WAY. The Department will secure all rights-of-way in advance of construction. Any exception will be indicated prior to the award of the contract.

The Contractor shall not enter upon any parcel until the proper rights of entry have been obtained.

The Contractor's attention is directed to the fact that Permanent Easements (P.E.), Temporary Easements (T.E.) and Temporary Occupancies (T.O.) are obtained by the Department for specific construction purposes. Contractors should not anticipate unlimited usage of such areas and must confine construction activities to such purposes as are specifically described in the ROW appropriation maps and/or as shown on the plans unless separate agreements are made between the Contractor and the landowner permitting other usage of such areas. Such limitations and related costs shall be reflected in the bid prices.

107-15 AIR QUALITY PROTECTION. The Contractor shall schedule and conduct activities to minimize impacts to air quality and to prevent hazardous or objectionable air quality conditions within the project limits and in areas adjacent to or affected by the work. The Engineer will suspend the performance of any construction activity that creates hazardous or objectionable air quality conditions until the unsatisfactory condition has been corrected.

A. Dust. The Contractor shall apply pro-active measures to prevent discharge of dust into the atmosphere that unreasonably interferes with the comfortable enjoyment of life and property or is harmful to plants or animals.

B. Burning. Any material generated by any activity for the development, modification and construction of any transportation facility shall not be burned on the contract site. This shall include but not be limited to products of land clearing and demolition.

C. Prevention. The Contractor shall employ appropriate protection techniques and/or systems to prevent hazardous or objectionable air quality conditions, particularly when conducting drilling, cutting, grinding, abrasive blasting or similar operations that impact air quality.

107-16 SOLID WASTE MANAGEMENT. The Contractor shall manage all waste generated in the performance of the contract in accordance with applicable federal, state, and local laws and regulations. Nothing herein is intended to prevent the Contractor from removing waste materials to appropriate off-site locations for beneficial reuse, recovery, or recycling purposes. The Contractor is encouraged to reuse, salvage or recycle excess materials to the maximum extent possible.

Solid Waste Management shall mean the collection, transportation, transfer, processing, recovery, storage, reclamation, treatment, handling and disposal of the waste whether performed directly by the Contractor or others. Unless otherwise noted in the contract documents, all materials or substances that are spent, useless, worthless, or in excess to the Department, including materials generated on-site by the Department's project supervision and inspection activities are considered to be waste.

Unless specifically noted in the contract documents, it is not expected that on-site landfill of regulated wastes will be allowed within the project limits. Payment for proper solid waste management is included in the various pay items. The absence or unavailability of disposal sites on the project or the refusal of a legally permitted solid waste management facility to accept waste shall not be the basis of a claim for additional compensation by the Contractor for the necessary and appropriate off-site disposal of wastes.

A. Construction and Demolition Debris. Construction and demolition debris (C&D) is uncontaminated solid waste resulting from land clearing and from the construction, remodeling, repair and demolition of utilities, structures, and roads. C&D debris includes, but is not limited to: uncontaminated concrete, asphalt pavement, brick, soil, rock, glass, wood (including painted, treated and coated wood and wood products), land clearing debris, plumbing fixtures, electrical wiring, electrical components containing no hazardous liquids, nonfriable asbestos, wall coverings, plaster, drywall, roofing shingles and other roof coverings and pipes or metal attached to or

embedded in these waste materials. Reinforcing steel embedded in concrete is considered an incidental metal and is included within the definition of concrete. Wastes may be presumed uncontaminated absent records, existing data, or knowledge/observation to the contrary. The term soil normally includes uncontaminated soil materials generated by the cleaning of ditches, drainage culverts, storm sewers, catch basins, and related appurtenances, and sweeping streets. Wood chips used for mulch, landscaping, or erosion control purposes are not solid waste. Construction and demolition debris may be disposed of in a C&D landfill or processing facility.

Construction and demolition debris limited to uncontaminated concrete, asphalt pavement, brick, glass, soil, and rock and may be buried on property owned by the Department in accordance with the requirements of §203-3.08 Disposal of Surplus Excavated Materials or §203–3.10 Embankments and §107-11 Restoration of Disturbed Areas Within the Right-of-Way. These wastes may also be disposed of at an off-site facility exempt from permit requirements that operates only between the hours of sunrise and sunset and takes no compensation, fee or other form of consideration. Exempt C&D debris shall not be pulverized, shredded, or otherwise processed such that the individual waste components are rendered unrecognizable.

Trees, stumps, wood chips and yard waste generated from activities within the right of way shall be segregated from other exempt wastes when buried. These wastes may be buried on property owned by the Department in accordance with the requirements of §203-3.08 Disposal of Surplus Excavated Materials and §107-11 Restoration of Disturbed Areas Within the Right-of-Way.

All disposal within the Right-of-Way shall be subject to the approval of the location, final condition and appearance by the Engineer. The Department makes no assurance that appropriate areas for the disposal of these wastes will be available for any individual project. If no disposal area is available within the Right-of-Way, the Contractor shall dispose of these wastes at an appropriately permitted C&D debris facility.

In Nassau and Suffolk Counties all construction and demolition debris shall be disposed of only in a C&D landfill or processing facility permitted by the New York State Department of Environmental Conservation (NYSDEC). In addition to the requirements of these specifications, no on-site disposal shall take place in these counties without appropriate notice to the Regional Office of the NYSDEC. In the Adirondack Park, construction and demolition debris shall only be deposited in a landfill under a permit issued by the Adirondack Park Agency.

B. Non-Hazardous Solid Waste. Non-hazardous solid waste includes, but is not limited to: office trash, garbage and roadside litter. The Contractor may collect and store non-hazardous solid waste on the project site in transfer containers or other appropriate containers pending transportation to a legally permitted solid waste management facility. The Contractor shall meet the following conditions:

- Waste management activities shall be controlled to prevent odors and other nuisance conditions.
- Putrescible solid waste shall be removed when transfer containers are full, or weekly, whichever comes first.
- Non-putrescible solid waste may be collected and stored on the site in a transfer or other appropriate container not longer than 45 days.

C. Non-Hazardous Industrial Waste. Non-hazardous industrial waste includes, but is not limited to: friable asbestos, pavement marking waste, petroleum contaminated soil, appliances, tires, empty drums and empty fuel tanks. These wastes require disposal at permitted solid waste management facilities or may be used in applications that have received generic or case-specific beneficial use determinations from the NYSDEC. Transport of these wastes off site in shipments exceeding 220 kilograms requires a waste transporter permit issued by NYSDEC.

1. Asbestos. Friable and nonfriable asbestos containing materials (ACM) shall only be

handled or packaged for disposal by a Department of Labor (NYSDOL) certified asbestos handler. Friable asbestos waste shall only be transported by a permitted waste transporter under a waste shipment record and disposed of at a permitted waste management facility approved for friable asbestos.

2. Pavement Marking Wastes. Removed pavement markings, including the pavement material and debris containing the removed markings shall be disposed of as industrial solid waste, at permitted facilities, typically a municipal landfill. Asphalt and cement concrete containing incidental markings, however, are considered C&D and shall be disposed of accordingly. Pavement marking waste should be collected by typical construction methods such as sweeping and/or vacuuming. A permitted waste transporter is required for transport of over 500 pounds of waste within a single load to a disposal facility. Yellow pavement marking products can contain lead and chromium in the pigments. Testing by the Department of yellow marking waste debris indicated that although it contains lead and chromium, it did not meet the regulatory limit (leaching potential by the toxicity characteristic leaching potential (TCLP) test) for classification as a hazardous waste and would therefore be considered a non-hazardous industrial waste.

Pavement marking wastes, including millings with adhering pavement material and road debris generated by cleaning and removal operations are non-hazardous industrial solid waste and shall be disposed of at permitted solid waste management facilities. Pavement marking wastes shall be collected for disposal by typical construction methods such as sweeping and/or vacuuming.

Yellow pavement marking products may contain lead and chromium in the pigments, and solid waste management facilities may question whether pavement marking wastes are regulated hazardous wastes. Through analytical testing and knowledge of the waste, the Department has determined that pavement marking wastes, as well as the dried pure paint samples, are not hazardous wastes.

3. Petroleum Contaminated Soil. Petroleum contaminated soil shall be disposed of as non-hazardous industrial waste at a permitted solid waste management facility or used in applications that have received generic or case-specific beneficial use determinations from the NYSDEC.

4. Empty Drums or Containers that Previously Held a Known Hazardous Material. In accordance with 6 NYCRR Part 371.1(h), drums and containers that have had the contents removed by common practices, have less than 25 mm of product residue on the bottom, and less than 3% of the original product are considered "empty" and nonhazardous, even if the material they previously contained would otherwise have been classified as a hazardous waste. This does not apply to drums or containers that held acutely hazardous wastes. Empty drums and containers shall be recycled or disposed of at a permitted waste management facility. Empty containers may be returned to the manufacturer, sent to a reconditioner or handled as scrap metal, cardboard, etc. and are exempt from waste transporter requirements when destined for such reuse.

D. Hazardous Waste. Hazardous wastes are those wastes that are specifically "listed wastes" per 6 NYCRR 371 and/or those that display hazardous wastes characteristics for ignitability, corrosivity, reactivity and/or toxicity.

1. Generator Status. Unless specifically noted otherwise in the contract documents, the Department will require generation of more than 100 kg of hazardous waste per month to be included in the definition of, and compliance with the regulations governing, a Large Quantity Generator.

a. Conditionally Exempt Small Quantity Generators (CESQG). Federal and State

hazardous waste regulations classify a CESQG as one that generates less than 100 kilograms of hazardous waste per month and stores less than 1,000 kilograms of hazardous waste.

b. Small Quantity Generator (SQG). Federal and State hazardous waste regulations classify an SQG as one that generates between 100 and 1,000 kilograms of hazardous waste per month and stores less than 6,000 kilograms of hazardous waste.

c. Large Quantity Generator (LQG). Federal and State hazardous waste regulations classify an LQG as one that generates more than 1000 kg of hazardous waste per month.

2. Hazardous Waste Requirements. The Contractor shall meet the following hazardous waste requirements:

a. Waste shall be properly packaged, with a written description and labeled as hazardous.

b. Waste shall be inspected at least weekly while stored on site.

c. Waste shall be shipped by a permitted waste transporter with a hazardous waste manifest and required documentation.

d. Waste shall be disposed of at a permitted hazardous waste treatment/disposal facility.

e. Waste shall be removed within 90 days after generation, unless a specific item requires removal sooner.

f. Hazardous waste shall be stored on the site of generation until manifested and shipped for disposal. The only exceptions for this are for CESQG wastes which may be temporarily relocated to non-permitted facilities.

g. Preparedness and prevention features and contingency planning and emergency procedures shall be developed as per 6 NYCRR 373-3.3 and 373-3.4, respectively.

h. Personnel must be trained in hazardous waste management procedures relevant to the positions in which they are employed.

i. Appropriate security shall be provided for hazardous wastes while stored on site.

SECTION 108 - PROSECUTION AND PROGRESS

108-01 START AND PROGRESS OF WORK.

A. Project Schedule. The contractor shall within five days after date of commencement of work, or within such time as determined by the Regional Director, prepare and submit to the Engineer for approval, a progress schedule showing the order in which the contractor proposes to carry on the work, the date on which it will start the major items of work (including but not limited to excavation, drainage, paving, structures, mobilization, soil erosion and sediment control, etc.) and the critical features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The chart shall show the order in which the contractor proposes to carry on the work. The chart shall be in a suitable scale to indicate graphically the total percentage of work scheduled to be completed at any time. The Department may require that the progress schedule, at a minimum, include the following items: (a) major work items and activities to be performed; (b) seasonal weather limitations; (c) time and money curve, and (d) phase duration or milestone events, if applicable.

The purpose of this scheduling requirement is to ensure adequate planning and execution of the work and to evaluate the progress of the work.

Approval of the progress schedule shall not be construed to imply approval of any particular method or sequence of construction or to relieve the Contractor of providing sufficient materials, equipment and labor to guarantee completion of the project in accordance with the contract proposal, plans and specifications. Such schedule may be utilized to facilitate the State's inspection and coordination of construction activities. Approval shall not be construed to modify or amend the agreement or the date of completion therein.

At the end of each payment estimate period, or at such intervals as directed by the Engineer,

Section 200
EARTHWORK

SECTION 201 - CLEARING AND GRUBBING

201-1 DESCRIPTION

201-1.01 General. This work shall consist of clearing, grubbing, removing and disposing of all trees, brush, stumps, fences, debris, and miscellaneous structures not covered under other contract items within the construction area and such other areas as specified or directed. The Contractor shall clear such additional areas within the limits of the right-of-way and easement lines as specified or directed.

201-1.02 No Burning Requirement. Materials generated by the work, including construction and demolition debris, shall not be disposed of by burning on or off the site. Off site burning in a permitted solid waste incinerator or in another lawful manner as refuse derived fuel will be permitted.

201-2 MATERIALS (Not specified)

201-3 CONSTRUCTION DETAILS

201-3.01 Limits of Work Areas. The Engineer will establish the limits of areas to be cleared and grubbed, to be cleared but not grubbed, or areas, objects or features that are designated to remain undisturbed. In general, the work areas shall include the road section, stream channels, ditches, temporary approaches to bridges, detours and other areas as shown in the contract documents or directed by the Engineer. The Engineer will designate fences, structures, debris, trees and brush to be cleared where grubbing is not required. Clearing beyond the areas of construction shall be done only where specified or directed.

201-3.02 Clearing and Grubbing. During the life of the contract the Engineer may order the clearing of any trees within the R.O.W. that the Engineer determines to be hazardous or dead and unsightly.

The Contractor shall carefully prune all branches of trees less than five (5) meters above any part of the roadway and all branches which have been broken or injured during construction. The work shall be done as specified under §614-3.01A Equipment and B. Pruning.

Whenever trees are felled or trimmed on/or adjacent to highways, all wood shall be immediately removed from the roadway or any area that would present a hazard to traffic. Grubbed stumps shall be moved immediately at least ten (10) meters from the edge of pavement. No trees, tree trunks, stumps or other debris shall be felled, sidecast or placed outside the limits of the road section. No grubbing will be required beneath the embankment where the finished grade will be two (2) meters or more above the original ground surface unless otherwise specified in the contract documents. Where trees or existing stumps are cleared and grubbing is not required, the tree trunk or existing stump shall be cut off not more than 150 mm above the original ground surface unless otherwise approved. Exposed stumps not required to be removed but which are within ten (10) meters of the edge of the pavement or are in a built-up area shall be chipped out to a depth of not less than 150 mm below the finished grade and the holes backfilled if directed by the Engineer. This work shall be completed within one week after start of work on the tree.

201-3.03 Disposal

A. General. All wood including grubbed stumps shall be removed from the contract site or otherwise disposed of.

B. Methods of Disposal of Wood and Brush.

1. Disposal (No Burning). All wood and brush shall be disposed of within fifteen (15) days after cutting or felling unless otherwise approved. No burning of land clearing materials that result from the clearing and grubbing operations, except in a permitted solid waste incinerator or as refuse derived fuel, will be permitted. The Contractor will have the following options or combination of options for disposal of this material:

a. The Contractor shall make every effort to salvage marketable timber as specified in paragraph B4 of this subsection.

b. When permitted by a note in the contract documents, disposable material may be placed at locations approved by the Engineer within the right-of-way but outside of the embankment area.

When permitted by a note in the contract documents, disposable material may be placed in the embankment side slope area. The contract documents will define the embankment side slope area and the procedures for the concurrent construction of the embankment and disposal section.

This type of disposal will require certain preparatory work. Preparation for direct burial of woody materials shall consist of cutting main trunks and limbs and chipping smaller limbs, branches, foliage and brush. Under conditions when disposal space and earth cover are limited in size and quantity, stumps will have to be ranked in size and placed in layers so as to make best use of the space available and the quantity of materials to be buried.

c. The Contractor may bury disposable material off the right-of-way at locations obtained by the Contractor at no expense to the State. Such locations are to be approved in writing by the Engineer. The disposal work will require the same preparatory work as stated in option b. above except that the Engineer may waive such requirements for miscellaneous work which may be accommodated in a satisfactory manner by other methods. The disposal area is to be covered with earth as hereinafter specified.

d. The Contractor may reduce all woody materials to chips and dispose of the chips as specified in paragraph B2 of this subsection.

e. The material may be sent to a refuse derived fuel processing facility or to other processing facility for eventual beneficial re-use as fuel or for other lawful re-use.

Under no circumstances is disposal to be made in swamp or wet lands. When the disposal area is within the embankment section or is formed by flattening the embankment slopes, the elevation of the normal embankment construction shall always equal or exceed that of the disposal area. There is to be absolutely no end dumping of disposable material over the sides of the embankment. All disposal areas are to be finally covered with a minimum of 600 mm of earth and graded to drain properly.

2. Chipping. Wood may be reduced to chips by the use of an approved chipping machine or stump grinder. Chips shall be 15 mm maximum thickness or of other approved thicknesses. Chips resulting therefrom may be disposed of by being stockpiled and used as mulch for planting, by distribution on the ground surface in wooded areas within the right-of-way as approved by the Engineer, or by disposal at a location off the contract site satisfactory to the Engineer.

3. Burying. No tree trunks, stumps or other debris shall be buried inside the right-of-way limits without the written approval of the Engineer. Disposal areas outside the right-of-way limits shall be approved in writing by the Engineer and shall be acquired by the Contractor at no expense to the State.

4. Salvage of Marketable Timber. In the interest of conservation, the Contractor shall make

every effort possible to salvage marketable timber produced as a result of clearing operations, provided the amount of timber is great enough to make the hauling practical. In general, marketable timber is construed to mean logs 2.5 to 5 m in length, plus appropriate trimming allowance, having a diameter inside the bark, at the small end, of approximately 250 mm. In the event that the Contractor is not successful in salvaging marketable timber, the Contractor shall advise the Engineer, in writing, of the efforts to salvage and indicate the reason why the timber could not be salvaged.

Any wood that is cut up in firewood lengths or other marketable lengths may be neatly piled adjacent to the right-of-way in an area provided by the Contractor for periods in excess of one week but shall be removed prior to completion of the contract.

201-3.04 Protection and Restoration. The Contractor shall comply with the following specification requirements of Section 107, Legal Relations and Responsibilities to Public; 107-08, Preservation of Property; 107-10, Restoration of Disturbed Areas Outside the Right-of-Way, 107-11, Restoration of Disturbed Areas Within the Right-of-Way.

201-4 METHOD OF MEASUREMENT

201-4.01 Per Hectare. Payment for Clearing and Grubbing will be made at the unit price bid per hectare computed to the nearest one one hundredth hectare.

201-4.02 Per Lump Sum. Payment for Clearing and Grubbing will be made on a lump sum basis for work satisfactorily completed. Monthly payments will be made in proportion to the amount of work done as determined by the Engineer.

201-4.03 Borrow Areas. Borrow pits or other pit areas from which material is secured shall not be included for measurement of clearing and grubbing.

201-5 BASIS OF PAYMENT.

201-5.01 Clearing and Grubbing. Payment will be made at the contract price to furnish all materials, labor and equipment necessary to satisfactorily complete the work as specified. No separate payment will be made for any excavation, backfill or earth cover necessary to complete the work of disposal outside the embankment area nor for the work in handling, storing, rehandling and hauling of disposable material within or outside the right-of-way.

Payment will be made under:

Item No.	Item	Pay Unit
201.06 M	Clearing and Grubbing	Lump Sum
201.07 M	Clearing and Grubbing	Hectare

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

202-1 DESCRIPTION. This work shall consist of the removal and disposal, wholly or in part, of all buildings, structures, pavements, obsolete utility lines and tanks which are released to the Contractor in accordance with the provisions of these specifications. The work includes the demolition of existing superstructures, substructures, supporting bents and columns, surrounding material, and the removal of old bituminous concrete overlay and bituminous patches, within the right-of-way, listed in the itemized proposal, or directed by the Engineer. It also includes salvaging and storing designated materials, relocating designated buildings and backfilling resulting trenches, holes, pits, and cellars.

performed. The Engineer may order undercutting and backfill without proof rolling of any cut where the need for corrective work, as determined by the Engineer, is obvious without actual proof rolling. The Engineer may also delete proof rolling in any cut section where, based upon a written evaluation by a Departmental Geotechnical Engineer, proof rolling would be detrimental to the work.

203-3.15 Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables. The type of material to be used in bedding, filling and backfill at structures, culverts, pipes, conduit and direct burial cable and payment lines therefore shall be in conformance with the details shown on the appropriate Standard Sheet or as noted on the plans or as ordered by the Engineer. Do not use RAP. Do not use slabs or pieces of either concrete or asphalt .

Fill or backfill material at structures, culverts and pipes shall be deposited in horizontal layers not exceeding 150 mm in thickness prior to compaction. Compaction of each layer shall be as specified under §203-3.12, Compaction. A minimum of 95 percent of Standard Proctor Maximum Density will be required. When placing fill or backfill around culverts and pipes, layers shall be deposited to progressively bury the pipe or culvert to equal depths on both sides. When filling behind abutments and similar structures, all material shall be placed and compacted in front of the walls prior to placing fill behind the walls to a higher elevation. The limits to which this subsection will apply shall be in accordance with the Standard Sheets or as modified on the plans.

Fill or backfill for conduit or cable placed in a trench shall be carefully placed in a horizontal layer to a depth of 150 mm over the top of the conduit or cable. This layer of material shall not be compacted, however, the remaining portion of the trench shall be backfilled in accordance with the preceding paragraph. Where cables or conduits are placed and backfilled by a machine in one operation, the above requirements for backfilling do not apply.

Where sheeting has been used for the excavation, and incremental removal of sheeting is not specified in the plans or proposal, sheeting shall be pulled when the trench has been backfilled to the maximum unsupported trench depth allowed by 29 CFR 1926.

203-3.16 Borrow. The management of a borrow source and the acceptability of all borrow material shall be subject to the approval of the Engineer at all times. The Contractor shall notify the Engineer at least ten (10) work days in advance of opening any borrow area, and request approval of the source under the pay item involved. Test pits required by the Engineer to evaluate the acceptability and limits of the source, shall be provided by the Contractor at the Contractor's own expense. Concurrent removal of material for more than one pay item from a single source or pit shall be prohibited except with the written permission of, and under such conditions and restrictions as may be imposed by the Engineer. All borrow pits shall be stripped of sod, topsoil and vegetable matter well in advance of any working face. The minimum distance by which stripping shall lead excavation for a given source shall be established by the Engineer to suit local conditions. Where a borrow source is not under direct control of the Contractor or where special conditions exist, the Engineer may waive any of the above requirements and establish alternative provisions for the control and acceptability of borrow.

Ordinary borrow will be accepted for use where the material qualifies under the definition of Suitable Material, §203-1.08. The borrow of select granular materials enumerated in §203-2.02 shall be accepted subject to meeting the additional provisions contained, therein. All borrow, whether ordinary borrow or select borrow placed within the limits of Embankment or the Subgrade Area shall be placed in conformance with §203-3.10 or §203-3.11 respectively, as appropriate, or where used for fill or backfill at structures, culverts and pipes, in conformance with §203-3.15.

203-3.17 Select Granular Fill, Slope Protection. The Contractor shall perform the excavation in accordance with the requirements for "Unclassified Excavation and Disposal" as described elsewhere in these specifications. The Contractor shall then spread material conforming to the requirements given in §203-2.02D, in one layer to its full thickness by a method approved by the Engineer. The work shall

204.01M	Controlled Low Strength Material (CLSM)	Cubic Meter
204.02 M	Controlled Low strength Material (CLSM) (No Fly Ash)	Cubic Meter

SECTION 205 (VACANT)

SECTION 206 - TRENCH, CULVERT AND STRUCTURE EXCAVATION

206-1 DESCRIPTION

206-1.01 General. This work shall consist of the excavation of all materials and backfill or disposal of excavated material required for trenches, culverts, structures, conduit and direct burial cable not otherwise provided for in other sections of these specifications. All such excavation shall be unclassified excavation as defined in §203-1.01. The work shall also consist of all required protection necessary to ensure the safety of the workers and the public.

206-1.02 Trench and Culvert Excavation and Trench and Culvert Excavation - Original Grade (O.G.) The work specified under these items shall include the excavation for and backfill of all culverts, pipe lines, and other minor structures including but not limited to leaching basins, catch basins, field inlets, manholes and drop inlets.

206-1.03 Structure Excavation. The work specified under this item shall include the excavation for all bridge foundations, walls and other major structures and backfill of suitable excavated material if another item is not specified.

206-1.04 Conduit Excavation and Backfill including Surface Restoration. The work specified under this item shall include the excavation, necessary backfill and surface restoration required for conduits and direct burial cables.

206-1.05 Test Pits. The work specified under this item shall include the excavation and backfill of test pits at locations shown in the contract documents, or as directed by the Engineer. Excavation and backfill methods, limits and equipment used shall be approved by the Engineer. This work will not relieve the contractor of the responsibility to locate underground facilities as required under 16 NYCRR 753.

206-2 MATERIALS. (Not Specified).

206-3 CONSTRUCTION DETAILS

206-3.01 General. The appropriate construction details specified for "Excavation and Embankment" in §203-3.01 through and including §203-3.12, §203-3.15, and the requirements of "Legal Relations and Responsibility to Public" in Section107 shall apply to the work specified in this section.

The excavation shall be dewatered and kept free from water, snow and ice when necessary.

Special care shall be taken not to disturb the bottom of the excavation, and not to remove the material at final grade until just before the structure is placed.

The Contractor shall be responsible at all times for carrying out of all excavation operations in a safe and prudent manner so that the workers, the public, and adjacent public and private property will be protected from unreasonable hazard. Details and requirements of this protection shall conform to Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA) and §107-05 Safety and Health Requirements Paragraph F and §107-08 Preservation of Property. All applicable local, State and/or Federal requirements shall be observed and necessary permits acquired by the Contractor.

If no support or protective system is shown in the plans or proposal, the Contractor may open the

excavation with the sides sloped to a stable slope not steeper than that allowed by the Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA). Taking this option, however, does not relieve the Contractor of responsibilities as stated in this subsection. When the Contractor chooses this option, the materials used and method of construction outside the payment lines shall be in accordance with the requirements of this Section.

When excavation is required for the installation of conduit or direct burial cable, the Contractor shall notify the Engineer upon completion of the excavation. No conduit or cable shall be placed in the excavation until the Engineer has approved the depth and cross-section.

206-3.02 Replacement of Pavement Structure Courses. When the Contractor, in placing conduits, direct burial cable or utilities, excavates into the pavement, subgrade, subbase, or shoulder courses, such courses must be replaced in kind, character and condition, to maintain a uniform road section.

206-3.03 Disposal of Excavated Material. The provisions of §203-3.06 and/or §203-3.07 shall apply to all material excavated under this section which is not used as backfill.

206-3.04 Test Pits. The Contractor shall excavate and backfill test pits in order to determine existing underground utility type, size and/or condition where new utility connections to existing facilities are proposed. The Contractor shall excavate and backfill test pits in a manner approved by the Engineer that prevents damage to wrappings, coatings or other protective coverings, such as by hand digging, vacuum excavation or similar non-destructive locating equipment. The limits of the excavation shall be those sufficient to determine existing utility type, size and/or condition.

206-4 METHOD OF MEASUREMENT

206-4.01 General. The quantity of excavation shall be the number of cubic meters of material computed from payment lines shown on the plans or the appropriate standard sheets, except where revised payment lines are established by the Engineer prior to performing the work. Work performed beyond any designated payment line will not be included in the computation of quantities for the item involved.

206-4.02 Trench and Culvert Excavation. Unless otherwise shown or indicated on the contract plans, payment lines for excavation of pipe and culvert lines, and minor structures will be determined as follows:

A. Bottom Payment Line. The elevation of the bottom payment line shall be the invert elevation of the pipe, conduit, or culvert. For pipes, conduits, or culverts of nominal horizontal dimensions of 300 to 3700 mm, the width of the excavations at the bottom payment line shall be the nominal inside horizontal dimension of the pipe, conduit, or culvert plus 1.2 m, or three (3) times the nominal inside horizontal dimension, whichever is less; for pipes with a nominal horizontal dimension greater than 3700 mm the width will be as shown on the appropriate standard sheets or in the contract documents. For concrete pipe, twice the minimum wall thickness shall be added to the preceding.

B. Top Payment Line. Except when otherwise provided in the contract, the payment line in a cut section shall be the surface at the centerline of the pipe, culvert or conduit after completion of the general excavation and prior to excavation to place material paid for under another item of the contract; except that, when an undercut is made for unstable conditions, the payment line will be at the top of the undercut backfill. The payment line in a fill section shall be the ground surface prior to commencing work on the contract.

C. Side Payment Lines. The side payment lines of the excavation shall be vertical to the bottom of payment line, regardless of whether sheeting is or is not required or used.

For utility lines, exclusive of conduit and cable lines, of less than 300 mm diameter, the excavation width shall be the actual bottom width necessary, as determined by the Engineer, to properly perform the installation work required, or 1 m, whichever is less.

D. Payment Lines for Minor Structures. Payment lines for minor structures shall be vertical from the bottom of the footing and shall extend out 0.6 m from the perimeter of the structure footing. The top payment line shall be the same as for (B) above.

206-4.03 Conduit Excavation and Backfill including Surface Restoration. The quantity of conduit and/or cable excavation and backfill including surface restoration for payment shall be the number of linear meters measured along the center of the conduit and/or cable placed, in accordance with the methods stated below.

Wherever a pair or group of conduits and/or cables are physically connected together, they shall be considered as a single conduit and/or cable.

A. Wherever conduit and/or cable in the same trench are physically separated laterally by 150 mm or more between centerlines, as shown on the plans or as directed by the Engineer, the linear meter measurement shall be made along the center of each conduit and/or cable.

B. Wherever a pair or group of conduits and/or cable in the same trench are physically separated laterally by less than 150 mm between centerlines of adjacent conduit and/or cable, as shown on the plans or as directed by the Engineer, the linear meter measurement for those conduits and/or cable shall be made along the center of that pair or group of conduit and/or cables.

206-4.04 Trench and Culvert Excavation - O.G. The provisions of §206-4.02 Trench and Culvert Excavation shall apply, except the top payment line shall be the existing ground surface at the centerline of the pipe, culvert or conduit prior to commencing work on the contract.

206-4.05 Test Pits. The quantity to be measured for payment will be the number of test holes excavated and backfilled in accordance with the contract documents.

206-5 BASIS OF PAYMENT

206-5.01 Trench, Culvert and Structure Excavation. The unit price bid for this work shall include the cost of labor, materials and equipment required to satisfactorily complete the work, including the costs of excavation, backfill (except select backfill paid for separately), disposal of excavated material, presplitting rock excavations where required, and keeping the site dewatered and free from earth, water, ice and snow when necessary.

The cost for necessary guarding and protection required to protect the public from open trenches and, that required for the protection to ensure the safety of the workers shall be included in the bid price for Trench, Culvert and Structure Excavation. Progress payments will be made after the excavation has been completed, and prior to the completion of other work included under this item, including but not limited to pumping, fencing and backfilling. Payment will be made, at the unit price bid, for 75% of the quantity excavated within the prescribed payment lines. The balance of the quantity excavated will be paid for upon proper completion of backfill placement.

If the Contractor chooses the slope layback option to satisfy OSHA, no extra payment will be made for the cost of any labor, equipment or material necessary to restore the area outside the payment lines shown on the plans.

206-5.02 Sheeting, Cofferdams or Temporary Water Diversion Structures. Payment for Sheeting, Cofferdams or Temporary Water Diversion Structures required by the plans, specifications, or ordered by the Engineer in writing will be made in accordance with the appropriate item.

Where cofferdams are specified for structure excavation, the work required to keep the site free from earth, water, ice and snow shall be included in the item for cofferdams when necessary.

206-5.03 Replacement of Pavement Structure Courses. With exception of the Conduit Excavation and Backfill including Surface Restoration item, the work of replacing pavement, subcourses and shoulder courses shall be paid for and performed under the provisions of their respective items and subsections.

206-5.04 Conduit Excavation and Backfill including Surface Restoration. The unit price bid per linear meter for this work shall include the cost of furnishing all labor, materials and equipment necessary to excavate and backfill the trench and to replace any pavement, shoulder, and sidewalk courses, subcourses, curbs, drives, lawns and other top surfaces as required to complete the work.

206-5.05 Test Pits. The unit price bid for this work shall include the cost of furnishing all labor, materials and equipment necessary to excavate and backfill the test pit and replace any pavement, shoulder and sidewalk courses, subcourses, curbs, drives, lawns and other top surfaces required to complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
206.01 M	Structure Excavation	Cubic Meter
206.02 M	Trench and Culvert Excavation	Cubic Meter
206.03 M	Conduit Excavation and Backfill including Surface Restoration	Meter
206.04 M	Trench and Culvert Excavation - O.G.	Cubic Meter
206.05 M	Test Pit Excavation	Each

SECTION 207 -GEOTEXTILES AND PREFABRICATED COMPOSITE DRAINS FOR STRUCTURES

207-1 DESCRIPTION

207-1.01 Geotextiles. The work shall consist of furnishing and installing approved Geotextile of the Class and Type indicated, at the locations, and in the manner shown on the plans or as directed by the Engineer, in writing, prior to performing the work.

207-1.02 Prefabricated Composite Drains for Structures. The work shall consist of furnishing and installing an approved Prefabricated Composite Structural Drain (PCSD) or Prefabricated Composite Integral Abutment Drain (PCIAD) as specified at the location (s) shown on the contract documents or as directed by the Engineer, in writing, prior to performing the work.

Prior to installation, the Contractor shall furnish the Engineer with copies of the manufacturer's literature with details and installation requirements for the PCSD or PCIAD. If not included in the manufacturer's literature, a letter identifying the geotextile wrap shall also be provided to the Engineer.

207-2 MATERIALS

207-2.01 General. The Geotextile and Prefabricated Composite Drain for Structures shall be the type appropriate for the intended use as shown on the plans and be listed in the Appropriate Approved List issued by Department's Materials Bureau. Evaluation of a Geotextile or Prefabricated Composite Drain for Structures not on the Approved List will be made in accordance with procedural directives of the Geotechnical Engineering Bureau. Evaluation will require a minimum of four months.

The Contractor shall provide PCSD or PCIAD that is a flexible product consisting of a geotextile bonded to an internal supporting core.

The Contractor shall provide PCSD or PCIAD that is resistant to deterioration from salts, road oils, fuels and other deleterious substances encountered in this type of application.

Only approved structural drains with an impermeable core will be permitted for use in installations

where fresh concrete is to be placed against the drain.

207-2.02 Basis of Acceptance

A. Geotextiles. The Geotextiles which are on the Approved List issued by the Department's Materials Bureau will be accepted on the basis of the brand name labeled on the Geotextile or the Geotextile container and verification of the Geotextile by a Departmental Geotechnical Engineer.

B. Prefabricated Composite Drains for Structures. The Prefabricated Composite Drain for Structures which are on the Approved List issued by the Department's Materials Bureau will be accepted on the basis of the brand name labeled on the drain's packaging and verification by the Engineer of the geotextile wrap being on the approved list for a drainage application.

207-2.03 Quality Assurance

A. Geotextiles. When the State elects to sample, one ten square meter sample will be obtained for quality assurance testing. The results of this testing will only affect a product's standing on the Approved List. Payment for this sample will be made at the unit bid price.

B. Prefabricated Composite Drains for Structures. When the State elects to sample, a 1 meter long by roll width sample will be obtained for quality assurance testing. The results of this testing will only affect a product's standing on the Approved List. No payment will be made for this sample.

207-3 CONSTRUCTION DETAILS

207-3.01 Geotextiles

A. General. The Geotextiles shall be protected from exposure to sunlight during transport and storage. After placement, the Geotextile shall not be left uncovered for more than two (2) weeks.

Traffic or construction equipment will not be permitted directly on the Geotextile. Geotextiles may be joined by either sewing or overlapping. Sewn seams shall be lapped a minimum of 100 mm and double sewn. The thread used to sew the seam shall be nylon or polypropylene. Overlapped seams shall have a minimum overlap of 500 mm except when placed under water where the overlap shall be a minimum of 1 m. All seams shall be subject to the approval of the Engineer. Geotextile which becomes torn or damaged due to the Contractor's operations shall be replaced or patched at no cost to the State. The patch shall extend 1 m beyond the perimeter of the tear or damage.

