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Westchester Medical Center
Valhalla, New York

WMC Health | Westchester Medical Center
Westchester Medical Center Health Network

TECHNICAL SPECIFICATIONS
FOR
LOT 7, 15 AND 16
PARKING EQUIPMENT UPGRADES AND LOT IMPROVEMENTS

CONTRACT NO. CMC-14639

Prepared For:

Westchester County Health Care Corporation

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TECHNICAL SPECIFICATIONS:

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections:

1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.
2. Division 31 Section "Dewatering" for disposal of ground water at Project site.

1.3 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion and Sedimentation Control Plan: Show compliance with requirements of the NYSDEC and Westchester County Department of Public Works and Transportation whichever is more stringent.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch - thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.

B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

3.2 TEMPORARY UTILITY INSTALLATION

A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

B. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.

C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

3.3 SUPPORT FACILITIES INSTALLATION

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

2. Maintain access for fire-fighting equipment and access to fire hydrants.

B. Parking: Use designated areas of Owner's existing parking area for construction personnel.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Temporary Erosion and Sedimentation Control: Comply with requirements of NYSDEC Construction General Permit, Westchester County Department of Public Works and Transportation or authorities having jurisdiction, whichever is more stringent, and requirements specified in Division 31 Section "Site Clearing."

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction as needed until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from the project site during the course of the project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

B. Stormwater Control: Comply with requirements of stormwater runoff, the erosion and sediment controls and authorities having jurisdiction.

C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

D. Site Enclosure Fence: Prior to commencing work, furnish and install site enclosure fence in a manner that will prevent pedestrians from easily entering site except by entrance gates.

E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas. SMOKING IS PROHIBITED ON THE ENTIRE HOSPITAL CAMPUS.
2. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

END OF SECTION 01 50 00

SECTION 01 50 01

MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Under this Item the Contractor shall maintain traffic and protect the public from damage to person and property within the limits of and for the duration of the contract in accordance with the plans, as specified herein and as ordered by the Engineer. The contractor shall conduct his operations in such manner as to insure the safety of motorists, pedestrians and his own employees and in such sequence that inconvenience and discomfort to the general public and delays to traffic will be kept to an absolute minimum. The contractor shall provide temporary signs, markers and other approved devices together with qualified, courteous personnel to protect and to guide traffic and pedestrians through and around the contract area. When necessary, the Contractor shall construct temporary detours and structures of sufficient strength and capacity to accommodate the volume and character of traffic on and along the road. The contractor shall give advance notice to the Owner, local police and fire department together with residents and other affected parties before commencing any operations which will interfere with the normal procedure of traffic or pedestrian flow along the road or roads, or into buildings and properties within the contract limits.

B. The Contractor is hereby informed that all the measures required to attain satisfactory accomplishment under this item are not necessarily included herein. He shall be prepared to supplement these specifications by such other work and methods as may be deemed necessary by the Engineer to achieve whatever results are desired.

C. Incorporated herein by reference, the Contractor shall also be responsible for complying with all applicable sections of the New York State Department of Transportation (NYSDOT) Standard Specifications, dated May 4, 2006, and any addendums thereto for all work within any public right-of-way.

D. The Contractor shall comply with all requirements of the Westchester County Department of Public Works and Transportation Highway Work Permits issued by the Department for all required road improvement work.

PART 2 - PRODUCTS

2.01 MATERIALS/EQUIPMENT

A. Signs shall be in accordance with the specifications and requirements contained in the New York State Manual of Uniform Traffic Control Devices (NYSMUTCD) latest revision. The Contractor's attention is directed to Section 1682 of the New York State Vehicle and Traffic

Law which mandates conformance with the above specifications. ALL SIGNS SHALL BE REFLECTIVE FLUORESCENT ORANGE.

B. Traffic cones shall have a minimum perpendicular height of 28-inches or higher with platform flat type base and tapered or ramp-like edges. They shall be orange in color with an orange base and kept clean for maximum visibility. When used after dark they shall have two white horizontal stripes of reflective material near the tip. The reflective material shall conform to the requirements of Subsection 730-05, Reflective Sheeting, Class A, B or C of the NYSDOT Standard Specifications. The upper stripe shall be 6-inches wide with its upper edge 3-to 4-inches below the top of the cone. The lower stripe shall be 4-inches wide with its upper edge 2-inches below the upper stripe.

C. Lighted barricades i.e.: barricades illuminated by steady burning Lights, including all single-unit, steady burning low intensity lights. The electrical power may be supplied by batteries, portable generators or commercial power. All electrical, steady burning lights shall be 69Watt. C-9 Traffic Lamps, emit yellow light, operate dusk to dawn and be mounted on portable or fixed barricades.

The Contractor shall maintain and repair any damage to the barricades, including necessary painting, reflectorizing and replacement of broken or worn parts and at all times keep the barricades clean, visible and lighted to the satisfaction of the Engineer and in conformance with the NYSMUTCD.

Use of open flame flares is prohibited.

D. Metal plating shall be safe and suitable for the intended use and shall comply with OSHA standards. If metal plating is to be left in place for more than 24-hours, the plating shall have the edges sealed in asphalt to provide a smooth lip. All plating and decking installed shall be made safe for vehicles and pedestrians and shall be adequate to carry the load. Size shall be large enough to span opening, be firmly bedded to prevent noise and rocking, shall overlap the edges of trenches and openings, be sufficiently ramped to provide smooth riding and safe conditions.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. The Contractor shall furnish, erect, move and remove temporary concrete barrier, construction barricades and lighting as specified above for barrier and barricades where and as indicated on the plans. Barrier and barricades shall be as referred to in the NYSDOT Transportation Construction and Materials Standard Specifications latest edition, as amended for Section 619-Maintenance and Protection of Traffic, and in accordance with the NYSMUTCD or as directed by the Engineer.

Barriers shall be fastened together to form a continuous chain so that no slack is evident at the joint connection. Construction barricades shall be so spaced to delineate a closed section of pavement to the approaching traffic.

B. The Contractor shall provide and maintain delineators on temporary barriers. The delineation shall make the barrier visual to approaching traffic as well as to traffic that is adjacent to the barrier. Delineation may be made with paint, reflective removable tape or other material meeting the requirements of NYSMUTCD and approved by the Engineer.

C. Where indicated on the plans or in the proposal, barrier and/or barricade shall be supplemented with lighting devices as indicated.

D. Plastic drums may be used for delineation and guiding devices as required and directed by the Engineer provided they are of the proper size and reflectorized as indicated in the NYSMUTCD. The plastic drums shall have provisions for the installation of ballast (weights) to prevent the drums from blowing over due to wind loading. The ballast shall be located at or near ground level and consist of bagged sand weighing no more than 50-pounds. For two-piece drums, only the base shall be detachable no more than 4-inchesabove the pavement. For one-piece drums the base shall be elongated to accept ballast bags on one or more sides. No open top or metal drums will be permitted.

When plastic drums are used for delineation they shall be maintained vertical, in proper alignment, and kept clean at all times. The sand bag ballast shall be placed inside for drums with detachable bases, and on the approach side for one-piece drums with elongated bases. Under no circumstances shall the ballast be placed on top of the drum. Where lights are specified on top of the drums, the lights shall be attached to the drums with nuts, bolts and washers.

Other markers or delineators may be circular or rectangular in shape and shall be constructed of reflective sheeting having a minimum area of 20 square inches or of reflective buttons having a minimum diameter of 3-inches. All reflective delineators or markers shall conform to the requirements of the NYSMUTCD.

E. The Contractor shall furnish, erect, move and remove delineation and guiding devices as required and directed by the Engineer. In areas where grading is being done, a safe and reasonable roadway shall be properly delineated at all times, either by the use of guiding devices or flagmen. The Contractor shall delineate areas where there is a drop-off near the edge of the traveled way and areas on which it is unsafe to travel.

F. Plastic drums or containers set on end, may be used as delineators, provided they are of proper size and reflectorized as indicated in the NYSMUTCD. They shall be kept clean at all times. Other markers or delineators may be circular or rectangular in shape and shall be constructed of reflective sheeting having a minimum area of 20 square inches or of reflective buttons having a minimum diameter of 3-inches. All reflective delineators or markers shall conform to the requirements of the NYSMUTCD.

G. The use of metal drums for barricades will not be permitted.

H. Timber for temporary structures (walkways, steps, crossovers, etc.) shall be sound, square edged, free from shakes, loose knots or decay and shall be securely fastened at all contact points by nailing or bolting as may be required. When specific details are not shown on the plans, timber shall be of the necessary sizes, dimensions and stress value to support the loads for which they are constructed. Only new timber shall be furnished for steps and handrails and when used for handrails they shall be surfaced on all four sides.

I. Provisions for Travel Way – The Contractor shall provide when possible, a travel way for two lanes of traffic. He shall so schedule his work as to keep to a minimum the amount of pavement that is removed in whole or in part or is substantially damaged at any one time. When and where necessary the traveled way shall be kept well drained and reasonably smooth and hard at all times. The required equipment and personnel to attain and maintain a satisfactory riding surface shall be available for use as needed when the work is under way or temporarily

suspended. Special attention shall be given to providing a satisfactory travel way over weekends, holidays and during the winter season.

J. Whenever it becomes necessary to maintain traffic on one lane, the Contractor shall provide adequate traffic controls on the section of roadway on which vehicle operation is maintained. He 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 flagpersons 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 NYSMUTCD and shall direct traffic in conformance with said manual. Sign Paddles, in lieu of flags, may be required by the Engineer.