B. Bedding and Slope Protection. The Geotextile shall be placed and anchored on a prepared surface approved by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying materials will not stretch or tear the Geotextile. Where Geotextile is placed above water, the backfill placement shall begin at the toe and proceed up the slope.

Where Geotextile is placed under water, the long dimension shall be placed parallel to the direction of flow. Successive Geotextile sheets shall be overlapped so that the upstream sheet is placed over the downstream sheet. As the Geotextile is placed under water, the backfill material shall be placed on it to the required thickness. The Geotextile placement shall not progress more than 15 m ahead of the backfill placement.

Rip-rap, stone filling (Heavy) or stone filling (Medium) shall not be dropped onto the Geotextile from a height greater than 0.3 m. Slope protection and smaller sizes of stone filling shall not be dropped onto the Geotextile from a height exceeding 1 m.

C. Separation and Stabilization. The Geotextile shall be placed as directed by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying material will not stretch or tear the Geotextile.

D. Drainage. The Geotextile shall be placed to conform loosely to the shape of the trench.

After placing the filter material, the Geotextile shall be folded over the top of the filter material to produce a minimum overlap of 300 mm. The Geotextile shall then be covered with the subsequent course.

207-3.02 Prefabricated Composite Drains for Structures. The Contractor shall install the drain in conformance with the manufacturer's installation procedures. The drain shall be installed so that the backfill, when placed, will be in contact with the geotextile and forms a continuous drainage layer without interruption within the drain's plane. At all locations, a positive outlet for the water in the drain shall be provided. This may involve making a hole in the core at the weep hole locations for approved drains with an impermeable core. Do not puncture the geotextile. Any damaged geotextile shall be repaired.

Adhesive shall be applied to the wall surface, and not directly to the drain.

During all periods of shipment and storage, the drain shall be wrapped and protected from direct exposure to sunlight, mud, dirt and debris.

Care shall be exercised while backfilling to prevent damage to the drain. Repairs or replacements of drain damaged by construction operations shall be performed, as directed by the Engineer, at no cost to the State.

207-4 METHOD OF MEASUREMENT

207-4.01 Geotextiles

A. General. The quantity of Geotextile will be the number of square meters computed from the payment lines shown on the plans or from payment lines established in writing by the Engineer. Measurement will not be made for Geotextile used for repairs, seams, or overlaps. If taken, the amount of quality assurance samples will be added to this quantity.

B. Drainage. The number of square meters shall be computed by multiplying the length of the trench where Geotextile is used by the theoretical perimeter (determined from the typical section).

207-4.02 Prefabricated Composite Drains for Structures. The quantity of PCSD or PCIAD is the number of square meters satisfactorily installed computed from the payment lines indicated in the contract documents or from payment lines established, in writing, by the Engineer.

207-5 BASIS OF PAYMENT

207-5.01 Geotextiles. The unit price bid per square meter for these items shall include the cost of furnishing all labor, equipment, and materials necessary to complete the work, including the cost of preparing the surface upon which the Geotextile is placed. No payment will be made for replacement or repairs.

207-5.02 Prefabricated Composite Drains for Structures. The unit price per square meter for this item includes the cost of furnishing all labor, equipment, and material necessary to complete the work. No payment will be made for repairs or replacement.

Payment will be made under:

Item No.	Item	Pay Unit
207.10 M	Geotextile Bedding	Square Meter
207.11 M	Geotextile Separation	Square Meter
207.12 M	Geotextile Drainage	Square Meter
207.13 M	Geotextile Slope Protection	Square Meter
207.14 M	Geotextile Stabilization	Square Meter

207.15 M	Prefabricated Composite Structural Drain	Square Meter
207.16 M	Prefabricated Composite Integral Abutment Drain	Square Meter

SECTION 208 (VACANT)

SECTION 209 - TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

209-1 DESCRIPTION

209-1.01 General. This work shall consist of furnishing, installing, maintaining, and removing temporary erosion and sediment control measures as shown on the contract documents or as ordered by the Engineer during the life of the contract to control soil erosion sediment and water pollution through use of temporary mulching, seeding, check dams, bales, sediment traps, turbidity curtain or silt fences.

The temporary erosion and sediment control provisions contained herein shall be accomplished in accordance with the schedule required under §107-12. They shall also be coordinated with the permanent erosion and sediment control features specified elsewhere in the contract documents to the extent practical to assure economical, effective and continuous soil erosion, sediment and water pollution control throughout the construction and post construction period.

209-2 MATERIALS. Unless otherwise stated elsewhere in the contract documents, the materials used to construct temporary soil erosion and sediment control measures shall be as stated herein.

209-2.01 Mulch. Mulch shall be hay, straw, wood fiber, or other suitable material acceptable to the Engineer.

209-2.02 Seed. Seed not otherwise specified in the contract documents shall be quick growing (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area and as a temporary cover, which will not compete with the grasses sown later for permanent cover.

209-2.03 Stone. Stone filling (fine and light) shall meet the requirements of §620-2.02. Bedding material shall meet the requirements of §620-2.05.

209-2.04 Haybale/Strawbale. Bales shall be tightly bound and shall meet the requirements of §713-18 and §713-19. Loose or broken bales will not be accepted. Hardwood stakes shall be 38mm x 38mm and a minimum of one meter long.

209-2.05 Geotextile. Geotextiles shall meet the requirements of §207-2. and be the type appropriate for the intended use as shown on the plans and as shown on the Approved List issued by the Department's Materials Bureau. Geotextiles shall be protected from exposure to sunlight during transport and storage.

209-2.06 Turbidity Curtain. Turbidity curtain assemblies shall consist of a geotextile and a flotation, securing and anchoring system. Prefabricated turbidity curtain systems may be used provided that all requirements of this specification are met.

The flotation, anchoring and securing system shall be fabricated to hold the curtain in place and keep it on the bottom and shall be as shown on the plans and meet the approval of the Engineer. Design analysis and shop drawings shall be provided if requested in writing by the Engineer.

The geotextile shall be of the woven type and shall be listed under the turbidity curtain(TC) category on the Department's Approved List.

209-2.07 Silt Fence. Field constructed silt fence assemblies shall consist of a geotextile [woven type], posts, mesh reinforcement backing, and fasteners. Prefabricated silt fence systems may be used provided that all requirements of this specification are met and they appear on the Department's Approved List under the category of prefabricated silt fence.

The geotextile shall be of the woven type and shall be listed under the turbidity curtain(TC) category on the Department's Approved List.

209-2.07 Silt Fence. Field constructed silt fence assemblies shall consist of a geotextile [woven type], posts, mesh reinforcement backing, and fasteners. Prefabricated silt fence systems may be used provided that all requirements of this specification are met and they appear on the Department's Approved List under the category of prefabricated silt fence.

A. Posts. Posts shall meet the following requirements:

1. Either wood, metal, or synthetic posts may be used. Softwood post shall be 38 mm x 89 mm, hardwood post shall be 38 mm x 38 mm, steel post shall be"T" or "L" shaped in cross section, with a minimum weight of 2 kg per meter.

2. Posts shall be a minimum of 1.2 m long.

B. Mesh Reinforcement. Mesh reinforcement shall be poly-propylene with a maximum 5 mm x 50 mm opening or 14 gauge (min) welded wire mesh with a maximum 100 mm x 100 mm opening. Either mesh shall be a minimum 760 mm wide.

C. Fasteners. Fasteners shall be heavy duty staples, hog rings, tie wires, or any other fastener compatible with the post material and approved by the engineer.

209-2.08 Gravel Bag and Sand Bag. Bags shall be fabricated from reinforced woven geotextile and shall include ties. No burlap bags shall be allowed. Sand or gravel shall be used as the fill material. Gravel shall meet the material specifications of size designation #1 of table 703-4. Sand shall meet the requirements of §703-06. All material used for gravel/sand bags shall be double bagged, inversely inserted and each bag individually tied to prevent leakage.

209-3 CONSTRUCTION DETAILS.

209-3.01 General. In the event of conflict between these specification requirements and pollution control laws, rules, regulations or permit conditions by other federal or state or local government agencies, the more restrictive laws, rules or regulations shall apply.

Temporary erosion and sediment control measures shall be inspected by the contractor and maintained during the life of the project, including winter shutdown, etc., and such maintenance and inspection shall continue until after the permanent stabilization measures are in place and the temporary control measures are ordered to be removed by the Engineer, and the disturbed area returned to it's original condition. The remaining disturbed areas shall be permanently stabilized consistent with the adjacent permanently stabilized area.

209-3.02 Authority of Work. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary erosion and sediment control measures to minimize damage to adjacent property and to minimize contamination of adjacent streams or other watercourses, lakes, ponds or other areas of water impoundment, and wetlands.

209-3.03 Schedule of Work. At the preconstruction conference or prior to the start of the applicable construction, the Contractor shall submit schedules for the accomplishment of temporary and permanent erosion and sediment control work to the Engineer. After receipt of all pertinent information from the Engineer, the Regional Landscape Architect will have fourteen working days to review and approve the submission and reply in writing to the Engineer. The Contractor shall begin work only after receiving written approval from the Engineer. All work done under this section shall be included as part of the construction schedule submitted by the contractor at the preconstruction meeting as required under the provisions of §107-12 Soil Erosion, Water and Air Pollution Abatement. The Contractor's schedules and

209-3.04 Areas of Work. The Engineer shall direct the Contractor to limit the area of clearing and grubbing, excavation, borrow and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding and other temporary and/or permanent control measures current in accordance with the accepted schedule.

Under no conditions shall the area of unprotected earth material exposed at one time by clearing and grubbing, excavation, borrow or fill within the right-of-way exceed 10 000 m2 without prior approval by the Engineer. The same limitation shall apply to all borrow or spoil areas and erodible haul roads outside the right-of-way.

The Engineer may decrease the area of unprotected erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.

Under no condition shall any area of unprotected erodible earth material exposed by clearing and grubbing, excavation, borrow or fill or other work within the right-of-way be left in an unprotected condition for a period of greater than 14 days.

When the Engineer determines the final stabilization, specified elsewhere in the contract documents, can not be completed, temporary stabilization shall be provided as specified in this section. The same limitations shall apply to all borrow or spoil areas and erodible haul roads outside the right-of-way.

Temporary soil erosion and sediment control may be included outside the right-of-way where such work is necessary as a result of highway construction. Legal right of access will be provided by the State in accordance with §107-14, Furnishing Right-of-Way.

209-3.05 Mulching. When mulching is used in conjunction with temporary seeding, the mulch shall be spread uniformly in a continuous blanket of sufficient thickness to hold the soil in place until permanent measures are in place. Mulch may be spread by hand, mechanical spreaders, or blowers.

Mulching may also be used without temporary seeding to temporarily stabilize unprotected erodible earth.

Should the Engineer determine at any time that the mulch has not stabilized the slope, the Contractor shall be responsible for remulching. Any work to be corrected shall be at the Contractor's expense, including regrading.

209-3.06 Seeding [Temporary]. Prior to the application of seed, the Contractor shall scarify all areas where compaction has occurred. The seed bed shall be loose and friable for positive seed retention.

Seed shall be spread to uniformly cover the ground. Seeds shall be evenly distributed by any method of sowing that does not injure the seeds in the process of spreading. Mulch shall be spread immediately following application of seed. Mulch and seed shall not be placed simultaneously, except in the case of hydroseeding.

The following seed rates shall apply when temporary seed and mulch is specified, unless otherwise specified in contract documents:

Ryegrass (annual or perennial)	3.5 gm/m^2
Cereal rye	11.2 gm/m^2
Winter wheat	11.2 gm/m^2

The Engineer shall determine the effectiveness of the above mentioned work on a weekly basis. Those areas where a stand of grass is not effectively controlling erosion, in the judgement of the Engineer, shall be re-prepared in accordance with the specifications. All work to be corrected shall be at the contractors expense.

209-3.07 Check Dam. Check dams shall be constructed as shown and located on the plans and as directed by the Engineer. A bedding type geotextile and/or stone scour protection shall be placed as indicated on the plans. Dams shall be inspected by the Contractor after each storm event, or if no storm

occurs, at the end of each week. At the time of inspection the Contractor shall:

A. Repair or rebuild the dam as necessary.
B. Remove any sediment deposits that exceed one-half the height of the dam. All sediment deposits shall be considered unsuitable material and disposed of in accordance with §203-3.08 Disposal of Surplus Excavated Materials. Sediment deposits shall be disposed of away from wetland, water courses or other bodies of water.

After the erodible area is permanently stabilized, the check dam materials shall become the property of the Contractor and shall be removed from the site.

209-3.08 Haybale/Strawbale. Bales shall be placed at locations and in configurations shown on the plans and as directed by the Engineer. Each bale shall be embedded into the soil a minimum of 100 mm, and be securely anchored. Hardwood stakes shall be installed a minimum of 300 mm into the ground. The first stake in each bale shall be driven at an angle toward the previously laid bale to force the bales together.

A bedding type geotextile and/or stone scour protection shall be placed as indicated on the plans.

Bales shall be inspected by the Contractor after each storm event, or at the end of each week. At the time of inspection the Contractor shall:

A. Replace any broken, or deformed or rotten bales.
B. Remove any sediment deposits that exceed 150 mm. All sediment deposits shall be considered unsuitable material and disposed of in accordance with §203-3.08 Disposal of Surplus Excavated Materials.
C. Reinstall misaligned bales.

After the erodible area is permanently stabilized, as determined by the Engineer, the Contractor shall remove the bales and stakes which shall become the property of the Contractor and shall be removed from the site.

209-3.09 Sediment Trap. Temporary sediment traps shall be constructed as shown and located in the Contract documents, and or as directed by the Engineer.

The Contractor shall inspect the sediment trap after each storm event, or at the end of each week. At the time of inspection the Contractor shall:

A. Repair the sediment trap as necessary due to water or other damage.
B. Remove any sediment deposits which exceed 150 mm or one-half of the design capacity, whichever is less. All sediment deposits shall be considered unsuitable material and disposed of in accordance with §203-3.08 Disposal of Surplus Excavated Materials.

After the surface area draining into the sediment trap has been stabilized to the satisfaction of the Engineer, the Contractor shall remove the installation (accumulated sediment, etc.) which shall become the property of the Contractor and shall be removed from the site.

209-3.10 Turbidity Curtain.

A. Installation. Unless otherwise detailed on the plans, the curtain shall be installed as follows:

1. Be "anchored" and secured to prevent any material from passing beneath, over, around or through the barrier.
2. Have a flotation system that will float if punctured or cut.
3. Have sufficient slack to permit the curtain to rise to the maximum expected high water level

including wave action without being overtopped and still be in continuous contact with the bottom.

4. Have adjacent portions of the curtain secured so that suspended soil particles will not pass between the sections. Where the Contract documents or the Engineer requires sewn seams, the fabric will be overlapped 100 mm and be stitched with two rows of thread that is rot and ultraviolet resistant.

5. Not be placed across a flowing stream.

6. Additional anchorage and/or anchorage cables are required in tidal applications.

B. Care during Construction.

1. The contractor shall immediately repair or replace defective or damaged portions of the turbidity curtain.

2. The turbidity curtain shall remain in place until such time that water contained within is free from turbidity. The curtain shall be removed within 72 hours after this determination has been made.

3. The area behind the turbidity curtain shall be cleaned prior to removal. All sediment deposits shall be considered unsuitable material and disposed in accordance with §203-3.08, Disposal of Surplus Excavated Materials.

C. Curtain Removal.

1. At the completion of the contract, the turbidity curtain shall be removed in such a manner so as to minimize release of sediment adhering to the turbidity curtain.

2. After removal the turbidity curtain shall become the property of the Contractor and shall be removed from the site.

209-3.11 Silt Fence.

A. Installation. Unless otherwise detailed in the contract documents, the fence shall be installed as follows:

1. Posts shall be driven into the ground, or adequately anchored if in rock.

2. Geotextile and mesh reinforcement shall be placed on the up flow side of the posts.

3. The geotextile shall be attached to each post in no less than 4 locations with approved fasteners.

4. The mesh reinforcement shall be attached to each post at the top, bottom, and two additional evenly spaced locations, or by a continuous corded attachment along the top of the assembly. Attachment is to be made with approved fasteners.

5. Any geotextile or mesh splices necessary for fence erection shall be continuous between two post sections.

6. Geotextile at the bottom of the fence shall be buried in a trench to a depth of 150 mm. The trench shall be back filled with the excavated soil and the soil compacted by tamping.

B. Care of Fence during Construction. The Contractor shall continuously maintain the integrity of the silt fence, including providing all necessary labor, equipment and materials, until earthwork construction is completed and permanent erosion control measures are in place. The Contractor shall inspect all temporary silt fence immediately after each storm and at least daily during prolonged rainfall to determine if the structure is functioning as designed. Any deficiencies shall be immediately corrected by the Contractor. Should the silt fence become damaged or otherwise ineffective while the barrier is still necessary, it shall be repaired or replaced promptly as directed by the Engineer.

Sediment deposits shall be removed wherever the deposit or debris buildup creates "Breaches"

or "Bulges" in the fence or more than 150 mm of material has accumulated. All sediment deposits shall be considered unsuitable material and disposed of in accordance with §203-3.08 Disposal of Surplus Excavated Materials.

The contractor shall immediately repair or replace defective or damaged portions of the fence assembly. Torn or punctured fabric shall be repaired by the placement of a patch, on the up slope side, consisting of an additional layer of fabric over the damaged area.

Maintenance should continue until permanent erosion and sediment control measures are in place, established or stabilized to the satisfaction of the Engineer.

C. Fence Removal. The silt fence shall remain in place until the area is permanently stabilized as shown in the project plans and the Engineer directs that it be removed. The fence materials shall become the property of the Contractor and be removed from the site. The Contractor shall remove and dispose of any sediment accumulations and restore the area as directed by the Engineer.

209-4 METHOD OF MEASUREMENT. Where the work to be performed is not attributed to the Contractor's negligence, carelessness or failure to install temporary or permanent controls in accordance with the soil erosion and sediment control plans or as directed by the Engineer, the method of measurement will be as stated herein.

209-4.01 Mulching. The quantity to be measured will be the number of square meters of mulching necessary to complete work.

209-4.02 Seeding [Temporary]. The quantity to be measured will be the number of square meters of temporary seeding necessary to complete the work.

209-4.03 Check Dam. Stone check dams will be measured by the number of check dams installed in accordance with the requirements of the contract documents and to the satisfaction of the Engineer. Hay/strawbale check dams, silt fence check dams, and sand/gravel bag check dams shall be measured by the number of linear meters placed as shown in the contract documents.

209-4.04 Haybale/Strawbale. Bales will be measured by the number of lineal meters of bales placed as shown in the contract documents. Measurement will not be made for bales used for repairs or replacement of defective material.

209-4.05 Sediment Trap. Sediment traps will be measured by the number of traps placed as shown in the contract documents.

209-4.06 Turbidity Curtain. Turbidity curtains will be measured by the number of square meters computed from payment lines in the plans or from payment lines established in writing by the Engineer. Measurement will not be made for turbidity curtain used for repairs, defective material, seams, or overlaps.

209-4.07 Silt Fence. Silt fence will be measured by the number of linear meters of silt fence placed as shown in the contract documents. Measurement will not be made for silt fence used for repairs, defective material, seams, overlaps, or silt fence improperly installed.

209-5 BASIS OF PAYMENT.

209-5.01 General. The unit price bid for all work items shall include the cost of furnishing all labor, equipment, and materials necessary to satisfactorily complete and maintain the work shown on the plans or ordered to be performed within the work limits by the Engineer. Progress payments will be made. Fifty percent of the price bid will be paid after installation. The remaining percentage will be paid when the area is permanently stabilized and the temporary control measure is removed.

Temporary control measures that are made necessary by the Contractor's negligence, carelessness or failure to install permanent controls as a part of the work as scheduled or as shown on the plans, shall be ordered by the Engineer to be accomplished and performed by the Contractor at his own expense.

In case of repeated failures on the part of the Contractor to control erosion, pollution and/or siltation, the Engineer reserves the right to employ outside assistance or to use State forces to provide the necessary corrective measures. Such incurred direct costs plus project engineering costs will be charged to the Contractor and appropriate deductions made from the Contractor's monthly progress estimate.

On those areas selected by the Contractor, either within or outside the work limits, which include but are not necessarily limited to, borrow pits, haul roads, disposal areas, and storage, maintenance, and batching areas, the temporary control work shall be the responsibility of the Contractor and shall be performed at his expense and in a manner approved by the Engineer. No direct payment will be made under §209 for this work; the cost is to be included in the other items of the Contract. Temporary control work on the aforesaid areas which are specifically designated for contractual operations by the State will be paid for under the provisions of this specification.

209-5.02 Mulching. The unit price bid per square meter shall include the cost of all labor, equipment, and materials necessary to satisfactorily install and maintain the mulched areas.

209-5.03 Seeding[Temporary]. The unit price bid per square meter shall include the cost of all labor, equipment, and materials necessary to satisfactorily install and maintain the seeded and mulched areas.

209-5.04 Check Dam. The unit price bid for stone check dams shall include the cost of all labor, equipment, and materials necessary to satisfactorily install, maintain, and remove the check dams. The unit price bid per linear meter for hay/strawbale check dams, silt fence check dams, and sand/gravel bag check dams shall include the cost of labor, equipment, and materials necessary to satisfactorily install, maintain, and remove the check dams.

209-5.05 Haybale/Strawbale. The unit price bid per linear meter shall include the cost of all labor, equipment, and materials necessary to satisfactorily install, maintain, dispose of surplus material and remove the haybales, including the necessary stakes and excavation. Any bales ordered to be replaced due to normal deterioration shall be additionally paid for under this item.

209-5.06 Sediment Trap. The unit price bid for each shall include the cost of all labor, equipment, and materials necessary to satisfactorily install, maintain, dispose of surplus excavated material and remove the sediment trap.

209-5.07 Turbidity Curtain. The unit price bid per square meter shall include the cost of furnishing all labor, equipment, and materials necessary to satisfactorily install, reinstall (after winter shut down) maintain, dispose of surplus excavated material and remove the turbidity curtain. Any repair or replacement of damaged or defective turbidity curtain shall be done at no additional cost to the State.

209-5.08 Silt Fence. The unit price bid per linear meter shall include the cost of furnishing all labor, equipment, and materials necessary to satisfactorily install, maintain, dispose of surplus excavated material and remove the silt fence. Any repair or replacement of damaged or defective silt fence shall be done at no additional cost to the State.

Payment will be made under:

Item No.	Item	Pay Unit
209.02	Mulching	Square Meter
209.03	Seeding[Temporary]	Square Meter
209.0401nn	Check Dam[Stone]	Each
209.0402	Check Dam[Hay/Strawbale]	Linear Meter

209.0403	Check Dam[Silt Fence]	Linear Meter
209.0404	Check Dam[Sand/Gravel Bag]	Linear Meter
209.05	Haybale/Strawbale	Linear Meter
209.06nn	Sediment Trap	Each
209.07	Turbidity Curtain	Square Meter
209.08	Silt Fence	Linear Meter

NOTE: nn denotes serialized pay item, see §101-02 Definitions of Terms under "Specifications". These items will be paid for by the each within established size groups.

SECTION 210 - REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIAL (BUILDINGS, BRIDGES AND HIGHWAYS)

210-1 DESCRIPTION. Under this specification, the Contractor shall remove and dispose of asbestos containing material from all locations of building(s), bridge(s) and/or highway(s) designated in the Contract Documents and/or where directed by the Engineer in accordance with: 12 NYCRR 56 or, if indicated, an approved variance thereof promulgated by the New York State Department of Labor (NYSDOL); the National Emission Standards for Hazardous Air Pollutants (NESHAP), promulgated by the United States Environmental Protection Agency (USEPA); and the Occupational Safety and Health Administration (OSHA).

Additional project specific requirements may be found on the plans or in the proposal in a note entitled "Asbestos Remediation Supplemental Requirements".

210-2 MATERIALS. All materials used in the performance of the work shall comply with all applicable regulatory standards. Respirators and filters shall comply with NIOSH and MSHA standards. HEPA filtration systems shall comply with ANSI Z9.2-79.

210-3 CONSTRUCTION DETAILS. Prior to beginning any work under this item, the Contractor shall supply the Engineer with proof that the firm performing the work has a valid asbestos handling license; that its insurance coverage whether provided by the Contractor or the Asbestos Subcontractor, is consistent with §107-06 Insurance and includes an asbestos specific occurrence type policy with no deductible or sunset clause; that its project supervisor is a NYSDOL certified asbestos project supervisor; that all employees engaged in the work are properly certified and have current physical examinations and respirator fit tests; and that the proper notification of work beginning on the asbestos project has been given to NYSDOL and USEPA. Also, after the work is completed, the Contractor shall provide the Engineer with a written certification ("Waste Shipment Record") that the material was disposed of in an approved waste disposal site. The certification shall include the name and address of the waste disposal site or sites used.

Unless indicated otherwise, the Contractor shall arrange and pay for all air quality monitoring required for regulatory compliance. The firm and persons engaged shall be: properly licensed and certified; independent of the Contractor or the Asbestos Contractor performing the asbestos work; properly insured; and approved in accordance with §108-05 Subletting or Assigning the Contract.

Asbestos containing material shall be disposed of in accordance with 40 CFR Part 61 and all other requirements and laws, rules, and regulations of Federal, State or local agencies. Disposal sites which accept asbestos containing materials for disposal shall be permitted by the New York State Department of Environmental Conservation (NYSDEC) to accept such material for disposal. If disposed of out-of-state, the rules, regulations, and laws of that state shall apply.

In the event of a conflict between these specification requirements and laws, rules and regulations of Federal, State or local agencies, the more restrictive of the specification or the laws, rules or regulations shall apply.

Two copies of Daily logs, Visitor Logs, OSHA Air Monitoring record, and New York State

SECTION 608 - SIDEWALKS, DRIVEWAYS AND BICYCLE PATHS

608-1 DESCRIPTION. This work shall consist of the construction of either a Portland Cement concrete sidewalk, an asphalt concrete sidewalk, an asphalt concrete driveway, bicycle paths, or furnishing and placing precast concrete paving, brick paving or grouted stone block paving. All work shall be in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the Engineer.

608-2 MATERIALS. Materials shall meet the requirements specified in the following subsections of section 700--Materials:

Portland Cement	701-01
Bituminous Materials (As specified)	702-00
Asphalt Cement for Paving	702-02 or 702-03
Fine Aggregates	703-01
Coarse Aggregates	703-02
Mortar Sand	703-03
Cushion Sand	703-06
Concrete Sand	703-07
Mineral Filler	703-08
Brick Pavers	704-08
Stone Blocks	704-09
Precast Concrete Pavers	704-13
Premoulded Resilient Joint Filler	705-07
Masonry Mortar	705-21
Wire Fabric For Concrete Reinforcement	709-02
Water	712-01

608-2.01 Portland Cement Concrete Sidewalk and Driveways. The material requirements and composition shall comply with the specifications for Class A concrete in §501-2 under "Portland Cement Concrete--General." Concrete shall be proportioned in accordance with the aggregate weights specified for Class A concrete in Table 501-3, Concrete Proportions.

608-2.02 Asphalt Concrete Sidewalks, Driveways, and Bicycle Paths. The mixture requirements for these items shall either be 9.5 mm or 19.0 mm mixtures. These mixtures shall be designed for <0.3 million ESALs and produced in accordance to Section 401 using coarse aggregate Type F9. The number of courses and course thicknesses shall be as given in Table 608 - 1, Hot Mix Asphalt Composition.

TABLE 608-1
HOT MIX ASPHALT COMPOSITION

Total Paved Thickness	9.5 mm Mix	19.0 mm Mix	Number of Courses
40 mm	40 mm		1
50 mm	50 mm		1
80+ mm	40 mm	40+ mm	2+

Notes:

1. For the 19.0 mm mixture, the maximum thickness that can be placed in one pass is 75 mm.
2. A course shall consist of one or more separate lifts of hot mix asphalt, as directed by the Engineer, to attain the indicated thickness.

608-2.03 Brick Paved Sidewalks and Driveways. Brick pavers shall meet the requirements of §704-08 and shall be the size(s), shape(s) and color(s) as specified in the contract documents.

A. Neoprene-Modified Asphalt Adhesive. Neoprene-modified asphalt adhesive shall consist of 2% neoprene, grade WM1, oxidized asphalt with a R & B softening point of 68°C minimum and a penetration of 80, and 10% asbestos-free fibers.

B. Mortar for Brick Paving. Mortar for brick paving shall meet the requirements outlined in §705-21 Masonry Mortar.

C. Sand-Cement Setting Bed. Sand-Cement Setting Bed shall consist of 1 part Portland Cement Type 2, §701-01 and 6 parts of Fine Aggregate, §703-01 by volume.

608-2.04 Grouted Stone Block Paved Sidewalks and Driveways. Stone blocks shall meet the requirements of Section §704-09 and shall be the size(s), shape(s) and color(s) as specified in the contract documents.

A. Sand-Cement Setting Bed. Sand-cement setting bed shall consist of 1 part Portland Cement Type 2, §701-01. and 6 parts of Fine Aggregate, §703-01 by volume.

B. Mortar For Stone Block Paving. Mortar for stone block paving shall meet the requirements outlined in §705-21 Masonry Mortar.

608-2.05 Precast Concrete Block Paved Sidewalks and Driveways. Precast concrete pavers shall meet the requirements of §704-13 and shall be the size(s), shape(s) and color(s) as specified in the contract documents. Unless otherwise specified in the contract documents the setting bed material shall consist of hard, durable; uncoated particles of soil or rock, free from lumps of clay and all deleterious substances.

Setting Bed Material shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
6.3 mm	100
2.0 mm	50-85
425 μm	20-45
75 μm	3-10

608-3 CONSTRUCTION DETAILS

608-3.01 Concrete Sidewalk and Driveways. The general construction details for manufacturing and transporting concrete shall meet the requirements of Section 501, Portland Cement Concrete-General. Placing and curing of concrete shall meet the requirements of Section 502, Portland Cement Concrete Pavement except that when a membrane curing compound is used it shall be clear with fugitive dye unless otherwise permitted by the Engineer.

The concrete shall be placed in one course to the full depth shown in the contract documents.

Wire fabric for concrete reinforcement, §709-02, shall be embedded at mid-depth in the slab.

The wire fabric shall consist of MW19 or MW20 wire at 150 mm centers transversely and longitudinally.

Transverse construction joints shall extend to the full depth of the slab and shall be spaced 6 m to 8 m apart. The edges of such joints shall be finished with an edging tool having a 6 mm radius.

The concrete shall be finished to produce a smooth surface and then lightly broomed to a uniform texture. The edges of all sidewalk slabs shall be tooled. Unless otherwise specified in the contract documents the concrete surface shall be scored and tooled at intervals of 1.5 m.

A premoulded resilient joint filler, §705-07, shall be installed at all joints between sidewalk and curb, pavement, building, etc.

608-3.02 Asphalt Concrete Sidewalks, Driveways, and Bicycle Paths. The provisions under §402-3 Construction Details for Hot Mix Asphalt (HMA) Pavements, shall apply.

The sidewalks, driveways, and bicycle paths shall be constructed to the depths and dimensions

indicated in the contract documents.

TABLE 608-1 ASPHALT CONCRETE COMPOSITION					
Total Paved Thickness	**Type 7**	**Type 6**	**Type 3**	**Type 1**	**Number of Courses**
25 mm	25 mm or	25 mm			1
30 mm	30 mm or	30 mm			1
40 mm	40 mm or	40 mm			1
50 mm		50 mm			1
65 mm	25 mm or	25 mm on	40 mm		2
75 mm	25 mm or	25 mm on	50 mm		2
90 mm	25 mm or	25 mm on	65 mm		2
100 mm	40 mm or	40 mm on	60 mm		2
115 mm	40 mm or	40 mm on	75 mm		2
125 mm	40 mm or	40 mm on	90 mm		2
140 mm	40 mm or	40 mm on	100 mm		2
140+ mm	25 mm or	25 mm on	40 mm on	Nec.	3

Notes:

1. Type 6 or Type 7 Top Courses shall not be applied directly to Type I Base Course.
2. For sidewalks and driveways included in this work, the surface course shall be-Type 6 or Type 7. The surface course of bicycle paths shall be Type 7 Top.
3. On two course applications, except Commercial Driveways, where Type 3 Binder is called for in thicknesses of 40 mm or 50 mm Type 6 Top course layer may be substituted for the Type 3 Binder course.
4. A course shall consist of one or more separate lifts of asphalt concrete, as directed by the Engineer to attain the indicated thickness.

608-3.03 Brick Paved Sidewalks and Driveways. All brick pavers shall be laid in the pattern shown in the contract documents or as directed by the Engineer to provide a uniformly even surface. Joints shall be hand tight unless otherwise specified. No brick pavers shall be laid or grouted in freezing weather.

A dry mixture of mortar for brick paving shall be swept over the brick pavers until the joints are completely filled. The joints shall be lightly wetted with water. Brick pavers shall be cleaned of excess mortar, and joints shall be finished prior to the mortar setting up. All brick paving shall be kept moist for 4 days after filling the joints with mortar. After the 4 day curing period, removal of remaining mortar film may be accomplished by the use of a light acid wash (10% solution of hydrochloric or muriatic acid) followed by flushing clean with water or as approved by the Engineer. Care shall be taken to avoid the use of acid in areas where runoff could damage trees or other vegetation.

All brick pavers used over tree pits shall be laid in a 75 mm bed of cushion sand with sand filled joints.

A. Brick Paved Sidewalks and Driveways (Sand Setting Bed). Brick pavers shall be laid in a properly compacted 50 mm bed of cushion sand over the specified subbase or subgrade.

B. Brick Paved Sidewalks and Driveways (Mortar Setting Bed). Brick pavers shall be laid in a bed of mortar with a minimum thickness of 25 mm over the specified concrete or bituminous subbase.

C. Brick Paved Sidewalks and Driveways (Bituminous Setting Bed). Brick pavers shall be laid in a 20 mm thick bituminous setting bed over the specified concrete or bituminous subbase. The setting bed shall consist of asphalt cement meeting the requirements outlined in either §702-02 or §702-03 mixed with fine aggregate meeting the requirements of §703-01. The asphalt cement shall be 7.0% of the total batch weight. The mix shall be heated to approximately 163°C. A coating of neoprene-modified asphalt adhesive shall be applied by mopping, squeegeeing or troweling over the top surface of the setting bed to provide bond under the bricks.

D. Brick Paved Sidewalks and Driveways (Sand-Cement Setting Bed). Brick pavers shall be laid on a 50 mm setting bed of sand-cement over the specified subbase. The sand-cement setting bed shall not be placed more than 4 hours prior to installing the brick paving.

E. Brick Paved Sidewalks and Driveways (Optional Concrete Setting Bed). The Contractor shall have the option of installing Brick Paved Sidewalks and Driveways by one of the following methods:

1. Bricks shall be laid on a bed of cement concrete as specified in the contract documents. The bricks shall be laid in the cement concrete while it is still fresh as approved by the Engineer and they shall be firmly positioned to provide a uniformly even surface, and a solid bedding under each brick.

2. Bricks shall be laid as provided for under "Brick Paved Sidewalks and Driveways (Mortar Setting Bed)" provided the finished surface shall conform to the lines and grades shown in the contract documents.

608-3.04 Grouted Stone Block Paved Sidewalks and Driveways. All grouted stone block pavers shall be laid in the pattern shown in the contract documents or as directed by the Engineer to provide a uniformly even surface. Joints between blocks shall be a maximum of 32 mm or as specified. No blocks shall be laid or grouted in freezing weather.

Unless otherwise approved by the Engineer, a dry mixture of mortar as specified for Brick Paved Sidewalks and Driveways, §608-2.03, shall be swept over the stone blocks until the joints are completely filled and the joints lightly wetted with water prior to the mortar setting up. All grouted stone block paving shall be kept moist for four days after filling the joints with mortar. After the four day curing period, removal of remaining mortar film may be accomplished by the use of a light acid wash (10% ± solution of hydrochloric acid) followed by flushing clean with water, or as approved by the Engineer. Care shall be taken to avoid the use of acid in areas where runoff could damage trees or other vegetation.