K. The Contractor shall keep the travel way free and clear of all dirt, debris, stones, timber or other obstructions. Material spilled from the Contractor's vehicles during hauling operations along or across any public traveled way shall be removed immediately, both within and outside the contract limits. Whenever dusty conditions arise as a result of the Contractor's operations they shall be corrected by the use of calcium chloride and/or water. Water used as a palliative shall be distributed uniformly over a minimum width of eight feet by use of spray heads or bar.

L. Temporary Signs, Devices, Etc. – The Contractor shall furnish and erect, or otherwise place as required and as directed by the Engineer, reflectorized signs, traffic cones, barricades and other approved devices to post the construction area and to inform the traveling public. All signs shall be mounted at the required height, kept clean and so placed as to be effective both day and night. Signs, cones, barricades, etc., shall be used and placed to apprise the motorists and/or pedestrians of any unusual or unsafe condition and give timely warning for the necessary action to traverse the area safely. Any area judged by the Engineer to be particularly hazardous shall be delineated by means of temporary concrete barriers with mounted flasher units. Signs, markers, barricades, etc., shall be moved, removed or changed as warranted to indicate actual conditions. At the conclusion of the work under the contract all temporary signs and guiding devices shall be removed and shall remain the property of the Contractor unless specified otherwise.

M. Flasher lights shall be in operation from sunset to sunrise and at such other times as may be necessary for their intended purpose. The use of fuel-burning devices will not be permitted.

N. The Contractor shall furnish, apply, and, when so ordered, remove pavement delineation where shown on the plans or as ordered by the Engineer in accordance with the NYSMUTCD. Unless otherwise shown on the contract plans or proposal or ordered by the Engineer, any course of asphalt concrete, including base and binder courses, upon which traffic will be maintained shall be properly delineated in accordance with this subsection before the end of the working day.

O. If paint is used, it shall be applied in accordance with the NYSDOT standard specifications. If tape is used, it shall be applied in accordance with the manufacturer’s recommendations, including the use of a primer where needed. The pavement surface shall be clean and dry and of a surface temperature recommended by the tape manufacturer at the time of tape installation. Tape shall conform to the shape of and adhere to the surface upon which it is installed. Any tape that fails to adhere to the pavement surface during the period of use shall be replaced by the Contractor at no expense to the County

P. Inclement weather or other factors may prevent the installation of permanent markings, either by the Contractor or others, in time for the opening to traffic of such pavement or structure. The Contractor, in such cases, shall install temporary pavement delineation as approved and the locations directed by the Engineer.

Q. Existing Signs – Existing highway and way finding signs and supports within the contract limits shall be maintained for the duration of the contract as directed by the Engineer. When necessary the Contractor shall remove signs, store, protect and keep them clean until replaced as directed by the Engineer. Should any signs require relocating at various stages of construction they shall be placed in locations visible to traffic.

Any signs or their component parts which are damaged or lost through negligence on the part of the Contractor shall be replaced and installed by him and at his expense.

R. Means of Ingress and Egress – The Contractor shall provide and maintain safe and passable means of ingress and egress to and from properties, buildings, intersecting roads at existing or new access points and at bus stops consistent with the work under contract and as directed by the Engineer. When necessary he shall construct temporary steps, crossovers, etc., to permit safe and easy passage through the contract area. He shall provide suitable areas and locations for the loading and unloading of passengers on roads within the contract limits that are serviced by motor buses.

S. The Contractor shall be liable and responsible for the materials and workmanship required to provide adequate and safe timber structures.

T. Temporary Paving – The Contractor shall place temporary paving for walks, drives, pavement, etc., where necessary and as directed by the Engineer. Materials shall be placed and compacted to the required thickness as determined by the Engineer and when used for trench paving it shall be maintained to the surface of the surrounding surface or pavement. The Contractor may use steel plates of adequate strength in lieu of timber bridging over trenches with the approval of the Engineer.

U. Snow and Ice Control – The Contractor shall so maintain the travel way within the contract limits that equipment for plowing of snow and sanding of ice may safely and effectively proceed through the construction area. He shall be responsible for the moving of any plowed snow that impedes or endangers the movement of traffic or hampers the functioning of drainage structures. He shall be responsible for maintaining snow and ice free conditions on any temporary timber facilities constructed by him for public use.

V. Flagmen – The Contractor shall employ a sufficient number of competent flagmen to guide traffic especially in areas where traffic is confined to one lane of travel or congestion occurs where construction equipment is working. They shall be physically and mentally qualified for the work, instructed and trained in the proper performance of their duties, efficient in their operations and courteous in their dealings with the public. They shall be properly attired for the work and equipped with the standard hand signaling devices for day or night use. When on duty the flagmen shall face traffic and stand clear of traffic lanes. Each flagman shall be so stationed as to be visible to traffic and so located as to give timely warning to motorists approaching the work site. Flagmen shall be instructed that delays to traffic shall not exceed five minutes at any single time unless conditions or circumstances warrant to the contrary.

W. Plan for Traffic Control – When the location, magnitude or other factors of work scheduled to be done will seriously disrupt the normal, orderly movement of traffic, the Contractor, on order from the Engineer and prior to the start of any contract operations, shall prepare and present a

plan showing his proposed methods for maintaining traffic. Said plan shall be reviewed by representatives of Westchester Medical Center, the Engineer, County Traffic Engineer and officials and/or duly authorized representative of the municipality wherein the project is located. A representative of Westchester Medical Center shall arrange for a meeting of the concerned parties at which time decisions will be made and noted as to acceptable procedures. During the progress of the work the Contractor may request modification of the accepted plan due to unforeseen or unexpected difficulties of whatever nature and such requests will be considered by the representatives of Westchester Medical Center and in the best interests of the traveling public.

X. Advance Notice of Construction – Before restricting the normal flow of traffic in any way the Contractor shall give 72-hours prior notice of same to the police and fire department(s) within whose jurisdiction the project is located. The Contractor shall assign a responsible employee to give the aforesaid notices.

Y. Requirements Modified or Waived – Attention is directed to the fact that certain requirements of this specification shall be modified or waived completely depending on the location, nature and extent of the work to be performed under the contract. The Contractor, accordingly, shall govern his amount bid for the item based on his observations and judgment unless details for the work are specified on the plans or in the proposal.

END OF SECTION 01 50 01

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Division 01 Section "Temporary Facilities and Controls" for temporary site fencing.
2. Division 31 Section "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

B. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Maintenance Recommendations: Care and protection of trees affected by construction during and after completing the Work.

C. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or videotape.

2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.5 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA.

1.6 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements.

1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart.

a. Height: 4 feet.
b. Color: High-visibility orange, nonfading.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.3 TREE- AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

B. Maintain protection zones free of weeds and trash.

C. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

D. Maintain protection-zone fencing in good condition as acceptable and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Division 31 Section "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

3.5 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

B. Soil Aeration: Where directed by Engineer, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 01 56 39

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related Sections:
   1. Division 01 Section Closeout Procedures – for general closeout procedures.
   2. Division 01 Section Operation and Maintenance Data – for operation and maintenance manual requirements.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:
   1. Record Drawings.
   2. Record Specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

1.03 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit two sets of marked-up record prints.
   2. Number of Copies: Submit copies of record Drawings as follows:
      a. Final Submittal: Submit two sets and PDF electronic files of marked-up record prints.

B. Record Product Data: Submit two copies and PDF electronic files of each submittal.
   1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.01 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining information.
d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Locations and depths of underground utilities.
   d. Revisions to routing of piping and conduits.
   e. Revisions to electrical circuitry.
   f. Actual equipment locations.
   g. Duct size and routing.
   h. Locations of concealed internal utilities.
   i. Changes made by Change Order or Change Directive.
   j. Details not on the original Contract Drawings.
   k. Field records for variable and concealed conditions.
   l. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Substantial Completion, review marked-up record prints with the Engineer and representatives of Westchester Medical Center. When authorized, prepare a full set of corrected electronic data files of the Contract Drawings, as follows:
   1. Format: Annotated PDF electronic file.
   2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

2.02 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Product Data as PDF electronic file and original paper copies.

PART 3 - EXECUTION

3.01 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for representatives of Westchester Medical Center and Engineer.

END OF SECTION 01 78 39

SECTION 02 41 20

SITE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related sections include the following:
   1. Division 31 Site Clearing
   2. Division 31 Site Preparation
   3. Division 31 Earthwork

1.02 SUMMARY

A. This Section includes demolition and removal of the following:
   1. Site improvements, utilities, street and walkway lighting, asphalt/concrete pavement, curbing, driveway aprons, sidewalks, signage, and miscellaneous structures.
   2. The existing pavements and miscellaneous structures to be demolished and stripped should be removed from within and at least to the limits shown on the design plans.
   3. Prior to stripping and demolition operations, all utilities should be identified, marked out in the field, and secured as necessary.

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

B. Abandon: Same as remove above. Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

C. Remove and Salvage: Detach items from existing construction and deliver them to the Owner where indicated on the plans.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.04 QUALITY ASSURANCE

A. Pre-Demolition Conference: Conduct pre-demolition conference at the Project Site a minimum of 72 hours prior to commencing any demolition work of this Contract. The meeting will be arranged by the Owner representatives upon notification of the Contractor and is to be attended by representatives of the Contractor, Owner, Project Manager.

1.05 PROJECT CONDITIONS

A. Adjoining on-site building occupants will continue to occupy their facilities immediately adjacent to the Project Site and demolition areas. Thus, the Contractor must conduct his operations in such a manner and make any arrangements necessary so that the building occupants use the facilities will not be disrupted during the course of the work.
   1. Provide not less than 72 hours' notice to the Owner of activities that will affect their respective use of their property.
   2. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.
      a. Do not close or obstruct walkways, exits, or other occupied or used facilities without written permission from authorities having jurisdiction or the affected property owner.

B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the conduct of the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the Owner representatives.