All blocks used over tree pits shall be laid in a 25 mm bed of cushion sand with sand filled joints.

A. Grouted Stone Block Paved Sidewalks and Driveways (Sand Setting Bed). Blocks shall be laid in a 75 mm bed of cushion sand over the specified subbase or subgrade.

B. Grouted Stone Block Paved Sidewalks and Driveways (Mortar Setting Bed). Blocks shall be laid in a bed of mortar with a minimum thickness of 25 mm over the specified concrete or bituminous subbase.

C. Grouted Stone Block Paved Sidewalks and Driveways (Sand-Cement Setting Bed). Blocks shall be laid on a 50 mm setting bed of sand-cement over the specified subbase. The sand-cement setting bed shall not be placed more than 4 hours prior to installing the block paving.

D. Grouted Stone Block Paved Sidewalks and Driveways (Optional Concrete Setting Bed). The Contractor shall have the option of installing Grouted Stone Block Paved Sidewalks and Driveways by one of the following methods:

1. Blocks shall be laid on a bed of cement concrete as specified in the contract documents. The blocks shall be laid in the cement concrete while it is still fresh as approved by the Engineer and they shall be firmly positioned to provide a uniformly even surface, and a solid bedding under each stone block.

2. Blocks shall be laid as provided for under "Grouted Stone Block Paved Sidewalks and Driveways (Mortar Setting Bed)" provided the finished surface shall conform to the lines and grades shown in the contract documents.

608-3.05 Precast Concrete Block Paved Sidewalks and Driveways. Precast concrete pavers shall be laid in the pattern shown in the contract documents or as directed by the Engineer to provide a uniformly even surface. Joints shall be hand tight unless otherwise specified. No pavers shall be laid in freezing weather.

After the pavers are in place, an approved sand joint filler shall be swept over the pavers until the joints are completely filled.

Unless otherwise specified in the contract documents, or directed by the Engineer, the Contractor shall install the pavers in accordance with the manufacturer's recommended procedures.

Precast Concrete Block Paved Sidewalks and Driveways (Granular Material Setting Bed). Unless otherwise specified in the contract documents, precast concrete pavers shall be laid on a setting bed not to exceed 50 mm of uniformly compacted material placed over the specified subbase.

608-4 METHOD OF MEASUREMENT

608-4.01 Concrete Sidewalks and Driveways. Portland Cement concrete sidewalks and driveways will be measured by the number of cubic meters of cement concrete necessary to construct sidewalks and driveways shown in the contract documents or as ordered by the Engineer.

608-4.02 Asphalt Concrete Sidewalks, Driveways and Bicycle Paths. Asphalt concrete sidewalks, driveways and bicycle paths will be measured by the number of metric tons of asphalt concrete furnished and incorporated in the work. Quality payment adjustments will be measured as outlined in §402-4, Method of Measurement.

608-4.03 Brick Paved Sidewalks and Driveways. Brick paving shall be measured as the number of square meters placed as shown in the contract documents or as ordered by the Engineer.

608-4.04 Grouted Stone Block Paved Sidewalks and Driveways. Grouted stone block paving shall be measured as the number of square meters placed as shown in the contract documents or as ordered by the Engineer.

608-4.05 Precast Concrete Block Paved Sidewalks and Driveways. Precast concrete paving will be measured by the number of square meters placed as shown in the contract documents, or as ordered by the Engineer.

608-5 BASIS OF PAYMENT

608-5.01 Concrete Sidewalks and Driveways. The unit price bid per cubic meter shall include the cost of preparing the subgrade, all materials, equipment and labor necessary to complete the work as specified except that any necessary excavation and subbase course will be paid for under their appropriate items.

Payment at the unit bid price will be made after the concrete sidewalk or driveway, and curing application have been properly placed.

608-5.02 Asphalt Concrete Sidewalks, Driveways, and Bicycle Paths. The unit price bid per metric ton shall include the cost of preparing the subgrade, all materials, equipment and labor necessary to complete the work as specified except that any necessary excavation and subbase course will be paid for under their appropriate items. Payment of Quality Units will be made based on the Index Price listed

in the contract documents. The index price shown in the itemized proposal for each Quality Unit shall be considered the price bid. The unit (index) price is NOT to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figure will be disregarded and the original price will be used to determine the total amount bid for the Contract.

608-5.03 Brick Paved Sidewalks and Driveways. The price bid per square meter shall include the cost of furnishing all labor, materials and equipment necessary to complete the work, including setting bed material, as specified except that any necessary excavation and subbase course will be paid for under their appropriate items;

608-5.04 Grouted Stone Block Paved Sidewalks and Driveways. The unit bid per square meter shall include the cost of furnishing all labor, materials and equipment necessary to complete the work, including setting bed material, as specified except that any necessary excavation and subbase course will be paid for under their appropriate items.

608-5.05 Precast Concrete Block Paved Sidewalks and Driveways. The unit price bid per square meter shall include the cost of all labor, materials and equipment necessary to complete the work, including setting bed material, except that any necessary excavation and subbase course will be paid for under their appropriate items.

Payment will be made under:

Item No.	Item	Pay Unit
608.0101 M	Concrete Sidewalks and Driveways	Cubic Meter
608.020101 M	Asphalt Concrete Sidewalks, Driveways and Bicycle Paths	Metric Ton
608.020110 M	Plant Production Quality Adjustment to 608.020101 M	Quality Unit
608.03 M	Brick Paved Sidewalks and Driveways (Sand Setting Bed)	Square Meter
608.04 M	Brick Paved Sidewalks and Driveways (Mortar Setting Bed)	Square Meter
608.05 M	Brick Paved Sidewalks and Driveways (Bituminous Setting Bed)	Square Meter
608.06 M	Brick Paved Sidewalks and Driveways (Sand-Cement Setting Bed)	Square Meter
608.07 M	Brick Paved Sidewalks and Driveways (Optional Concrete Setting Bed)	Square Meter
608.08 M	Grouted Stone Block Paved Sidewalks and Driveways (Sand Setting Bed)	Square Meter
608.09 M	Grouted Stone Block Paved Sidewalks and Driveways (Mortar Setting Bed)	Square Meter
608.10 M	Grouted Stone Block Paved Sidewalks and Driveways (Sand-Cement Setting Bed)	Square Meter
608.11 M	Grouted Stone Block Paved Sidewalks and Driveways (Optional Concrete Setting Bed)	Square Meter
608.12 M	Precast Concrete Block Paved Sidewalks and Driveways (Granular Material Setting Bed)	Square Meter

SECTION 609 - CURB AND CURB & GUTTER

609-1 DESCRIPTION. Construct and place curb, and curb & gutter, and/or reset curb as specified in the Contract Documents or established by the Engineer.

609-2 MATERIALS. The materials shall meet the requirements of the following subsections of Section 700 -Materials Details.

Portland Cement, Type II	701-01
Concrete Repair Material	701-04
Concrete Grouting Material	701-05
Anchoring Material - Chemically Curing	701-07
Coarse Aggregate	703-02

609.0901 M	Optional Curb (Precast Concrete Type PVF150 or Cast-In-Place Concrete Type VF150 or Granite Type C)	Meter
609.0902 M	Optional Curb (Precast Concrete Type PM100 or Cast-In-Place Concrete Type M100 or Granite Type E100)	Meter
609.0903 M	Optional Curb (Precast Concrete Type PT100 or Cast-In-Place Concrete Type T100)	Meter
609.15 M	Resetting Existing Curb	Meter
609.21XX M	Painted Hot Mix Asphalt Curb* (Various Types as indicated)	Meter
609.22XX M	Unpainted Hot Mix Asphalt Curb* (Various Types as indicated)	Meter

* Refer to Standard Pay Item Catalog for full Item Number and Description.

SECTION 610 - TURF AND WILDFLOWER ESTABLISHMENT

610-1 DESCRIPTION. The work covered by this section includes work necessary to establish and care for turf and wildflowers.

610-1.01 Applying Soil Amendments. The work consists of furnishing and placing soil amendments as specified at the locations indicated in the contract documents or where directed by the Engineer.

610-1.02 Establishing Turf. The work consists of preparing ground surfaces for seeding; furnishing and installing fertilizer, seed, mulch, and mulch anchorage on areas indicated in the contract documents or where directed by the Engineer. The work also consists of producing a satisfactorily established turf and caring for the turf as specified. The work may also include furnishing and applying limestone as specified in the contract documents.

610-1.03 Establishing Wildflowers. The work consists of preparing ground surfaces for seeding; furnishing and installing seed, mulch and mulch anchorage on areas indicated in the contract documents or where directed by the Engineer; and caring for and establishing the work specified.

610-2 MATERIALS

610-2.01 Applying Soil Amendments. The materials shall meet the requirements of the following subsections of section 700-Materials Details and/or as further specified in the contract documents.

Limestone	713-02	Fertilizer	713-03

610-2.02 Establishing Turf. The materials shall meet the requirements of the following subsections of section 700-Materials Details and/or as further specified in the contract documents.

Limestone	713-02	Mulch anchorage	713-12, Type A
Fertilizer	713-03	Hay	713-18
Seeds	713-04	Straw	713-19
Wood fiber	713-11		

Turf establishment materials not otherwise specified in the contract documents shall be as follows:

Fertilizer	713-03 Type No. 3 10-6-4 (50% N-UF)
Hay or Straw	713-18 or 713-19
Mulch anchorage	713-12, Type A
Seeds	713-04 and as follows:

Name	Variety	Wt. of Pure Live Seed Per m^2
Red Fescue (Festuca rubra)	Commercial	6.0 g
Perennial Ryegrass (Lolium perenne)	Commercial	3.4 g
White Clover (Trifolium repens)	Commercial	
	Max. 25% hard seed	0.6 g
Total		10.0 g

610-2.03 Establishing Wildflowers. The materials shall meet the requirements of the following subsections of section 700-Materials Details and/or as further specified in the contract documents.

Seeds	713-04	Mulch anchorage	713-12, Type A
Straw	713-19		

610-3 CONSTRUCTION DETAILS

610-3.01 Applying Soil Amendments. Fertilizer and/or limestone shall be evenly spread over the surface of the soil in the areas described in the contract documents or where directed by the Engineer. The rates of application shall be as specified in the contract documents. Any method of application that will insure an even distribution will be acceptable. When hydraulic application is used the minimum rate of water shall be 0.5 L/m^2 unless otherwise specified in the contract documents.

610-3.02 Establishing Turf

A. Rates. Application rates for turf establishment materials shall be specified in the contract documents. When no rates for establishing turf are specified in the contract documents, the following shall apply:

Fertilizer	-	90 g/ m^2
Seed	-	10 g pure live seed/m^2
Mulch	-	0.5 kg/m^2
Mulch Anchorage	-	Manufacturer's recommended rate

B. Limitations. The contractor shall notify the Engineer at least 2 working days before the start of any seeding operation and shall not begin the work until the Engineer has given permission. When sodding and turf establishment are to be done in the same general areas, the sodding shall be done first, and equipment used during turf establishment shall not damage the sodded areas.

C. Inoculation of Leguminous Seeds. All seeds of leguminous plants requiring inoculation shall be inoculated prior to mixing or sowing unless otherwise specified or approved or unless accompanied by a certificate of preinoculation. When seeds requiring inoculation are to be sown dry, the inoculant shall be applied in accordance with its accompanying instructions and the seeds allowed to dry sufficiently for proper handling. Seeds shall be sown within thirty hours after this treatment. When seeds requiring inoculation are to be sown by water pressure, the inoculant may be added to the water and seed mixture, together with limestone and/or fertilizer as specified, providing the pH of the solution does not exceed 8.

D. Ground Preparation and Seeding. All turf establishment areas shall be approved by the Engineer prior to seeding. Areas to be seeded with turf seeds shall be maintained at approved grades and irregularities that will hold water shall be eliminated. Weed growth that, in the Engineer's judgment, may adversely affect germination or growth shall be removed or controlled as approved or as directed by the Engineer prior to seeding. Limestone, fertilizer and seeds in the amounts specified shall be evenly distributed on the areas to be seeded. All mechanical equipment used for soil preparation for seeding shall be as approved. Equipment shall pass parallel to the contours unless otherwise approved except that crawler tractors shall pass at right angles to the contours. Establishing turf shall be done using Method No. 1, unless Method No. 2 is specified. Regardless

of the method used,the finished surface of any area that is seeded shall not be rougher, more uneven or have more or larger stones, clods, roots, or other foreign materials than the area it adjoins. In built up and residential areas handraking will usually be necessary to produce the required smoothness and uniformity, particularly where grading and turf establishment is to be adjacent to lawns.

Method No. 1. Areas to be seeded shall be scarified sufficiently to break up the surface crust immediately before seeding except where, in the judgment of the Engineer, the ground is already loose and friable as immediately following grading. Where topsoil is not specified, all loose stones and other objects over 50 mm in greatest dimension, or other sizes as specified, shall be removed and disposed of as approved. All embedded stones and other objects protruding more than 50 mm above the surface, or other heights specified, shall also be removed and disposed of as approved. Where topsoil is specified the maximum loose stone size shall be 50 mm or as otherwise specified under §613-2. Unless otherwise specified in the contract documents, only limestone and/or fertilizers may be mixed together with the seeds (including legume inoculants when required) immediately before sowing. Any method of sowing that does not injure the seeds in the process of spreading will be acceptable.

Method No. 2. Areas to be seeded shall be harrowed, disked, or otherwise completely pulverized to a state of tillage acceptable to the Engineer. All stones and other undesirable material over 25 mm in greatest dimension or other sizes as specified shall be removed and disposed of as approved. Fertilizer and/or limestone as specified shall be uniformly distributed on the area to be seeded. Seeds shall be distributed uniformly by any approved method that does not injure the seeds in the process of spreading. Following distribution, seeds shall be incorporated into the soil to a depth not exceeding 5 mm by raking, rolling brush or chair harrowing, or any other approved method.

E. Mulching. Mulch shall be spread uniformly in a continuous blanket of sufficient thickness to hide the soil from view, taking care not to over apply. Mulch may be spread by hand or by machinery. Mulch may be spread before seeding turf but not later than 72 hours after seeding turf unless otherwise approved or directed. Anchorage is required unless otherwise specified in the contract documents. Mulch and mulch anchorage shall be applied separately from seeds unless otherwise specified in the Contract Documents.

F. Liability. When the Engineer determines that any seeded area has failed for any reason to produce a satisfactorily established turf after a suitable period of time has elapsed, the Contractor shall repeat all the work required by the Section until a satisfactory growth of turf has been established. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until a satisfactory turf has been established.

G. Care During Construction. The Contractor shall care for seeded turf areas until final acceptance of the contract. Care shall consist of providing protection against traffic by providing approved warning signs or barricades; and shall consist of repairs to any seeded turf areas damaged by wind, water, fire, traffic or other causes. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall then be refertilized, reseeded and remulched as specified herein.

Method No. 1. The Contractor shall mow all turf establishment areas seeded on 1 on 3 or flatter slopes unless otherwise specified or directed by the Engineer. Such turf areas shall be mowed to a height of 100 mm when growth reaches 200 mm and thereafter as directed by the Engineer.

Method No. 2. The Contractor shall mow all turf establishment areas seeded under Method No. 2 to a height of 75 mm after initial growth reaches 125 mm, and then once a week thereafter unless otherwise approved. Clippings from the first mowing shall be removed.

610-3.03 Establishing Wildflowers

A. Rates. Application rates for wildflower establishment materials shall be as specified in the contract documents.

B. Limitations. The contractor shall notify the Engineer at least 2 working days before the start of any seeding operation and shall not begin the work until the Engineer has given permission.

C. Inoculation of Leguminous Seeds. Shall be as required under §610-3.02 C. Inoculation of Leguminous Seeds.

D. Ground Preparation and Seeding. All wildflower establishment areas shall be approved by the Engineer prior to seeding. Areas to be seeded with wildflower seeds shall be maintained at approved grade sand irregularities that will hold water shall be eliminated. Weed growth that, in the Engineer's judgment, may adversely affect germination or growth shall be removed or controlled as approved or as directed by the Engineer prior to seeding. Seeds in the quantities specified shall be evenly distributed on the areas to be seeded. All mechanical equipment used for soil preparation or seeding shall be as approved and shall pass parallel to the contours unless otherwise approved except that crawler tractors shall pass at right angles to the contours. Areas to be seeded shall be scarified sufficiently to break up the surface crust immediately before seeding except where the ground is already loose and friable as immediately following grading. All stones and other objects over 50 mm in greatest dimension or other sizes as specified shall be removed and disposed of as approved. Any method of sowing that does not injure the seeds in the process of spreading will be acceptable. The finished surface of any area that is seeded shall not be rougher, more uneven or have more or larger stones, clods, roots, or other foreign materials than the area it adjoins.

E. Mulching. Mulch shall be spread uniformly in a continuous blanket taking care not to over apply. Mulch may be spread by hand or by machinery. Mulch shall not be spread before nor later than 72 hours after seeding wildflowers. Anchorage is required unless otherwise specified in the contract documents. Mulch and mulch anchorage shall be applied separately from seeds.

F. Liability. When the Engineer determines that any seeded area has failed for any reason to produce a satisfactorily established growth of wildflowers after a suitable period of time, the Contractor shall reseed such areas in the same manner as specified in the contract until a satisfactorily established growth of wildflowers has been established. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until a satisfactory growth of wildflowers has been produced.

G. Care of Wildflowers During Construction. The Contractor shall care for the seeded wildflower areas until final acceptance of the contract or as required under §610-3.04. Care of wildflowers shall consist of keeping the wildflowers in a healthy growing condition by watering, controlling weeds, and by any other necessary operations. Care shall also consist of providing protection against traffic by providing approved warning signs or barricades, and shall consist of repairs to any seeded wildflower area damaged by wind, water, fire, traffic or other cause. Damaged areas shall be repaired to re-establish the condition and grade of the area prior to seeding and shall be reseeded and remulched as specified herein. The Contractor shall mow wildflower establishment areas once a year in the autumn after the seed heads have matured, as approved by the Engineer for the duration of the contract.

610-3.04 PERIOD OF ESTABLISHMENT FOR WILDFLOWERS. The Period of Establishment for Wildflowers shall begin immediately following the satisfactory completion of all the wildflower seeding as confirmed in writing by the Engineer. The Contractor shall be required to continue the work specified under §610-3.03 G. Care of Wildflowers During Construction for a period of one year or until the contract is complete, whichever is later.

In the event the Contractor requests acceptance of the contract and the "Period of Establishment" is not yet completed, the State, if approved by the Commissioner, may pay the Contractor monies

retained under provisions of Section 38 Subdivision 7 of the Highway Law upon receipt of a certified check or securities as are listed in Subdivision 3 of Section 139 of the State Finance Law, in the amount of at least double the value of the uncompleted work under "Period of Establishment". For the purpose of determinations for contract acceptance prior to completion of the work under "Period of Establishment", the value of the work required under "Period of Establishment", including necessary reseeding, shall be considered as a sum equal to 10% of the price bid for the item of Establishing Wildflower unless otherwise specified.

When all work in the contract excepting §610-03, Establishing Wildflowers, has been completed and accepted, the Contractor agrees to procure and maintain for the duration and purposes of any such work of establishment, and at the Contractor's expense, insurance for liability for damages imposed by law, in insurance companies authorized to do such business in the State covering all such operations, whether performed by the Contractor or subcontractors.

Before commencing any such work, the Contractor agrees to furnish to the Commissioner a certificate or certificates of insurance, in a form satisfactory to the Commissioner, showing that the Contractor has complied with this provision as to insurance, which certificate or certificates shall provide that the policies shall not be changed or cancelled until 30 days written notice has been given to the Commissioner.

The kind and amounts of insurance are as specified under §611-3.06 Period of Establishment.

At the conclusion of the Period of Establishment the Contractor shall remove any trash or debris from the wildflower planting area. Areas that, in the judgment of the Engineer, have failed to produce an established growth of wildflowers shall be noted for reseeding in accordance with the contract specifications.

This requirement shall not prevent the release of the retained monies as herein defined at the expiration of the Period of Establishment but a certified check or securities, as previously described, equal to at least double the value of any uncompleted work will be required. No work other than re-grading to establish condition of the area, reseeding and remulching will be required after the conclusion of the Period of Establishment for Wildflowers.

610-4 METHOD OF MEASUREMENT

610-4.01 Applying Soil Amendments. Applying soil amendments will be measured as the number of kilograms of soil amendments that have been acceptably applied.

610-4.02 Establishing Turf. Establishing turf will be measured as the number of square meters of surface area that have been satisfactorily seeded.

610-4.03 Establishing Wildflowers. Establishing wildflowers will be measured as the number of square meters of surface area that have been satisfactorily seeded.

610-5 BASIS OF PAYMENT

610-5.01 Applying Soil Amendments. The unit price bid per kilogram shall include the cost of all labor, equipment, materials and incidentals, including water necessary to complete the work as specified.

610-5.02 Establishing Turf. The unit price bid per square meter shall include the cost of all labor, equipment, materials and incidentals, including water necessary to complete the work as specified.

610-5.03 Establishing Wildflowers. The unit price bid per square meter shall include the cost of all labor, equipment, materials and incidentals, including water and watering necessary to complete the work as specified.

Payment will be made under:

Item No.	Item	Pay Unit
610.0101 M	Applying Soil Amendments	Kilogram
610.0203 M	Establishing Turf	Square Meter
610.03 M	Establishing Wildflowers	Square Meter

SECTION 611 - PLANTING

611-1 DESCRIPTION. This work consists of furnishing, planting and caring for plants as specified in the contract documents. This work shall include all care of planting operations and establishment necessary to complete the work as specified.

611-2 MATERIALS

611-2.01 Plants. Trees, shrubs and vines, groundcovers and special plants shall be as specified under §713-06 and as further specified in the contract documents. The Contractor shall be responsible for furnishing the vendor with a copy of the appropriate contract documents containing the plant material specifications.

611-2.02 Planting Materials. Topsoil, organic materials, fertilizer, mulch and materials for the protection of plants shall be specified under §713, Landscape Development Materials and as further specified in the contract documents.

Water shall be specified under §712-01 Water.

611-3 CONSTRUCTION

611-3.01 General

A. Planting Season. The planting seasons shall be as specified in the contract documents. No planting shall be done when the soil is frozen or otherwise in an unsatisfactory condition for working as determined by the Engineer.

B. Obstructions below Ground. The Contractor shall verify the locations of underground tanks, utilities and other nonmovable obstructions. Where nonmovable obstructions are encountered, the plant pits shall be relocated, as directed by the Regional Landscape Architect.

C. Delivery. The Contractor shall notify the Engineer at least two full working days before intended delivery of plants or planting materials, to the site. The Engineer shall be furnished legible copies of the certificates of inspection of plant materials as specified in §713-06 and a copy of the invoice for each shipment showing point of origin, sizes, quantities, sizes, and kinds of materials supplied. Plants which fail to meet the specifications, as determined by the Regional Landscape Architect, will be rejected. All rejected plants shall be promptly removed from the project site.

D. Storage. All plants shall be properly protected from damage and drying out. Such protection shall include the time when the plants are in transit, being handled or in temporary storage. Bare root plants not planted immediately shall be puddled and heeled in. The bundles of heeled in plants shall be opened and the plants shall be spaced separately. The roots of the heeled in plants shall have their earth balls protected by earth, mulch or straw, or they may be heeled in. All plants not planted immediately shall be watered as approved by the Regional Landscape Architect.

611-3.02 Ground Preparation

A. Layout. Locations for plants and outlines of areas to be planted shall be staked or marked out on the ground by the Contractor to the satisfaction of the Regional Landscape Architect before any plant pits or plant beds are dug.

B. Undesirable Material. When rock, construction debris or other undesirable materials is encountered while digging, the materials shall be removed to the depth and width necessary to obtain the specified plant pit diameter and depth, or the plant pit may be relocated as directed by the Regional Landscape Architect.

C. Plant Pit Diameter. The minimum plant pit diameter shall bear the following relationship to the diameter of the root spread or root balls of the plants to be planted in them, unless otherwise specified in the contract documents.

Root Spread/Root Ball Diameter	Plant Pit Diameter
under 0.6 m	Twice the root spread or root ball diameter
from 0.6 m to 1.2 m	Equal to the root spread or root ball diam. plus 0.6 m
over 1.2 m	One and one half times the root spread or root ball diameter

The sides of the plant pits shall be loose and friable at the time of planting.

D. Plant Pit Depth. The depth of all plant pits shall allow the root ball to sit on undisturbed subgrade unless otherwise specified in the contract documents. Pit depth for bare root plants shall be as specified in the contract documents.

E. Planting Beds. Plants in planting beds shall either be planted in individual plant pits, or the entire planting bed shall be excavated and backfilled with planting soil as specified in the contract documents. Existing vegetation shall be removed from all planting beds as specified in the contract documents or as directed by the Regional Landscape Architect.

F. Drainage. Where an impervious layer of soil is encountered during the excavation of plant pits or beds, all such soil shall be removed to a depth as approved by the Engineer and the pits or beds shall be backfilled with acceptable planting soil.

G. Planting Soil. Planting soil shall be unamended existing soil excavated from the plant pit unless one of the following alternates is specified elsewhere in the contract documents.

Alternative 1. Amended existing soil excavated from the plant pit.
Alternative 2. Unamended approved topsoil.
Alternative 3. Amended approved topsoil thoroughly premixed with specified soil amendments at the specified rates.

When specified, fertilizer shall be applied within the plant saucers or over the plant beds, unless otherwise specified in the contract documents.

H. Disposal of Excess Soil. Excess soil shall be removed immediately and disposed of in disposal areas designated in the contract documents or at an on-site or off-site location, consistent with law, rule or regulation, and as approved by the Engineer.

611-3.03 Setting Plants

A. General. All plants shall be set plumb at such a level that they bear the same relation to the surface of the surrounding ground as they bore to the ground from which they were dug. Planting soil shall be carefully backfilled into plant pits in layers not to exceed 0.1 meter in depth, and shall be tamped to prevent voids and settling before additional planting soil is placed. Thorough watering shall accompany backfilling of planting soil unless otherwise approved. A saucer shall be formed around each plant pit as specified in the contract documents.

B. Balled Plants. Following placement in the plant pit, balled plants shall have all natural burlap cloth, ropes, wire baskets, twine, and nonbiodegradable woven and nonwoven fabrics completely removed from the upper one third (⅓) sides and top of the root ball to a maximum depth of 0.5 meter. There is no requirement to remove the fabric or basket from the bottom of the root ball.

C. Container Grown Plants. Container grown plants shall be removed from their containers. Roots which are matted or entangled shall be straightened or cut and removed. Encircling roots shall be cut in a vertical direction.

D. Bare Root Plants. Roots of bare root plants shall be properly spread out in a radial position and planting soil shall be carefully worked in among them. All dead, broken, frayed and twisted

roots shall be cleanly cut off.

E. Wrapping. When wrapping is specified in the contract documents, the wrapping material shall be a single layer of burlap bandage or paper. The wrapping shall extend from the ground line to the height of the first branch, and be wound spirally upwards from the ground line, overlapping 40 mm. The wrapping shall be securely tied in place with biodegradable twine at 0.4 meter intervals, or by other means approved by the Regional Landscape Architect.

F. Staking, Guying and Anchoring. No tree shall be staked, guyed or anchored, unless otherwise specified in the contract documents. When staking is specified, stakes shall be placed in the plant pit prior to backfilling.

G. Pruning. Plants pruned before their arrival will be rejected unless such pruning is specified in the contract documents. Pruning at the time of planting shall be limited to the removal of dead, conflicting and broken branches; and to other pruning consistent with good horticultural practice unless otherwise specified in the contract documents or as directed by the Regional Landscape Architect.

H. Mulching. Where mulching is specified, it shall completely cover the area of the plant pit or planting bed to the depth specified in the contract documents. Mulch shall be placed at the time of planting.

611-3.04 Restoration. Areas disturbed by the planting operations shall be restored by disposing of excess soil, stones and rubbish such as twine, pruned limbs, tree wrap, containers, burlap and wire baskets as approved by the Engineer. Existing turf areas disturbed by planting operations shall be restored to a satisfactory condition which may include topsoil, regrading, fertilizing, seeding and mulching. All waste material generated as a result of the work shall be properly disposed of in accordance with law, rule or regulation, and in a manner approved by the Engineer.

611-3.05 Care of Planting.

A. General. Care of planting shall begin immediately after each plant is planted and shall continue until the final acceptance of the contract and as required under §611-3.06, Period of Establishment. Care of planting shall consist of keeping the plants in a healthy growing condition by watering, weeding, cultivating, pruning, tightening of guys if staked, remulching, applying approved antidesiccants and pesticides, and by other operations as necessary.

B. Care of Planting Work Schedule. The Contractor shall prepare and submit a Care of Planning Work Schedule to the Engineer for approval. The schedule shall identify how and when all other work specified under §611-3.05 Care of Planting will be accomplished. Exceptions to the approved schedule shall be subject to advance written approval of the Engineer.

C. Watering. All plants shall be watered at the directed times and at the rates specified in the contract documents, or as ordered by the Engineer. Each watering shall provide not less than 20 L of water per plant pit. Payment for the furnishing and applying of water shall be as stated in §611-5 Basis of Payment.

D. Weeding. All plant pits and planting beds shall be maintained weed free by methods approved by the Regional Landscape Architect.

E. Remulching. All plant pits and planting beds shall be remulched as necessary to maintain the required depth specified in the contract documents.

F. Pruning. All dead, injured or diseased wood shall be removed in accordance with good horticulture practice and as approved by the Regional Landscape Architect.

G. Remedial Measures. In the event of the threat of serious damage from insect or diseases, the plants shall be treated by preventative or remedial measures according to good horticultural practice as approved or as directed by the Regional Landscape Architect.

H. Antidesiccants. When specified in the contract documents, plants shall be sprayed with an antidesiccant meeting the requirements of §713-08, Materials for the Protection of Plants. The antidesiccant shall be applied according to the manufacturer's recommendations to thoroughly cover all above ground parts.

I. Removal and Replacement. At the conclusion of the essential portion of the planting work all plants shall be in a healthy, unimpaired and undamaged condition as determined by the Regional Landscape Architect. All plants that are dead, missing, or in an unhealthy or badly impaired condition, as determined by the Regional Landscape Architect, shall be removed and replaced with new, healthy plant material as specified. All planting to be completed or replaced shall be planted not later than the next succeeding planting season as specified in the contract documents.

611-3.06 Period of Establishment

A. General. The Contractor shall be required to continue the work specified under §611-3.05 Care of Planting for a period of one year following the satisfactory completion of all of the planting on the contract as confirmed in writing by the Engineer, or for the duration of the contract, whichever is later. The Period of Establishment applies to all planting unless otherwise specified.

B. Period of Establishment Work Schedule. The Contractor shall prepare and submit a Period of Establishment Work Schedule to the Engineer. The schedule shall describe how and when all work specified under §611-3.06 A. General shall be accomplished. The schedule shall be approved by the Engineer prior to the beginning of the Period of Establishment.

C. Contract Acceptance. In the event the Contractor requests acceptance of the contract and the Period of Establishment is not yet complete, the State, if approved by the Commissioner, may pay the Contractor monies retained under provisions of Section 38 subdivision 7 of the Highway Law upon receipt of certified check or securities as are listed in subdivision 3 of section 139 of the State Finance Law, in the amount of at least double the value of the uncompleted work under Period of Establishment.

For the purpose of determinations for contract acceptance prior to completion of the work under "Period of Establishment," the value of the work required under "Period of Establishment," including necessary replacement, shall be considered as a sum equal to 10% of the price bid for the item of planting unless otherwise specified.

D. Insurance. When all work in the contract excepting Section 611, Planting, has been completed and accepted, the Contractor agrees to procure and maintain for the duration and purposes of any such work of establishment, and at the Contractor's own expense, insurance in accordance with the provisions of §107-06 Insurance.

E. Requirements. At the conclusion of the Period of Establishment the Contractor shall remove all stakes, guy wires and tree wrappings unless otherwise approved. All plants in an unhealthy or badly impaired condition, as determined by the Regional Landscape Architect, shall be removed and replaced or removed and noted for replacement at the next succeeding planting season.

F. Conclusion of the Period of Establishment. These requirements shall not prevent the release of the retained monies as herein defined at the expiration of the Period of Establishment. However, a certified check or securities, as previously described, equal to at least double the value of any uncompleted work will be required. No work other than replacement will be required after the conclusion of the Period of Establishment.

611-4 METHOD OF MEASUREMENT. Planting will be measured as the number of plants of each kind, size or quality as set forth in the contract documents which are counted in place as having been completed and accepted.

611-5 BASIS OF PAYMENT. The unit price bid for each plant of each kind, size or quality, as set forth in the contract, which has been acceptably planted shall include the cost of all labor, equipment, materials and incidentals, including watering and planting soil to complete the work specified.

Furnishing water and watering plants as required under §611-3.05 Care Of Planting will be paid for under the pay item for Watering Vegetation when this item is specified in the contract documents. No separate payment will be made for water used in the initial planting operation, as required in §611-3.03A. No separate payment will be made for water used during the Period of Establishment.

Progress payments for work satisfactorily performed in the excavation and backfilling of plant pits and plant beds may be made in amounts not to exceed twenty percent (20%) of the unit price bid for the respective plants.

Payment will be made under:

Item No.	Item	Pay Unit
611.01 M	Planting - Major Deciduous Trees	Each
611.02 M	Planting - Minor Deciduous Trees	Each
611.03 M	Planting - Coniferous Trees	Each
611.04 M	Planting - Deciduous Shrubs	Each
611.05 M	Planting - Evergreen Shrubs	Each
611.06 M	Planting - Vines & Groundcovers	Each
611.07 M	Planting - Special Plant Materials	Each

Refer to the Contract Proposal for full item number and full description.

SECTION 612 - SODDING AND PLACING EROSION CONTROL MATERIALS

612-1 DESCRIPTION. This work shall consist of sodding and/or placing erosion control material.

612-1.01 Sodding including Top Soil Bed. The work shall consist of preparing the sod bed, furnishing, delivering, placing, and caring for sod in the locations shown and specified in the contract documents.

612-1.02 Furnishing and Placing Erosion Control Materials. The work shall consist of preparing the ground surface, furnishing, placing and caring for erosion control material in the locations shown and specified in the contract documents.

612-2 MATERIALS

612-2.01 Sodding including Top Soil Bed. Materials for sodding shall meet the following requirements.

Water	712-01
Topsoil	713-01
Sod	713-14
Fertilizer	As specified in the contract documents. Where not specified, fertilizer shall be 713-03 Type No. 1 or as approved by the Engineer.

Other materials used for sodding shall be as approved by the Engineer.

612-2.02 Furnishing and Placing Erosion Control Materials. Erosion control materials shall meet the requirements of §713-07 and shall be of the Type and Class specified in the contract documents.

612-3 CONSTRUCTION DETAILS

612-3.01 Sodding including Top Soil Bed

A. Limitations. The Contractor shall notify the Engineer at least two working days before beginning to place sod. The Contractor shall not begin the work until written permission from the Engineer has been received.

No frozen sod shall be placed nor shall sodding be done when the ground surface is frozen. When frost or excessive moisture exist that will prevent satisfactory results from being obtained for any stage of work, the Engineer will stop the work and it shall be resumed only when allowed by the Engineer.

B. Procuring Sod. The Contractor shall exercise maximum care to retain the soil existing on the roots of the sod during transporting, handling and transplanting operations. Dumping or dropping of sod from vehicles will not be permitted. Sod shall be planted within twenty-four hours from the time of harvesting, unless it is tightly rolled, or stored roots-to-roots. All sod in stacks shall be kept moist and protected from exposure to the sun and from freezing. The maximum period of time from harvesting to planting shall not exceed forty-eight hours. Sod that is stored on the project site prior to planting shall meet the moisture requirements of §713-14 at the time of planting.

C. Ground Preparation. There shall be a minimum of 50 mm of topsoil under all sod unless otherwise specified. The subgrade of areas to be sodded shall be excavated and firmed to a sufficient depth below the finished grade of the sod to accommodate the tamped or rolled thickness of topsoil and sod.

Fertilizer shall be applied at a rate of 6 grams of nitrogen per square meter unless otherwise specified in the contract documents.

Fertilizer applied under this work shall be uniformly mixed with the topsoil to a depth of at least 50 mm before the sod is laid, unless otherwise specified or approved.