C. Storage or sale of removed items or materials on-site is not permitted.

1.06 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 312000 Earthwork of these specifications.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of site demolition work required.

B. Inventory and record the condition of items to be removed and salvaged.

C. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Owner’s representatives.

3.02 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities and structures to be demolished.
   1. Arrange to shut off indicated utilities with the Owner’s representative.

B. Temporary Shoring: Provide and maintain shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

C. Removed and Salvaged Items: Comply with the following:
   1. Clean salvaged items of dirt and demolition debris.
   2. Store items in secure area until delivery to Owner.
   3. Transport items to Owner's storage area designated by Owner.
   4. Protect items from damage during transport and storage.

3.03 PROTECTION

A. Existing Facilities: Protect adjacent walkways, building entries, traffic and wayfinding signs and other building facilities during demolition operations.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during demolition and cleaned and reinstalled in their original locations after demolition operations are complete.

C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.
   1. Do not interrupt existing utilities serving both on-site and off-site adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
      a. Provide at least 72 hours' notice to Owner if shutdown of service is required.

D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.
   1. Protect existing site improvements, appurtenances, and landscaping to remain.
   2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent structures and facilities to remain.
   3. Provide protection to ensure safe passage of people around demolition area and to and from occupied portions of adjacent buildings and structures.
   4. Protect walls, structures, and other adjacent exterior construction that are to remain and that are exposed to demolition operations.

3.04 DEMOLITION, GENERAL

A. General: Demolish all items, as either indicated on the plans or encountered in the field during the course of the work, completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

B. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.05 MECHANICAL DEMOLITION

A. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.

B. Existing Utilities: Remove existing utilities and below-grade utility structures.
1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Section 312000 Earthwork of these specifications.

C. Site Drainage: Site soils may soften when exposed to water, every effort must be made to maintain drainage of surface water runoff away from construction areas and open excavations by grading and limiting the exposure of excavations and prepared subgrades to rainfall.

3.06 EXPLOSIVE DEMOLITION

A. Explosives: Use of explosives during the course of the demolition work is not permitted.

3.07 SITE RESTORATION

A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from demolition operations with satisfactory soil materials according to backfill requirements in Section 312000 Earthwork.
1. Rough grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.08 REPAIRS

A. General: Promptly repair damage to adjacent construction caused by demolition operations.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.09 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project Site and legally dispose of them off site.
1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: On-site burning of rubbish and demolished materials will not be permitted.

C. Disposal: Transport demolished materials off Owner's property and provide for the legal off-site disposal of the material.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION 02 41 20

SECTION 10 14 50

TRAFFIC SIGNAGE AND PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Additional requirements for field engineering also may be described in other Sections of these Specifications.

1.02 DESCRIPTION OF WORK:

A. The Contractor shall furnish and apply temporary and permanent pavement marking paints, including glass beads thereto, at the locations and in accordance with patterns indicated on the contract drawings or as ordered by the Owner's Representative and in conformance with these Specifications. This work shall apply to all areas of the site.

B. The Contractor shall furnish and install temporary and permanent traffic signs in accordance with the contract drawings and Specifications or in a manner approved by the Owner's Representative.

C. The Contractor shall remove and dispose of all temporary signs and support structures upon completion of the work.

1.03 SUBMITTALS:

A. The Contractor shall submit to the Owner's representative or Construction Manager documentation for material compliance. Three copies shall be submitted for approval.

B. Fabrication of support structures shall be submitted to the Owner’s representative or Construction Manager for approval prior to ordering of materials.

1.04 PRODUCT HANDLING:

A. Work Included: Protect products scheduled for use in the work by means including, but not necessarily limited to, those described in this Section.

B. Quality Assurance: Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

C. Manufacturers' Recommendations: Except as otherwise approved by the Owner's Representative, determine and comply with manufacturers' recommendations on product handling, storage and protection.

D. Repairs and Replacements: In the event of damage, promptly make replacements and repairs to the approval of the Owner's Representative.

1.05 JOB CONDITIONS:

A. General:
   1. Before any pavement marking work is begun, a schedule of operations shall be submitted for the approval of the Owner's Representative and/or the Construction Manager. In addition, a schedule of operations for temporary markings and patterns for detours and other temporary traffic controls shall be submitted to and approved by the Owner's Representative and/or the Construction Manager prior to placement.
   2. When pavement markings are applied under traffic, the Contractor shall provide all necessary flags, markers, signs, etc., to protect the painted markings until thoroughly dry. The application of pavement markings shall be done in the general direction of traffic; striping against traffic shall not be allowed, unless the area is not in use.
   3. The Contractor shall be responsible for removing, to the satisfaction of the Owner's Representative, tracking marks, spilled paint or paint applied in unauthorized areas.

1.06 APPLICABLE CODES:

A. All pavement markings, traffic control letters, arrows, handicap/accessible symbols and signs shall conform to the Manual of Uniform Traffic Control Devices (latest edition) and materials shall conform to the current Standard Specifications of the New York State Department of Transportation (NYSDOT).

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Pavement Marking Paints
   1. White, yellow and blue reflectorized pavement marking paints with glass beads shall be in accordance with New York State Standard Specifications Construction and Materials, latest edition.
   2. Paint material and application shall meet or exceed all applicable Federal, State and local regulations as required to perform the work specified herein.

B. Installation of Signs
   1. The Contractor shall install signs as shown on the contract drawings and as directed by the Owner's Representative.
   2. These signs shall be installed including all necessary hardware on poles, and/or sign posts.
   3. Where existing signs are to be removed within a concrete sidewalk, the openings shall be backfilled with sand and compacted to subgrade. If the sidewalk is to remain, a concrete patch similar in color to the existing walk shall be placed and finished with the same texture to that of the surrounding walk. In landscaped areas, the holes shall be filled in with clean soil, lightly compacted, and then seeded.
   4. All signs are to provide a minimum clearance of 7'-0" from the grade elevation to bottom of sign unless otherwise indicated.
   5. All supports used to secure signs shall be galvanized steel and suitable to support the signs in accordance with the manufacturers' recommendations.
   6. All handicapped/accessibility signage shall show symbols of accessibility as per current ADA specifications.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Refer to Section 31 15 00 – Site Preparation.

3.02 PAVEMENT MARKINGS:

A. Detour and other temporary markings shall be removed as directed by and to the satisfaction of the Owner's Representative and/or the Construction Manager.

The method of removal is subject to the approval of the Owner's Representative. Painting out pavement markings will only be approved for very short term use. Grinding, scraping, 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.

When necessary, the Contractor shall establish marking line points at 25-foot intervals throughout the length of the pavement or as directed by the Owner's Representative.

The Contractor shall be responsible for cleaning the pavement to the satisfaction of the Owner's Representative of dust, dirt, old pavement markings, concrete curing compounds and other foreign material which may be detrimental to the adhesion of the paint film.

The paint shall be applied only on thoroughly dry pavement surfaces when the atmosphere temperature is at or above 40°F and when the weather is otherwise favorable in the opinion of the Owner's Representative.

B. Painted pavement markings shall, unless otherwise noted herein, be applied with atomizing spray type striping machines. The equipment shall be compatible with and suitable for the application of the type of paint being used and shall be approved by the Owner's Representative. Applied markings shall have clean-cut edges, true and smooth alignment and a uniform film thickness of 15±1 mil. Glass beads shall be applied uniformly over and into the wet paint film at a rate of 6 pounds per gallon of paint. Glass bead dispensers shall be of a type that will mechanically and automatically give such performance. All painted pavement markings in roadways shall be topped with glass beads, only parking stall pavement markings are exempt from application of glass beads. Glass beads shall be applied immediately after paint is placed to assure maximum adhesion of glass bead particles to paint surface.

C. White and yellow reflectorized pavement markings, NYSDOT Item No. 727.01, to be applied in accordance with NYSDOT Standard Specifications Section 685.
   1. All stop bars: White
   2. All solid lane dividers at intersections: White
   3. All arrows and “ONLY” in travel lanes: White
   4. Parking lines and spaces: White
   5. All at grade handicapped space lines, associated access aisle, and symbols: Blue
   6. All double center line lane marking (opposing traffic): Yellow
   7. All single lane marking (skip lines-between travel lanes moving in same direction): White
   8. All other markings shall be painted markings in accordance with Section B, directly above.

   Do not apply parking and lane marking paint until layout and placement have been verified with the Owner’s representative and/or Construction Manager.

3.03 SIGNS:

A. All signage as shown on the drawings shall conform to the latest edition of the Manual of Uniform Traffic Control Devices of the NYSDOT Traffic and Safety Division.

B. All handicapped signage shall show symbols of accessibility as per current ADA Accessibility Guidelines.

C. Fabrication of all components and erection of the completed sign shall be done in a workmanlike manner and shall produce a finished sign installation to the satisfaction of the Owner's Representative. Holes may be punched or drilled; cut edges shall be smooth and true and free from burrs or ragged breaks. All fabrications except for cutting or lower ends of embedded posts shall be done in the shop except upon express permission of the Owner's Representative.

Overhead panels shall be constructed similarly to ground-mounted sign panels except lock bolts, hex bolts, nuts and washers shall conform to the requirements of Section 715-16 Stainless Steel Connecting Products of the NYSDOT Standard Specifications. Threads on threaded bolts must be burred after tightening to prevent loosening.

D. Sign locations shown on the contract drawings are approximate and the exact location of each sign will be determined by the Owner's Representative in the field.

END OF SECTION 10 14 50

SECTION 282350 – SECURITY CAMERAS

PART 1 - GENERAL

1. 1 DESCRIPTION OF WORK

Includes security cameras and poles, installation, wiring, testing and positioning (adjustment) during testing procedures.

PART 2 - PRODUCTS

2.1 GENERAL

Imager Camera: Vicon Model SN683D-WIR as manufactured by INEX/ZAMIR and as approved by Owner. Include mounting bracket and 6-inch steel posts anchored into a concrete footing

Area Camera: Vicon Model V988B-W311MIR as manufactured by Vicon Industries and as approved by Owner's Representative. Include mounting bracket and 6-inch steel posts anchored into a concrete footing.

PART 3 - EXECUTION

3.1 INSTALLATION

Installation as indicated on detail sheets and plan sheets.

END OF SECTION 232850

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections:
1. Division 31 Section Erosion and Sediment Control – for temporary erosion and sedimentation control measures
2. Division 02 Section Site Demolition – for demolition of structures and site improvements

1.02 SUMMARY

A. Section Includes:
1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities
7. Temporary erosion- and sedimentation-control measures.

1.03 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.04 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.05 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
   1. Use sufficiently detailed photographs or videotape.
   2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Pre-Installation Conference: Conduct conference at Project site.

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service and "Call Before You Dig" for area where Project is located before site clearing.

C. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

D. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Impoundment of water.
   4. Excavation or other digging unless otherwise indicated.
   5. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

E. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

F. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section 312000 Earthwork.

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.01 PREPARATION

A. Provide and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain.

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide all means necessary to install, inspect and maintain, and remove temporary erosion and sediment control measures as shown on the drawings and as required to minimize the erosion and unspecified transport of soil and sediment from the site.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site according to requirements in Division 01 Section 015639 Tree and Plant Protection.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.04 EXISTING UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
   1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.
   1. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be removed.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Engineer not less than seven days in advance of proposed utility interruptions.

E. Excavate for and remove underground utilities indicated to be removed.

3.05 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
   2. Remove stumps and remove roots dispose of offsite.
   3. Use only hand methods for grubbing within protection zones.
   4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

3.06 TOPSOIL STRIPPING

A. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

B. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
   1. Limit height of topsoil stockpiles to 10 feet
   2. Do not stockpile topsoil within protection zones.
   3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

3.07 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, pavements, curbs, and aggregate base as indicated.

3.08 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 10 00

SECTION 31 15 00

SITE PREPARATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related specification sections include but are not limited to:
   1. Division 02 Section 024120 Site Demolition
   2. Division 01 Section 015639 Temporary Tree and Plant Protection

1.02 DESCRIPTION OF WORK:

A. The work of this Section includes all labor, materials, necessary equipment, appliances, materials and services for any reasonable incidental to complete the Site Improvements and related work indicated on the drawings and/or specified herein including but not necessarily limited to the following:
   1. Demolition of existing pavements, utility infrastructure, and all associated below-grade structures (foundations, manholes, etc.) including removal of all debris as indicated on the plans.
   2. Protection and trimming of existing trees.
   3. Installation and maintenance of Erosion and Sediment Control devices prior to any earthwork operations. Includes the placement, replacement and relocation of erosion and sediment controls in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.
   4. Clearing and grubbing.
   5. Removal off-site of tree stumps and other vegetation.
   6. Stripping, storing and the on-site reuse of topsoil.
   7. Disposal off-site of excess excavated material and/or excavated materials not suitable for backfilling including the removal of all combustible or other organic material.
   8. Supply and placement of acceptable fill material to maintain the elevations shown on the drawings.
   9. Excavation, backfilling, compaction and preparation of subgrade for roadways, yards, lawns, sidewalks, walkways and driveways as shown on the drawings and as required. Maintain temporary surface drainage and erosion control of the site.
   10. Backfilling to grade against footings, foundations, utility chambers, electrical vaults, retaining walls, manholes, field inlets/catch basins, trenches and other items of work as hereinafter specified.
   11. Excavation, sheeting, shoring, placement of base material and backfilling for utilities including storm, sanitary sewer and water mains.
   12. Excavation, sheeting, shoring, placement of base material and backfilling for mechanical and electrical work, including excavation and installation of light pole bases.
   13. All necessary pumping and dewatering, including settling basins.

14. Responsibility for all necessary trade union contract provisions during the site clearing and excavation work of this Section as well as throughout the project.
15. Maintenance of access to the site.
16. Layout of line and grade to perform the work as shown on the drawings and contained in the Specifications.
17. Disconnection, removal or abandonment of all existing utility lines including but not limited to, poles, pipes, ductbanks, manholes, vaults, boxes and conduits not required on the site.
18. Installation of site utilities including domestic water, fire protection, hydrants and storm drainage.
19. The removal of existing and the installation of new site lighting and signage where indicated on the plans.
20. The removal of existing and the installation of new sidewalks, walkways, driveways and wheel stops as shown on the drawings and contained in the Specifications.
21. Make connections into existing utilities as shown on the plans including all excavation, sheeting and shoring, trenching, laying of pipe and conduit, abandonment and/or removal of existing structures, repair of damage to existing structures and utilities, construction and installation of new structures, backfilling, compaction and landscaping.
22. Excavation, compaction, grading and placement of paving as shown on the Plans.
23. Obtaining all permits required for the above work, including the payment of all associated and/or bonds associated therewith.
24. Cleaning of all new storm drainage facilities.
25. Excavation, grading and fencing required to complete the installation of drainage structures, stormwater basins, control manholes, drain inlets, storm pipes, and drainage swales.
26. Maintenance of stream flows and drainage ways at all times during construction.

1.03 REFERENCE STANDARDS:

A. Work of this contract which is not specified herein shall conform as applicable to the "Standard Construction Specifications and Standard Construction Details" of the New York State Department of Transportation, the “New York State Standards and Specifications for Erosion Control,” and the project’s approved “Stormwater Pollution Prevention Plan (SWPPP).”

PART 2 – NOT USED

PART 3 – EXECUTION

3.01 RESPONSIBILITY OF CONTRACTOR:

A. General
   1. The Contractor shall do all the work and shall furnish all the materials, tools and appliances necessary or proper for performing and completing the work required by this contract to the satisfaction of the Owner's Representative and Construction Manager in accordance with the specifications and drawings herein mentioned.

B. Protection of Existing Improvements
   1. Provide barricades, coverings or other types of protection necessary to prevent damage to existing improvements indicated to remain in place.
   2. Protect improvements on adjoining properties as well as those on the Owner's property.

3. Restore any improvements damaged by this work to their original condition, as acceptable to the owner and other parties or authorities having jurisdiction.

C. Protection of Existing Trees and Vegetation
   1. Protection of existing trees and other vegetation if and as indicated to remain in place is the responsibility of the Contractor. Protection systems once installed shall be maintained by the Contractor and shall not be removed or disturbed without the approval of either the Owner or Construction Manager.
   2. Comply with the protection requirements indicated in Division 01 Section 015639 Tree Protection and Pruning.

D. Permits
   1. The Contractor shall, at his own expense, obtain all the necessary permits and licenses required by Town, County, State or other public authorities; shall give all notices required by law or ordinances; and shall post all Bonds and pay all fees and charges incident to the due and lawful prosecution of the work covered by this Contract. If any of the Contractor's work shall be done contrary to such laws, ordinances, rules and regulations without such notice, the contractor shall bear all cost arising therefrom.

E. Prevention of Dust Hazard
   1. The Contractor agrees that in the event a silica or other harmful dust hazard is created in the construction of the work herein contracted to be done, and for which appliances or methods for the elimination of such silica dust or other harmful dust have been approved by the State or governing authorities having jurisdiction, said Contractor will install, maintain and keep in effective operation such appliances and methods for the elimination of such silica dust or other harmful dust hazard or hazards, and in the event this provision is not complied with, this contract shall be void.

F. Existing Utilities
   1. Under Section 119B of the Public Service Law, Article 36 of the General Business Law and Industrial Code Rule 53, the Contractor is required to:
      a. Contact Underground Facilities Protective Organization (UFPO at 1-800-962-7962) at least three full working days prior to the start of work.
      b. Contact a private utility mark out company.
      c. Verify the precise locations of the underground facilities, once the buried utilities are marked.
      d. Protect and preserve utility staking’s, markings or other designations.
      e. Provide support and prevent damage to any underground facility or its protective coating.
      e. Understand and use the State Color Code for facility markings.
   2. Final locations of such utilities identified in the field are to be field located by the Contractor using careful hand excavation prior to the conduct of the Work.
   3. No assurance can be given that the locations of the existing subsurface utility lines shown on the plans are entirely correct or complete. Final locations shall be field located by each utility operator.
   4. Do not interrupt existing utilities serving facilities occupied and used by others, except when permitted in writing by the Owner's Representative and then only after acceptable temporary utility services have been provided.
   5. It shall be the Contractor's responsibility to protect all existing utilities from damage during all phases of construction, whether or not said utilities have been located by the Utility. Location work which is to be done by the Utility (or Private Forces) as specified under Paragraph F.1

and F.2 above is to be done as an aid and guide for the Contractor's operations and is not guaranteed to be exact and said location work shall not be made the basis of any claim for additional compensation by the Contractor if existing utilities are damaged by any of the Contractor's operations.

The Contractor shall exercise extreme care during all excavation and backfilling operations and any existing utility, pavement, curb, etc. which becomes damaged due to any of the Contractor's operations shall be replaced or repaired to the satisfaction of the Owner's.