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

E. Placing Sod. The soil on which the sod will be laid shall be moist. The soil shall be watered prior to sodding, if so directed. The sod shall be laid smoothly, edge to edge and all openings shall be plugged with sod. In drainage ways and where continuous or solid sodding is indicated and/or specified in the contract documents, the sod shall be laid with the longest dimension parallel to the contours. Sodding shall start at the base of slopes and progress upwards in continuous parallel rows. Vertical joints between sides shall be staggered. Immediately after laying, sod shall be pressed firmly into contact with the sod bed by tamping, rolling, or by any other method that will eliminate air pockets, provide true and even surfaces, insure knitting and protect all exposed sod edges, but without damaging or displacing the sod or deforming the finished sod surface. At the time of placing, the sodded areas shall be watered evenly and at a rate of 20 liters per square meter.

F. Anchoring. Sod shall be firmly anchored in all drainage ways, on slopes 1 on 2 or steeper, and wherever else specified or directed. Sod shall be anchored immediately after tamping. All anchors shall be driven flush to the ground.

G. Finishing. Excess sod or excess soil resulting from the sodding operation shall be disposed of by the Contractor. Excess soil shall not be left to form a ridge adjacent to the sodded area or sodded strips.

H. Care During Construction. The Contractor shall care for the sodded areas until all work on the entire contract has been completed and accepted. When necessary, such care shall consist of providing protection against traffic by approved warning signs or barricades. In locations where mowing is specified, the grass shall be mowed until the acceptance of the Contract to a height of 75

mm when the growth reaches a height of 125 mm or as directed.

All sod shall be watered at weekly intervals for a minimum of four weeks following installation and in accordance with §615-3.01, unless otherwise specified or directed. Additional watering shall be performed if specified in contract documents. When watered, sufficient water shall be applied to wet the sod at least 50 mm into the sod bed. Watering shall be done in a manner that will not cause erosion or other damage to the finished surfaces. Any surfaces that have settled, become gullied or otherwise damaged shall be repaired at the Contractor's expense to re-establish the grade and conditions of the soil prior to sodding and shall then be re-fertilized and re-sodded as specified under this work.

I. Liability. When the Engineer decides that any area that has been sodded fails for any reason to produce a satisfactory turf after a suitable period of time has elapsed, the Contractor shall re-sod such areas in the same manner as specified in the contract until a satisfactory turf has been established. Any work to be corrected shall be at the Contractor's expense. The contract will not be accepted until a satisfactory turf has been produced unless the work necessary to assure satisfactory turf will be done under the provisions of an uncompleted work agreement.

612-3.02 Furnishing and Placing Erosion Control Materials

A. Limitations. The time of placement shall be as specified in the contract documents and/or according to manufacturer's recommendations. No erosion control material shall be placed on frozen ground.

B. Ground Preparation and Installation. Areas to receive an erosion control material shall be shaped, graded and compacted to the lines and grades shown in the contract documents or as directed by the Engineer. Except on freshly placed topsoil, areas to receive erosion control materials shall be scarified to a minimum depth of 25 mm immediately prior to installation of the erosion control materials. All loose stones, clods, sticks, or other undesirable material over 25 mm in greatest dimension shall be removed and disposed of by the Contractor.

When jute mesh is used it shall be placed without stretching on the freshly prepared surface so that it lays loosely on the soil and in contact with the soil at all points; and then it shall be rolled or tamped firmly into the soil surface. The upper end of each roll of jute mesh shall be turned down and buried to a depth of 150 mm with the soil firmly tamped against it. Check slots shall be constructed at 15 m intervals unless otherwise specified in the contract documents. The construction procedure shall consist of placing a fold of jute mesh 150 mm vertically into the ground and tamping soil firmly against it. Jute mesh shall be placed so that all edges shall have a minimum overlap of 150 mm. The ends of rolls shall be placed with the upgrade section on top. Jute mesh shall be held tightly to the soil by anchors driven firmly into the ground. Jute mesh anchors shall be spaced not more than 1 meter apart on the sides and along the centerline of all drainage ways. Jute mesh roll ends and check slots shall have anchors spaced at 300 mm intervals.

Class I, II, III erosion control materials shall be placed and firmly anchored as stated in the manufacturer's instructions.

Class IV erosion control materials shall be applied as recommended by the manufacturer. Where applied, Soil Stabilizers, Type A shall be minimum of 6 mm thick. Type A & B are intended to be applied with conventional hydraulic seeding equipment. Soil Stabilizer, Type B, may also be placed through dry spreading. When dry spreading method is used, the contractor shall apply the material uniformly. When Soil Stabilizer, Type A is used, seeds must be sown separately and prior to the application of the soil stabilizer.

All areas where erosion control materials have been satisfactorily placed shall be seeded in accordance with Section 610 - TURF ESTABLISHMENT, the erosion control material manufacturers recommendations and/or as further specified in the contract documents, except that mulching shall be as specified or approved.

C. Liability. When any area fails for any reason to produce a satisfactory turf after a suitable period of time has elapsed, the Contractor shall re-establish the grade, replace the erosion control

materials, and re-establish turf, in the same manner as specified in the contract documents until a satisfactory turf has been established. Any work to be corrected shall be at the Contractor's expense. The Contract will not be accepted until a satisfactory turf has been produced, unless the work necessary to assure satisfactory turf will be done under the provisions of an uncompleted work agreement.

D. Care and Repair. The Contractor shall care for the areas where erosion control materials have been placed until acceptance of the Contract or acceptance of the turf, whichever is later. Where necessary, such care shall consist of providing approved warning signs or barricades for protection against traffic. Any surfaces that have settled, become gullied or otherwise damaged, do to the Contractor's operations, shall be repaired at the Contractor's expense to re-establish the grade and soil conditions that existed prior to placing erosion control materials. Turf shall be re-established as specified in the contract documents. In locations where mowing is specified, the turf shall be mowed unless otherwise approved, to a height of 100 mm when growth reaches 200 mm until acceptance of the Contract.

612-4 METHOD OF MEASUREMENT

612-4.01 Sodding including Top Soil Bed. Sodding including top soil bed will be measured as the number of square meters of surface area that have been acceptably completed.

612-4.02 Furnishing and Placing Erosion Control Materials. Furnishing and placing erosion control materials will be measured as the number of square meters of surface area that have been acceptably completed.

612-5 BASIS OF PAYMENT

612-5.01 Sodding including Top Soil Bed. The unit price bid per square meter shall include the cost of all labor, equipment, materials, including topsoil placed under the sod, water used during planting, and necessary excavation, equipment and incidentals necessary to acceptably complete and care for the work as specified. When the quantity of sod is equal to or less than 400 square meters, the watering necessary to establish the sod after planting shall be included in the price bid for sodding including top soil bed. When the quantity of sod exceeds 400 square meters, the watering, except initial watering at time of planting, shall be paid for under the watering vegetation item in the Contract.

612-5.02 Furnishing and Placing Erosion Control Materials. The unit price bid per square meter shall include the cost of all labor, materials, equipment and incidentals necessary to complete and care for the work as specified, except that furnishing and placing seed, fertilizer and, where specified, mulch are paid for under the turf establishment item and furnishing and placing topsoil will be paid for under the topsoil item in the Contract.

Payment will be made under:

Item No.	Item	Pay Unit
612.01 M	Sodding including Top Soil Bed	Square Meter
612.0201 M	Class I Type A Erosion Control Material	Square Meter
612.0202 M	Class I Type B Erosion Control Material	Square Meter
612.0203 M	Class I Type C Erosion Control Material	Square Meter
612.0204 M	Class II Type A Erosion Control Material	Square Meter
612.0205 M	Class II Type B Erosion Control Material	Square Meter
612.0206 M	Class II Type C Erosion Control Material	Square Meter
612.0207 M	Class III Type A Erosion Control Material	Square Meter
612.0208 M	Class III Type B Erosion Control Material	Square Meter
612.0209 M	Class III Type C Erosion Control Material	Square Meter
612.020910 M	Class III Type D Erosion Control Material	Square Meter
612.0210 M	Class IV Type A Erosion Control Material	Square Meter

612.0211 M	Class IV Type B Erosion Control Material	Square Meter

SECTION 613 - TOPSOIL

613-1 DESCRIPTION. This work shall consist of furnishing and placing topsoil in conformance with the lines, grades and thicknesses shown in the contract documents or as designated by the Engineer.

613-2 MATERIALS. Topsoil shall conform to the requirements §713-01, Topsoil. Unsuitable material from required excavations, that meets these requirements, is acceptable.

613-3 CONSTRUCTION DETAILS

613-3.01 Preparation of Areas to be Topsoiled. The subsoil within the areas to be covered by topsoil shall be graded so that the completed work after topsoil is placed, shall conform to the specified lines and grades. Where specified or directed, the Contractor shall scarify or till the surface of the subsoil before the topsoil is placed to permit bonding the topsoil with the subsoil. Tillage by disking, harrowing, raking or other approved methods shall be accomplished in such a manner that depressions and ridges formed by tillage shall be parallel to the contours.

613-3.02 Placing and Spreading of Topsoil. Topsoil in an unworkable condition due to excessive moisture, frost or other conditions shall not be placed until it is suitable for spreading. Topsoil shall be placed on the designated area and spread to the specified thickness. After the topsoil is spread, all large stiff clods, rocks, roots or other foreign matter shall be cleared and disposed of by the Contractor as approved so that the finished surface will be acceptable for subsequent work such as seeding, sodding, mulching or planting.

613-3.03 Restoration. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding. Surplus topsoil shall be used to flatten embankment slopes or placed in other locations approved by the Engineer.

613-4 METHOD OF MEASUREMENT. Topsoil quantities shall be in cubic meters, computed from payment lines shown on the plans or standard sheets, except where revised payment lines are established by the Engineer prior to performing the work.

613-5 BASIS OF PAYMENT. The unit price bid shall include the cost of furnishing all equipment, labor and materials required to complete the work as specified.

Payment will be made under:

Item No.	Item	Pay Unit
613.0101 M	Topsoil	Cubic Meters

SECTION 614 - CARE, THINNING AND REMOVAL OF TREES

614-1 DESCRIPTION. This work shall consist of care of trees, selective thinning and tree removal as specified.

614-1.01 Care of Trees. The work shall be performed on existing trees shown in the contract documents or designated by the Engineer and shall include one or both of the following operations, or as specified: Pruning; Fertilizing.

614-1.02 Selective Thinning. The work shall consist of felling specifically identified trees, disposing of all wood and debris, and will usually require topping, limbing, stump removal and restoration as shown in the contract documents, in the proposal or as directed.

614-1.03 Tree Removal. The work shall consist of felling trees, disposing of all wood and debris, and may require topping, stump removal and other work as shown in the contract documents or as directed by the Engineer.

614-2 MATERIALS

614-2.01 Care of Trees. Mulch, and other special materials shall be as specified in the contract documents. Fertilizer shall be §713-03, Type 3, 10-6-4, unless otherwise specified. Water shall be as specified under §712-01. Materials for the protection of plants shall be as specified under §713-08.

614-2.02 Selective Thinning. Pesticides §713-13 for basal treatment of stumps shall be as specified.

614-2.03 Tree Removal. The materials for backfilling the stump holes and for establishing grass on the stump hole areas shall be as specified or as approved.

614-3 CONSTRUCTION DETAILS

614-3.01 Care of Trees

A. Equipment. Workers shall not be permitted to climb trees with climbing spurs but they shall employ accepted tree climbing methods. All tools used and methods employed shall be as approved except that no anvil type pruners will be permitted. The cutting surfaces of all tools, ladders, ropes, soles of workers shoes and other objects coming into contact with the tree shall be washed with an approved disinfectant at the start of any work on a tree to prevent the spread of plant diseases when ordered by the Engineer.

B. Pruning. When pruning is specified, the quantity of trees as shown in the contract documents shall be pruned of undesirable wood and the resulting crown shaped to the natural habit of the kind of the tree and as approved. Any and all branches interfering with or hindering the healthy growth of the tree shall be removed. All diseased branches and all dead branches 25 mm or more in diameter shall be removed. Any branch which may be partly dead, yet has a healthy lateral branch at least one-third the diameter of the parent branch shall be removed beyond the healthy branch. All branches less than 5 meters above any part of the roadway or interfering with sight distance or signs shall be removed as directed. All stubs or improper cuts resulting from former pruning shall be removed. All cuts shall be cleanly made with sharp tools as close to the parent trunk or limb as possible without disturbing the callus collar. All large bark wounds shall be scar traced in accordance with good horticultural practice to the satisfaction of the Engineer. All existing nails, spikes, wire or other materials found driven into or fastened to the trunk or branches shall be removed or if approved they shall be cut flush in a manner to permit complete healing over.

C. Fertilizing. When fertilizing is specified, the quantity of trees shown in the contract documents shall be fertilized as specified for Method No. 1, No. 2 or No. 3.

Method No. 1. Holes shall be made in the earth about 400 mm deep and 400 mm apart, and located in the outer two-thirds (as measured on the radius) of the circular area lying under the limits of the tree branches. The holes shall be made with a crowbar, soil auger, pneumatic equipment or other approved tools and care shall be taken to avoid injury to the roots. Fertilizer shall be applied at the rate specified and shall be evenly distributed over the area to be fertilized by placing equal amounts of fertilizer in the lower 300 mm of each hole.

Method No. 2. Fertilizer shall be applied at the rate specified with sufficient water pressure to saturate the soil for the area and depth of the tree roots. Standard high pressure power tree spraying equipment with a valve controlled pipe used as a jet irrigator or other approved equipment may be used.

Method No. 3. Fertilizer rate and method of application shall be as specified in the contract documents.

D. Cleanup and Disposal. All trunks, branches, rubbish and debris resulting from the work shall be removed and disposed of by the Contractor as specified in §201-3.03, Disposal.

614-3.02 Selective Thinning. All trees and shrubs to be removed will be designated by the Engineer either by separate marking, marking in sample areas, or otherwise, to guide the Contractor on the scope and detail of the work. All stumps shall be cut to a height of about 150 mm above the ground unless otherwise specified or approved. An approved pesticide shall be applied to all live stumps in accordance with the manufacturer's recommendations. An approved dye shall be added to the pesticide mixture to identify treated stumps and stubble.

Care shall be taken in the felling of trees and the operation of equipment to prevent injury to trees and shrubs which are to be preserved. All injuries to the limbs, bark and roots of such plants shall be repaired as directed by the Engineer.

Selective thinning work shall be completed in any area before any planting or seeding work is begun in that area unless otherwise approved.

All wood, stumps, brush and other debris resulting from the work shall be disposed of as specified in §201-3.03, Disposal.

614-3.03 Tree Removal

A. General. No tree shown in the contract documents or listed for removal under this section shall be cut until it is approved by the Engineer. All work involving public utilities shall be coordinated with the respective utility company.

All trees shall be "topped" and "limbed" before felling unless otherwise approved.

Stumps of trees removed under this item and existing stumps listed for removal shall be grubbed, ground or cut as specified. Stumps shall include all visible wood and roots and shall be grubbed, ground or cut to the depth specified below the average grade or as directed by the Engineer. All stump holes shall be backfilled with the specified or approved materials compacted to the satisfaction of the Engineer within one week after start of work on the tree. The work of establishing grass on the stump hole areas shall be performed as specified or approved.

If, in the opinion of the Engineer, unsafe tools, equipment or methods are employed, work shall be stopped until such unsafe conditions have been corrected.

B. Disposal of Wood. The requirements of §201-3.03, Disposal, shall apply.

C. Liability. The Contractor shall protect and shall be liable for injuries to all plants, curbs, pavements, structures, utility lines and other features on the highway right-of-way and adjacent property. Replacements and restoration shall be as approved by the Engineer.

614-4 METHOD OF MEASUREMENT

614-4.01 Care of Trees. Care of trees shall be measured by the number of trees of each size group as set forth in the contract which are counted in place as having been completed and accepted.

614-4.02 Selective Thinning. Selective thinning shall be measured by the number of square meters satisfactorily completed.

614-4.03 Tree Removal. Tree removal shall be measured by the number of trees of each size group which have been satisfactorily removed. All trees shall be measured before they are cut. Measurements shall be made 1.4 meters (commonly referred to as D.B.H. -Diameter Breast High) above the ground. Removal of Existing stumps shall be measured by the number of stumps which have been satisfactorily removed.

614-5 BASIS OF PAYMENT

614-5.01 Care of Trees, Selective Thinning and Tree Removal. Payment for each item of work will be based on the unit price bid, which payment shall constitute full compensation for all labor, materials, equipment and incidentals necessary to complete the work as specified.

When trees and their respective stumps are specified in the contract documents for removal, payment for each tree removal shall include the work required for removal of the respective stump.

Removal of existing stumps shall be paid for separately.

Tree removal on an each basis shall be limited to those trees specifically listed for removal in the proposal or designated by the Engineer to be removed under this item.

Payment will be made under:

Item No.	Item	Pay Unit
614.01xx M	Care of Trees	Each
614.02 M	Selective Thinning	Square Meter
614.03xx M	Tree Removal	Each

Note: xx denotes serialized pay item. See §101-02 Specifications.

SECTION 615 - LANDSCAPE MISCELLANEOUS

615-1 DESCRIPTION. This work shall include watering plants, shrubs, ground covers, vines and other plants as specified in the contract documents. This work shall also include other landscape development items as specified in the contract documents, applicable standard sheets and in accordance with the specifications.

615-2 MATERIALS

615-2.01 Watering Vegetation. The materials shall meet the requirements of the following subsection of section 700-Materials Details.

Water	712-01

615-3 CONSTRUCTION DETAILS

615-3.01 Watering Vegetation. Water shall be applied in such a manner that the required volume of water will be provided without damage to plants, mulch, stakes, plant saucers, sod or other areas to be watered. Damage resulting from watering operations shall be repaired at the Contractor's expense.

615-4 METHOD OF MEASUREMENT

615-4.01 Watering Vegetation. This work will be measured in kiloliters of water applied. The quantity applied will be determined from approved meters, or by measurement in tanks or tank trucks of predetermined capacity.

615-5 BASIS OF PAYMENT

615-5.01 Watering Vegetation. The unit price bid shall include the cost of furnishing and applying water, all labor, equipment and incidentals necessary to satisfactorily complete the work.

Payment will be made under:

Item No.	Item	Pay Unit
615.03 M	Watering Vegetation	Kiloliter

SECTIONS 616 AND 617 (VACANT)

SECTION 618 - BITUMINOUS MATERIAL

618-1 DESCRIPTION. Under this work the Contractor shall furnish and place bituminous material of the type and quantity specified on the plans or in the specifications.

618.58 M	Tar (RT-10)	Liter
618.59 M	Tar (RT-11)	Liter
618.60 M	Tar (RT-12)	Liter
618.61 M	Tar (CB-5)	Liter
618.62 M	Tar (CB-6)	Liter
618.90 M	Asphalt Emulsion Tack Coat	Liter

SECTION 619 - MAINTENANCE AND PROTECTION OF TRAFFIC

619-1 DESCRIPTION

619-1.01 General. This work shall consist of maintaining traffic and protecting the public from damage to person and property within the limits of and for the duration of the contract.

619-1.02 Basic Maintenance and Protection of Traffic. Traffic shall be maintained over a reasonably smooth traveled way which shall be so marked by signs, delineators, guiding devices and other methods that a person who has no knowledge of conditions may safely and with a minimum of discomfort and inconvenience ride, drive or walk, day or night, over all or any portion of the highway and/or structure under construction where traffic is to be maintained. All work shall conform to the requirements of the M.U.T.C.D. The basic maintenance and protection requirements shall be as follows:

A. Surface. Maintain the surface condition of the traveled way so it is consistent with the appropriate speed limit.

B. Drainage. Maintain the drainage facilities and other highway elements, old or new, including those on detours.

C. Bus Stops. Maintain existing bus stops so bus passengers are reasonably accommodated.

D. Pedestrian Traffic. Provide adequate protection for pedestrian traffic during all phases of construction.

E. Intersecting Highways. Provide ingress and egress to and from intersecting highways, homes, business and commercial establishments.

F. Dust Control and Spillage. Control dust and keep the traveled way free from materials spilled from hauling equipment. This shall also apply to dust control and spilled material resulting from the Contractor's operations in the areas outside the contract limits.

G. Flagger. Provide the necessary traffic control equipment and flaggers for adequate traffic control.

H. Repairs. Make the necessary repairs to existing pavement and structure wearing surfaces as required to provide a reasonably smooth roadway where vehicle operation is maintained.

I. Responsibility to the Public. Protect the public from damage to person and property which may result directly or indirectly from any construction operation. The specification requirements of section 107, Legal Relations and Responsibility to Public, shall apply.

J. Schedule. Schedule work to keep to a minimum, and consistent with the physical requirements of the contract, the amount of existing pavement and/or facilities that are destroyed or substantially torn-up at any one time. Unless otherwise indicated on the plans or in the proposal the length of existing facility destroyed shall not exceed two kilometers, nor shall any part be closed to traffic during seasonal shutdown periods, unless the Contractor has submitted and the Engineer has approved a detailed schedule of operations reflecting a proposal to the contrary.

K. Snow and Ice Control. Maintain the traveled way in such a condition and conduct operations in such a manner that snow and ice may be readily controlled by others as and when necessary, and in such a manner that proper drainage is provided for the melting of snow in the banks resulting

from normal plowing. This shall include, but not be limited to, the cutting of weeps through banked or accumulated snow to provide proper drainage of surface runoff into the highway ditches and/or culverts. The Contractor shall not, however, be responsible for snow and ice control on the pavement or shoulders.

L. Delineation and Guiding Devices. Provide and maintain delineation and channelization devices which shall include delineators, plastic drums, cones, temporary curb 300 x 300 mm and smaller exposed section, and other similar materials or methods acceptable to the Engineer.

The installation, moving and removing of any such delineators or channelization devices together with removal of existing pavement markings shall be included in the work.

M. Project Site Patrol. The Contractor shall provide personnel to patrol the contract area as necessary to ensure that conditions on the site are adequate for public safety and convenience at all times. The Contractor is placed on notice that maintenance and protection of traffic over a highway during construction is considered as important as the construction itself. The Contractor shall, therefore, at all times conduct the operations in a manner to ensure the convenience of all travelers and the abutting property owners and their safety as well as the safety of the Contractor's own employees.

Such conduct shall include, but not be limited to: ensuring that all construction materials and equipment are removed from the work site during non-working hours, or are protected in such manner that they shall not constitute a traffic hazard; conducting the operations in such a manner as to minimize the amount of time during which fixed objects and steep side slopes are without guide rail protection; conducting shoulder construction and paving operations in such a manner as to minimize the period of time the traveling public is exposed to sharp dropoffs; and not allowing workers to park personal vehicles in the shoulder area on roads with operating speeds less than 70 km/h and within ten meters of the traveled way on other roads, unless protected by barrier.

N. Shadow Vehicle. For purposes of these specifications, a shadow vehicle is defined as a slowly moving or stopped vehicle operating or placed in a traffic lane, or adjacent thereto, upstream of a construction work zone. The purpose of shadow vehicles is to guide traffic around a construction work area or to reduce the possibility of harm to workers in the work area. Shadow vehicles shall be required when shown on the plans or for all slowly moving work areas in travel lanes, except where the travel lane is closed to traffic by barrier, barricades, plastic drums, arrow panels, flagpersons or cones. Slowly moving work areas are those which move at a speed of 2km/h or more but at least 25km/h less than the legal speed limit. Shadow vehicles shall weigh 8200 kg to 9100 kg. Ballast may be used to bring a lighter weight vehicle up to the indicated weight. Shadow vehicles shall be equipped with Mobile Construction Zone Impact Attenuators, §712-06 and one Type B Arrow Panel as described in the M.U.T.C.D. On roads with posted speed limits of 65 mph within 335 meters upstream of the shadow vehicle, or whenever indicated on the plans or in the proposal, the Mobile Construction Zone Impact Attenuator shall be listed as a National Cooperative Highway Research Report 350 Test Level 3 device on the Approved List. On other roads the attenuator shall meet the requirements of NCHRP 350 Test Level 3 or Test Level 2, NCHRP 230, or other testing protocol as stated in §712-06.

619-1.03 Construction Signs, Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricades, and Lighting for Construction Barricades. The Contractor shall furnish, install, move, and maintain construction signs, temporary box beam barrier, temporary concrete barrier, construction barricades, and lighting for construction barricades where shown on the plans or when ordered by the Engineer, and in accordance with the M.U.T.C.D.

619-1.04 Temporary Structures and Approaches. The Contractor shall construct,move or remove, as directed, temporary structures, approaches, detours, pavements and necessary appurtenances.

619-1.05 (Vacant).

619-1.06 Short-Term Pavement Markings. Short-term pavement markings are intended for use on any new pavement or milled surface until the subsequent pavement course is placed or the final pavement markings are installed. The Contractor shall furnish, apply and when so ordered, remove short-term pavement markings where shown on the plans, or directed by the Engineer, in accordance with these specifications.

619-1.07 Temporary Traffic Signals. The Contractor shall furnish, install, move, remove and maintain temporary traffic signals and necessary components where indicated on the plans or as directed by the Engineer. The temporary traffic signals and necessary components that are furnished by the Contractor shall remain the property of the Contractor.

619-1.08 Mailboxes. During construction, the Contractor shall maintain in a usable condition and location specified by U.S. Postal requirements, postal route mailboxes serviced from motor vehicles.

619-1.09 Opening Highway to Traffic Prior to Contract Acceptance. This work includes the maintenance and protection of traffic on any portion of pavement, structure, or ramp directed in writing by the Regional Director to be opened to traffic prior to contract acceptance and on which traffic was not specified to be maintained and protected during construction. Pavement sections on new locations which are indicated to be used in the maintenance of traffic plan or which are requested by the Contractor to be used to maintain traffic, shall not fall in this category.

619-1.10 Railroad Protection. Where the contract work affects railroad companies, the maintenance and protection of traffic requirements specified in §105-09, Work Affecting Railroads and special provisions of the contract proposal shall apply.

619-1.11 Duration of Contract. The duration of the contract, for the purpose of this work, shall be from the date any work is started on the contract, including moving in equipment, signs, offices, shops and the like, until the date the contract is officially accepted.

619-1.12 Maintain Traffic Signal Equipment. The Contractor shall maintain in proper operation, existing, relocated, modified or newly installed traffic signals indicated in the contract documents or directed by the engineer for the period specified in the contract documents.

619-1.13 Flashing Arrow Board. Furnish, install, maintain and remove Flashing Arrow Board warning devices in accordance with plans, NYS Manual of Uniform Traffic Control Devices or the directions of the Engineer. Flashing arrow boards are intended for use as temporary traffic warning devices during construction and obstruction periods, and under this item the Contractor shall provide Flashing Arrow Boards made necessary by the operations. The number and type required shall be the number and type necessary, in accordance with the criteria given below, to satisfactorily guide traffic through the construction. The actual number will depend on the Contractor's sequence of operations.

619-1.14 Construction Zone Pavement Markings. The Contractor shall furnish, apply, maintain and remove construction zone pavement markings conforming to the NYSMUTCD at the locations, and in accordance with the patterns, indicated in the contract documents or directed by the Engineer. These pavement markings are intended for use in detours, temporary pavement realignments and crossovers, lane shifts and closures, and other temporary traffic patterns associated with the construction activities.

619-1.15 Maintenance and Protection of Traffic During Nighttime Operations. Nighttime operations consists of work specifically scheduled to occur after sunset and before sunrise. In addition to the requirements of basic maintenance and protection of traffic, additional requirements for maintenance and protection of traffic during nighttime operations shall be as follows:

A. Traffic Control Supervision. The Contractor shall provide a full-time traffic control supervisor for nighttime operations with adequate training, experience, and authority to implement and maintain all traffic control operations. The traffic control supervisor must be approved by the

Engineer based on a written request by the Contractor detailing the training and experience of the traffic control supervisor. The traffic control supervisor shall be assisted by a full-time traffic control crew equipped with a suitable vehicle or vehicles and a mobile communications system consisting of radios or cellular phones. The duties and responsibilities of the traffic control supervisor shall be included in the plan of nighttime operations. During setup and removal of lane closures and other traffic control setups, the traffic control supervisor and crew shall be assisted by additional workers as necessary.

B. Plan of Nighttime Operations. Thirty days prior to the start of night work, the contractor shall submit a written plan for nighttime operations to the Engineer. The plan shall detail all aspects of the traffic control setup; lighting plans; the functions, responsibilities and identities of the traffic control supervisor and crew; and other details as necessary. It shall include a contingency plan identifying foreseeable problems and emergencies that may arise, and the approach that will be used to address them. This plan shall be revised and updated by the contractor as necessary during the progress of the work to accommodate actual conditions on the project.

C. Project Site Patrol. During nighttime operations, the traffic control supervisor and crew shall constantly patrol the contract area to ensure that conditions on the site are adequate for public safety and convenience at all times, to ensure worker safety from intrusions into the worksite, and to ensure that the provisions for maintenance and protection of traffic in the contract documents and in the plan for nighttime operations are adhered to. The traffic control crew shall maintain and adjust signs, channelizing devices, area lighting and other traffic control devices as necessary.

D. Waiver of Requirements. When the work does not require closure of an active lane, roadway, or ramp and when no construction operations occur adjacent to active traffic lanes; the requirements for a full-time traffic control supervisor and full-time project site patrol shall be waived. However, the contractor shall provide a competent supervisor and workers to install, maintain, adjust, and remove traffic control devices as required by the work operations. The details of the supervision and site patrol to be provided under this waiver shall be included in the plan of nighttime operations.

E. Trained Flaggers. All flaggers used in nighttime operations shall be formally trained in flagging operations. This training may consist of ATSSA (American Traffic Safety Services Association), Union, or trade association training, or training by an individual who has received formal training from a recognized program or agency in work zone traffic control. Prior to the start of work, the contractor shall provide the Engineer with a written summary of training for each individual flagger. When requested by the Engineer, flaggers shall demonstrate their competency in flagging procedures. Flaggers not thoroughly competent in flagging procedures to the satisfaction of the Engineer shall be replaced at once.

F. Emergency Flares. A supply of emergency flares shall be maintained by the Contractor for use in the event of unanticipated situations such as traffic accidents, equipment breakdowns, failure of lighting equipment, etc.

619-2 MATERIALS. All materials used shall comply with the requirements of the appropriate subsections of Section 700, Materials, or as established by this section, the applicable standard sheets or the plans.

619-2.01 Existing Pavement Repair. Existing pavements shall be kept in repair using materials compatible with the pavement. In general, plant-mixed bituminous concrete is suitable for all pavement surfaces. Material other than plant-mixed bituminous concrete may be used if approved by the Engineer.

619-2.02 Construction Signs, Other Signs, and Sign Covers. Rigid sign panels may be aluminum, fiberglass, galvanized steel, or plywood, except that sign panels placed on Type III Breakaway Barricades shall be aluminum.

Rigid lightweight plastic may also be used for sign panels, but not for panels larger than 1200 X

1200 mm. The rigid lightweight plastic substrate shall consist of at least two parallel surfaces of plastic separated by plastic foam or stiffener/spacers. A single piece plastic extrusion simulating this construction will also be acceptable. External stiffeners may be used to prevent warping and excessive flexing, or to attach the panel to posts. If through bolting is used to attach the panel to stiffeners, or to attach the panel directly to the posts, the bolt heads shall be provided with clear washers to minimize obscuring the legend. The rigid lightweight plastic substrate, plus any external stiffeners, shall not have a combined mass of more than 6 kg/m2.

On rigid panels, all colors of sign faces, except orange, shall be reflectorized and meet the requirements of §730-05 Reflective Sheeting, Materials Designation 730-05.02 (Class B). When orange signs on rigid panels are specified they shall be fabricated using reflectorized fluorescent orange colored sheeting meeting Materials Designation 730-05.04 (Class D).

Flexible sign panels shall be a solid, orange colored, durable elastomeric material. Flexible sign panels fabricated from mesh will not be allowed.

Flexible signs shall be orange in color and a reasonable visual match to Munsell Book Notation 2.5 YR 5.5/14. The orange color flexible panels shall be approved by the Engineer prior to use. Flexible sign panels need not be reflectorized.

Black sign characters shall be non-reflective, and shall conform to the requirements of §730-13 Reflectorized Sheeting Sign Characters (Type V).

White sign characters shall meet the requirements of either §730-12 Reflectorized Sheeting Sign Characters (Type IV) or §730-13 Reflectorized Sheeting Sign Characters (Type V).

Covers used to inactivate unneeded signs shall match the size and shape of the sign and shall cover the entire sign face. More than one layer of fabric may be required to prevent legibility of the sign legend to be covered. The covers shall be a heavy duty, opaque material; and dark green, brown, or black, in color. The sign cover shall be attached to the sign in a secure manner using straps or other means approved by the Engineer. The finished sign covers shall be neat in appearance, with all fasteners secured on the backside of the sign face.

619-2.03 Delineators, Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricades, Lighting for Construction Barricades, Tubular Markers, and Short-Term Pavement Markings. Delineators, barricades, lighting for construction barricades, short-term pavement markings, tubular markers and similar materials shall meet the requirements of these specifications and shall be in accordance with the plans, applicable standard sheets and the M.U.T.C.D. No materials or methods which will cause damage to any pavement or paving course that will be retained shall be employed in the removal of pavement markings.

Tubular markers shall meet the requirements of §730-09 Tubular Markers for Construction Zone Channelization. Tubular markers and cones purchased after October 1, 1998 shall be certified by their manufacturers or vendors as complying with NCHRP 350 testing requirements. The basis for such certifications shall be full or simplified crash testing or satisfactory in-service performance of identical or similar devices.

Temporary box beam barrier shall meet the requirements of box beam median barrier as specified in §710-21 Box Beam Guide Railing and Median Barrier. After the removal of the barrier, the pavement repairs shall be made in accordance with the applicable requirements of Section 402 - Hot Mix Asphalt (HMA) Pavements or Section 502 Portland Cement Concrete Pavement.

Temporary concrete barriers shall conform to the dimensions, joint connections, materials details, and anchoring details shown on the standard sheet or approved material details. The barrier sections shall be precast concrete units. The Manufacturer shall certify that the temporary concrete barrier units conform to the details shown on the standard sheet or approved materials details.

The details for temporary concrete barrier shown on the standard sheet or approved materials details are standard. Designs, other than those shown on the standard sheet or the approved materials details, may be proposed and, if found acceptable, they will be placed on the approved list. No variation in the method of connecting the units together will be approved unless evidence that the temporary concrete barrier, with the proposed joint system, has been successfully crash tested by a recognized testing agency. The test vehicle shall be smoothly redirected without showing any evidence of penetrating or

vaulting. The tests shall be conducted in accordance with NCHRP 350 under the following criteria:

1. Test vehicle shall be the 2000P
2. Impact angle 25° ±2°.
3. Impact speed 100 km/h.

In no case shall the tested deflection of the barrier exceed 400 mm.

The cross sectional dimensions shown on the standard sheet shall be used in all cases without variation.

The Engineer will inspect the temporary concrete barrier sections upon delivery to the project site for conformance to specifications. Any barrier sections having damage and/or defects in the concrete and/or joint connections will be rejected by the Engineer when, in the Engineer's judgement, the performance of the barriers will be affected.

The temporary concrete barrier sections shall form a smooth and continuous barrier when joined together. Any sections damaged or misaligned while in service shall be corrected or replaced to the satisfaction of the Engineer.

When reflectorization is required by the M.U.T.C.D. reflective sheet material shall be used and it shall conform to §730-05, Reflective Sheeting, Material Designations 730-05.02 (Class B) or 730-05.03 (Class C), except where glass or plastic buttons are used as delineators. Construction barricades, cones and drums may be reflectorized with reflective sheeting conforming to the requirements of §730-05, Reflective Sheeting, Materials Designation 730-05.01 (Class A). All traffic cones 700 mm in height, when used after dark, shall have two (2) white horizontal stripes of reflective material near the tip. The reflective material shall conform to the requirements of §730-05 Reflective Sheeting, Class A, B or C. The upper stripe shall be 150 mm wide with its upper edge 75 to 100 mm below the top of the cone. The lower stripe shall be 100 mm wide with its upper edge 50 mm below the upper stripe.

When reflectorization is not required, any paints utilized shall be of an exterior type conforming to the appropriate Highway Color Tolerance Chart PR Colors No. 1 through No. 6. These requirements must be maintained throughout the period of the contract with repair or replacement made by the Contractor as necessary.

Short-term pavement markings shall consist of reflectorized pavement marking paints, removable reflectorized pavement marking tape, non-removable reflectorized pavement marking tape, or removable raised reflectorized pavement markers. Removable reflectorized pavement marking tape and raised reflectorized pavement markers shall be selected from the Department's Approved List of "Removable Reflectorized Pavement Markings". Pavement marking paints shall meet the material requirements of Section 640 Reflectorized Pavement Marking Paints. Non-removable pavement marking tape shall be specifically designed for use as a pavement marking and shall be approved by the Engineer prior to application. All line segments shall be not less than 100 nor more than 150 mm in width and the colors shall be as specified in the M.U.T.C.D.

619-2.04 Temporary Structures and Approaches. When specific details are shown on the plans for temporary structures, the materials specified shall be used, except that substitutions or alterations may be permitted if approved by D.C.E.S. Mill inspection will not be required for structural steel furnished under this item. Certified copies of the manufacturer's test results shall be submitted to the Engineer. When specific details are not shown on the plans, the Contractor shall assume all liability and responsibility for determining that all materials required conform to the current AASHTO specifications for Highway Bridges unless otherwise approved by the DCES. Used material shall not be furnished for Fracture Critical Members. Excluded from this provision are pedestrian and pre-engineered (fabricated) proprietary structures.

619-2.05 Temporary Traffic Signals. All span wire, inductance loop wire, shielded lead-in cable, traffic signal cable, and other wire used for temporary traffic signals shall be new material meeting the applicable requirements of §680-2 of the Standard Specifications.

All other equipment for temporary traffic signals shall meet the requirements of §680-2 of the Standard Specifications except for the following modifications:

A. Used Equipment. Used equipment in good operating condition may be furnished to provide the required operation of the signals.

B. Manufacturer's Certification. Manufacturer's certification of compliance will not be required.

C. Signal Controller. The signal controller may be either solid state or electro-mechanical.

D. Traffic Signal Heads. The material and painting requirements of §724-04 Traffic Signal Heads, shall not apply except that the signal head housing shall be made of aluminum alloy and shall be painted with an exterior dark green enamel paint or epoxy powder coating.

E. Conflict Monitor. Means shall be provided to prevent the signal from displaying indications which will result in two or more conflicting traffic movements being permitted simultaneously.

619-2.06 Type III Construction Barricades. Type III construction barricades shall meet the requirements of the following specifications:

A. Barricade Frames. Barricade frames for Type III construction barricades shall meet the requirements of the following specifications:

1. PVC Pipe Barricade Frames for Alternate "A" and "B". PVC Pipe barricade frames shall be fabricated from plastic pipe conforming to the following table:

TABLE OF ACCEPTABLE MATERIALS FOR PVC PIPE BARRICADES

NPS DESIG-NATION	PIPE		FITTINGS	
	A.S.T.M.	*SDR RANGE	ALTERNATE A	ALTERNATE B
3	D2241	21.0 TO 32.5	D2665 OR D2466	D2468, D2661, D2665, D2466
3	D2665	---	D2665 OR D2466	D2468, D2661,D2665, D2466
3-½ **	D2241	21.0 TO 41.0	D2466	D2468,D2466
4 **	D2241	21.0 TO 64.0	D2665 OR D2466	D2468, D2661, D2665, D2466
4	D2665	---	D2665 OR D2466	D2468, D2661, D2665,D2466
4	D2729	---	D2729	D2729

* SDR (Standard Dimension Ratio) as specified in the various A.S.T.M. Designations.

** NPS 3-½ OR 4 A.S.T.M. D2241 SDR 21 to SDR 26 shall be used on barricades which are extended for sign mounting. These pipes shall not be used on other barricades.

All joints in Alternate "A" shall be glued with a solvent cement compatible with the pvc pipe chosen by the Contractor.

All joints in Alternate "B" shall be free to separate upon vehicle impact. Pipes and fittings shall be tied together with a braided nylon rope as shown on the Standard Sheet.

2. Metal Barricade Frames for Alternate "M". Square tubing for the Alternate "M" barricades shall be either perforated or unperforated steel conforming to one of the following:

12 Ga. ASTM A653M Grade A
14 Ga. ASTM A1011 Grade 50

The brackets shall be fabricated from 6 mm plate conforming to ASTM A653M Grade A or ASTM A1011 Grade 50.

The bolts shall be ASTM F568 Class 4.6 and the nuts shall be ASTM A563M Grade 0. Both the nuts and the bolts shall be galvanized in accordance with the requirements of §719-01 Type II.

The Contractor may at its option supply ungalvanized square steel tube and brackets. However, any rust which may, as determined by the Engineer, impair the collapse of the barricade upon impact may result in the rejection of the barricade unit.

3. Polyethylene Barricade Frames for Alternate "C". Base and upright for the Alternate "C" barricade shall consist of molded medium density polyethylene tubing meeting the requirements of ASTM D1248-IIA3. The angled brace shall consist of extruded high density PE meeting the requirements of ASTM D1248-IIIA4. Polyethylene tubing and miscellaneous hardware shall be of the dimensions and sizes indicated on the standard sheets. All joints in the PE components shall have tight friction fits designed to withstand normal wind and construction site conditions but to separate on impact.

B. Panels for Rails or Signs. Barricade rails and signs mounted on the barricade shall be aluminum or high density polyethylene (HDPE) panels . Aluminum rail and sign panels shall be 0.635 and 3.2 mm thick respectively and shall conform to the requirements of §730-01 Aluminum Sign Panels. HDPE panels shall be 3.2 mm nominal thickness and shall conform to the requirements of ASTM D1248-IIIA5.

The three rails of the barricade shall have 150 mm wide reflectorized orange and white diagonal stripes sloping at an angle of 45°. The stripes shall slope downward toward the side on which traffic is to pass. The reflective sheeting for the stripes shall conform to the requirements of §730-05 Reflective Sheeting, Materials Designation 730-05.01 (Class A) or 730-05.02 (Class B) or 730-05.03 (Class C) at the Contractor's option.

619-2.07 Maintain Traffic Signal Equipment. All traffic signal hardware including but not limited to wire, cable, conduit, pullboxes, switchpacks, modules and relays, signal heads, poles, and pedestrian push buttons used to maintain proper operation shall meet the applicable requirements of §680-2 materials. Parts and materials which are to continue in operation beyond the contract duration shall be new.

619-2.08 Flashing Arrow Board. The Flashing Arrow Boards shall be trailer mounted self contained units or, with permission of the Engineer, truck mounted self-contained units. Flashing Arrow Boards shall display a flashing symbol consisting of flashing yellow lights arranged on a panel to form an arrow.

The arrow panel shall consist of 1200 X 2400 mm rectangular solid panel finished in non-reflective black, and shall be mounted so that the bottom of the panel is a minimum of 2.1 m above the roadway. The arrow indication shall cover the entire area of the panel, and shall be composed of lamp units with five lamps in the arrowhead and five lamps in the shaft.

Lamps shall be arranged and controlled to provide the following mode selections: Left Arrow, Right Arrow, Left and Right Arrow, and Caution. In the three directional modes, the lamps in the shaft next to the arrow point shall not illuminate. The caution mode shall consist of either two pairs of alternately flashing lamps arranged in a pattern that does not indicate direction, or four lamps simultaneously flashing in each of the four corners of the board. The rear face of the arrow panel shall contain one or more clear lamps to indicate that the arrow board is operating properly. Arrow panel operation controls shall be mounted in a lockable enclosure.

The lamps shall flash at a rate of not less than 25 nor more than 40 flashes per minute with a minimum lamp "on time" of at least 50 percent of the cycle. The lamps shall be recess mounted or alternatively equipped with an upper hood of not less than 180 degrees. The lamps shall be equipped with an automatic solar cell controlled dimming switch activated at a level of approximately five candellas. The solar cell dimming switch shall be equipped with a delay to prevent undesirable actuation from car lights. The dimming voltage to the lamps shall be manually controllable over a five to twelve volts effective range.

Flashing Arrow Boards shall be powered by line voltage, diesel motor generator system, or by a solar charged battery system. Boards powered by diesel motor generator system shall be capable of sustained operation for 72 continuous hours at normal operating voltage. Solar charged arrow boards shall be capable of continuous operation on battery power only for the same period at normal operating

voltage. The flashing arrows of diesel or line powered boards shall be legible at a minimum distance of 1600 meters on a bright sunny day or a clear night. The flashing arrows of solar charged boards shall be clearly legible continuously from any point on the traveled way or shoulder from the beginning of the lane closure taper to an upstream distance of 500 meters on a bright sunny day or a clear night.

619-2.09 Plastic Drums. Plastic Drums may be used for channelization devices, provided they are of the proper size and reflectorized as indicated in the M.U.T.C.D. Plastic drums purchased after October 1, 1998 must be certified by their manufacturers or vendors as complying with NCHRP 350 testing requirements. The basis for such certifications shall be full or simplified crash testing or satisfactory in-service performance of identical or similar devices. The plastic drums shall have provisions for the installation of ballast (weights) or retainer rings to prevent the drums from blowing over due to wind loading. The ballast or retainer rings must be designed to separate from the drum on impact. The ballast shall be located at or near ground level and consist of bagged sand, or other material approved by the Engineer, weighing no more than 22 kilograms. The sand shall be contained in waterproof closed bags or in a waterproof compartment of the device specifically designed for the purpose. For two-piece drums, only the base shall be detachable no more than 100 mm above the pavement. For one-piece drums, the base shall be elongated to accept ballast on one or more sides. No open or top metal drums will be permitted.

619-2.10 Construction Zone Pavement Markings. These markings shall consist of reflectorized pavement marking paints, removable reflectorized pavement marking tape, or removable raised reflectorized pavement markers. Pavement marking paints shall meet the material requirements of §640-2. Removable reflectorized pavement marking tape and raised reflectorized pavement markers shall meet the requirements of §727-02 and shall be selected from the Department's Approved list of "Removable Reflectorized Pavement Markings." All longitudinal line segments shall be not less than 100 mm nor more than 150 mm in width and colors shall be as specified in the MUTCD and shown on the plans.

The type of pavement marking material to be supplied shall be as required by the pay item. In the case of the "Optional Construction Zone Pavement Markings" pay items, the Contractor may select the type of material to be used from the choices permitted in the preceding paragraph, except that reflectorized pavement marking paint shall not be used on any top pavement course that is to remain in place without overlaying at the completion of the project, except where the location of those markings coincide with final painted pavement markings. Raised reflectorized pavement markers shall not be used to simulate marking letters or symbols.

619-3 CONSTRUCTION DETAILS

619-3.01 Basic Maintenance and Protection of Traffic. Under this work, the Contractor shall maintain and protect traffic in accordance with the following:

A. General. The Contractor shall generally provide a traveled way suitable for two lanes of moving traffic, or more lanes if shown on the plans, or in the proposal. The traveled way shall be kept reasonably smooth and hard at all times, and shall be well drained and free of potholes, bumps, irregularities and depressions that hold or retain water. Construction operations shall be conducted to insure a minimum of delay to traffic. Stopping traffic for more than five minutes shall not be permitted unless specifically authorized in writing by the Engineer. The necessary equipment and personnel to attain and maintain a satisfactory riding surface shall be available and used as needed at all times when work is under way and when work is temporarily suspended for any period of time. Special attention to maintenance of a satisfactory traveled way shall be given during weekends, holidays and the winter season.

B. Cleaning of Highways. The Contractor shall keep the traveled way free of foreign objects such as spilled earth, rock, timber and other items that may fall from transporting vehicles. Materials spilled by or dropped from the undercarriage of any carrying vehicle used in the Contractor's hauling operations along or across any public traveled way both within and outside the contract limits shall be removed immediately.

C. Dust Control. Dusty conditions resulting from the Contractor's operations shall be corrected by the use of calcium chloride and/or water. Water used as a dust palliative shall be distributed uniformly over a minimum width of 2400 mm by the use of suitable spray heads or spray bar.

Nothing in these specifications shall preclude the use of a dust palliative which has been evaluated and found to be environmentally compatible and is used in conformance with any conditions placed on its use. This use shall be at no additional cost to the State and as approved by the Engineer. A list of acceptable dust palliatives is available from the Director, Geotechnical Engineering Bureau or a Departmental Soils Engineer.

D. Traffic Control. Whenever it becomes necessary to maintain traffic on one lane, the Contractor shall provide adequate traffic controls on the section of highway on which vehicle operation is maintained. The Contractor shall employ a sufficient number of competent flagpersons and/or temporary traffic signals to control one lane traffic continuously. In the event the length of the one lane operation is extremely short and conditions are favorable for safe operation, the Engineer may, in writing, authorize the Contractor to dispense with flaggers or traffic control signals. The Contractor shall also provide a sufficient number of competent flaggers in areas where construction equipment is operating in potential conflict with public traffic, regardless of the volume of traffic or the sight distance. Flaggers shall wear orange hard hats meeting current OSHA standards for impact, electrical shock, and burn protection and vests in conformance with the M.U.T.C.D., and shall direct traffic in conformance with said manual. Signal Paddles meeting the requirements of Section 293.2 of the MUTCD shall be used as the standard signaling device for flagging operations where one or more flaggers are controlling a single stream of traffic, or two alternating streams of traffic proceeding in opposite directions. Signal flags may be substituted where display of the STOP and SLOW faces in opposite directions may be inappropriate or misleading, or in other situations, when approval is granted by the Engineer.

E. Drainage. The Contractor shall devote particular attention to all drainage facilities, keeping them fully operative at all times. Ditches shall be provided at all times, even during grading operations and periods of accumulated plowed snow, to adequately drain the traveled way and the remainder of the right-of-way areas.

F. Ingress and Egress. The Contractor shall provide and maintain, at all times, safe and adequate ingress and egress to and from intersecting highways, homes, business and commercial establishments at existing or at new access points, consistent with the work, unless otherwise authorized by the Engineer. The Contractor will not be responsible for snow removal from driveways or entrances. On highways on which motor bus service is maintained, the Contractor shall provide suitable areas or locations for the loading and unloading of passengers. The existing pavement, at improved intersecting streets, shall not be disturbed without prior consent of the Engineer.

G. Channelization, Delineation, Pavement Edge Drop-off Protection. The Contractor shall furnish, erect, move, maintain and remove delineators, channelizing devices, and traffic barrier as required by the contract documents and as directed by the Engineer. In areas where grading is being done, a safe and easily traveled roadway shall be properly marked at all times either by the use of delineation and channelizing devices or flaggers. Where private driveways, pedestrian or handicapped facilities exist, the entire access area shall be kept safe and smooth for convenient ingress and egress. Any area determined by the Engineer to be particularly hazardous shall be marked by the use of flashing warning lights conforming to the requirements of the MUTCD in addition to the channelizing or delineation devices.

1. Channelization. Channelizing devices shall be provided as shown in the plans and proposal, or as required by the Engineer, to physically separate traffic from the portion of roadway not available for travel, and to mark the limits of the roadway that is available for travel. Channelizing devices shall consist of cones, plastic drums, tubular markers, Type III

Barricades, or vertical panels. The design and usage of these devices shall conform to the requirements of the MUTCD.

The placement and spacing of these devices in tapers shall not exceed the values given in the MUTCD. Along pavement edge drop-offs, placement and spacing shall be in accordance with Table 619-1 of these specifications. At locations other than tapers and pavement edge drop-offs, unless specific placement and spacing of devices is shown in the contract documents, the placement and spacing between devices shall be selected by the Contractor subject to the Engineer's approval. The spacing shall be sufficiently close to clearly indicate the intended path through the work zone and the portions of the roadway not available for use. If, after deployment of the selected devices, the Engineer is not satisfied that the spacing and placement is sufficient, the Engineer may direct that a different spacing be used.

All channelizing devices shall be maintained upright, in proper alignment and orientation, and kept clean at all times. If ballast is used to maintain alignment and position of the devices, it shall consist of dry sand or other material approved by the Engineer, and placed at ground level. The sand shall be contained in waterproof closed bags or in a waterproof compartment of the device specifically designed for the purpose. Under no circumstances shall ballast be placed on top of a drum or at any point above ground level on any of these devices. If plastic drums are used, they shall be two-piece devices with detachable bases or one-piece devices with elongated bases provided to hold the ballast. In the case of one-piece devices, the ballast shall be placed on the side from which traffic approaches. In no case will the use of steel drums or open-top plastic drums be permitted. Where warning lights are attached to the channelization devices, a bolt, nut and washer shall be used for the attachment as recommended by the manufacturer, and the battery should be located at ground level.

2. Delineation. If post-mounted delineators are used, they shall be securely mounted and placed in accordance with the requirements of the MUTCD. They shall be placed only behind curbing or to mark the outside limits of usable shoulders. Post-mounted delineators are not required to be installed behind channelizing devices, but such an installation is not prohibited. Other delineators for mounting on traffic barriers or other purposes may be circular or rectangular in shape and shall be constructed of reflective sheeting having a minimum area of 12 900 square millimeters or a reflective button having a minimum diameter of 75 mm.

3. Drop-off Protection. For drop-offs within three meters of the travel lanes, except bridge drop-offs or other drop-offs in excess of 1.8 m deep, the Contractor shall provide traffic protection in accordance with the provisions of Table 619-1, "Required Protection for Pavement-edge Drop-offs" and its accompanying notes, unless otherwise shown in the Contract documents. In all cases, construction operations shall be conducted so as to minimize to the extent practicable the time, depth, and length of drop-offs to which motorists are exposed. At the close of work each day, the Contractor shall provide the treatment shown in Table 619-1. At the time a drop-off condition first occurs, the protection treatment shall be installed based on the anticipated number of days the traffic will be exposed to the drop-off. The anticipated exposure time shall be determined by the Contractor, subject to verification by the Engineer. If at any time subsequent to installation of the protection treatment, the Engineer determines that the anticipated exposure time is likely to increase such that additional protection is required, that increased protection shall be installed as soon as practicable, and it shall be based on the revised anticipated exposure time measured from the first day the drop-off condition existed. In addition, "LOW SHOULDER" or "NO SHOULDER" signs, as appropriate, shall be used for all drop-offs within 1.5 m of the shoulder edge. For long drop-offs, these signs shall be placed beyond intersections and at spacing not exceeding 300 meters. For drop-offs less than 50 mm deep, the "LOW SHOULDER" sign will not be necessary after edge lines are installed.

If a ramp is required by Table 619-1, it shall be constructed from the pavement surface to the surface of the excavated area using a slope not steeper than the slope shown in the table. Ramp material shall be erosion resistant, fully compacted, and compatible with the material in

the excavated area. At the Contractor's option, a preformed ramp may be used provided it is adequately anchored to the underlying course. Unless indicated otherwise in the plans or permitted in writing by the Engineer, channelizing devices or positive barrier used to protect drop-offs shall not intrude into the travel way to the extent that they reduce available lane width to less than 3 meters on roadways with actual operating speeds of 70 km/h or less or 3.35 m on all other roadways. Channelizing devices may be placed in the drop-off area only for depths of up to 150 mm if their placement on the roadway would reduce lane widths below the values specified above. For drop-offs deeper than 150 mm, the channelizing devices must be placed entirely on the pavement.

If the Contractor's operations are scheduled or delayed such that positive barrier is required by Table 619-1, or if the Contractor chooses, with written approval from the Engineer, to provide a positive barrier in lieu of the treatment shown in Table 619-1, the barrier shall be installed at no additional cost to the State. The positive barrier shall meet all the requirements of the Standard Specifications and Standard Sheets for temporary concrete barrier. (Box Beam Guide Railing or Heavy Post Blocked-Out Corrugated Beam Guide Rail may be used if approved in writing by the Engineer and the distance from the back of the rail to the drop off is at least 1.2 m for the corrugated beam rail and 1.5 m for the box beam.) Any anticipated or proposed use of positive barrier by the contractor shall require submittal of a plan for approval by the Regional Director. The plan shall include barrier type, location, terminal and end treatment, and any necessary traffic control devices such as signing, barricades, channelizing devices etc in accordance with the MUTCD. The contractor shall construct his plan under the following guidelines.

Approach ends of positive barrier shall be flared at the taper rate shown in Table 619-2. When operating speeds are over 65 km/h, an approved safety terminal or sand barrel array will be required on approach ends of temporary concrete barrier when the offset from the edge of traveled way to end of the full section barrier is less than 3.7 m. In traversable medians, gores and other areas where impacts on a tapered concrete end section could allow vehicles to penetrate into opposing or adjacent lanes of traffic, the use of the tapered concrete end section is prohibited. Box beam and heavy post blocked-out corrugated beam guide rail shall be anchored with the appropriate end assemblies and anchorage units shown on the standard sheets for these systems. Alternate methods of terminating positive barrier such as connecting to existing barrier or shielding behind other barrier will be considered for approval. If a work zone crash cushion is used, any work zone crash cushion purchased after 10/1/98 must comply with NCHRP 350. The test level shall be as indicated in §712-06. Work zone crash cushions purchased before 10/1/98 may be phased out as they complete their normal service life.

H. Signs

1. Control and Authority. All existing highway signs, markers, delineators and their supports (authorized by the Department of Transportation) within the contract limits shall remain under the control and jurisdiction of the Engineer and shall be maintained for the duration of the contract by the Contractor if directed by the Engineer. Any signs not authorized by the Department of Transportation, shall be removed from the right-of-way if ordered by the Engineer.

2. Maintenance of Route Marker Signs. Route marker signs shall be maintained by the Contractor during construction. Should relocations be necessary at various stages of construction, they shall be in conformance with the M.U.T.C.D. and the directions of the Engineer to locations visible to traffic. Appropriate directional signing shall also be used in conjunction with route marker signs.

3. Storage of Existing Signs, Markers and Delineators. The Contractor, when ordered, shall remove existing signs, markers and delineators and their supports which interfere with the construction operations; store, protect, clean and replace them on the contract as directed to

locations approved by the Engineer. Signs, markers and delineators not to be replaced, shall be cleaned and delivered to the Engineer as directed. Signs, markers and delineators lost or damaged because of negligence on the part of the Contractor, shall be replaced at the Contractor's expense.

TABLE 619-1 REQUIRED TREATMENT FOR PAVEMENT EDGE DROP-OFFS

Depth of Drop-off (mm.)	Anticipated Exposure Time (Calendar Days)	AADT ≤ 7500		AADT ≥ 7500 and all Freeways and Expressways	
		Operating Speed ≤70 km/h	Operating Speed > 70 km/h	Operating Speed ≤ 70 km/h	Operating Speed >70 km/h
50 to 150	≤7	30	45	15	15
	8 to 60	30 / 1:1	60/ 1:1	15 / 1:1	30 / 1:1
	60+	30 / 1:1	60 / 1:1	15 / 1:3	60/ 1:3
150 to 600	≤7	15	15	15	15
	8 to 60	15	60 / 1:3	30 / 1:3	60 / 1:3
	60+	15	60 / 1:3	30 / 1:3	60 / 1:3
600+	≤7	15	15	15	15
	8 to 60	30 / 1:3	60 / 1:3	30 / 1:3	60 / 1:3
	60+	30 / 1:3	60 / 1:3	30 / 1:3	Positive Barrier

DEVICE SPACING / RAMP SLOPE
METERS / VERT. :HORIZ.

Notes

1. The table shows spacing for drums or Type III barricades. The spacing shall be halved if other channelizing devices are used. Type III barricades may be used instead of drums, if space permits, but no separate payment will be made unless otherwise shown on the plans
2. For drop-off lengths shorter than the maximum devices spacing shown in Table 619-1, or for drop-offs at intersections, the device spacing shall be shortened to provide adequate channelizing as directed by the Engineer.
3. Two flashing warning lights shall be used at the beginning of each work zone drop-off.
4. The ramp from the pavement surface to the excavated area shall not exceed the slope shown in the Table. Cases where no slope is shown, no sloped ramp is required.
5. Whenever it is not practicable in the opinion of the Engineer to achieve the desired ramp slope shown in the Table, the flattest practicable ramp shall be constructed and the device spacing shall match the 7 day spacing, except positive barrier shall be required for drop-offs exceeding 600 mm on roadways with traffic volumes exceeding 7500 vehicles per day.
6. At the Contractor's option, required 1:3 ramps may be flattened to 1:4 and device spacing increased to 60 meters.
7. For drop-offs located more than 3 meters from the edge of the travel lane, ramping shall not be required and the minimum required spacing for drums and Type III barricades shall be 30 meters. (15 meters for alternate devices). Drums or Type III Barricades spaced at 15 meters or other approved devices spaced at 15 meters may be substituted for positive barrier. Signs and flashing warning lights shall be provided as required in this Section for drop-offs greater than 150 mm.
8. For winter shutdown periods, the Contractor shall restore the roadway to the normal operating

condition whenever possible. If this cannot be achieved, a compacted 1:4 ramp shall be provided at all pavement edge drop-offs. If a 1:4 ramp cannot be provided, a positive barrier shall be required, unless otherwise directed by the Regional Construction Engineer, at no additional cost to the State.

9. For drop-offs exceeding 600 mm in depth for exposure times of 7 days or less, and when an offset of at least 600 mm cannot be provided from the edge of travel lane to the drop-off, alternate traffic control plans may be required by the Engineer.

Table 619-2 TAPER RATES FOR POSITIVE BARRIER

OPERATING SPEED (km/h)	50	65	80	90	100	110
TAPER RATE FOR TEMPORARY CONCRETE BARRIER	8:1	11:1	14:1	16:1	18:1	20:1
TAPER RATE FOR BOX BEAM OR HEAVY POST CORRUGATED BEAM	7:1	9:1	11:1	12:1	13:1	15:1

I. Existing Pavement Markings. The Contractor shall remove, as soon as practicable, existing pavement markings where indicated on the plans, in the proposal or where ordered by the Engineer. This shall include any pavement markings that are added during the course of the work. If darkness or inclement weather interferes with removal operations, such operations should be accomplished during the next daylight period or as soon thereafter as weather conditions permit.

The method of removal is subject to the approval of the Engineer. Obliterated markings shall be unidentifiable as pavement markings under day or night, wet or dry conditions. Overlaying existing stripes with black paint or asphalt does not meet the requirements of covering, removal or obliteration; however, the use of removable, nonreflective, preformed tape is permitted where markings need to be covered temporarily. Grinding, sandblasting, etc., must be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that will mislead or misdirect the motorist.

J. Exposed Guide Railing, Median Barrier, and Bridge Railing Ends. During non-work hours, when traffic is being maintained on the facility, all exposed approach ends (free ends) of guide railing, median barrier, and bridge railing shall be marked with a reflectorized drum and temporarily terminated. Corrugated beam guide railing and median barrier, and heavy post blocked out corrugated beam guide railing and median barrier shall be temporarily terminated by having the exposed approach ends (free ends) dropped to the ground and pinned in a manner approved by the Engineer. The approach ends of box beam guide railing, median barrier and bridge railing shall be temporarily terminated with box beam guide railing end assemblies utilizing two splice plates and the proper number of bolts per connection. No posts for anchorages will be required. Special temporary splice plates will be needed to adapt box beam guide railing end assemblies to box beam median barriers.

619-3.02 Construction Signs, Reflectorized Signs, and Sign Covers. The Contractor shall furnish and erect appropriate construction signs to adequately and safely inform and direct the motorist and to satisfy legal requirements. All signs shall indicate actual conditions, and shall be removed and/or relocated, or changed immediately as required in the contract documents and as directed by the Engineer.

All signs shall be the property of the Contractor and shall be maintained in good condition for the duration of the contract. All signs shall be removed from the work site when the contract is accepted.

Sign sizes and details shall conform to the standard sheets, MUTCD, and the contract documents. The number of signs indicated on the standard sheets, in the MUTCD, and in the contract documents are a minimum number and the contractor shall have an adequate quantity of these signs available for immediate use, as required. The Engineer may order that additional signs be used.

All wood supports, and backs of plywood sign panels shall be painted with two coats of white paint.

All signs shall be kept clean, mounted at the required height on adequate supports, and placed in the

proper position and alignment so as to give maximum visibility. In general, sign orientation shall conform to the MUTCD, Section 201.5, subdivision (g). All sign supports shall display the sign panel in as vertical an orientation as possible. The deviation angle from vertical shall not exceed ±5 degrees.

Signs that are erected and removed or relocated on a daily basis, or that must be frequently relocated to adjust to the location of construction operations, may be mounted on portable sign supports. Signs that are to remain at a fixed location may be supported on posts mounted in the ground. The type of sign supports used shall be selected by the contractor, subject to the approval of the Engineer. If rigid diagonal bracing is used, the high end of the bracing shall face away from approaching traffic. All supports, except those located beyond the deflection distances of guiderail or temporary barrier, or otherwise protected against impact by errant vehicles, shall meet the following safety requirements for portable and fixed supports.

A. Portable Supports. Ballast used to stabilize supports shall be bagged sand or other suitable material approved by the Engineer, and shall be located at ground level. Portable supports shall comply with one of the following:

1. Manufactured portable supports designed for the display of signs in temporary traffic area. For manufactured supports purchased after October 1, 2000, the Contractor shall obtain from the supplier, and provide to the Engineer upon request, a certification that the support meets the requirements of NCHRP 350 Test Level 2 or Test Level 3. The use of devices certified as meeting Test Level 2 shall be limited to roadways with a posted speed limit of 40 mph or less. Test Level 3 devices may be used on all roadways.

2. Wood supports of a configuration which has been satisfactorily crash tested as indicated in # 1 above.

3. Metal supports fabricated in accordance with the details shown on the standard sheet entitled "Type III Construction Barricades".

Fabricated wood or metal supports shall not be placed on their sides unless they are placed behind a barrier or removed a safe distance from the roadway, as determined by the Engineer.

B. Fixed Supports. If stakes are used to attach the lower end of diagonal braces to the ground, they shall not protrude more than 100 mm above the ground surface. Fixed supports shall comply with one of the following:

1. Type A Sign Supports meeting the requirements of §730-24 and the applicable Materials Details may be used for sign sizes appropriate for those supports.

2. Sign posts and footings meeting the requirements of §730-20 and the applicable Standard Sheets may be used for sign sizes appropriate for those supports.

3. Wood posts, excluding any synthetic or composite wood product, may be used as follows:

a. Wood posts up to 89 mm by 89 mm with no holes drilled.

b. Wood posts up to 89 mm by 140 mm having 2 holes of 38 mm diameter, drilled in the direction perpendicular to the flow of traffic and located 100 mm and 450 mm above ground level. These holes shall be filled with flexible caulking.

No more than two posts of acceptable sizes as listed above shall be located within a single 2.1 meter width, and no more than one post of acceptable size as listed below shall be located within a single 2.1 meter width.

c. Wood posts up to 89 mm by 140 mm with no holes drilled.

d. Wood posts up to 140 mm by 184 mm having 2 holes of 75 mm diameter, drilled in the direction perpendicular to the flow of traffic and located 100 mm and 450 mm above

ground level. These holes shall be filled with flexible caulking.

Wood posts larger than 140 mm by 184 mm shall not be used.

4. Any other support that the Contractor may select, upon submission of documentation to the Engineer demonstrating that the post selected meets the current AASHTO and NCHRP criteria for impact performance of Highway Sign Supports.

Supports for construction signs shielded by barrier or guiderail, and located beyond the deflection distance described below, do not have to conform to the above safety requirements.

TABLE 619-3 GUIDERAIL & CONCRETE BARRIER DEFLECTION DISTANCES

Guide Rail Type	Post Spacing	Deflection Distances
Cable	4880 mm	3350 mm
	3660 mm	2900 mm
	2440 mm	2440 mm
	1220 mm	2130 mm
Corrugated Beam (Weak Post)	3810 mm	2440 mm
	1900 mm	1830 mm
	1270 mm	1520 mm
Corrugated Beam (Heavy Post)	1900 mm	1220 mm
	950 mm	610 mm
Box Beam	1830 mm	1520 mm
	910 mm	1220 mm
Concrete Barrier	NOT APPLICABLE	0 mm

Flexible signs will only be allowed for short-term, daytime use, for portable type signs that are deployed for use on a daily basis. They may not be used overnight, or for signs mounted on supports installed in the ground, or on portable supports that are left in place continuously for more than one work day. All flexible sign panels shall be mounted on supports with adequate bracing, so as to minimize flutter and to support the intended shape of the sign.

Intermixing reflective fluorescent orange colored signs with non-fluorescent orange colored flexible signs within the same series of signs shall not be allowed.

All construction signs shall be mounted in accordance with the MUTCD. Signs on rigid panels, except rigid lightweight plastic sign panels, shall be mounted at a minimum height of 1.5 m. Flexible sign panels, including rigid lightweight plastic sign panels, shall be mounted at a minimum height of 1.5 m, or optionally as low as 0.3 m when the following conditions are met:

A. On two lane, two-way roadways and four lane divided highways, when signs are placed on the left and the right sides of the roadway.

B. Where there will be no parked vehicles to obstruct the view.

C. When at least one advance work zone warning sign, mounted at a height of 1.5 m is located upstream of any flexible signs to alert motorists that they are entering a construction zone.
D. When the Engineer determines that the lower mounting height does not adversely affect the motorists' visibility of the sign.

If signs are temporarily covered, the cover shall be attached in a manner that completely covers the face of the sign. No adhesive shall be applied to the face of the sign, and the method of attaching the cover shall not damage the sign face. Sign covers shall be secured firmly to prevent dislodging and shall be maintained in good condition to present a neat appearance and minimize distraction to motorists traveling through the work zone. Sign covers shall contain no wording or images. Damaged covers which are determined by the Engineer to be no longer effective shall be replaced.

On limited access highways, when the normal legal speed limit is 50 MPH and higher, the Contractor shall have available at the project site, sufficient warning signs as described below, to inform oncoming traffic of a stopped, or very slow traffic condition. These signs shall be placed, moved, covered, maintained and removed in a manner directed by the Engineer.

The sign shall measure 1.2 m x 1.2 m, and letters shall be 175 mm Series D, similar to a W8-10, except it shall read "BE PREPARED TO STOP." The background color shall be fluorescent orange (Materials Designation 730-05.04, Class D). Each sign shall be mounted on a suitable portable support, and each shall be equipped with a pair of warning flags conforming to the requirements of the MUTCD, Section 294.2. Both sides of the approach shall be signed unless the median is too narrow, or if there are fewer than three lanes in the approach.

The sign shall be posted approximately 460 m upstream of the end of the queue, and when the end of the queue moves, the sign shall also be moved to maintain that spacing. If the resulting location places the sign upstream of the first warning sign for the project, the contractor shall also furnish and place an appropriate general work zone sign. The work zone sign shall be placed approximately 300 m in advance of the "BE PREPARED TO STOP" sign.

Whenever a reduced regulatory speed limit for a highway work area has been legally established by any means, the R-2 speed limit signs and, if used, the R2-10 speed zone ahead signs for the reduced speed shall be supplemented by a work zone warning panel as described below.

The work zone warning panels shall be the same width as the speed limit sign they are supplementing. They shall be 150 mm high with 75 mm Series B lettering when used with size B speed limit signs; 200 mm high with 100 mm Series B lettering when used with size C speed limit signs; 300 mm high with 150 mm Series B lettering when used with size D speed limit signs and 400 mm high with 200 mm Series B lettering when used with size E speed limit signs. The panel shall read "WORK ZONE" with black legend and fluorescent orange background (Materials Designation 730-05.04, Class D). These panels shall be placed on the same posts and immediately above the speed limit signs.

Signing advising motorists of increased fines for speeding within a highway work area shall be installed on the mainline in advance of any highway construction or maintenance work area where the work encroaches on a travel lane. It shall also be installed where work encroaches on the shoulder for more than one day unless otherwise indicated by the Engineer. The signing shall conform to one of the following methods as shown on the plans or directed by the Engineer:

The "FINES DOUBLED FOR SPEEDING IN WORK ZONES" sign shall be installed upstream of the first advance warning sign. It shall not be placed between a warning sign and the condition to which it relates, or within a warning sign countdown series. To avoid the aforementioned conditions, install the sign approximately 300 m upstream of the first warning sign on highways with 85th percentile speeds equal to or greater than 70 km/h (45 mph) and 100-150 m upstream for speeds under 70 km/h (45 mph.) The sign shall have black legend and border on a white background (Materials Designation 730-05.01, Class A) except for the top of the sign which has black background and white "STATE LAW" legend. If not otherwise detailed in the plans, the sign shall be a minimum of 600 mm wide by 900 mm high with "STATE LAW" in 75 mm Series D white lettering on a black background and "FINES DOUBLED FOR SPEEDING IN WORK ZONES" in 75 mm Series C black lettering. Unless otherwise indicated in the plans, a double sized sign shall be used in freeway and multilane applications where the 85th percentile

speed equals or exceeds 55 mph.