G. Traffic Regulation

1. The Contractor shall regulate and maintain traffic, post construction and detour signs and do such work as may be required for the proper safeguarding and handling of all traffic both on and off-site. Such traffic regulations shall be in accordance with the requirements of the New York State Department of Transportation and the New York State Department of Public Safety.
2. As set forth on the plans or as ordered by the Owner, streets along the line of work shall be maintained in one or both directions. Occupants of the facility along the line of work or persons having business with such occupants shall have safe means of ingress and egress at all times. Access to all driveways shall be maintained at all times. Fire, police and emergency personnel and equipment shall have safe and adequate access at all times to all portions of the line of work. When so directed, the Contractor shall provide approved safe and adequate temporary bridging over newly-built work to protect the work from any injury which might result from traffic.
3. Unless otherwise specified, no direct payment will be made for regulating and maintaining traffic, compensation for same being considered as included in the prices bid for the work of the contract.
4. The Contractor shall supply and maintain all lights, flares, torches, fences, barricades, steel plates, flagperson and/or other protection devices necessary to adequately protect traffic during construction.
5. A detailed construction phasing plan shall be prepared by the contractor which shall include scope, duration, traffic and safety control measures both on and off-site. The phasing plan included on the contract documents provides the overall sequence of work for all trades. The contractor shall modify the plan as needed to maintain safe and adequate access to the facility at all times. At no time will access to the facility be closed without written approval by the Owner.
6. The Contractor shall notify the Owner’s representative and/or the Construction Manager at least 72 hours in advance of any change in on-site circulation patterns so that notification may be given to local emergency service providers.

H. Nuisances

1. The Contractor shall avoid injury to persons and, so far as possible, all odors, smoke, noise, nuisance, vibration or disturbances, as from machinery, pumping, air compressing, blasting, blacksmithing or trucking, and the contractor shall be liable for all damages therefrom or for violation of any and all related present and future local laws, ordinances or regulations or otherwise. Approved silencers shall be installed on noise making equipment.

I. Sanitary

1. The Contractor will be required to strictly observe the sanitary rules and regulations of the State and County Departments of Health.
2. The Contractor shall prohibit and prevent the committing of nuisances on the site of the work. When directed by the Owner's Representative, the contractor shall summarily discharge any

and every employee who commits a nuisance. Sanitary precautions shall at all times be satisfactory to the Owner's Representative.

3.02 SITE CLEARING:

A. Clearing and Grubbing
   1. Remove curbing, pipes, catch basins, manholes, subsurface structures and other improvements or obstructions that interfere with installation of new construction. Also, remove such items elsewhere on the site or premises as specifically indicated.

B. Topsoil Removal
   1. Strip Topsoil to whatever depths encountered and in such a manner so as to prevent intermingling with the underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
   2. Where trees are indicated to remain, stop topsoil stripping a sufficient distance from such trees to prevent damage to their main root system.
   3. Refer also to Division 31 Section 311000 Site Clearing of these specifications.

3.03 EROSION AND SEDIMENT CONTROL:

A. Refer also to Division 31 Section 311750 Erosion and Sediment Control of these specifications.

3.04 DISPOSAL OF WASTE MATERIALS:

A. Burning of combustible cleared and grubbed materials is not permitted on the Owner's property.

B. Removal from the Owner's Property - Remove all waste materials including any unsuitable backfill material from the Owner's property and legally dispose of it.

3.05 SURVEY LAYOUT OF WORK:

A. The Contractor to provide mathematical delineation of all critical horizontal and vertical points for the entrance roads, driveways, parking areas, walkways and underground utilities. In addition, reference points shall be in the New York State Planar Grid System.

B. Layout and stake all required grades and lines. This work shall be done by a New York State Licensed Land Surveyor employed by the Contractor and approved by the Owner's Representative and/or the Construction Manager.

C. Carefully maintain all bench marks, monuments and other reference points, and if they are disturbed or destroyed through operations of the Contractor, they shall be replaced in a manner satisfactory to the Owner's Representative at the Contractor's expense.

END OF SECTION 31 15 00

SECTION 31 17 50

EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK:

A. Provide all means necessary to install, inspect and maintain, and remove temporary erosion and sediment control measures as required to minimize the erosion and unspecified transport of soil and sediment from the site. THE CONTRACTOR SHALL MINIMIZE SITE DISTURBANCE.

1.03 QUALITY ASSURANCE:

A. General

1. Install and maintain all soil erosion and sediment control measures in compliance with the New York State Department of Environmental Conservation General Permit for Storm Water Discharges from Construction Activities.

2. Contractor shall implement all measures required prior to the start of any other activities on site.

3. Install all erosion and sediment controls in accordance with the latest edition of the *New York State Standards and Specifications For Erosion And Sediment Control, November 2016* (N.Y.S. Guidelines).

4. Grade and maintain site at all times such that all storm water runoff from disturbed areas is diverted to soil erosion and sedimentation control facilities.

5. No soil, not protected by erosion and sedimentation control measures, can be disturbed at any time.

6. The Contractor shall comply with applicable Federal, State, and local regulations relating to the prevention and abatement of pollution.

7. The Contractor shall be responsible for maintaining all erosion and sediment control devices and shall be required to provide measures to correct problems encountered in the field whether or not the measures are shown on the plan. Measures that include the installation of additional sediment traps, erosion control blankets or reducing the amount of exposed soil

may be necessary to comply with the NOI and Part 700 etseq of Title 6, Chapter X of NYCRR

B. Product Data: Submit manufacturer's catalogue cuts, specifications and installation instructions for silt fences, filter fabrics and erosion control blankets.

C. Product Stockpiling: Stockpiles of stabilization measures such as haybales, silt fence, 1½-inch gravel for check dams, filter fabric, and mulch shall be maintained at the site for use in stabilizing disturbed areas in advance of severe weather conditions.

PART 2 - PRODUCTS

2.01 INLET PROTECTION: Filtrexx inlet protection or approved equal.

2.02 DEWATERING PITs: Number and location to be determined by contractor.

2.03 SILT FENCE: Silt fence fabric shall be Mirafi 100X or equal. Wood posts shall be of sound quality hardwood, a minimum 36-inches long and 2-inches square. Metal posts shall be standard T and U section weighing not less than one pound per linear foot. Wire fence backing shall be a minimum 14½ gage with a maximum 6-inch mesh opening and securely attached to fence posts. Posts shall extend a minimum of 16-inches into the ground.

2.04 HAY BALE BARRIERS: Wood posts shall be of sound quality hardwood, a minimum 36-inches long. Metal posts shall be standard T and U section weighing not less than one pound per linear foot.

2.05 FILTER FABRIC: Filter fabric shall be Mirafi 600x.

2.06 TEMPORARY STABILIZATION

A. Establishment of Temporary Grass Cover: Prepare seed bed, scarify if compacted, remove debris and obstacles such as rocks and stumps, and seed within 24 hours. Amend soil, lime soil to pH of 6.0 and fertilize at a rate of 14 pounds per 1,000 square feet with a 5-10-10 or equivalent fertilizer. Work amendments a minimum of 4-inches into soil. If seeding in October/November, seed shall be Certified Aroostook winter rye at 100 pounds per acre, otherwise seed shall be ryegrass (annual or perennial) at 30 pounds per acre.

B. Mulch/RECP: Small grain straw mulch or Type 1 erosion control blankets as specified on drawing SP-5.1. Straw mulch shall be applied at a rate of two tons (100 to 120 bales) per acre. Erosion control blankets shall be BonTerra S2 installed as recommended by manufacturer.

C. Install Temporary Stabilization within 24-hours after the end of construction activities in an area unless there is snow cover or construction activities will resume within seven days.

D. Tackifier: When covering between October and April, cover exposed soils with hydroseed and tackifier with the following application rates:

1.	Slopes less than 3 Vert.:12 Horiz.	75 lbs/ac
2.	Slopes between 3 Vert.:1 Horiz. and 2 Vert.:1 Horiz.	100 lbs/ac
3.	Slopes greater than 2 Vert.:1 Horiz.	150 lbs/ac

Acceptable product: Conwed Fibers Con-Tack AT Tackifier as manufactured by Profile Products, LLC (800) 366-1180

PART 3 - EXECUTION

3.01 GENERAL: Install and remove measures as required. The measures shall be maintained until permanent protection of the contributing watershed is approved by the Owner's Representative. All storm drainage outlets that have been silted due to the work will be cleaned, as required.

3.02 INSPECTIONS: Inspect and report measures daily and within 24-hours of the end of a 0.5 inch or greater storm event. All inspections are to be made by a NYS trained and certified contractor. Stabilized areas will be inspected monthly until the entire site is stabilized.

3.03 MAINTENANCE: Maintenance and deficiencies shall be completed within two calendar days of determining its need.

3.04 PAVEMENT: Provide temporary pavement when adjacent to traffic lanes and when directed by the Engineer.

END OF SECTION 31 17 50

SECTION 31 20 00

EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related sections include but are not limited to:
   1. Division 02 Section 024120 Site Demolition
   2. Division 31 Section 311500 Site Preparation
   3. Division 31 Section 311750 Erosion and Sediment Control

C. Any conflict in requirements between the Drawings, Specifications, Geotechnical Report, or other design documents should be interpreted in favor of the most restrictive requirement unless otherwise directed by the Engineer.

1.02 SUMMARY

A. Section Includes:
   1. Definition of excavation, fill and backfill materials.
   2. The preparation and dewatering requirements for open excavations and/or structures.
   3. General excavation requirements.
   4. Excavation requirements for buildings and structures.
   5. Excavation requirements for preparing subgrades for walks and pavements.
   6. Excavation requirements for utility trenches.
   7. Excavation of landscaped areas.
   8. Subgrade inspection requirements.
   9. General backfill requirements.
   10. Backfill requirements for utility trenches.
   11. Fill material requirements.
   12. Soil moisture control requirements.
   13. Compaction requirements of backfills and fill material.
   14. Bedding course placement under slabs-on-grade, walks and other structures.
   15. Subbase course placement under asphaltic concrete pavements.
   16. Drainage course for porous pavement and underdrain systems.
   17. Subsurface drainage.
   18. Field quality control of subgrade preparation, material backfill and compaction testing.
   19. Protection of excavated and graded areas.
   20. Storage of soil materials.
   21. Unauthorized excavation.
   22. Removal of excess and unsuitable material from the site.

1.03 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beneath, beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench to the top of the proposed subgrade as shown and detailed on the plans.

B. Structural Fill: Fill material placed under structures after removal of unsuitable bearing materials. Material shall be 3/4 inch, clean aggregate or other material as approved by the project's geotechnical engineer.

C. Subbase Course: Aggregate layer placed between the existing subgrade and hot-mix asphalt paving.

D. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe and in other open excavated areas to support new curbing, walks, concrete stairs, slabs-on-grade, manholes or other structures. The bedding material shall also be used to backfill trenches to the depths and/or limits detailed on the plans. Sand bedding material shall be used in place of the aggregate material specified where required by either the local utility, Owner's representative or Project Engineer.

E. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill, or soil from on-site sources meeting the specifications for fill material and determined suitable for on-site use.

F. Drainage Course: Aggregate layer supporting the collection and transporting of water.

G. Earth Excavation: Defined to include removal, and if required proper disposal off-site, of the following:
   1. Soil and all other materials encountered of any name and nature that are not classified as rock excavation or unauthorized excavation.
   2. Hardpan, loose or decomposed bedrock or other such material that may require intermittent drilling and wedging to increase production or facilitate handling of the material with equipment normally used in the particular excavation operation.

H. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as shown on the contract drawings. Authorized additional excavation and replacement material will be paid for according to Contract provisions.

I. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.

J. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner, Construction Manager, or Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation. Remedial work may include, but not be limited to, replacement of the unauthorized excavation by backfilling and compacting as specified for authorized excavations of the same classification, unless otherwise directed by the Owner's Representatives.

K. Fill: Soil materials used to raise existing grades.

L. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard for bulk excavation or 3/4 cubic yard for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.

1) Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
2) Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

M. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd**.** or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D 1586

N. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, inlets, catch basins, manholes, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

O. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below the subbase or bedding course, drainage or reservoir course, or topsoil materials.

P. Recycled Material: The use of recycled material from any off-site source will not be permitted.

Q. Utilities: On-site underground pipes, conduits, ducts, tunnels, and cables, as well as underground services within buildings.

1.04 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
2. Controlled Low Strength Material (CLSM).
3. Warning tapes.
4. Imported borrow fill and aggregate

B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: 12-inches by 12-inches.
2. Warning Tape: 12-inches long; of each color.
3. Earthwork, borrow fill, aggregate materials; 5 gallon pail containing a representative sample plus a sealed quart plastic bag containing a representative moisture sample of material passing the No. 4 sieve.

C. Qualification Data: For qualified testing agency.

D. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

E. Pre-Excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.05 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.06 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify "Call Before You Dig" for area where Project is located before beginning earth moving operations.

C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.

D. Do not commence earth moving operations until plant-protection measures are in place.

E. Do not commence earth moving operations until all subsurface utilities have been located and marked in the field.

F. The following practices are prohibited within areas not identified as work zones shown on the approved Construction Plan:
1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Erection of sheds or structures.
4. Impoundment of water.
5. Excavation or other digging unless otherwise indicated.
6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Subsurface Information:

1. The Owner makes no predictions or representations regarding the character or extent of soil, rock or other subsurface condition to be encountered during the work. The Contractor shall make his own deductions on the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those

as calculated and/or anticipated by him. Borings and other exploratory operations may be performed by the Contractor, at the Contractor's option and following the Owner's approval. No change in the Contract Sum will be authorized for such additional exploration undertaken by the Contractor.

2. The Contractor shall make his own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations resulting from the subsurface conditions.
3. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the confirmation of the ground, the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; the general and local conditions, water levels and all other matters which can in any way affect the work.
4. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of adjoining properties and the proposed sequence of construction.
5. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all New York State and Federal regulations in regard to the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, and SP according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3-inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups SM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
   2. Unsatisfactory materials also include materials below structures and/or foundations determined by the Owner’s Representatives to be unsatisfactory bearing materials.

D. Subbase Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; NYSDOT Type 1. The use of recycled material from any off-site source will not be permitted and recycled material from onsite demolition may not be used without written authorization from the owner.

E. Structural Fill: Naturally or artificially, well graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1½ -inch sieve and not more than 12 percent passing a No. 200 sieve. This material must be approved by the Owner’s Representatives.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel or crushed stone; ASTM D 2940; except with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 8 sieve.

G. Trap Rock: Narrowly graded mixture of washed crushed stone ASTM D 448; coarse-aggregate grading Size 1; with 100 percent passing a 4-inch sieve and 0 to 15 percent passing a 1½-inch sieve.

H. Sand: ASTM C 33; fine aggregate.

I. Topsoil and other Planting Media: See Division 32 Section 329000 Planting Media Preparation and Placement.

J. CLSM high slump mixture of Portland cement, fly ash and fine aggregate formulated, licensed and marked K-Krete or equal.
   1. Provide mixture with a 28 day compressive strength of 200 psi with no measureable shrinkage or surface settlement.

2.02 GEOTEXTILES

A. Subsurface Drainage Geotextile: Filter fabric, manufactured for subsurface drainage applications, should meet the following minimum requirements as described in the "Subsurface Investigation and Analysis Report":
   1. Minimum Permittivity (ASTM D4991) = 0.2 sec^{-1}
   2. Maximum AOS (ASTM D4751) = 0.25 mm

B. Acceptable Products:
   1. Mirafi 140N by Mirafi, Inc. or approved equal.

2.03 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6-inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30-inches deep; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Telephone and other communications.
   4. Blue: Water systems.
   5. Green: Sewer systems.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.02 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.03 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by the Owner's Representatives. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
   1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
      a. Intermittent drilling; if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
   2. Rock excavation includes removal and disposal of rock if material cannot be reused on-site or found to be surplus excavated material. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
      a. 12-inches outside of minimum required dimensions of concrete cast against grade.
      b. 12-inches beneath bottom of concrete slabs-on-grade.
      c. 12-inches beneath pipe in trenches, and the greater of 24-inches wider than pipe or 30-inches wide.

3.04 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1-inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

   1. Excavation for Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1-inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:
   1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.05 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.06 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12-inches higher than top of pipe or conduit unless otherwise indicated.
   1. Clearance: 12-inches each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 6-inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

3.07 EXCAVATION OF AREAS TO BE LANDSCAPED

A. Excavate existing soil to the depths required to prepare the subgrade to receive topsoil, amended soil, drainage course material or other material as detailed on the plans. Loosen subgrade using rototillers to a minimum depth of 6-inches. Remove all stones larger than 1-inch in any dimension and all sticks, roots, rubbish, and other extraneous matter within the planted areas and legally dispose of them off the Owner's property.

B. If underground utilities, rock or groundwater conditions are encountered at an elevation at or above the elevation of the required subgrade the Contractor shall notify the owner's representative immediately.

3.08 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, sub-drainage.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.09 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Place and compact initial backfill of satisfactory soil, free of particles larger than 1-inch in any dimension, to a height of 12-inches over the pipe or conduit.
   1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Place and compact final backfill of satisfactory soil or Control Density Backfill Material to final subgrade elevation.

F. Install warning tape directly above utilities, 12-inches below finished grade, except 6-inches below subgrade under pavements and slabs.

3.10 FILL MATERIAL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, gravel material.
   3. Under steps and ramps, use structural fill.
   4. Under building slabs, use structural fill.

C. Place fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
   1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF BACKFILLS AND FILL MATERIAL

A. Place backfill and fill materials in layers not more than 12-inches in loose depth for material compacted by heavy compaction equipment, and not more than 4-inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
   1. Under structures, steps, and pavements, scarify and re-compact top 12-inches of existing subgrade and each layer of backfill or fill material at 95 percent.
   2. Under walkways, scarify and re-compact top 6-inches below subgrade and compact each layer of backfill or fill material at 95 percent.

3. Under turf or unpaved areas, scarify and re-compact top 6-inches below subgrade and compact each layer of backfill or fill material at 90 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

3.13 SUBBASE COURSE UNDER ASPHALTIC CONCRETE PAVEMENTS

A. Place subbase course on existing and/or compacted subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements as follows:
1. Place subbase course material over subgrade and under hot-mix asphalt pavement.
2. Shape subbase course to required crown elevations and cross-slope grades.
3. Place subbase course 12-inches or less in compacted thickness in a single layer.
4. Place subbase course that exceeds 12-inches in compacted thickness in layers of equal thickness, with no compacted layer more than 12-inches thick or less than 3-inches thick.
5. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.14 BEDDING COURSE UNDER SLABS-ON-GRADE, WALKS AND MISC. STRUCTURES

A. Place bedding course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact bedding course under slabs-on-grade, walks and other structures as follows:
1. Place bedding course 12-inches or less in compacted thickness in a single layer.
2. Place bedding course that exceeds 12-inches in compacted thickness in layers of equal thickness, with no compacted layer more than 12-inches thick or less than 3-inches thick.
3. Compact each layer of bedding course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place subsurface drainage geotextile, drainage course filter material and sub-drainage pipe in accordance with the details shown on the plans.
1. Surround drain pipe with 6-inches minimum drainage course material (as specified herein) or as detailed on plans.

3.16 FIELD QUALITY CONTROL

A. Soil Material Testing: A representative sample as required by the owner's representatives from a truck load of imported material shall be tested for conformance to the specifications.