If indicated on the plans or approved by the Engineer as an alternative to the "FINES DOUBLED FOR SPEEDING IN WORK ZONES" sign, a reduced work area speed limit sign may be supplemented by an R2-13 "FINES DOUBLE" panel in addition to the "WORK ZONE"panel. The R2-13 "FINES DOUBLE" panels shall be the same width as the speed limit sign they are supplementing. They shall be 300 mm high with 75 mm Series D lettering when used with size B speed limit signs; 450 mm high with 100 mm Series D lettering when used with size C speed limit signs; 600 mm high with 150 mm Series D lettering when used with size D speed limit signs and 900 mm high with 200 mm Series D lettering when used with size E speed limit signs. The panel shall read "FINES DOUBLE" with black legend and borders and white background (Materials Designation 730-05.02, Class B). These panels shall be placed on the same posts and immediately below the speed limit signs. If the R2-13 "FINES DOUBLE" panel is added to a previously installed speed limit assembly, it may be necessary to install additional sign posts based on an assessment of the adequacy of the existing posts to support the additional panel. It may also be necessary to adjust sign mounting heights to meet the 1500 mm minimum mounting height requirement in §619-3.02 B.

Both the work zone warning and the fines double panels shall be completely covered or otherwise removed from view when the R-2 speed limit sign is covered or removed.

619-3.03 Temporary Box Beam Barrier, Temporary Concrete Barrier, Construction Barricades, and Lighting for Construction Barricades. The Contractor shall furnish, erect, move and remove, temporary concrete barrier, construction barricades and lighting for construction barricades where and as indicated on the plans, on the standard sheets, in the M.U.T.C.D., or as directed by the Engineer. Posts and painted members or bands used to delineate drop-offs will not be considered barricades. The contractor shall provide and maintain delineation on temporary barriers. This delineation shall make the barrier visible to approaching traffic as well as traffic which is adjacent to the barrier. The contractor shall have the choice of using one, or more, of the following: Warning lights, delineators, pavement marking, reflectorized tape placed on the barrier, reflective paint, or any other device subject to the approval of the Engineer. The delineation devices shall be maintained dirt and snow free and visible throughout the term of the contract including shutdown periods.

Where indicated on the plans or in the proposal, construction barricades shall be supplemented by approved flashing or steady burning lights, as indicated.

Temporary box beam barrier shall be erected in accordance with the requirements for box beam median barrier specified in §606-3.01 and §606-3.03.

Each run, or bay, of temporary concrete barrier units shall be fastened together to form a continuous chain. After placement each successive unit shall be moved longitudinally to remove the slack in the joint between units. The units at each end of a run or bay shall be anchored as shown on the standard sheet. In order to reduce movement of the barrier on structures, areas where limited deflection is desired, or where directed by the Engineer, one of the methods shown on the standard sheet shall be used. Where shown on the plans or directed by the Engineer, the ends of the barrier run shall be fitted with an impact attenuation device or fitted with a tapered end section and flared back as directed.

Steady burning or flashing barricade lights have a minimum nominal diameter of 175 mm and shall emit yellow light. Steady burning lights may be used to supplement other channelizing devices to delineate the traveled way. Flashing lights shall not be used for delineation or channelizing purposes.

Flashing barricade lights shall be either Type A, Low Intensity, or Type B, High Intensity conforming to the requirements of section 294.3 of the M.U.T.C.D. High intensity lights shall be used where barricade lights are required to operate 24 hours per day. Low intensity lights shall be used where barricade lights are required only at night. In that event, the hours for operation of the low intensity lights shall be dusk to dawn.

Steady burning lights shall have a minimum beam intensity of 2 candelas maintained within a solid angle of 9° on each side of the vertical axis, and 5° above and 5° below the horizontal axis. The hours for operation of steady burning barricade lights shall be dusk to dawn.

619-3.04 Temporary Structures and Approaches. Temporary structures and their approaches or existing structures that are moved to provide temporary structures along with their temporary approaches shall be constructed in such a manner and sequence that interference with and inconvenience to the traveling public and the abutting owners is kept to a minimum. The Contractor shall be responsible for the workmanship, upkeep and safety of all temporary structures and approaches. All fabrication shall conform to the current AASHTO Specifications for Highway Bridges, Division II except as modified herein. Fabrication shall be performed by an AISC Category III Certified Fabricator

When specific details are not indicated on the plans, the Contractor shall design all elements of the temporary structure and approaches including the railing system. Design shall be done in conformance with the A.A.S.H.T.O. standard specifications for Highway Bridges which is current on the date of advertisement for bids. Design live load shall be MS 18 unless otherwise noted on the plans. Plans and design computations shall bear the stamp and signature of a Professional Engineer licensed to practice in the State of New York.

Prior to beginning construction of any structure designed by the Contractor or the Contractor's agents the Contractor shall submit detailed plans to the D.C.E.S. for review and approval in accordance with §585-3.02. Such review, however, shall not relieve the Contractor of the responsibility for the adequacy and design of such temporary structures and approaches. If the Contractor proposes to construct with used materials, the Contractor's Engineer shall submit with the plans the method for documenting that all primary member material meets the design. In the absence of Mill Certification Reports, physical testing shall be performed. Excluded from this provision are proprietary structures. All welding required for the fabrication of temporary steel structures shall be performed in accordance with the provisions of the New York State Steel Construction Manual. Complete joint penetration groove welds in main material shall be radiographed as described therein. The DCES reserves the right to perform in-process fabrication inspection. The Contractor shall notify the DCES of the fabrication Schedule 10 days prior to commencement of work.

619-3.05 Tubular Markers. Tubular markers shall be installed according to the manufacturer's instructions on asphalt or concrete pavement that has been properly cleaned with a wire brush to remove all paints, dirt, oil or any substance which will interfere with the proper bond. Bonding agents shall be of sufficient amount or size to ensure proper bonding of the base to the pavement. When epoxy is used the epoxy shall be applied evenly to the bottom of the base of the marker and the base shall be pressed firmly on the pavement surface until a bead of epoxy appears around the edge. When installing the marker with a butyl pad, the pad shall cover the entire bottom of the base of the marker. Tubular markers not installed properly along the required line, as determined by the Engineer, shall be removed and reset.

Tubular markers damaged by the Contractor's operation or by traffic shall be replaced within 24 hours or as directed by the Engineer. The Engineer shall direct the Contractor to replace damaged reflective sheeting as required. This sheeting shall be removed and disposed of in an approved manner at the time as directed by the Engineer.

619-3.06 Short-Term Pavement Markings. The Contractor shall furnish, apply, maintain, and when so ordered, remove short-term pavement markings, where shown in the contract documents or where directed by the Engineer. Any pavement upon which traffic will be maintained shall be properly marked before nightfall or the end of the working day, whichever comes sooner, in accordance with this subsection.

Short-term pavement markings shall be installed and maintained in accordance with the patterns and colors indicated for pavement marking, Parts 260 to 263 of the M.U.T.C.D. or as directed by the Engineer. Where the limits of passing and no-passing zone have not been determined prior to construction, the Contractor shall allow the Engineer one week after the placement of binder or top course to determine these limits. If the Engineer codes these limits right on the pavement surface, this coding shall be preserved, by the Contractor, offset from the roadway.

Alternately, if the pay item 'Determination of No-Passing Zones and Pavement Coding' is included in the contract, this determination shall be made by the Contractor either on binder course or top course.

The following pavement marking patterns shall be installed as short-term pavement markings:

1. Yellow broken lines, partial barrier lines and full barrier lines used to separate opposing traffic flows on two-way roadways.
2. White broken lane lines to separate traffic flows in the same direction on multi-lane highways.

Stop bars, hatch lines and edge lines will not normally be required under short-term pavement markings but may be ordered by the Engineer. Broken lines may be as short as 1200 mm. Short-term pavement markings as described above, will be considered acceptable as the only pavement markings in place for periods normally not longer than fourteen (14) days, unless otherwise extended by the Engineer.

Within 14 days after paving, or the time period as extended by the Engineer, if the Contractor fails to install either the succeeding pavement course, or the final pavement markings on contracts with pay items for such, the short-term pavement markings shall be supplemented (at no additional expense to the State) with edge lines, 3 meter broken lines, stop bars, cross walks and arrows. In the event the project is to remain uncompleted over the winter, other than for staged construction when indicated, the short-term pavement markings shall be supplemented (at no additional expense to the State) by full pavement markings in accordance with the pattern indicated in the plans. If no full pavement marking pattern is given in the plans, the short-term pavement markings shall be supplemented as directed by the Engineer. The pavement markings used to supplement the minimum short-term pavement markings shall be designated as 'Temporary Pavement Markings' and use the materials as described below.

Removable tape and raised markers can be used as short-term pavement markings for solid and broken lines on any pavement course. However, on the final pavement surface, these shall be offset, if possible, from the location of the final mark in order to prevent interference with the adhesion of the final mark.

Pavement marking paint can be used as short-term pavement markings for solid and broken lines on all underlying pavement courses (ie base, binder, leveling and shim). On top course, or final pavement surface, paint may only be used if the final marking pattern is known prior to paving, and the contract does not contain durable markings (ie thermoplastic or epoxy marks). Where paint is used on the final pavement surface, it shall be applied before nightfall in the final location. If the Contractor is unable to place the final pavement marking paint before nightfall on contracts with pay items for Reflectorized Pavement Marking Paints (Section 640), then removable short-term pavement markings shall be installed before nightfall offset from the final location at no additional cost to the State.

Non-removable tape may be used as short-term pavement markings only for broken lines on underlying pavement courses. Non-removable tape will not be allowed to mark barrier lines on any pavement course.

If paint is used for short-term pavement markings, it shall be applied in accordance with the requirements of Section 640, Reflectorized Pavement Marking Paints. If tape is used, it shall be applied to a clean, dry pavement in accordance with the manufacturer's recommendations. Tape shall conform to the shape of, and adhere to the surface upon which it is applied. If raised marker units are used, they shall be of a color in accordance with the M.U.T.C.D. A raised marker unit spaced every 1500 mm may be used as a substitute for a solid line. Three raised marker units, evenly spaced 600 mm apart, may be used as a substitute for a 1200 mm long broken line. Four raised marker units, evenly spaced one meter apart, may be used as a substitute for a three meter long broken line.

Any markings, including raised markers, that fail to adhere to the pavement, become abraded, dislodged by snowplowing, or in the opinion of the Engineer become ineffective in any manner during the "period of use" shall be replaced by the Contractor at no additional expense to the State. The "period of use" shall be defined as the time from when the short-term pavement markings are first applied to the time when the markings are either paved over, the project's final markings are applied, or contract acceptance, whichever is first. After their period of use, short-term pavement markings, and temporary markings added to supplement short-term pavement markings shall be removed from the pavement by the Contractor, if ordered by the Engineer, as described in Section 635 Cleaning and Preparation of Pavement Surfaces.

In the event of sudden, unforeseen precipitation or other extraordinary situations, Do Not Pass signs may be used in lieu of short-term pavement markings for up to three consecutive calendar days on two or three lane, two-way, roadways under the following conditions:

1. The signs meet the requirements of Section 214.2 of the NYSDOT MUTCD and spaced not more than 300 meters apart.
2. The signs shall be supplemented with delineators and/or plastic drums spaced as directed by the Engineer, but not more than 60 meters apart and meeting the requirements of Section 291.2 of the NYSDOT MUTCD and §619-3.01G. of the Standard Specifications, respectively.
3. No payment will be made for the installation of Do Not Pass signs, delineators and plastic drums when necessitated by the Contractor's failure to place short-term pavement markings.

619-3.07 Temporary Traffic Signals. The traffic signal system shall be constructed in such a manner that interference with and inconvenience to the traveling public is kept to a minimum. The Contractor shall maintain in proper operation, all temporary signals used for Maintenance and Protection of Traffic until approved removal. The Contractor shall be responsible for their continuous 24-hour operation except for reasonable shutdown during relocation and transfer operations.

If for any reason a signal is not functioning as required, the Contractor shall commence repair work on this signal within two hours after notification of a malfunction. The Contractor shall provide a flagger at each malfunctioning traffic signal during repair work. The flagger control shall be provided until the temporary traffic signal is restored to proper operation.

On each approach, one signal face shall be at the right side of the roadway or over the right half of the roadway. One signal face shall also be installed at the left side of the roadway or over the left half of the roadway.

The lateral distance between signal faces for each approach shall be a minimum of 2400 mm and a maximum of 8230 mm.

In the event flashing operation occurs, all signal faces shall show flashing red indications. Flashing operation of signal is considered a malfunction.

In the event the Contractor elects to use temporary traffic signals to control traffic in lieu of flaggers, the Contractor shall submit complete plans of the proposed work to the Engineer for approval at least 30 days before signals are required for the maintenance of traffic. Plans shall show type of proposed equipment, details of construction, and table of operation of the temporary signal system.

619-3.08 Mailboxes. The Contractor shall not move any mailbox which contains mail. The Contractor will advise the owner to remove such mail before the box is moved. Before acceptance of the work, any mailbox which has been disturbed or removed, shall be replaced by the Contractor in a location approved by the Engineer.

In the event the original mounting post has been lost, damaged, or is unusable, the Contractor shall furnish a similar device or mounting acceptable to the Engineer, or when directed shall furnish a galvanized pipe mounting post of 25 mm (minimum) diameter with flanged top fitting and will firmly install the new mounting and mailbox at the designated location and at the proper height in accordance with the requirements of the U.S. Postal Service and to the satisfaction of the Engineer.

619-3.09 Opening Highway to Traffic Prior to Contract Acceptance. The construction details specified in §619-3.01 through §619-3.08 shall apply when required.

619-3.10 Maintain Traffic Signal Equipment. General. Existing, relocated, modified or newly installed traffic signals identified in the contract documents or by the Engineer shall be maintained in proper operation as specified in Requirement A, B or C of this subsection as called for in the contract documents.

Proper operation shall include the maintenance of all features of the traffic signal operation in effect and operating at the time any work begins on the contract as defined in §619-1.11, Duration of Contract. Traffic actuated phases shall be maintained actuated and signals operating within signal systems shall remain in step with the remainder of the system unless otherwise approved by the Engineer. Except for

emergencies, no changes in the signal operation or timing shall be made without prior approval by the Engineer. If emergency conditions dictate a change in the operation, the Engineer shall be notified accordingly by the start of the next work day. Unless otherwise approved by the Engineer, an altered signal operation must be returned to the original signal operation within 24 hours.

The Contractor shall maintain in operation all equipment including signal heads, supports, cable, wiring, existing and new span wire mounted signing, controllers, master controllers, detector systems, conflict and current monitors, relays, switch packs, and all other accessory and necessary equipment. Maintenance shall also include the repair and replacement of existing detector loops, under separate items. All parts, supplies, equipment and labor shall be furnished by the Contractor.

The Contractor shall have capable traffic signal repair personnel on call 24 hours a day ,seven days a week, and shall provide to the Engineer a single telephone number for contacting them. If for any reason, a signal is not functioning properly, the Contractor shall commence work on the signal within two hours notification. If directed by the Engineer, the Contractor shall notify the appropriate police agency for traffic control operations. If the police agency cannot or will not provide traffic control, the Contractor shall provide flaggers at locations specified by the Engineer within the two hour time period. The Contractor shall continue the flagger services until the signal is in proper operation. Reflectorized "Flagger Ahead" signs shall be used in conformance with the M.U.T.C.D. on all approaches to an intersection controlled by flaggers.

The Contractor shall, on a daily basis, provide the Engineer with a record of all maintenance calls received and responded to, as well as a record of all corrective action taken by the Contractor.

Where the Contractor is required to temporarily relocate existing traffic signals because of his construction operations, all existing equipment, fittings, wire, cable, conduit, and related materials shall be reinstalled and extended where necessary. Temporary timber poles (Class 2), guys and related material shall be furnished and installed where necessary. Temporary timber poles shall be treated with an appropriate wood preservative in accordance with the American Wood Preserver's Association Standard C2. Preservative retentions shall be appropriate for the specie when used in ground contact application.

Requirement A. The contractor shall maintain in proper operation,for the duration of the contract, the indicated existing, relocated, modified and newly installed signals as required by the contract documents. If such signals are to be removed, the Contractor shall be responsible for the operation and maintenance of them until their approved removal. The Contractor shall be responsible for their continuous operation except for reasonable shutdown periods authorized by the Engineer during relocation and transfer operations. All of the requirements in the "General" subsection of this specification shall apply.

Requirement B. All requirements of the "General" subsection shall apply except that the State shall assume operation and maintenance responsibility for the signal from the Contractor following successful completion by the Contractor of the installation/modification testing as required by §680-3.32, Tests. Assumption of operation and maintenance responsibility by the State shall not relieve the Contractor of the responsibility under §104-08, Warranties and Guarantees, for the correction of defects in material or labor provided by the Contractor. However, the six month period shall be measured from the day the State assumes maintenance responsibility. The Contractor is specifically notified that State assumption of maintenance responsibility shall not relieve the Contractor of any responsibilities under §107-09, Damage.

Requirement C. All the requirements of the "General" subsection shall apply except that at relocated, modified or newly installed signals, the State will assume responsibility for the following four items after successful testing as required by §680-3.32, Tests, has been completed. At existing microcomputer traffic signals, the State shall be responsible for those four items for the duration of the contract.

1. Supply and maintenance of the microcomputer assembly and software.
2. Programming of the microcomputer furnished by the State.

3. Operation or timing changes directed by the Engineer.
4. Normal (no abuse, or vandalism) equipment failures of existing, relocated, modified or new traffic signal equipment furnished by the State.

All other operational features and signal equipment shall be maintained by the Contractor in accordance with the "General" provisions of this subsection for the duration of the contract. Prior to the assumption by the State of maintenance responsibility for relocated, modified or newly installed signals, the Contractor shall maintain such signals under the "General" provisions of this specification. It shall be the Contractor's responsibility to investigate all maintenance calls as outlined in the "General" provisions. If the malfunction is in the equipment supplied by the State, the Contractor shall notify Regional Traffic and Safety personnel and, if directed by the Engineer, provide flaggers until the arrival of State maintenance personnel. Such flagging operations in excess of four hours per maintenance call shall be paid for as extra work.

Assumption of the above listed responsibilities by the State shall not relieve the Contractor of the responsibility for operation and maintenance of the signal as required by this section. Further, the Contractor will not be relieved of any responsibility required under §104-08, Warranties and Guarantees, for the correction of defects in material or workmanship provided by the Contractor. The Contractor shall also be aware that State assumption of the above responsibilities shall not relieve the Contractor of responsibilities under §107-09, Damage.

619-3.11 Flashing Arrow Boards. The Contractor shall provide Flashing Arrow Boards on multilane highways with preconstruction posted speed limits of 45 mph and higher whenever a lane is closed to traffic and vehicles are required to merge with traffic in adjacent lanes. One Flashing Arrow Board is required for each lane closed to traffic, regardless of the duration. Flashing Arrow Boards shall also be provided at locations where posted speeds are below 45 mph when shown on the plans or when indicated in the proposal.

Flashing Arrow Boards will not be required where they would interfere with the operation of a 3 color signal or flasher or where there is an operation controlled by a signal or flagger. Flashing Arrow Boards will not be required for alignment changes or lane diversions where the number of through traffic lanes is not reduced unless specifically indicated on the plans.

Flashing Arrow Boards shall be placed in accordance with the Manual of Uniform Traffic Control Devices. They shall be used as a substitute for the W1-11B; W1-11C; W1-12B; or W1-12C large arrow sign located nearest the beginning of the taper. The arrow boards shall be mounted so that the base of the panel is at least 2.1 m above the pavement surface and properly aligned to provide optimum viewing by approaching motorists. Flashing Arrow Boards may be relocated or reoriented on a daily basis or more frequently as ordered by the Engineer.

Where the posted preconstruction speed limit on the highway is 45 mph or greater within 2.0 km upstream of the board, only diesel or line powered arrow boards shall be used, unless indicated or directed otherwise. Where the posted preconstruction speed limit is below 45 mph for at least 2.0 km upstream of the taper, diesel powered, line powered or solar charged boards shall be used as approved or as directed by the Engineer.

The Contractor shall be responsible for maintenance, repair and continuous operation of the Flashing Arrow Board until progress of work no longer requires its use, as directed by the Engineer.

619-3.12 Construction Zone Pavement Markings. All pavement markings and patterns shall be placed as shown on the plans, or directed by the Engineer, and in accordance with the MUTCD.

Except when other spacings are permitted by the plans or proposal, raised reflectorized pavement markings shall be spaced as required in this paragraph. When raised reflectorized pavement markers are used to simulate a solid line, they shall be spaced 1500 mm apart; and when these markers are used to simulate a 3 m broken line, 4 equally spaced markers shall be used, with a marker at beginning and end of each line segment. Other line patterns shall be as specified in the MUTCD. When used to supplement a solid or broken line, markers shall be spaced a maximum of 24 m on tangents and a maximum of 12 m for curves with a radius less than 860 m.

The application of pavement markings on roadways open to traffic shall be done in the direction of traffic.

When required by the Engineer, the Contractor shall establish marking line points at 9 m intervals as necessary to control the lateral position of the line.

A. Application. All pavement marking materials shall be installed in accordance with the manufacturer's instructions. In addition, pavement marking paints shall be installed according to the provisions of §640-3.

B. Maintenance of Pavement Markings. The Contractor shall be responsible for maintaining the construction zone pavement markings for the duration of the temporary traffic pattern or detour. Any marking material that fails to provide for any reason, both satisfactory daytime and nighttime delineation, in the opinion of the Engineer, shall be replaced immediately by the Contractor at no additional cost to the State. Replacement shall, as a minimum, be required for the following degrees of material loss:

1. Removable Tape. Any gap exceeding 15 m in length in a solid line, or loss of shorter segments exceeding 10 percent of the total length in any 250 m segment of solid line, or more than two consecutive segments of broken line.

2. Raised Markers. Loss of more than 2 markers used to simulate a 3 m broken line; loss of more than 3 consecutive markers used to simulate a solid line, or more than 5 percent of the markers within a 250 m segment of solid line; when used to supplement a line, loss of 2 or more consecutive markers or more than 5 percent of the markers within a 1000 m segment of solid or broken line.

3. Traffic Paint. Abrasion of the line such that more than 10 percent of the underlying pavement is visible within any segment of broken line or within any 100 m section of solid line; failure of any line to be clearly visible at night under low-beam headlamp illumination when viewed from a distance of 60 m.

If the Contractor elects to use raised pavement markers as the marking material under the optional construction zone pavement markings items, the Contractor shall be responsible for maintaining these markings in acceptable condition during winter months, including loss of markers by snow plows. The Contractor shall either replace lost markers between storms, or place an alternate marking material as allowed by this specification to maintain all markings in acceptable condition, subject to the approval of the Engineer. No additional payment shall be provided for such replacement of lost markers.

The Contractor shall not be responsible for snowplow damage or loss of raised markers provided under pay items requiring the use of these markers. In the event that such markers are damaged or lost, the Engineer shall decide whether to replace the lost markers in kind or with other marking materials at the time the loss occurs. Payment shall be provided under the appropriate item for any markers replaced, or for alternate marking materials installed.

C. Removal of Pavement Markings. Construction zone pavement markings used to delineate temporary traffic patterns shall be removed at the completion of that phase of the work and prior to the installation of the next temporary pattern, or return to the permanent pattern.

Traffic paint shall be removed by mechanical means subject to their ability to achieve satisfactory results. After removal, there shall be no paint residue or pavement scarring that conflicts with successive pavement markings under any viewing conditions - wet or dry, day or night.

Marking tapes and raised markers shall be removed, intact or in large pieces, using manual methods or a mechanical roll-up device. The use of heat, solvents or other chemicals, grinders, or blasters will not be allowed on top-course pavement that is to remain in place without overlaying, or on other pavement surfaces where subsequent temporary traffic patterns are to be placed. After

removal, there shall be no resultant damage to or permanent marks or scars on the pavement surface.

Temporary adhesive residues that will eventually be worn from the pavement will be allowed to remain, providing that they are not left in a pattern that will mislead or misdirect motorists. The Engineer will be the sole determiner of misleading temporary marks.

The removal of construction zone pavement markings shall not be required from detours or other areas directed by the Engineer where they do not conflict with permanent markings at the completion of the work. Removal shall be required where it is necessary to transition pavement marking patterns on the detour into permanent markings at the completion of the detour phase.

D. Damage to Pavement Surfaces. Any damage to the finished pavement surface, any permanent marks or scars on the finished pavement surface (including remaining pavement marking material), or any adhesive residues left in a pattern that may mislead or misdirect traffic, that results from the removal of pavement markings shall be removed or repaired as directed by and to the satisfaction of the Engineer at no expense to the State, including complete removal and/or replacement of the damaged pavement section if necessary. The Engineer shall be the sole determiner of satisfactory repair.

619-3.13 Maintenance and Protection of Traffic During Nighttime Operations. In addition to the requirements of basic maintenance and protection of traffic, additional requirements for maintenance and protection of traffic during nighttime operations shall be as follows:

A. Worker Protection. All workers involved in nighttime operations shall, at all times, wear reflective hard hats and vests or high visibility apparel as described below:

1. Hard hats shall be equipped with a minimum of 7600 mm² of reflective tape on all four sides (i.e. 1900 mm² per side).

2. Vests and high visibility apparel shall be orange, yellow, or strong yellow-green in color or fluorescent versions of these colors (flaggers shall wear orange) and shall include retroreflective material, white or silver in color, visible for a minimum of 300 m in all directions under headlight illumination.

3. Retroreflective clothing shall be designed to clearly identify the wearer as a person and shall be visible through a full range of body motions.

4. Retroreflective clothing and vests shall be closed front and rear. Open front vests shall not be permitted.

5. All retroreflective clothing and vests shall be in clean condition or replaced as necessary to maintain visibility and reflectivity.

These requirements apply to truck drivers and equipment operators when out of an enclosed cab.

B. Vehicle Protection. All vehicles and equipment in the traffic control zone shall be equipped with rotating amber beacons which shall be visible from all directions for a minimum of 300 m during daylight. Beacons shall be mounted in a manner which does not cause glare for the driver or operator.

Vehicles operating or parked on the pavement of a closed roadway or travel lane shall display 4-way flashers or beacons at all times.

Rollers shall display a 50 mm band of reflective tape on the front and rear (60 000 mm² per end minimum).

All trucks shall display a minimum of 60 000 mm² of reflective tape on the rear.

Haul trucks shall display a 600 mm by 1200 mm orange reflective sign with the legend "Construction Vehicle - Do Not Follow" in black lettering on the tailgate.

All construction equipment when moving at a speed below the operating speed of traffic in an open travel lane or on a shoulder adjacent to an open travel lane shall be equipped with an amber rotating beacon and shall be followed by a chase vehicle equipped with an amber rotating beacon

and 4-way flashers.

Vehicles (except for rollers) shall travel facing in the same direction as adjacent traffic in order to avoid glare and confusion to drivers.

C. Signs, Delineation and Guiding Devices. All signs, delineators and guiding devices for nighttime operations shall be kept clean and visible with good reflectivity.

Type III construction barricades shall be used whenever an entire roadway or ramp is closed to traffic.

Plastic drums or 300 mm by 600 mm vertical panels shall be used for channelizing and delineating lane closures. Oversize (900 mm) cones may be used on tangent runs beyond the completion of the lane closure tapers. Spacing shall be in accordance with the following:

Estimated Operating Speed (km/h)	Maximum Spacing (m)
30	6.0
50	9.0
≥70	12.0

Delineation at gores or intersections shall be spaced at intervals equal to one-half of the above table values and shall consist of plastic drums or 300 mm by 600 mm vertical panels except that every other device may be an oversize (900 mm) cone at the Contractor's option.

When traffic will be traveling adjacent to closed travel lanes; two plastic drums, two 300 mm by 600 mm vertical panels or two oversize (900 mm) cones shall be placed transversely in each closed lane at 225 m maximum intervals (unless a lesser spacing is shown on the plans) except where it would interfere with paving, rolling or other ongoing operations. A Type III construction barricade may be substituted at the Contractor's option. No additional payment for Type III construction barricades will be made when used for this purpose.

619-4 METHOD OF MEASUREMENT

619-4.01 Basic Maintenance and Protection of Traffic. Payment for Basic Maintenance and Protection of Traffic will be made on a lump sum basis.

619-4.02 Construction Signs. Payment for signs will be made on a lump sum basis.

619-4.03 Temporary Box Beam Barrier, and Temporary Concrete Barriers. The quantity of temporary box beam barrier, and temporary concrete barrier shall be computed by the number of meters, measured to the nearest meter, placed in accordance with the contract documents and/or direction of the Engineer. Temporary box beam barrier shall be measured in accordance with the requirements of §606-4.01. Temporary concrete barrier shall be measured along the centerline of the uppermost surface. Temporary concrete barrier installed at the option of the Contractor, or required solely by a delay in the Contractor's operations, shall not be included in the measurement or payment for temporary concrete barrier.

619-4.04 Construction Barricades. Barricades will be computed for payment by the number of meters measured to the one tenth, along the face of each barricade unit installed. No payment will be made for spaces between individual barricade units. Type III Construction Barricades used at the option of the Contractor in lieu of drums or other channelizing devices shall not be included in the measurement or payment for Type III Construction Barricades.

Whenever barricades are moved to a new location or the diagonal stripes are changed to allow traffic to pass on the other side of the barricade, measurement will be made in the same manner as if it were a new barricade. Minor movements of the barricade from one side of the roadway to the other side, daily replacement to the same location or rearrangement within a work area, not requiring any change in the diagonal stripes, will not be considered as movement to a new location and will not be measured as additional barricades

619-4.05 Lighting for Construction Barricades. Lighting for construction barricades (powered from electrical power line or self-powered flashers) will be computed for payment by the number of meters of barricade actually lighted. Measurement shall be made to the nearest one-tenth meter along the face of each barricade unit. No payment will be made for spaces between individual barricade units. No separate measurement will be made for the two flashing warning lights used at the beginning of each work zone drop-off, as required by these specifications.

619-4.06 Temporary Structures and Approaches. Temporary structures and their respective approaches will be computed for payment on a unit price basis for each structure including its approaches.

619-4.07 Flashing Arrow Board. When this work is specified to be measured as lump sum, it shall be measured on a lump sum basis, for the Flashing Arrow Boards of the required type satisfactorily furnished, installed, maintained, and removed in accordance with these specifications.

619-4.08 Short Term Pavement Markings. Short Term Pavement Markings will be measured in meters along the center line of the pavement stripe and shall be based on a 100 mm wide stripe. Measurement for striping with a plan width greater or less than the basic 100 mm, as shown on the plans or as directed by the Engineer, will be made by the following method:

$$\frac{\textit{Plan Width of Striping (millimeters)} \times \textit{Number of Meters}}{\textit{100 millimeters}}$$

No payment will be made for the length of skips in the dashed line.

If raised marker units are used, reimbursement will be made as if the substituted line were in place. For example, for three raised marker units substituted for a 1200 mm long broken line, reimbursement will be made for 1.2 meters.

619-4.09 Temporary Traffic Signals. Payment for Temporary Traffic Signals will be made on a lump sum basis.

619-4.10 Mailboxes. Mailboxes will be computed for payment on the basis of each mailbox moved or replaced. Where multiple mailboxes are installed on a single post, payment shall be based upon the number of mailboxes so installed.

619-4.11 Opening Highway to Traffic Prior to Contract Acceptance. The additional basic maintenance and protection of traffic required for the highway opened to traffic in accordance with §619-1.09 will be computed by the lane kilometers, measured to the nearest tenth, per calendar day. The lane-kilometer per calendar days to be paid for shall not include the length of temporary connections, length of ramps, or any pavement opened for the convenience of or at the request of the Contractor.

619-4.12 Maintain Traffic Signal Equipment. Maintenance of existing and new traffic signal equipment will be computed for payment on a monthly basis for each signalized intersection being maintained. Payment will be made to the nearest 1/4 month increment.

619-4.13 Tubular Markers. This work shall be measured as the number of tubular markers furnished and installed to the satisfaction of the Engineer.

619-4.14 Construction Zone Pavement Markings. Pavement striping will be measured by meter along the centerline of the pavement stripe, and will be based on a 100 mm wide stripe. When raised pavement markers are used to simulate or to supplement a pavement marking, they shall be measured as the number of linear meters of simulated or supplemented pavement stripe (e.g. a 3 meter longitudinal line segment is simulated by four, or more, individual marker units; the pavement striping will be measured as 3 meters, regardless of the number of markers installed). Measurement for striping with a plan width greater than the basic 100 mm as shown on the plans or as directed by the Engineer, will be made by the following method:

$$\frac{\text{Plan Width of Striping (millimeters) x Number of Meters}}{\text{100 (millimeters)}}$$

No measurement will be made for the number of meters of gaps between broken and dotted line segments. All payments for longitudinal lines shall be made on the basis of the theoretical required plan quantity.

Letters and symbols will be measured by each unit applied. A unit will consist of one letter or one symbol. Example: "SCHOOL" would be measured as six units. Double and triple headed arrows will be measured as a single unit, each "R" in a railroad grade crossing marking will be measured as a single unit, but the "X" in railroad grade crossing markings (MUTCD figure 263-33) will be measured by the number of meters of 100 mm stripe.

When raised pavement markers are used to supplement a pavement marking stripe, the supplemental raised pavement markers will be measured and paid separately from the appropriate pavement marking stripe.

619-5 BASIS OF PAYMENT

No payment will be made under Basic Maintenance and Protection of Traffic for each calendar day during which there are substantial deficiencies in compliance with the specification requirements of any subsection of this section, as determined by the Engineer, including but not limited to Basic Maintenance and Protection of Traffic, Construction Signs, Construction Barricades, Barriers, Temporary Impact Attenuators, Impact Attenuators, Crash Cushions, Crash Terminals, Lighting for Construction Barricades, Temporary Structures and Approaches, Short-Term Pavement Marking, Construction Zone Pavement Markings, Temporary Traffic Signals, Mailboxes, Maintain Traffic Signal Equipment and Opening Highway to Traffic Prior to Contract Acceptance.

The amount of such calendar day non-payment will be determined by dividing the lump sum amount bid for Basic Maintenance and Protection of Traffic by the number of calendar days between the date the Contractor commences work and the date of completion as designated in the proposal, without regard to any extension of time.

In addition, liquidated damages will be assessed at the rate shown in Table 108-1 of §108-03 for each subsequent calendar day or part thereof that a cited deficiency resulting in non-payment, as prescribed herein, is not corrected or is permitted to recur.

If the Contractor fails to adequately conform to the provisions required under Construction Signs, Barriers, Temporary Impact Attenuators, Impact Attenuators, Crash Cushions, Crash Terminals, Construction Barricades, Lighting for Construction Barricades, Temporary Structures and Approaches, Short-Term Pavement Marking, Construction Zone Pavement Markings, Temporary Traffic Signals, Mailboxes, Maintain Traffic Signal Equipment and Opening Highway to Traffic Prior to Contract Acceptance, to the degree that such failure is deemed by the Engineer to adversely affect the maintenance and protection of traffic, the above liquidated damages will be assessed in addition to any payment deductions from Basic Maintenance and Protection of Traffic for inadequate work as specified herein. The assessment of liquidated damages will not exceed the above amount per calendar day regardless of the number of violations.

If the Contractor fails to maintain and protect traffic adequately and safely for a period of 24 hours, the Engineer shall correct the adverse conditions by any means deemed appropriate, and shall deduct the cost of the corrective work from any monies due the Contractor. The cost of this work shall be in addition to the liquidated damages and non-payment for Basic Maintenance and Protection of Traffic listed above.

However, where major nonconformance with the requirements of this specification is noted by the Engineer, and prompt Contractor compliance is deemed not to be obtainable, all contract work may be stopped by direct order of the Engineer, regardless of whether corrections are made by the Engineer as stated in the paragraph above.

619-5.01 Basic Maintenance and Protection of Traffic. The lump sum price bid for Basic Maintenance and Protection of Traffic shall include all equipment, materials and labor necessary to adequately and safely maintain and protect traffic, except as provided for in separate payment items in the proposal. However, if the Contractor elects to utilize temporary traffic signals to control traffic in lieu of flaggers, the cost of such signals together with all costs of installation, operation and removal shall be included in the price bid for Basic Maintenance and Protection of Traffic.

The cost of temporarily terminating guide railing, median barrier, or bridge rail during non-work hours shall be included in the lump sum price bid for this item.

In the event the proposal does not include a separate item of payment for Opening Highway to Traffic Prior to Contract Acceptance and the Regional Director directs, in writing, any portion of pavement, structure or ramp to be opened to traffic prior to contract acceptance and on which traffic was not specified to be maintained and protected during construction, the price bid for Basic Maintenance and Protection of Traffic shall include any and all costs for opening said portion or portions to traffic prior to contract acceptance.

In the event the contract completion date is extended, no additional payment will be made for Basic Maintenance and Protection of Traffic.

Progress payments will be made for this item in proportion to the total amount of contract work completed less any deductions for unsatisfactory maintenance and protection of traffic.

619-5.02 Construction Signs. The lump sum price bid shall include the cost of labor, equipment and material, necessary to erect, remove, relocate, protect, maintain, store or replace any construction signs required to properly sign the contract. The lump sum price bid shall also include the cost of repairing or replacing reflectorized signs, when the Engineer determines that the reflective sheeting material no longer meets the specifications.

No payment will be made under Section 619 Basic Maintenance and Protection of Traffic for each calendar day during which there are substantial deficiencies in compliance with the requirements of this specification, as determined by the Engineer. The amount of each calendar day non-payment will be determined by dividing the lump sum bid by the number of calendar days between the date the Contractor commences work and the date of contract completion, as designated in the contract proposal, without regard to any extension of time.

In addition, liquidated damages will be assessed at the rate shown in Table 108-1 of §108-03, for each calendar day or part thereof that a cited deficiency, which results in non-payment, is not corrected, or is permitted to recur.

Partial payments will be made. Fifty (50) percent of the lump sum price will be paid when ten (10) percent of the contract work has been completed. The remaining fifty (50) percent will be paid proportionally in accordance with the total contract work completed, beginning with the estimate following the initial payment on this item.

619-5.03 Temporary Box Beam Barrier, and Temporary Concrete Barrier. The unit price bid per meter of temporary box beam barrier, and temporary concrete barrier shall include all material, equipment, and labor necessary to erect, maintain, and remove the required barrier, including any required connection devices, end treatments, delineation or guiding devices, repair of pavement after removal of box beam barriers, and devices for pinning and connecting temporary precast concrete barrier units. Any movement of temporary box beam barrier or temporary concrete barrier, except movements of the concrete barrier necessary to maintain, realign, or replace damaged units will be considered as a movement to a new location and the Contractor will be entitled to payment for the movement.

After placement, payment will be made for ninety (90) percent of the quantity of temporary box beam barrier, or temporary concrete barrier furnished and erected in accordance with the contract requirements. The remaining ten (10) percent will be paid upon removal. Temporary concrete barrier installed at the option of the Contractor, or required solely by a delay in the Contractor's operations, shall not be included in the measurement or payment for temporary concrete barrier.

619-5.04 Construction Barricades. The unit price bid per meter of barricade shall include all material, equipment and labor necessary to erect, maintain and remove required barricades. Whenever barricades are moved to a new location or the diagonal stripes are changed to allow traffic to pass on the other side of the barricade, payment will be made in the same manner as if it were a new barricade. Minor movements of the barricade from one side of the roadway to the other side, daily replacement to the same location or rearrangement within a work area, not requiring any change in the diagonal stripes, will not be considered as movement to a new location and will not be paid for as additional barricades.

After placement, payment will be made for ninety (90) percent of the quantity of barricade furnished and erected in accordance with the contract requirements. The remaining ten (10) percent will be paid upon removal. Type III Construction Barricades used at the option of the Contractor in lieu of drums or other channelizing devices shall not be included in the measurement or payment for Type III Construction Barricades

619-5.05 Lighting for Construction Barricades. The unit price bid shall include the cost of furnishing all labor, materials, equipment, and power necessary to provide, maintain, and remove Lighting for Construction Barricades. Should a barricade that is lighted be moved to a new location or the diagonal stripes be changed to allow traffic to pass on the other side of the barricade, payment shall be made in the same manner as if it were a new installation of lighting for barricades. Minor movements of barricades that are lighted, such as a movement from one side of the road to the other side or rearrangements within the same work area not requiring any change in the diagonal stripes, will not be considered as a movement to a new location. This will be true, regardless of the source of power.

After installation and demonstration of satisfactory operation, payment will be made for seventy-five (75) percent of the quantity of barricade lighting furnished and installed in accordance with the contract requirements. The remaining twenty-five (25) percent will be paid for upon removal. No separate payment will be made for the two flashing warning lights used at the beginning of each work zone drop-off, as required by this specification.

619-5.06 Temporary Structures and Approaches. The unit price bid shall include all labor, material and equipment necessary to build, move, remove, dismantle and/or store the structure specified together with all work related to construction, removing and restoring approaches.

Payment will be made at the unit price bid for each temporary structure and its approaches as follows:

Seventy-five (75) percent when the temporary structures and approaches are complete and operable.

Twenty-five (25) percent when the temporary structures and approaches or appurtenances are permanently removed.

619-5.07 Tubular Markers. The unit price bid for tubular markers shall include the cost of furnishing all labor, materials, equipment, and all incidentals necessary to complete the work in accordance with this specification and as directed by the Engineer. The unit price bid shall include the cost of replacing damaged reflective sheeting. The cost to remove and reset tubular markers due to contractor error shall be borne by the Contractor. Removal at the completion of the work or when no longer needed shall also be included in the unit bid price. Tubular markers that are in good condition may be relocated as directed by the Engineer. Whenever tubular markers are moved to a new location, payment will be made as if it were a new tubular marker.

619-5.08 Short-Term Pavement Markings. The unit price bid shall include the cost of furnishing all labor, material and equipment necessary to apply, maintain and remove short-term pavement markings in compliance with the requirements of §619-3.06. A separate payment will be made each time short-term pavement markings are first applied on a pavement course in accordance with the contract requirements. No payment will be made for the application, maintenance and removal of "temporary pavement markings" required after 14 days, or for short-term pavement marking necessitated by the Contractor's failure to place the final pavement marking paint before nightfall.

No payment will be made for the installation of Do Not Pass signs, delineators and plastic drums when necessitated by the Contractor's failure to place short-term pavement markings

619-5.09 Temporary Traffic Signal. The lump sum price bid for this item shall include the cost of all labor, materials, and equipment necessary to furnish, install, operate, maintain, move, and remove the signals for the required duration of the work. The bid price shall include the cost of electric power necessary to operate the signals until their removal is approved or ordered by the Engineer. Permanent signal control equipment will be paid for under separate contract items.

For the purposes of progress payment, the lump sum bid for the item shall be apportioned equally between the number of signals called for in the plans and proposal. If it becomes evident that a different number of temporary signals will be used, the lump sum bid should be apportioned equally between the revised number of signals and progress payments adjusted accordingly.

Payments will be made on each individual signal as follows:

Sixty (60) percent when the signal is installed and is in proper operation.

Forty (40) percent when all necessary work for this item is completed.

619-5.10 Mailboxes. The unit price for each mailbox shall include all equipment, material and labor necessary to move, maintain or replace rural route mailboxes in their final position or location. Only one payment for each mailbox will be made regardless of the number of times it is moved or replaced and shall be made when the mailbox has been placed in its final location.

619-5.11 Opening Highway to Traffic Prior to Contract Acceptance. Payment will be made for additional basic maintenance and protection of traffic as indicated in §619-1.09. The unit price bid shall include the cost of all materials, equipment and labor to provide the basic maintenance and protection of traffic.

In the event that additional signs, barricades, or other items are required to supplement the work under this item, payment shall be made upon erection as follows:

A. Where contract unit bid items, exclusive of lump sum items, cover the supplementary work ordered, payment will be made at the contract unit bid prices.

B. Where lump sum items, exclusive of the Basic Maintenance and Protection of Traffic item, or no contract unit bid items cover the supplementary work ordered, payment will be made at agreed prices or by force account.

No payment will be made under this item during any period for which the Contractor has been granted an extension of time with engineering charges and/or for which the Contractor has been assessed liquidated damages.

619-5.12 Other Work. The work required for Clearing and Grubbing, Furnishing and Applying Water, and Furnishing and Applying Calcium Chloride for dust control, and for placing bituminous plant mixed material for patching existing pavement, or where specifically ordered by the Engineer or as shown on the plans shall be paid for under their respective pay items. During the winter period when plant mixed bituminous material is unavailable the material used for patching shall be a suitable "winter mix" approved by the Materials Bureau. Payment for the bituminous patching material used, regardless of the type, will be made under the top course roadway paving item.

No payment will be made for any bituminous concrete determined by the Engineer to be necessary as a result of the Contractor's failure to complete paving operations prior to the weather and seasonal limitations, pursuant to §402-3.01. Also, no separate payment will be made for interim pavement markings, applied, maintained, or removed pursuant to §619-3.06 Short Term Pavement Markings.

Whenever any of the above items do not appear in the contract, payment for the work equivalent to such item will be included in the lump sum price bid for Basic Maintenance and Protection of Traffic.

619-5.13 Damage. Payment for damage to any phase of the work included in this section shall comply with the requirements of §107-09, Damage.

619-5.14 Maintain Traffic Signal Equipment. The unit bid price per signalized intersection per month shall include the cost of all labor, materials and equipment necessary to perform the work with the exception of inductance loop replacement which will be paid for separately. The cost of the electric power shall be the responsibility of the original maintaining agency. No payment will be made during any period for which the contractor has been granted an extension of time with engineering charges.

619-5.15 Flashing Arrow Board. The lump sum amount bid for this work shall include the cost of all material, equipment, labor, maintenance, and electrical power necessary to complete this work in a manner approved by the Engineer.

Progress payments will be made for this work in proportion to the total amount of contract work completed.

619-5.16 Construction Zone Pavement Markings. The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to install, maintain, and remove pavement markings as required by §619-3.12. No payment shall be made under these items for short term pavement markings installed to meet the requirements of §619-3.06. When raised pavement markers are used to supplement a pavement marking stripe, payment shall be made for each item.

The non-payment and Liquidated Damage provisions of §619-5 Basis of Payment - General shall apply to these items of work.

Progress payments will be made. Quantities will be measured for payment when the pavement striping is satisfactorily installed and payment will be 75%. The remaining 25% will be measured for payment following satisfactory removal of the pavement striping.

Payment will be made under:

Item No.	Item	Pay Unit
619.01 M	Basic Maintenance and Protection of Traffic	Lump Sum
619.02 M	Construction Signs	Lump Sum
619.0303 M	Flashing Arrow Boards	Lump Sum
619.0413 M	Type III Construction Barricades	Meter
619.0502 M	Lighting for Construction Barricades	Meter
619.06 M*	Temporary Structures and Approaches	Each
619.10 M	Mailboxes	Each
619.1101 M	Opening Highway to Traffic Prior to Contract Acceptance	Lane Kilometer- Calendar Day
619.13 M	Temporary Traffic Signals	Lump Sum
619.1502 M	Short Term Pavement Markings	Meter
619.1611 M	Maintain Traffic Signal Equipment (Requirement A)	Intersection Month
619.1612 M	Maintain Traffic Signal Equipment (Requirement B)	Intersection Month
619.1613 M	Maintain Traffic Signal Equipment (Requirement C)	Intersection Month
619.17 M	Temporary Concrete Barrier	Meter
619.18 M	Temporary Box Beam Barrier	Meter
619.2001 M	Tubular Markers White Tape	Each
619.2101 M	Construction Zone Pavement Marking Stripes (Optional)	Meters
619.2102 M	Construction Zone Pavement Marking Letters (Optional)	Each
619.2103 M	Construction Zone Pavement Marking Symbols (Optional)	Each
619.2104 M	Construction Zone Pavement Marking Stripes - Removable Tape	Meters
619.2105 M	Construction Zone Pavement Marking Letters - Removable Tape	Each
619.2106 M	Construction Zone Pavement Marking Symbols - Removable Tape	Each
619.2107 M	Construction Zone Pavement Marking Stripes - Simulated by Raised Markers	Meters
619.2108 M	Construction Zone Pavement Marking Stripes - Supplemented by Raised Markers	Meters

* Refer to the Standard Contract Pay Item Catalog for full Item Number and full description.

SECTION 713 - LANDSCAPE DEVELOPMENT MATERIALS

713-01 TOPSOIL

SCOPE. This specification covers the material requirements for topsoil for use in turf and wildflower establishment, sodding or planting.

MATERIAL REQUIREMENTS. Topsoil may be naturally occurring or may be manufactured. Topsoil shall be free from refuse, material toxic or otherwise deleterious to plant growth, subsoil, woody vegetation and stumps, roots, brush, stones, clay lumps or similar objects. Manufactured topsoil shall consist of a mineral component and amendments to meet the specified organic content, pH and other requirements. Sod and herbaceous growth such as grass and weeds need not be removed but shall be thoroughly broken up and mixed with the soil during handling or manufacturing operations.

Topsoil shall meet the following requirements unless otherwise specifically stated in the contract documents:

- The pH of the material shall be between 5.5 and 7.6.
- The organic content shall be not less than 2% or more than 20%.
- Gradation:

Sieve Size	Percent Passing by Weight
50.0 mm	100
25.0 mm	85 to 100
6.3 mm	65 to 100
75 μm	20 to 80

The maximum size of objects other than stones shall be 50.0 mm.

- The Contractor may amend topsoil with approved materials and by approved methods to meet the above specifications. Materials used to amend the organic content of topsoil shall conform with the requirements of 713-15 Organic Material. Amendments shall not contain any material that is deleterious to soil structure, plant growth or seed germination.

STOCKPILING. Topsoil may be acquired from sites that are designated in the contract documents or approved by the Engineer. If no topsoil sites are designated in the contract documents, the material proposed for use as either naturally occurring topsoil or manufactured topsoil must be stockpiled, sampled and tested prior to its use. Topsoil deficient in organic content and/or pH may be used prior to amending and retesting only when used for turf and wildflower establishment or sodding.

Stockpiles shall contain not less than 150 cubic meters, or the minimum required for the contract, shall have a height of at least 1.2 meters unless otherwise approved, and shall be trimmed to uniform surfaces and slopes.

SAMPLING. Samples of naturally occurring topsoil, manufactured topsoil or amended soil mixture will be taken by a representative of the Department. Samples taken for topsoil that has been amended or manufactured with approved composted sewage sludge shall be identified as such. Topsoil containing foreign material may be rejected on the basis of a visual examination prior to testing. The topsoil sampling procedure shall be as required in the Department's "Sampling Procedures for Topsoil." Contractors may obtain copies of the procedures from the Engineer. Contractors who believe that an error was made in sampling the topsoil shall, within one work day, indicate the alleged error in writing to the Engineer.

TESTING. All material tests required by this section, except for the testing of composted sewage sludge and topsoil containing composted sewage sludge, will be done by the Department in conformance with the procedures contained in the appropriate Department publications or test methods current on the date of advertisement for bids.

Composted sewage sludge used to amend or manufacture topsoil shall conform to the applicable

requirements of §713-15 Organic Material. Composted sewage sludge shall require a certificate, from a laboratory approved by the DEC, verifying compliance with all applicable laws, rules and regulations. The certification shall be supplied by the Contractor, at the Contractor's sole expense, and prior to the delivery of any composted sewage sludge, topsoil containing composted sewage sludge or other such regulated material to the contract site. The material shall be approved before it is used. A copy of the specifications shall be furnished to the laboratory by the Contractor.

Topsoil that has been amended with approved composted sewage sludge or other such regulated material shall be tested by an established Engineering or Agronomy firm which provides soils laboratory services. The test is to assure compliance with the pH, organic content and gradation requirements of this section. A copy of the specification and the Department's current test methods shall be furnished to the laboratory by the Contractor. The testing of topsoil amended with approved composted sewage sludge shall be done at the Contractor's sole expense. Samples shall be taken by a representative of the Department and the laboratory results shall be returned to the Regional Landscape Architect.

The Contractor shall notify the Engineer of the intended source of the material at least three weeks in advance of the scheduled use of the material to allow time for sampling, shipping of the sample and testing.

BASIS OF ACCEPTANCE. Acceptance of topsoil will be based upon the test results unless otherwise specified. Tested topsoil must be approved in writing by the Engineer before any material is used, except that topsoil used for establishing turf and wildflowers or sodding may be placed at the Contractor's option, prior to amending it to correct deficiencies in its organic content and/or pH. Acceptance of topsoil placed prior to correcting organic content and/or pH deficiencies will be based on retest results of samples taken after the placed topsoil has been amended.

713-02 LIMESTONE

SCOPE. This specification covers the material requirements for limestone.

MATERIAL REQUIREMENTS. Limestone shall be ground limestone having a minimum total neutralizing value of 88% calcium carbonate equivalence. A minimum of 90% shall pass the 0.85 mm mesh sieve and a minimum of 60% shall pass the 0.15 mm mesh sieve.

PACKAGING. Agricultural limestone packed in the manufacturer's standard containers shall weigh not over 45 kg each, with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container.

DELIVERY. Bulk shipments shall be accompanied by a certificate providing the names, weight and analysis as specified herein for packaged material.

BASIS OF ACCEPTANCE. The manufacturer's label or certificate indicating compliance with these specifications shall be the basis of acceptance.

713-03 FERTILIZER

SCOPE. This specification covers the material requirements for fertilizers.

MATERIAL REQUIREMENTS. Fertilizers may be either fluid or dry formulations of commercial carriers of available plant nutrients.

The following mixed commercial fertilizers shall contain total nitrogen, phosphoric acid and soluble potash in the ratios stated:

Type No. 1. 1-2-1 (approximate analysis)
Type No. 2. 1-1-1 (approximate analysis)

The following fertilizers shall be as specified:

Type No. 3. 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen(3.5%WIN). The balance of the nitrogen shall be present as methylene urea, water soluble urea, nitrate and ammoniacal compounds.

Type No. 4. Nitrate of soda, shall contain a minimum of 16% nitrogen.

Type No. 5. Ammonium sulfate shall contain a minimum of 20.5% nitrogen.

Type No. 6. Ammonium nitrate shall contain a minimum of 33% nitrogen, one-half of which is in the ammonium form and one-half of which is in the nitrate form.

Type No. 7. A nitrogen carrier containing a minimum of 45% nitrogen such as Urea or equivalent.

Type No. 8. Bonemeal shall be commercial steamed bonemeal, finely ground with a minimum of 1.0% nitrogen and a minimum of 20% phosphoric acid.

Type No. 9. Superphosphate shall be an approximate 0-20-0 formulation with an acceptable minimum of eighteen percent (18%) available phosphoric acid.

Type No. 10. Vacant

Type No. 11. A fertilizer in standardized packets designed to control the release of their contents over a specified period of time. The minimum guaranteed analysis shall be 16-8-8.

Type No. 12. Shall be as specified in the contract documents.

PACKAGING. Fertilizers shall be in the manufacturer's standard containers. Containers shall not weigh more than 45 kg and shall include a label stating the name of the material, the net weight of the contents, the manufacturer's name, and the guaranteed analysis of the fertilizer. Labels on containers of fluid fertilizers shall state the net volume of the container.

DELIVERY. Bulk delivery of fertilizer shall be accompanied by the manufacturer's certificate stating the name of the manufacturer, the guaranteed analysis and the weight of the shipment. Certificates accompanying bulk deliveries of fluid fertilizers shall also state the net volume of the shipment.

BASIS OF ACCEPTANCE. The manufacturer's label or certificate indicating compliance with these specifications shall be the basis of acceptance. The Engineer reserves the right to reject any material that has become caked or otherwise damaged.

713-04 SEEDS

SCOPE. This specification covers the material requirements for seeds.

MATERIAL REQUIREMENTS. Each species, variety and strain of grasses, legumes, wildflowers and cereals and the minimum percentage of germination of each shall be as specified in the contract documents unless otherwise approved.

Material other than pure live seed shall comprise only nonviable seed, chaff, hulls, live seed of crop plants other than those specified, harmless inert matter and weed seeds except that weed seeds other than seeds of noxious weeds will be permitted up to 1% of the gross weight of each kind of seed. Legume seeds requiring inoculation shall be accompanied by adequate amounts of their proper inoculants unless accompanied by certification of preinoculation.

The percentage of purity shown on the label will be acceptable. The percentage of germination for each of the species, variety or strains of seeds shown on the label shall not be less than the minimum percentage specified in the contract documents. The percentage of pure live seed of each kind in each container or bag of seeds delivered will be computed by multiplying the percent germination by percent purity and dividing by 100. The percentage of pure live seed of each kind multiplied by the net weight of the container or bag will indicate the number of kilograms of pure live seed of each kind in the container or bag.

Nomenclature. The common and scientific names of grasses, legumes, wildflowers and cereals specified in the contract documents shall conform to one or more of the authorities on botanical nomenclature recognized by the American Association of Nurserymen.

Legume Inoculants. Inoculants for treating legume seeds shall be a standard culture of nitrogen fixing bacteria that is not more than one year old. Each inoculant shall be the specific culture required for each legume. It shall be supplied only from manufacturers licensed to sell legume inoculants in New York State.

Packaging. Seeds shall be furnished and delivered in labeled containers or bags that are acceptably sealed or sewn tight.

When seeds are to be accepted by certification, they may be mixed prior to delivery.

When sampling and testing is specified, seeds shall not be sown until written approval is issued. Approved seeds may be mixed prior to delivery.

LABELING. All seed and seed labels shall be in accordance with State and Federal Laws, Rules and Regulations, including Article 9 Section 137 of the Agriculture and Markets Law.

SAMPLING AND TESTING

A. Certification. Seeds will be accepted on the basis of certification unless otherwise specified in the contract documents. The certification shall consist of the label that shall be attached to each container of seed in accordance with the provisions of the New York State Agriculture and Markets' Law. Seeds will not be accepted by certification unless the test dates shown on the seed container labels are within the same calendar year that the seeds are sown.

Seeds will not be accepted if seed container labels are removed prior to the time of sowing nor will seeds be accepted if container labels have been altered, are obliterated or are otherwise illegible.

B. Sampling and Testing. Seeds will be subject to sampling and testing when specified in the contract documents and/or whenever the Engineer determines that seed damage or deterioration may have occurred as a result of handling, transit or storage.

Seeds specified for sampling and testing, and other seeds to be sampled and tested as determined by the Engineer, shall not be sown until test results are received and written approval is issued.

Sampling shall be done by a representative of the New York State Department of Transportation. Testing shall be done by the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, New York, and the test results obtained will be considered final.

Tolerances established by the Agricultural Experiment Station will be used to determine if the seeds conform to the specifications.

BASIS OF ACCEPTANCE. The seeds shall meet the minimum specified requirements regardless of the guarantee of qualities or dates of testing and after the application of tolerances approved by the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, New York. Seed that has become wet, moldy or otherwise damaged in transit or storage will not be acceptable. After delivery to the Contractor, seed shall be stored so that it is protected from damage or deterioration from any source. Provisional acceptance of seeds shall be obtained before the seeds are sown. Final acceptance may be subject to the results of official sampling and testing. The Contractor shall furnish the vendor with the specifications for the material.

713-05 WOOD CHIPS

SCOPE. This specification covers the material requirements for wood chips used as mulch, landscape bedding or erosion control.

MATERIAL REQUIREMENT. Wood chips used for mulch, landscape bedding or erosion control may be either of the following, unless otherwise specified in the contract documents. Wood chips shall not exceed 80 mm in the greatest dimension.

A. TYPE A. This shall be derived from green hardwood or softwood. The chips shall be free from leaves, young growth, unchipped branches, twigs 50 mm or less in diameter, wood shavings, sawdust or foreign materials such as stones, nails, plastic, etc.

B. TYPE B. Shall be either Type A green wood chips or wood chips derived from unadulterated construction and/or demolition waste wood. Wood chips derived from construction and/or demolition waste wood shall not be contaminated with paint, chemicals, shingles, glass, nails, etc.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection, upon delivery, by the Engineer for compliance with the materials requirements and applicable certification of compliance with 6 NYCRR Part 360.

713-06 TREES, SHRUBS AND VINES

Nomenclature. The common and scientific names of plants shall be in conformity with the approved names by S.P.N. (Standard Plant Names) or its successor as the American Association of Nurserymen's recognized authority on botanical nomenclature.

Quality and Size. Plants, including root spread and ball size, shall be in accordance with the current edition of "American Standard for Nursery Stock," a code of standards sponsored by the American Association of Nurserymen, or as further specified in the contract documents. All plants shall have a normal habit of growth and be typically characteristic of their respective kinds. When a minimum and maximum size is specified, an average size is required. Plants shall not be pruned before delivery and no plants shall be cut back from larger sizes to meet the sizes specified. Plants shall be free from injury, insect damage, infestation and disease. Plants shall be nursery grown unless otherwise specified and bear evidence of proper nursery care, including adequate transplanting and root pruning. Plants specified from collected sources shall be clean, sound stock, free from decayed stumps and from fire injury.

Container grown material, including container sizes and soil, shall be as specified in the Contract Documents.

The container shall be sufficiently rigid to hold the ball shape and protect the root ball during handling and shipping. Container grown plants shall have been grown in the container long enough for the new fibrous roots to have developed so that the root ball is firm and will retain its shape and hold together when removed from the container. The plants shall be in a healthy growing condition with tops which are of good quality, and shall have been adequately hardened off before shipment.

Specimen plants shall be as specified in the Contract Documents.

Digging Plants. Plants shall be dug with care and skill immediately before shipment. No cold storage plants will be accepted unless approved. Plants stored temporarily shall be properly heeled in or otherwise protected from injury. Digging shall avoid all possible injury to, or loss of, roots, but roots cut shall be cleanly cut.

Root Protection. After plants are dug, their roots shall be protected from injury such as caused by heat, sun, wind and freezing temperatures. All bare roots of trees, shrubs and vines shall be puddled at the time of digging unless otherwise approved. Puddling shall be done in a wet clay mixture, of a quality to adhere to all parts of the root system. Roots of bare root plants which have been thoroughly covered at the time of digging with an anti-desiccant as specified under §713-08 will not require puddling. Bare roots shall be further protected by wrapping in wet straw, moss, burlap or other suitable material.

Transportation. Tarpaulins or other covers shall be placed over plants transported by open trucks or by open freight cars. Doors on closed trucks shall be kept closed to prevent draughts. Shipments made in boxcars or closed trucks shall be adequately ventilated to prevent "drafts." The heads of trees shall be tied in carefully to prevent fracturing or breaking the branches. Trunks and branches shall be adequately supported and padded to avoid scraping or bruising.

Trees. Nursery grown trees shall have no cuts of limbs which are not healing and no cuts over 20 mm which have not completely calloused over, no cut back crowns or leaders and no abrasions of the bark. Trees shall have good fibrous root systems characteristic of the kind. Deciduous trees shall have normal spread of crowns unless otherwise specified.

Bare root (B.R.) trees shall not require earth adhering to the roots except as required for puddling as specified. Any trees specified as bare root will be accepted balled and burlapped at the unit price bid for bare root trees.

Balled and burlapped (B&B) trees shall be properly dug and protected to preserve the natural earth in contact with the roots. No manufactured balls will be accepted. The balls shall be of the required size, firmly wrapped and tied with approved materials. No balled plants will be acceptable if the ball is cracked or broken.

Balled and platformed trees (B&P) shall be balled as specified for balled and burlapped trees. Platforms shall be square or octagonal shaped in a size slightly larger than the diameter of the bottom of the soil mass, inserted under each ball and securely lashed to the ball by means of ties from the platform corners to the rope collar on top of the ball.

Container grown trees shall be as specified in the contract documents.

The tops of trees shall be well formed structural but they are not required to have more than reasonably straight trunks, nor better than average well balanced crowns, nor be of specimen quality unless specimen plants are specified on the plans.

Shrubs. Shrubs shall have good fibrous root systems. The quality of balled and burlapped and balled and platformed shrubs shall be as specified for B&B and B&P trees herein. Container grown shrubs shall be as specified in the contract documents.

Plants specified as sods or clumps shall be dug from good soil which has produced a fibrous root system typical of the nature of the plant. The sods shall be dug with earth and incidental vegetation adhering to the roots. If the soil or habit of the root growth is such that the roots are not adequately protected, the sods shall be wrapped in burlap or other suitable material.

Vines. Vines shall be vigorous, well-furnished plants with good vigorous root systems. Vines shall be field grown (F.G.) unless otherwise specified. Pot grown plants (P.G.) shall be vigorous, well-developed plants, well established in pots with sufficient roots to hold the earth intact after removal from containers but they shall not be rootbound.

Substitutions. No change of quantity, size, kind or quality of plants as specified will be accepted except upon written approval.

LABELING. Labeling shall be in accordance with normal large scale nursery labeling practice except that the Contractor may be required at any time to supply positive identification of any plant.

BASIS OF ACCEPTANCE. The Contractor shall furnish the vendor with a copy of the specifications for the plants. The Contractor shall be responsible for all certificates of inspection of plant materials which may be required by Federal, State or other authority to accompany shipments of plants. All plants shall be subject to inspection at any place and at any time. Inspections desired by the Contractor, if approved, shall be at the expense of the Contractor. The Contractor shall be represented at all inspections. The Engineer reserves the right and option to place Department seals on any or all materials selected. Selection and/or tagging of material shall cover the type and body quality of the plant only, but shall not constitute final acceptance nor preclude the right of rejecting plants not fully meeting the requirements of the specifications.

The Department reserves the right to identify by suitable non-injurious means such as painting, marking

by various methods, etc. all plant material rejected upon delivery to the contract site.

713-07 JUTE MESH OR OTHER APPROVED EROSION CONTROL MATERIALS

SCOPE. This specification covers the material requirements for Erosion Control Materials.

MATERIAL REQUIREMENTS

Class I. Short term duration, light duty, organic or synthetic erosion control material (unless only 100% organic products are specified).

Type A. Products for use where the slopes do not exceed 1:4. No minimum shear stress flow is required. The product shall be capable of withstanding moderate foot traffic without tearing or puncturing.

Type B. Products for use on slopes 1:3 and flatter.

Type C. Products for use on slopes 1:3 or flatter, or, in channels where the calculated shear stress flow is 70 Pa or less. Products shall be capable of withstanding shear stress flows of at least 70 Pa.

Class II. An intermediate-duration, erosion-control material.

Type A. Jute Mesh. For use on slopes 1:2 or flatter. Jute Mesh shall be of a uniform open plain weave of undyed and unbleached single jute yarn. Jute mesh shall be woven as follows:

- Approximately 55 warp ends per meter width.
- Approximately 37 weft ends per linear meter.
- Mass of jute mesh shall average 0.5 kilogram per square meter (plus or minus 5%).

Type B. Organic or non-organic products for use on slopes 1:2 or flatter, or in channels when the calculated shear stress flow is 95 Pa or less. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Type C. Products made entirely of organic materials. For use on slopes 1:2 or flatter, or in channels when the calculated shear stress flow is 95 Pa or less. Only 100% organic materials are allowed. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Class III. Permanent synthetic, ultra-violet stabilized erosion control materials.

Type A. Products for use on slopes 1:2 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Type B. Products for slopes 1:2 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 170 Pa.

Type C. Products for slopes 1:1 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 240 Pa.

Type D. Products for slopes 1:1 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 380 Pa.

Class IV. Soil Stabilizers - Soil stabilizers are considered a short term duration erosion control device. When used alone, they shall be used on slopes 1:3 or flatter. They shall not be used in channels.

Type A. A cementitious soil binder which is added to wood cellulose fiber mulch, or a bonded fiber matrix. They are intended to form a thick heavy bodied crust or mat like barrier that controls water and wind induced erosion. Type A, may be used by itself, and is approved for use with Class III, Type A, B and C erosion mats where those mats are used on slope applications.

Type B. A polyacrylamide (PAM) and calcium solution intended to reduce the erodibility of bare soils during construction activities or to enhance the performance of mulching on permanent slopes. Soil stabilizer, Type B, shall bond soil particles and shall effectively increase the soil particle size to 1.0 mm or larger. It shall reduce the movement of soil through chemical bonding, increase the particle size thus making silt fence more effective, and increase the water absorption of the soil.

BASIS OF ACCEPTANCE. Acceptance of Class I, II, III and IV Erosion Control Material is based upon the supplier's name and address on the product container label appearing on the Department's Approved List, and a certification of compliance with these specifications.

As an erosion control material is received on a project site, the Engineer shall remove two square meters, for quality assurance, and submit it to the Geotechnical Engineering Bureau for testing. This pertains to Classes I, II, and III only, Class IV does not require a submission. The results of the quality assurance testing will not affect the use of a material on the project for which it is supplied. It is for the purpose of monitoring any changes in manufacturing processes which may affect the original properties that were determined at the time of initial approval.

The erosion control material will be tested for mass per unit and thickness. If the results are below the minimum acceptable for approval, the product's status on the Approval List will be reevaluated. The manufacturer will be notified of the review. Possible actions range from retesting of the manufacturer's line of products to immediate removal of those products from the Approved List.

Application for addition to the Approved List can be made to the Landscape Architecture Bureau. This evaluation will be performed in accordance with procedural directives of the Landscape Architecture Bureau. A geotextile component may be included in Class III Erosion Control Material. The geotextile component will be evaluated in accordance with procedural directives of the Geotechnical Engineering Bureau. Suppliers seeking addition to the Department's Approved List should allow 6 months for the evaluation.

713-08 MATERIALS FOR PROTECTION OF PLANTS

SCOPE. This specification covers the material requirements for materials used in planting operations. For methods of installation, see current standard sheet, as applicable.

MATERIAL REQUIREMENTS

Rodent Guards. Rodent guards shall be capable of protecting plants from girdling by rodents and shall be as specified in the contract documents or as approved by the Engineer.

Stakes for Supporting Trees

A. Above Ground Support. Stakes for supporting trees shall be of white or red cedar, or other approved material. Stakes 2.5 m to 3.0 m long shall have a minimum diameter of 50 mm to 60 mm. Stakes 3.75 m long shall have a minimum diameter of 80 mm. The maximum diameter of stakes shall not exceed 100 mm. Stakes shall be pointed at one end and shall have a maximum allowable deflection of 40 mm for every meter of length. All stakes shall be sound and free from insects and fungi.

B. Underground Support. Stakes for supporting trees shall be of approved hardwood or other approved material. Hardwood stakes shall be 50 mm by 100 mm nominal size, approximately 1.25 m long. Stakes shall be pointed at one end. All stakes shall be sound and free from insects and fungi.

Deadmen and Guy Stakes. Deadmen and guy stakes used to anchor guy wires or cables, which support trees, shall be of the quality and sizes required.

Wire. Wire for guying plants shall be new annealed steel wire (either galvanized or ungalvanized) or aluminum wire of the A.S. & W. gauge specified.

Bracing Materials. The size and quality of cables, turnbuckles, thimbles, leg hooks, eye bolts, rods, washers and nuts shall be as specified on the plans or as approved.

Jute Burlap. Jute burlap shall be in 100 mm wide strips and weigh 265 g/m^2.

Hose. Hose for protecting the bark from guy wires shall be good quality braided rubber, plastic hose as approved, or reinforced materials. Hose shall be at least 20 mm outside diameter.

Twine. Twine for use in wrapping trees shall be jute twine not less than two ply for trees 80 mm or less in diameter, and three ply for trees over 80 mm in diameter.

Paper. Wrapping paper for trees shall be waterproof paper 30-30-30 krinklecraft or equal in 100 mm wide strips.

Anti-Desiccants. Anti-desiccants shall be emulsions or other materials which will provide a protective film over plant surfaces, permeable enough to permit transpiration.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.

713-09 AND 713-10 (VACANT)

713-11 WOOD FIBER MULCH

SCOPE. This specification covers the material requirements for wood fiber for use as a mulch in conjunction with turf establishment or erosion control.