B. Imported Material that does not meet the specified gradation shall be removed from the site and replaced with conforming material.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Turf Areas, Planting Areas or other Unpaved Areas: Plus or minus 1-inch of the proposed top of subgrade elevation to receive topsoil, planting and/or amended soil mix, drainage course material or other material to the depths detailed on the plans.
2. Concrete Pavements, Walks and other structures: Less than 1/2 inch of the proposed bottom of the bedding course as detailed on the plans.
3. Asphalt Pavements: Less than 1/2 inch of the proposed bottom of the subbase course as detailed on the plans.

3.18 PROTECTION OF THE WORK AREAS

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Owners Representative; reshape and re-compact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 STORAGE OF SOIL MATERIALS

A. Stockpile borrows soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.20 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Owner's Representatives.
1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by the Owner's Representative.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Unless directed otherwise, transport surplus satisfactory and unsatisfactory soil off Owner's property.

1. Remove waste materials, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes construction dewatering.

B. Related Sections:

1. Division 01 Section “Photographic Documentation" for recording preexisting conditions and dewatering system progress.
2. Division 31 Section "Earth Moving" for excavating, backfilling, site grading, and for site utilities.
3. Division 31 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

1.03 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Remove dewatering system when no longer required for construction.

1.04 SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing NYSDEC and Westchester County Department of Public Works and Transportation.

1.06 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Construction Manager and Owner's representatives no fewer than two days in advance of proposed interruption of utility.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing during dewatering operations.

3.02 INSTALLATION

A. Install dewatering system utilizing a pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

2. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

END OF SECTION 31 23 19

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related Sections:
   1. Division 01 Section Temporary Facilities and Controls – for temporary utilities and support facilities.
   2. Division 31 Section Dewatering – for dewatering system for excavations.

1.02 SUMMARY

A. Section includes temporary excavation support and protection systems.

1.03 PERFORMANCE REQUIREMENTS

A. Furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
   1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
   2. Prevent surface water from entering excavations by grading, dikes, or other means.
   3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
   4. Monitor vibrations, settlements, and movements.

1.04 SUBMITTALS

A. Shop Drawings: For excavation support and protection system.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 QUALITY ASSURANCE

A. Pre-Installation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
      a. Existing utilities and subsurface conditions.
      b. Proposed excavations.

c. Proposed equipment.
d. Monitoring of excavation support and protection system.
e. Working area location and stability.
f. Abandonment or removal of excavation support and protection system.

1.06 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
1. Notify Construction Manager and Owner no fewer than three (3) days in advance of proposed interruption of utility.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 3 inches.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.02 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

3.03 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
   1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
   2. Fill voids immediately with approved backfill compacted to density specified in Division 31 Section 312000 Earthwork.
   3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Leave excavation support and protection systems permanently in place.

END OF SECTION 31 50 00

SECTION 32 12 16

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 STREETS AND SIDEWALKS:

A. General Requirements
   1. The Contractor shall furnish, place, construct and incorporate into the work, parking and driveway pavements where indicated on the plans in accordance with the Westchester County Department of Public Works Transportation Standard Construction Specifications.
   2. The Contractor is further directed to the Construction Details shown on the contract drawings.

1.03 DESCRIPTION OF WORK:

A. General
   1. Extent of asphalt concrete paving work is shown on the drawings including parking areas, driveways and temporary and permanent pavement replacement in areas where existing street pavements have been removed due to trenching operations.
   2. Prepared subbase is specified in Division 31 Section 312000 Earthwork.

B. Aggregate Subbase
   1. Where applicable, is specified in Division 31 Section 312000 Earthwork.

C. Material Certificates
   1. Provide copies of material certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.

D. Codes and Standards
   1. Comply with New York State Department of Transportation standard specifications, latest edition and with the Westchester County Departments of Public Works and Transportation governing regulations.

E. Weather Limitations
   1. Apply prime and tack coats when ambient temperature is above 50°F (10°C) and when temperature has not been below 35°F (1°C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
   2. Construct asphalt concrete surface course when atmospheric temperature is above 40°F (4°C) and only after base course and binder course have been exposed to one winter season. Base course may be placed when air temperature is above 30°F (-1°C) and rising.

F. Grade Control

1. Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. General
   1. Use locally available materials and gradations as required by the Town of Mount Pleasant Department of Public Works and Westchester County Departments of Public Works and Transportation which exhibit a satisfactory record of previous installations.

B. Base Course Aggregate
   1. Sound, angular, granular stone as specified on the plans.

C. Asphalt Concrete
   1. As specified on the plans.

D. Tack Coat
   1. Emulsified asphalt; AASHTO M 140 (ASTM D 997) or M 208 (D 2397); SS-1h or CSS-1h, diluted with one part water to one part emulsified asphalt.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION:

A. Remove loose material from compacted subbase surface.
   1. Proof roll prepared subbase with a ten-ton roller to check for unstable areas and areas requiring additional compaction.
   2. Notify Owner's Representative of unsatisfactory conditions. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.

B. Tack Coat
   1. Apply to contact surfaces of previously constructed asphalt concrete binder course and surfaces abutting or projecting into existing asphalt concrete pavement. Distribute at rate of 0.10 gallons per square yard of surface.
   2. Allow to dry until at proper condition to receive paving.
   3. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.

3.02 PLACING PAVEMENT MIX:

A. General
   1. Place asphalt concrete mix on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225°F (107°C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section and compacted thickness.

B. Paver Placing
   1. Place in strips not less than 10 feet wide, unless otherwise acceptable to Owner's Representative. After first strip has been placed and rolled, place succeeding strips and

extend rolling to overlap previous strips. Complete base course and binder course for a section before placing surface course. Base course and binder course shall be exposed one winter season before applying surface course.

C. Joints
1. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

3.03 ROLLING:

A. General
1. Begin rolling with a ten-ton roller when mixture will bear roller weight without excessive displacement.
2. Compact mixture with hot hand tampers or vibrating place compactors in areas inaccessible to rollers.

B. Breakdown Rolling
1. Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.

C. Second Rolling
1. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

D. Finish Rolling
1. Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

E. Patching
1. Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.

F. Protection
1. After final rolling, do not permit vehicular traffic on pavement until mixture has cooled enough not to become marked. Erect barricades to protect paving from traffic.

3.04 FIELD QUALITY CONTROL:

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

B. Thickness
1. In-place compacted nominal pavement thickness will not be acceptable if exceeding following allowable variation from required thickness:

Base Course: 1/4"
Binder Course: 1/4"
Surface Course: 1/4"

2. The sum total thickness of all the courses shall not vary from the total nominal thickness indicated on the plans by more than 1/2 inch.

C. Surface Smoothness
1. Test unfinished surface of each asphalt concrete course for smoothness, using 10 foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
Base Course Surface: 1/4"
Wearing Course Surface: 1/8"

D. Crowned Surfaces
1. Test with crowned template centered and at right angle to crown. Maximum allowable variance from template, 1/4 inch.
2. Variations exceeding above tolerances shall be satisfactorily corrected at no additional cost to the Owner.
3. Check surface areas at intervals as directed by the Owner's Representative.

3.05 TEMPORARY PAVEMENT:

A. Where trench excavations have been performed within an existing street, furnish and lay a temporary pavement on an approved subgrade to the lines and grades specified herein. Cut the existing pavement with suitable tools as specified in Division 31 Section 312000 Earthwork. The construction of the temporary pavement shall consist of 2-inch compacted thickness of hot-mix asphaltic concrete unless otherwise specified by the Owner's Representative.

B. Before the material is spread, paint all curb edgings, surfaces of manholes and other structures which will come into contact with the new pavement with a bituminous emulsion or priming material acceptable to the Owner's Representative. Take care to prevent staining, smearing or defacing the exposed faces of the curbs and other structures during the spreading and rolling of the material.

C. After spreading, roll the material by means of a well balanced roller weighing not less than 15 tons. In all places not accessible to the roller, compact the material thoroughly by tampers weighing not less than 25 pounds and having a bearing area not exceeding 50 square inches.

D. Maintain temporary pavement until such time that the final settlement of the trench shall have taken place in the opinion of the Owner's Representative. Correct any settlement taking place by furnishing, spreading and rolling additional material over that previously laid.

3.06 PAVEMENT REPLACEMENT:

A. In areas where temporary pavement has been placed, remove said temporary pavement to the subgrade line as specified. Bring the subgrade to the proper elevation and compact it.

B. Where specified by the Owner's Representative, excavate a shelf to provide a bearing area on all sides for the new pavement. The width of said shelf and pavement thickness shall be as shown on the plans or as directed by the Owner's Representative.

END OF SECTION 32 12 16

SECTION 32 12 17

POROUS ASPHALT CONCRETE PAVING

PART 1 GENERAL

1.1 DESCRIPTION

A. This specification is intended to be used for porous asphalt pavement in parking lot.

B. The porous asphalt pavement specified herein is modified after the National Asphalt Pavement Association (NAPA) specification outlined in *Design, Construction, and Maintenance Guide for Porous Asphalt Pavements, Information Series 131* (2008) and *Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115* (2002) and the University of New Hampshire Stormwater Center *Design Specifications for Porous Asphalt Pavement Infiltration Beds* (2009).

D. Alternative specifications for mix, such as Open Graded Friction Courses (OGFC) from Federal Agencies or state Departments of Transportation (DOT), may be used if approved by the Engineer. The primary requirements for the specifications of the mix are performance grade (PG) asphalt binder, binder content, binder draindown, aggregate gradation, air void content, retained tensile strength (TSR).

1.2 SUBMITTALS

A. Submit a list of materials proposed for work under this Section including the name and address of the materials producers and the locations from which the materials are to be obtained.

B. Submit certificates, signed by the materials producers and the relevant subcontractors, stating that materials meet or exceed the specified requirements, for review and approval by the Engineer.