MATERIAL REQUIREMENTS. Wood fiber shall be a first generation product manufactured directly from 100 percent wood which has been recovered or diverted from solid waste.

Wood fiber shall be manufactured from unadulterated wood that is not contaminated with paint, chemicals, shingles, plastic or other foreign materials. Wood fiber mulch shall not be manufactured from or include paper.

Wood fiber mulch shall be manufactured so that the wood fibers will remain uniformly suspended in water under agitation and will blend with seeds, fertilizer and other additives to form a homogeneous slurry. It shall have the characteristics which, upon hydraulic application, shall form a blotter-like ground coating with moisture absorption and percolation properties and the ability to cover and hold seeds in contact with the soil.

Wood fiber mulch shall contain no growth or germination inhibiting factors, and shall contain a non-permanent green dye. Wood fiber mulch shall be supplied in the manufacturer's standard containers, with the name of the material, net weight of contents, the manufacturer's name and the air dry weight of fiber (equivalent to 10% moisture) appearing on each container.

BASIS OF ACCEPTANCE. Manufacturer's product label and certification indicating compliance with these specifications and any applicable regulatory requirements pertaining to solid waste management.

713-12 MULCH ANCHORAGE

SCOPE. This specification covers the material requirements for mulch anchorage.

MATERIAL REQUIREMENTS. Mulch anchorage shall be Type A, unless otherwise specified in the contract documents.

Type A: Shall be approved non-asphaltic commercially available products that are specifically formulated for the purpose of anchoring or tacking hay or straw mulch. Mulch anchorage shall include a non-permanent green dye. The paper content of paper-based hydraulic mulch anchorage shall be 100

percent post consumer recovered from solid waste. At least 98 percent of such paper shall be recovered newsprint. The materials shall be mixed and applied in accordance with the manufacturer's instructions.

Type B: Shall be either Type A or asphalt emulsion meeting the requirements of either 702-3201 Asphalt Emulsion or 702-90 Asphalt Emulsion Tack Coat. When asphalt emulsion is used it shall be uniformly applied at the rate of 0.02 L/m², unless otherwise specified in contract documents.

PACKAGING. Mulch Anchorage Type A shall be furnished in the manufacturer's standard containers with the name of the material, net weight of contents, the manufacturer's name and the dry weight of fiber (equivalent to 10% moisture) appearing on each container. The instructions for mixing and application shall also appear on each container.

Asphalt emulsion used for Mulch Anchorage Type B has no packaging requirements. The Engineer shall reject any asphalt material that is not homogenous or has separated. Asphalt separation caused by freezing unacceptable.

The Engineer shall reject any materials that have become wet, caked, frozen, separated or otherwise unfit for use.

BASIS OF ACCEPTANCE. The basis of acceptance for Mulch Anchorage Type A shall be the manufacturer's product label or product literature that indicates compliance with this specification.

The basis of acceptance for asphalt emulsion used as Mulch Anchorage Type B shall be as specified under Section 702 Bituminous Materials.

713-13 PESTICIDES

SCOPE. This specification covers the material requirements for pesticides used to manage vegetation, insects, rodents and/or other target pests.

MATERIAL REQUIREMENTS. Pesticides shall be approved commercially available products that are currently registered by the United States Environmental Protection Agency and the New York State Department of Environmental Conservation. Pesticides shall also have all required labels indicating that they are approved for the intended use.

Pesticides shall be mixed and used in strict conformance with the instructions on the label or supplemental labels.

PACKAGING. Pesticides shall be delivered and securely stored until used in the manufacturer's standard containers that have legible labels affixed in accordance with the provisions of the federal and state pesticides laws, rules and regulations in effect at the time of delivery.

Pesticides that do not meet these packaging requirements, at any time, will be rejected by the Engineer and shall be removed from the Contract site immediately.

The Engineer shall reject any pesticides that have become wet, caked or otherwise unfit for use.

BASIS OF ACCEPTANCE. The basis of acceptance shall be original, sealed, and properly labeled pesticide containers; and two copies of sample labels and supplemental labels that include instructions for the intended use of the pesticide.

The Department reserves the right to inspect the condition of pesticides and pesticide containers at any time while they are on the Contract site and to direct immediate removal of any pesticides and/or containers that do not meet these specifications.

713-14 SOD

SCOPE. This specification covers the material requirements for sod.

MATERIAL REQUIREMENTS. Sod shall be commercially grown sod and shall be accompanied by a certificate indicating compliance with the regulations of the New York State Department of Agriculture and Markets.

Sources of sod shall be made known to the Engineer at least five days before cutting. Sod shall be cut into squares or rectangular portions which shall be 300 mm wide, or as approved, and may vary in length, but shall be of a size which will permit them to be lifted without breaking. The sod, when delivered to the contract site, shall be sufficiently moist so the soil will adhere firmly to the roots when it is handled. Height of the grass shall not exceed 80 mm. The sod shall be cut to a minimum thickness of 20 mm. The sod shall be reasonably free from weeds in conformance with accepted commercial practice and shall consist of a mixture of permanent grasses such as bluegrass and/or fine leaved fescues, unless otherwise specified.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.

713-15 ORGANIC MATERIAL

SCOPE. This specification covers the material requirements for organic material used in conjunction with amending or manufacturing topsoil.

GENERAL. Organic materials regulated by the New York State Department of Environmental Conservation shall meet all applicable regulatory requirements.

MATERIAL REQUIREMENTS

A. Humus or Peat. The material shall be commercially produced natural humus or peat from freshwater sources and may contain sedge peat, sphagnum peat or reed peat. The material shall be free from hard lumps, roots, stones and other objectionable materials. There shall be no admixture of refuse or material toxic to plant growth. It shall be in a shredded or granular form able to pass through a 12.5 mm sieve. According to methods of testing of A.O.A.C. in effect on the date of the invitation of bids, the acidity shall be not less than 3.5 pH. and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water holding capacity shall be 200% by weight on an oven-dry basis.

B. Peat Moss. Peat moss shall be commercially produced and shall be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. It shall be free from wood, decomposed colloidal residue and other foreign matter. It shall have an acidity range of 3.5 pH to 5.5 pH as determined in accordance with methods of testing of A.O.A.C. in effect on the date of advertisement for bids. Its water absorbing ability shall be a minimum of 1100% by weight on an oven-dry basis.

C. Source-Separated Compost. Source-separated compost shall be commercially or municipally produced and shall be an organic substance produced by the biological and biochemical decomposition of source-separated compostable material that is separated at the point of waste generation. Source-separated compostable materials may include, but are not limited to, leaves and yard trimmings, food scraps, food processing residues, manure and/or other agricultural residuals, forest residues and bark, and soiled and/or unrecyclable paper.

Source-separated compost shall be reasonably free of sticks, stones, refuse, materials deleterious to soil structure, or any material toxic or detrimental to plant germination and growth. Source-separated compost shall also meet the following additional specifications:

A) Minimum organic matter shall be 30% (dry weight basis) as determined by loss on ignition;
B) Product shall be loose and friable, not dusty, and have a moisture content of 35% - 60%;
C) Particle size shall be <12.5 mm.
D) Soluble salts content shall be < 4.0 mmhos/cm (ds/m);
E) Compost shall be stable to very stable according to the test method current on the date of

advertisement for bids.
F) pH shall be between 6.0-8.0.

D. Composted Sewage Sludge. Composted sewage sludge is regulated by the New York State Department of Environmental Conservation (DEC) and must meet all applicable regulatory requirements.

TESTING. Source separated compost will be subject to testing by the Department to assure it is stable.

Composted sewage sludge used to amend or manufacture topsoil shall have a certificate, from a laboratory approved by the DEC, verifying compliance with all applicable laws, rules and regulations. Only facilities permitted to compost sewage sludge under 6 NYCRR Part 360, Solid Waste Management Facilities, shall be allowed to furnished finished compost for use in topsoil. The certification shall be supplied by the Contractor, at the Contractor's sole expense, and prior to the delivery of any composted sewage sludge, topsoil containing composted sewage sludge or other such regulated material to the contract site. The material shall be approved before it is used. A copy of the specifications shall be furnished to the laboratory by the Contractor.

BASIS OF ACCEPTANCE. Acceptance of humus, peat and peat moss will be based on the Producer's label or certificate of analysis by an established laboratory indicating compliance with the material requirements.

Acceptance of source-separated compost shall be based upon the Producer's label or certificate of analysis by an established laboratory indicating compliance with the material requirements; and a delivery inspection by the Engineer. Source-separated compost may be sampled and tested by the Department to assure compliance with the material requirements.

Acceptance of composted sewage sludge shall be based on certification by a DEC approved laboratory indicating compliance with the material requirements and all applicable regulations.

713-16 AND 713-17 (VACANT)

713-18 HAY

SCOPE. This specification covers the material requirements for hay.

MATERIAL REQUIREMENTS. Hay for mulching shall be mowings of acceptable herbaceous growth which is free from noxious weeds. Materials which are low grade and unfit for farm use such as "U.S. sample grade" will be acceptable. Weight shall be calculated on the basis of material having not more than 15% of moisture content.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with material requirements.

713-19 STRAW

SCOPE. This specification covers the materials requirements for straw.

MATERIAL REQUIREMENTS. Straw for mulching shall be stalks of oats, wheat, rye or the approved crops which are free from noxious weeds. Materials which are low grade and unfit for farm use, such as "U.S. sample grade" will be acceptable. Weight shall be calculated on the basis of the materials having not more than 15% of moisture content.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.

APPENDIX E

HDD EXIT PIT AT JONES BEACH APPROVAL LETTERS

OFFICE OF PARKS, RECREATION, HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

May 12, 2005

Leonid Shmookler
Ecology and Environment, Inc.
Buffalo Corporate Center
368 Pleasant View Drive
Lancaster, NY 14086

Dear Mr. Shmookler;

Re: CORPS/PSC Case 02-T-0036
Neptune Regional Transmission Project
Atlantic Ocean Exit Pit
02PR00422

Thank your for requesting the comments of the New York State Historic Preservation Office (SHPO) with regard to the potential for this project to affect significant historical/cultural resources. SHPO has reviewed your submission of April 28, 2005 regarding the proposed location of the Atlantic Ocean Exit Pit. After reviewing the material submitted SHPO concurs that there are no historic preservation concerns at the proposed exit pit location. We look forward to reviewing the evaluation of the five underwater targets that have been identified in New York waters.

Please contact me at extension 3291, or by e-mail at douglas.mackey@oprhp.state.ny.us, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

New York State Department of Environmental Conservation

Division of Legal Affairs, 14th Floor

625 Broadway, Albany, New York 12233-1500
Phone: (518) 402-9222 ∃ **FAX:** (518) 402-9018
Website: www.dec.state.ny.us

February 22, 2005

VIA ELECTRONIC & US MAIL

JOHN W. DAX, ESQ.
Cohen, Dax & Koenig, P.C.
90 State Street, Suite 1030
Albany, New York 12207

Re: ***Neptune Regional Transmission System, LLC***
PSC Case 02-T-0036

Dear Mr. Dax:

This will acknowledge receipt of your letter dated February 14, 2005 concerning Neptune's proposed plans for locating the horizontal directional drilling ("HDD") exit pit in the Atlantic Ocean south of Jones Beach in conjunction with the above-referenced cable project. Your letter also included an aerial photo indicating recent survey results and proposing coordinates for the exit pit at 626353.9E, 4494279.8N (UTM 18).

In addition, as a result of subsequent e-mail communications between you and I on February 16, 2005, it is the Department's understanding that the HDD entry pit (as depicted in Neptune's recent aerial photo) will be located landward of the State Coastal Erosion Hazard Area (ECL Article 34; 6 NYCRR Part 505) and, therefore, not within the Department's regulation. Based upon the foregoing, the proposed location of the exit pit is consistent with the provisions of Condition 16 of the amended Article VII certificate and is hereby approved by the Department.

If you have any questions, or need anything further, please feel free to contact me. Thank you.

Sincerely,

Mark D. Sanza

Mark D. Sanza, Esq.
Associate Counsel

c: Petra Kreshik, Esq. (OPRHP)
Steve Blow, Esq. (DPS)
Betsy Hohenstein

APPENDIX F

INDEPENDENT INSPECTOR QUALIFICATIONS

THIERRY GARCY — Independent Inspector

EDUCATION

B.S., Chemical Engineering, City University of New York at City College

CERTIFICATIONS

Registered Engineer-in-Training, State of New York

Mr. Garcy is a chemical engineer. He has 14 years' experience in managing projects requiring the interpretation and application of environmental regulatory requirements for solid and hazardous waste management, wastewater disposal, and water quality protection projects. He provides chemical and environmental engineering support and construction oversight.

He has worked on the following projects:

Hexagon Laboratories, Bronx, New York. As E & E's resident engineer for this site under E & E's standby contract with the New York State Department of Environmental Conservation (NYSDEC), Mr. Garcy provided oversight for and documented remedial activities undertaken by the potentially responsible party and managed the subcontractor performing survey tasks.

Corbin Street Intermodal Rail Facility, Newark, New Jersey. For the Port Authority of New York and New Jersey (PANYNJ), Mr. Garcy is part of the E & E team providing environmental support and oversight for the phased expansion of intermodal rail support and access to the Port Newark and Elizabeth Port Authority Marine Terminal. He identified existing environmental conditions near the project site, contributed to the Phase I environmental site assessment, and helped develop the Phase II work plan to characterize the extent of on-site contamination. As sampling supervisor, he ensured that the fieldwork was completed in accordance with the work plan.

Military Ocean Terminal Bayonne, New Jersey. For the Baltimore District of the United States Army Corps of Engineers, Mr. Garcy oversaw PCB removal operations completed by the site remediation contractor and performed on-site sampling at targeted areas throughout the former military base, which is scheduled for closure.

NYSDEC Environmental Engineer, Stony Brook, New York

During eight years with NYSDEC, Mr. Garcy completed technical reviews of engineering design reports and plans for several multimillion-dollar projects, including a municipal solid waste landfill and a waste-to-energy plant, in southern New York State. He also was the NYSDEC engineering project site inspector for a variety of solid waste management facilities (SWMFs) on

Long Island. Mr. Garcy conducted routine inspections of operator activities at the following sites:

1. Huntington Landfill Closure Cap Construction, East Northport, NY
2. Blydenburgh Landfill Closure Cap Construction, Islip, NY
3. Cosentino Commerce Center Development Site, Smithtown, NY
4. Islip Resource Recovery Facility, Islip, NY
5. GED Methane Recovery Facility, Islip, NY
6. Zapco Energy Recovery Facility, Smithtown, NY
7. 110 Sands & Gravel, Hempstead, NY
8. Shelter Island Landfill Closure Cap Construction, Shelter Island, NY
9. Brookhaven Ash Landfill Liner Construction, Brookhaven, NY
10. Islip Yard Waste Composting Facility, Islip, NY

While with NYSDEC, he completed training as a solid waste management facility inspector, as well as a course in hazardous waste operations and safety (GeoEnvironmental Consultants).

JASON K. GAC — Independent Inspector

EDUCATION

B.S., Environmental Engineering, cum laude, State University of New York at Buffalo

CERTIFICATIONS

Registered Engineer-in-Training, State of New York

Mr. Gac is an environmental engineering specializing in construction oversight at waste sites. He monitors the work of site contractors to ensure cost-effectiveness, timeliness, and compliance with contract specifications and applicable regulations and permits. He performs scheduling and budgeting, compilation and analysis of field data and delineates contaminated areas.

He has worked on the following projects:

McCormick and Baxter Creosoting, Portland, Oregon. For The Oregon Department of Environmental Quality, Mr. Gac oversaw construction of a 25-acre sediment cap on a primarily creosote-contaminated riverbed. Cap materials consisting of sand, gravel, organoclay, and articulated concrete block were emplaced using cranes, barges, and reverse dredges. Mr. Gac tracked contractor time and materials on change orders, monitored daily work progress, and evaluated the results of verification core sampling. He oversaw contractor and subcontractor work to verify compliance with project design specifications.

Niagara Transformer, Cheektowaga, New York. Under E & E's standby contract for the New York State Department of Environmental Conservation (NYSDEC), in preparation for the start-up of PCB remediation at this active transformer manufacturing facility, Mr. Gac provided construction oversight of interim remedial measure (IRM) activities to limit the off-site migration of PCB-contaminated groundwater and prevent exposure pathways to human health and the environment. The IRM components included limited excavation and off-site disposal of soil and sediment, installation of a new storm sewer system, abandonment of the existing storm sewer system in place, pressure grouting beneath an active loading dock, and installation of shotcrete in an adjacent drainage ditch.

Peterson and Schriever AFBs, Colorado. As part of E & E's wastewater infiltration and inflow (I/I) study for the Air Force Center for Environmental Excellence, Mr. Gac was team leader for the oversight of sanitary sewer inspection and cleaning of select sanitary sewer lines on each base. A combined 26,000 linear feet of sanitary sewer was hydraulically cleaned and videotaped. Mr. Gac determined areas of I/I and helped develop sanitary sewer rehabilitation plans and cost estimates for correction of problem areas.

Niagara Falls International Airport-Air Reserve Station, Niagara Falls, New York. For the United States Air Force Reserve Command, Mr. Gac is providing performance monitoring for an on-base, TCE-contaminated groundwater site through routine sampling of groundwater and surface water in area creeks.

Dearcop Farm, Gates, New York. For NYSDEC, he performed multimedia sampling to determine drum and tank contents remaining on site after the remedial action at this 16-acre industrial landfill.

Additional Training. Mr. Gac has completed the 40-hour, OSHA-required hazardous waste operations course, Red Cross first aid and cardiopulmonary resuscitation training.

MICHAEL SANDLER
Resident Construction Inspector
Lawler, Matusky & Skelly Engineers LLP

Years Experience: 30

Education: Construction Supervision, Architectural Design, 1979
Concrete Design and Inspection, 1972
William Howard Taft High School, Bronx, New York, 1962

Certifications: Training in Health and Safety Operations at Hazardous Materials Sites 29CFR1910.120 (E)(3) as defined by OSHA and mandated by SARA; American Red Cross Standard First Aid and Adult CPR

Relevant Work History: Mr. Sandler is a construction inspector in LMS' Engineering Group. Representative projects include the following.

Chief Inspector
Marine borer elimination project at 135th Street, New York, New York for the New York City Department of Sanitation - The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and New York State Department of Environmental Conservation (NYSDEC) field representatives. Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs, contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 1999.

Chief Inspector
Marine borer elimination project at Greenpoint, Brooklyn, New York for the New York City Department of Sanitation - The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and New York State Department of Environmental Conservation (NYSDEC) field representatives. Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs, contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 2000.

Chief Inspector
Marine borer elimination project at Northshore, Queens, New York for the New York City Department of Sanitation - The project included dredging and upland disposal of excavated contaminated waste and pile wrapping and pier rehabilitation. Responsibilities included: Ensuring all Federal, state, and local environmental regulations were enforced. Liaison between DOS and its agents and contractors and between DOS and New York State Department of Environmental Conservation (NYSDEC) field representatives. Supervising, scheduling and monitoring the inspection staff. Insuring quality assurance/quality control during construction. Maintaining correspondence files, shop drawings, daily logs,

contract specifications and drawings. Preparation of daily reports, meeting minutes, monthly reports, payment requisitions and change orders, 2001.

Town Project Representative
Construction of a 100+ acre shopping mall on the site of former municipal landfills in West Nyack, New York for the Department of Environmental Control for the Town of Clarkstown and the New York State Department of Environmental Conservation. Responsibilities included: Overseeing, attending meetings, report writing, record keeping and coordinating with the agencies and developer. The work included the closing of the landfills and the construction of temporary and permanent leachate collection systems. Site work, including, the blasting of approximately one million cubic yards of rock and its transport and backfill in other areas of the site. Re-grading to accommodate roadways, retaining walls, and parking areas and the construction of an overpass bridge over the New York State Thruway, 1998.

Resident Inspector
Construction of a CERCLA Ground Water Recovery Facility, including recovery, wastewater treatment and injection systems, in Cape May Court House, New Jersey, for the New Jersey Department of Environmental Protection - Responsibilities included: Inspecting construction activities and insuring quality assurance/quality control. Coordinating with agencies and contractors. Maintaining correspondence files, shop drawings, contract specifications and drawings. Preparation of daily reports, quantity surveys, monthly reports, payment requisitions, change orders and "As-Built" drawings, 1995.

Resident Inspector
Construction of Turn Lanes, State Highway, Route 9, Poughkeepsie, New York, for the New York State Department of Transportation - Responsibilities included: Inspecting the construction. Ensuring quality assurance/quality control. Coordinating with agencies and contractors, maintaining correspondence and testing files, preparing meeting minutes, daily reports and As-Built drawings, 2003.

Resident Inspector
Construction of Water Systems, Rockland County, New York, for United Water New York - Responsibilities included: Supervising the construction. Ensuring quality assurance/quality control. Coordinating with agencies and contractors, overseeing system testing, maintaining correspondence files, preparing daily reports and As-Built drawings, 2004.

PETER VARNER
Construction Inspector
Lawler, Matusky & Skelly Engineers LLP

Years Experience: 7

Education: B.S., Geology, 1998
B.A., Secondary Education (Earth Science), 1998

Relevant Work History: Mr. Varner is a construction inspector in LMS' Engineering Group. His responsibilities include providing resident engineering services for construction projects.

Village of Andes, NY (2001 to 2002). Mr. Varner provided resident engineering services for the construction of new water lines for Andes. The project required the relining of existing reservoirs, as well as new piping and new corrosion control and chlorination chemical feed systems. It was necessary to take the reservoirs out of service sequentially in order to assure continued fire protection throughout the project.

Mountainside Farms Wastewater Treatment Plant (2002 to 2003). He recently served as the resident engineer for the construction of the Mountainside Farms project and provided the day-to-day O&M for the plant for the first year of operation. The upgraded WWTP consists of the installation of a flocculating clarifier, a new treatment building that houses continuous backwash upflow filters, an ultraviolet disinfection system, chemical storage, filter and effluent pumps, and a control room, and piping to and from the diversion chamber to the treatment building. He was responsible for insuring quality assurance/quality control during construction, coordinating with agencies and contractors, maintaining correspondence files, concrete quantity records, concrete and soil test results, shop drawings, daily logs, contract specifications and drawings.

Grand Gorge Sewer Extension, in the Town of Roxbury, NY (2002). Mr. Varner served as the resident engineer for the Grand Gorge project.

Village of Andes, NY (2003 to present). Currently, Mr. Varner is serving as the resident engineer for the sewer installation and treatment plant construction for the Village of Andes new infrastructure project.

Varner Bros. Construction, D.B.A. **1999-2001**
Stone Ridge, New York

Owner/Operator
Prior to joining LMS, Mr. Varner owned and operated a construction company, where he gained experience in obtaining and executing residential and commercial contracts, including projects for complete residential homes, HVAC systems and electrical retrofits. Projects included:

- Residential Home Construction: Served as general contractor for new home construction. Obtained building, electric, and septic system permits. Responsibilities included: specification of scope of work for subcontracts; negotiation of subcontracts; interviewing and hiring laborers; establishment of site-specific worker's compensation and liability insurance program; estimation and ordering of materials and equipment to coincide with scheduled construction tasks; supervision of employees and subcontractors; communication with building, electrical, and plumbing inspectors. This project was completed within the six-month and $155,000 estimates.

- Interior Remodeling of Single-Family Home: Complete 12-week remodeling service in Rockland

County, New York. Tasks included partial demolition and removal of existing interior; reconstruction of kitchen and bathrooms; installation of new plumbing, electrical systems and appliances; installation of new flooring; drywall replacement and finishing. Total cost: $35,000

- Commercial Apartment Entrance Upgrade: Under subcontract, provided all services for replacement of concrete entrance ways with framed decks at an operational commercial apartment complex. This $90,000 contract required removal of 32 concrete decks, followed by replacement with pressure-treated decks, each within business hours to minimize inconvenience to tenants. Taking advantage of the 10,000lb lull provided for removal of concrete slabs, all decks were mass produced on the ground, then lifted and attached by machine. This reduced labor cost of five carpenters by more than 50%, and made it possible to complete each entrance in 4 hrs, rather than an estimated 10.

APPENDIX G

PRELIMINARY JOINT BAY POSITIONS

HVDC 500kV Preliminary Joint Bay Positions

ID	Joint Reference Name	Cum. (ft)	Partial (ft)	Cum. (m)	Partial (m)	Notes(Approx. Station Marks)
1	LI-SLJ(0)	0	0	0	0	Sea/Land joint position - Jones Beach
2	LI-LJ(1)	2,300	2,300	701	701	23+00
3	LI-LJ(2)	5,100	2,800	1,554	853	51+00
4	LI-LJ(3)	7,100	2,000	2,164	610	71+00
5	LI-LJ(4)	10,050	2,950	3,063	899	100+50
6	LI-LJ(5)	13,050	3,000	3,978	914	130+50
7	LI-LJ(6)	16,000	2,950	4,877	899	160+00
8	LI-LJ(7)	19,050	3,050	5,806	930	190+50
9	LI-LJ(8)	22,050	3,000	6,721	914	220+50
10	LI-LJ(9)	25,000	2,950	7,620	899	250+50
11	LI-LJ(10)	28,070	3,070	8,556	936	280+70
12	LI-LJ(11)	31,150	3,080	9,495	939	311+50
13	LI-LJ(12)	33,950	2,800	10,348	853	338+50
14	LI-LJ(13)	36,780	2,830	11,211	863	367+80
15	LI-LJ(14)	39,650	2,870	12,085	875	396+50
16	LI-LJ(15)	41,480	1,830	12,643	558	414+80
17	LI-LJ(16)	44,450	2,970	13,548	905	444+50
18	LI-LJ(17)	47,250	2,800	14,402	853	472+50
19	LI-LJ(18)	50,250	3,000	15,316	914	502+50
20	LI-LJ(19)	53,270	3,020	16,237	920	532+50
21	LI-LJ(20)	56,250	2,980	17,145	908	562+50
22	LI-LJ(21)	59,250	3,000	18,059	914	592+50
23	LI-LJ(22)	62,250	3,000	18,974	914	622+50
24	LI-LJ(23)	65,310	3,060	19,906	933	653+10
25	LI-T(24)	67,926	2,616	20,704	797	HVDC termination at the Converter Station - (1000ft in Converter Station included, length to be verified)

HVAC 345kV Preliminary Joint Bay Positions

ID	Joint Reference Name	Cum. (ft)	Partial (ft)	Cum. (m)	Partial (m)	Notes(Approx. Station Marks)
26	LI-T(25)	0	0	0	0	HVAC termination at the Converter Station
27	LI-LJ(26)	2,189	2,189	667	667	1021+89
28	LI-LJ(27)	4,377	2,188	1,334	667	1043+77
29	LI-LJ(28)	6,566	2,189	2,001	667	1065+66
30	LI-LJ(29)	8,114	1,548	2,473	472	1081+14
31	LI-LJ(30)	9,663	1,549	2,945	472	1096+63
32	LI-T(31)	11,219	1,556	3,420	474	HVAC termination at the Substation (total length to be verified)

NEW YORK STATE BOARD ON ELECTRIC GENERATION
SITING AND THE ENVIRONMENT
----------x

In The Matter of the Application of the Application of Neptune Regional Transmission System LLC for a Certificate of Environmental Compatibility Public Service Need Pursuant to Article VII of the Public Service Law

Case No. 02-T-0036

----------x

AFFIDAVIT OF SERVICE

STATE OF NEW YORK)
)ss:
COUNTY OF ALBANY)

Terri S. Hart, being duly sworn, deposes and says:

I am over the age of 18, I am not a party to this action, and I am employed by the law firm of Cohen & Dax, PC, 90 State Street, Suite 1030, Albany, New York 12207.

On the 8th day of August, 2005, I caused to be delivered a true and correct copy of a supplement to the second Environmental Management and Construction Plan of Neptune Regional Transmission System, LLC to the persons at the addresses shown on the attached list.

Service was accomplished by delivery in one of the following ways as indicated on the attached lists: 1) by hand delivery; 2) by placing the document in a Federal Express or UPS envelope and said envelope having been picked up by a Federal Express or UPS employee; or 3) by placing the document in a postage paid envelope and placing the envelope in a mail box regularly maintained by the United States Postal Service, located in the city and county of Albany, New York.

I declared, under penalty of perjury, that the foregoing is true and correct.

Terri S. Hart
TERRI S. HART

Sworn to before me this
8th day of August, 2005

Notary Public

MARTHA R. MARTINEZ
Notary Public, State of New York
No. 01MA6086463
Qualified in Columbia County
Commission Expires Jan. 21,

Neptune Regional Transmission System, LLC
Service List Via Hand Delivery

Hon. Jaclyn A. Brilling
Secretary
NYS Department of Public Service
Three Empire State Plaza, 3rd Floor
Albany, NY 12223-1350

Hon. William Bouteiller
Administrative Law Judge
NYS Dept. of Public Service
Three Empire State Plaza
Albany, NY 12223-1350

Steven Blow, Esq.
NYS Dept. of Public Service
Counsel's Office, 18th Floor
Three Empire State Plaza
Albany, NY 12223-1350

Mr. Norman Morrisson
NYS Dept. of Public Service
Office of Efficiency and Environment
Three Empire State Plaza
Albany, NY 12223-1350

Mr. Jim De Waal Malefyt
NYS Dept. of Public Service
Three Empire State Plaza
Albany, NY 12223-1350

Mr. Andrew C. Davis
NYS Dept. of Public Service
Three Empire State Plaza
Albany, NY 12223-1350

Mark Sanza, Esq.
NYS Dept. of Environmental Conservation
Division of Legal Affairs
625 Broadway
Albany, NY 12233

Jennifer L. Hairie, Esq.
NYS Dept. of Environmental Conservation
Division of Legal Affairs
625 Broadway
Albany, NY 12233

Denise M. Sheehan, Acting Commissioner
NYS Dept. of Environmental Conservation
625 Broadway
Albany, NY 12233

Bernadette Castro, Commissioner
NYS Office of Parks, Recreation and Historic Preservation
One Empire State Plaza, 20th Floor
Albany, NY 12238-0001

Petra M. Kreshik, Esq.
Associate Attorney
NYS Office of Parks, Recreation and Historic Preservation
One Empire State Plaza, 20th Floor
Albany, NY 12238-0001

Brian Rowback, Executive Director
NYS Dept. of Transportation
50 Wolf Road, 6th Floor
Albany, NY 12205

Neptune Regional Transmission System, LLC
Service List Via Federal Express Delivery

Mr. Jon Kaiman, Supervisor
Mr. David I. Wasserman, Planning Commissioner
Andrew M. Hyman, Esq., Deputy Town Attorney
Town of North Hempstead
200 Plandome Road
Manhasset, NY 11030

Ms. Kate Murray, Town Supervisor
Joseph J. Ra, Esq., Town Attorney
Brad Regenbogen, Esq., Deputy Town Attorney
Town of Hempstead
One Washington Street
Hempstead, NY 11550

Hon. John Venditto, Supervisor
Town of Oyster Bay
Town Hall East
54 Audrey Avenue
Oyster Bay, NY 11771

Westbury Memorial Public Library
445 Jefferson Street
Westbury, NY 11590

Levittown Public Library
1 Bluegrass Lane
Levittown, NY 11756

Oyster Bay-East Norwich Public Library
89 E. Main Street
Oyster Bay, NY 11771

John Norbeck, Regional Director
Long Island State Park
625 Belmont Avenue
Babylon, NY 11702

Sloan Bullough, Program Analyst
Peebles Island State Park
Field Services Bureau
Delaware Avenue
Cohoes, NY 12047

Joseph Brown, PE
Regional Trans. Maintenance Engineer
NY S Dept. of Transportation
NYS Office Building
250 Veterans Memorial Highway
Hauppauge, NY 11788

Thomas Kunkel, Regional Director
NYS Dept. of Environmental Conservation
One Hunter's Point Plaza
47-40 21st Street
Long Island City, NY 11101-5407

Peter A. Scully, Regional Director
NYS Dept. of Environmental Conservation
SUNY – Building 40
Stony Brook, NY 11790

Neptune Regional Transmission System, LLC
Service List Via US Mail Delivery

Hon. Nathan Rudgers
Commissioner
NYS Dept. of Agriculture & Markets
10 B Airline Drive
Albany, NY 12235

Hon. Randy A. Daniels
Secretary of State
NYS Department of State
41 State Street
Albany, NY 12231

Keith D. Martin, Esq.
NYS Dept. of Transportation
1220 Washington Avenue
Albany, NY 12232

Mr. Darryl H. Cabbagestalk, Project Management
NYC Dept. of Environmental Protection
59-17 Junction Blvd., 11th Floor
Flushing, NY 11373

Christopher King, Esq.
Assistant Corporation Counsel
New York City Law Department
100 Church Street, Room 3-129
New York, NY 10007

Jeffrey L. Riback, Esq.
Associate Counsel
Consolidated Edison Company of New York, Inc.
4 Irving Place, Room 1820
New York, NY 10003

Andrew Gansberg, Esq.
Richard Cogen, Esq.
Nixon Peabody, LLP
Omni Plaza, Suite 900
30 South Pearl Street
Albany, NY 12245

Noelle M. Kinsch, Esq.
Robert J. Alessi, Esq.
Pierre F. De Ravel D'Esclapon, Esq.
Leboeuf, Lamb, Greene & Macrae
One Commerce Plaza, Suite 2020
99 Washington Avenue
Albany, NY 12210-2820

Charles J. Micoleau, Esq.
Curtis, Thaxter, Stevens, Broder
& Micoleau, LLC
One Canal Plaza
PO Box 7320
Portland, ME 04112-7320

Thomas D. Emero, Esq.
General Counsel
GenPower New York LLC
1040 Great Plain Avenue
Needham, MA 02492-2517

Mr. Daniel McBrearty
Project Manager
TransEnergie U.S. Ltd.
110 Turnpike Road, Suite 300
Westborough, MA 01581-2864

Mr. Edward Grilli
Chief of Staff
Long Island Power Authority
333 Earle Ovington Blvd., Suite 403
Uniondale, NY 11553

Mr. Edward J. Cherian, Jr.
The Louis Berger Group
75 Second Avenue, Suite 700
Needham, MA 02494

Mr. Charles A. Gargano, Chairman
Empire State Development Corp.
30 South Pearl Street
Albany, NY 12245

Mr. Jeff Reidenaver
100 Halsted Street
East Orange, NJ 07018

Mr. Richard A. Muddiman
C/o Pegasus Transmission
80 Bailey Road
West Bolton, Quebec J0E 2T0
Canada

Hon. Charles Lavine
New York State Assembly
13th District
70 Glen Street, Suite 100
Glen Cove, NY 11542

Hon. Carl Louis Marcellino
New York State Senate
5th District
250 Townsend Square
Oyster Bay, NY 11771

Hon. Charles J. Fuschillo, Jr.
New York State Senate
8th District
30 South Ocean Avenue, Suite 305
Freeport, NY 11520

Hon. Michael A.L. Balboni
New York State Senate
7th District
151 Herricks Road, Suite 202
Garden City Park, NY 11040

Jane Houdek, Esq.
Deputy County Attorney
County of Nassau
1 West Street
Mineola, NY 11501

Mr. Ronald Masters
Commissioner of Public Works
Town of Hempstead
One Washington Street
Hempstead, NY 11550-4923

Mr. Vance Bar
Ms. Bridget Kennedy
NYS Department of State
Division of Coastal Resources
41 State Street
Albany, NY 12231

Mr. John A. O'Leary
GenPower NY LLC
1040 Great Plaine
Needham, MA 02492

Edgar K. Byham, Esq.
Principal Attorney
New York Power Authority
123 Main Street
White Plains, NY 10601-3170

Hon. Donna Ferrara
New York State Assembly
15th District, 150 Post Avenue
Westbury, NY 11590

Hon. Thomas P. DiNapoli
New York State Assembly
16th District
11 Middle Neck Rd., Suite 200
Great Neck, NY 11021

Hon. David G. McDonough
New York State Assembly
19th District
3000 Hempstead Turnpike
Suite 110
Levittown, NY 11756

Richard W. Lenz, Pe.E., N.S.P.E
Commissioner
Town of Oyster Bay
Dept. of Public Works
150 Miller Place
Syosset, NY 11791-5699