C. Submit samples of materials for review and approval by the Engineer. For mix materials, samples may be submitted only to the Quality Assurance (QA) inspector with the Engineer's approval.

D. Submittal requirements for samples and certificates are summarized in 1.3 Quality Control / Quality Assurance (QC*/QA)*

1.3 QUALITY CONTROL / QUALITY ASSURANCE (QC/QA)

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

B. Codes and Standards - All materials, methods of construction and workmanship shall conform to applicable requirements of AASHTO ASTM Standards, NYSDOT Standard Specifications, or other standards as specified.

C. QC/QA requirements for production of mix are discussed in the Materials section, and for construction of the porous media beds and paving in the Execution section.

Table 1. Submittal Requirements.

Material or Pavement Course*	**Properties to be Reported on Certificate****
~~choker course, reservoir course~~	~~gradation, max. wash loss, min. durability index, max. abrasion loss, air voids (reservoir course)~~
~~filter course~~	~~gradation, permeability/ sat. hydraulic conductivity~~
~~filter blanket~~	~~gradation~~
~~geotextile filter fabric~~	~~manufacturer's certification, AOS/EOS, tensile strength~~
striping paint	certificate
binder	PGAB certification
coarse aggregate	gradation, wear, fracture faces (fractured and elongated)
fine aggregate	gradation,
silicone	manufacturer's certification
Fibers (optional)	manufacturer's certification
mineral filler (optional)	manufacturer's certification
fatty amines (optional anti-strip)	manufacturer's certification
hydrated lime (optional anti-strip)	manufacturer's certification

* Samples of each material shall be submitted to the Engineer (or QA inspector for mix). These samples must be in sufficient volume to perform the standardized tests for each material.
** At a minimum, more material properties may be required (refer to Materials Section).

1.4 PROJECT CONDITIONS

A. Site Assessment should be performed per the steps outlined in IS 131 (NAPA, 2008).

B. Construction Phasing should be performed as outlined in IS 131 (NAPA, 2008).

C. Protection of Existing Improvements

1. Protect adjacent work from the unintended dispersal/splashing of pavement materials. Remove all stains from exposed surfaces of pavement, structures, and grounds. Remove all waste and spillage. If necessary, limit access to adjacent work/structures with appropriate signage and/or barriers.

2. Proper erosion and sediment control practices shall be provided in accordance with existing regulations. Do not damage or disturb existing improvements or vegetation. Provide suitable protection where required before starting work and maintain protection throughout the course of the work. This includes the regular, appropriate inspection and maintenance of the erosion and sediment control measures.

3. Restore damaged areas, including existing pavement on or adjacent to the site that has been damaged as a result of construction work, to their original condition or repair as directed to the satisfaction of the Engineer at no additional cost.

D. Safety and Traffic Control

1. Notify and cooperate with local authorities and other organizations having jurisdiction when construction work will interfere with existing roads and traffic.

2. Provide temporary barriers, signs, warning lights, flaggers, and other protections as required to assure the safety of persons and vehicles around and within the construction area and to organize the smooth flow of traffic.

E. Weather Limitations

1. Porous asphalt, Open graded friction course, or dense-mixed asphalt shall not be placed between November 15 and March 15, or when the ambient air temperature at the pavement site in the shade away from artificial heat is below 60 °F or when the actual ground temperature is below 50 °F. Only the Engineer may adjust the air temperature requirement or extend the dates of the pavement season.

2. The Contractor shall not pave on days when rain is forecast for the day, unless a change in the weather results in favorable conditions as determined by the Engineer.

1.5 REFERENCES

A. *General Porous Asphalt Bituminous Paving and Groundwater Infiltration Beds,* specification by UNH Stormwater Center, February, 2005.

B. *Design, Construction, and Maintenance Guide for Porous Asphalt Pavements, Information Series 131*, National Asphalt Pavement Association (NAPA), 2008.

C. *Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115*, NAPA, 2002.

D. *Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, PA, 1997 or latest edition.

E. *Standards of the American Association of State Highway and Transportation Officials* (AASHTO), 1998 or latest edition.

F. *Section 02725 - General Porous Pavement and Groundwater Infiltration Beds*, specification from NAPA Porous Asphalt Seminar handout, Cahill Associates, Inc., 2004.

G. *Correlations of Permeability and Grain Size*, Russell G. Shepherd, Groundwater 27 (5), 1989.

H. *Groundwater*, R. Allan Freeze and John A. Cherry, 1979.

I. *Standards Specifications,* New York State Department of Transportation, latest edition, including all addendums.

J. University of New Hampshire Stormwater Center *Design Specifications for Porous Asphalt Pavement Infiltration Beds,* 2009.

PART 2 PRODUCTS

2.1 MATERIALS

A. Porous Asphalt Mix

1. Mix Materials
   Mix materials consist of modified performance grade asphalt binder (PGAB), coarse and fine aggregates, and optional additives such as silicone, fibers, mineral fillers, fatty amines, and hydrated lime. Materials shall meet the requirements of the NAPA's Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115 (2002), except where noted otherwise below or approved in writing by the Engineer.

2. Polymer Modified PGAB and Mix Designs.
   The asphalt binder shall be a polymer and/or fiber modified Performance Graded asphalt binder (PGAB) used in the production of Superpave Hot Mix Asphalt (HMA) mixtures. The PGAB shall be two grades stiffer than that required for dense mix asphalt (DMA) parking lot installations, which is often achieved by adding a polymer and/or fiber. Mix designs will meet or exceed criteria listed in Table 5

   The PGAB polymer modifiers are to be either styrene butadiene rubber (SBR) or styrene butadiene styrene (SBS). The quantity of rubber solids in the SBR shall typically be 1.5-3% by weight of the bitumen content of the mix.

   The dosage of fiber additives shall be either 0.3 percent cellulose fibers or 0.4 percent mineral fibers by total mixture mass. The binder shall meet the requirements of AASHTO M320.

   The PGAB may be pre-blended or post-blended. The pre-blended binder can be pre-blended at the source or at a terminal. For post-blended addition, the modifier can either be in-line blended or injected into the pugmill at the plant.

   The following asphalt mix designs are acceptable:

   a. PG 64-28 with 5 pounds of fibers per ton of asphalt mix. This mix is recommended for smaller projects with lower traffic counts or loading potential. This mix is manageable at common batch plants.

   b. Pre-Blended PG 64-28 SBS with 5 pounds of fibers per ton of asphalt mix. This mix is recommended for large projects > 1acre where high durability pavements are needed. The SBS will be supplied by an approved PGAB supplier holding a Quality Control Plan approved by NYSDOT. A Bill of Lading (BOL) will be delivered with each transport of PG 64-28 SBS. A copy of the BOL will be furnished to the QA inspector at the Plant.

3. Anti-Stripping Mix Additives.
   The mix shall be tested for moisture susceptibility and asphalt stripping from the aggregate by AASHTO T283. If the retained tensile strength (TSR) < 80% upon testing, a heat stable additive shall be furnished to improve the anti-stripping properties of the asphalt binder. Test with one freeze-thaw cycle. The amount and type of additive (e.g.

fatty amines or hydrated lime) to be used shall be based on the manufacturer's recommendations, the mix design test results, and shall be approved by the Engineer.

Silicone shall be added to the binder at the rate of 1 oz. per 5000 gal. Fibers may be added per manufacturer and NAPA IS 115 recommendation if the draindown requirement cannot be met (<0.3% via ASTM D6390) provided that the air void content requirement is met (>18%, or >16% as tested with CoreLok device). Additives should be added per the relevant DOT specification and NAPA IS 115.

4. Coarse Aggregate.
   Coarse aggregate shall be that part of the aggregate retained on the No. 8 sieve; it shall consist of clean, tough, durable fragments of crushed stone, or crushed gravel of uniform quality throughout. Coarse aggregate shall be crushed stone or crushed gravel and shall have a percentage of wear as determined by AASHTO T96 of not more than 40 percent. In the mixture, at least 75 percent, by mass (weight), of the material coarser than the 4.75 mm (No. 4) sieve shall have at least two fractured faces, and 90 percent shall have one or more fractured faces (ASTM D5821). Coarse aggregate shall be free from clay balls, organic matter, deleterious substances, and a not more than 8.0% of flat or elongated pieces (>3:1) as specified in ASTM D4791.

5. Fine Aggregate.
   The fine aggregate shall be that part of the aggregate mixture passing the No. 8 sieve and shall consist of sand, screenings, or combination thereof with uniform quality throughout. Fine aggregate shall consist of durable particles, free from injurious foreign matter. Screenings shall be of the same or similar materials as specified for coarse aggregate. The plasticity index of that part of the fine aggregate passing the No. 40 sieve shall be not more than 6 when tested in accordance with AASHTO T90. Fine aggregate from the total mixture shall meet plasticity requirements.

6. Porous Asphalt Mix Design Criteria.
   The Contractor shall submit a mix design at least 10 working days prior to the beginning of production. The Contractor shall make available samples of coarse aggregate, fine aggregate, mineral filler, fibers and a sample of the PGAB that will be used in the design of the mixture. A certificate of analysis (COA) of the PGAB will be submitted with the mix design. The COA will be certified by a laboratory meeting the requirements of AASHTO R18. The Laboratory will be certified by the NYSDOT and/or qualified under ASTM D3666. Technicians will be certified by the regional certification agency in the discipline of HMA Plant Technician.

   Bulk specific gravity (SG) used in air void content calculations shall not be determined and results will not be accepted using AASHTO T166 (saturated surface dry), since it is not intended for open graded specimens (>10% AV). Bulk SG shall be calculated using AASHTO T275 (paraffin wax) or ASTM D6752 (automatic vacuum sealing, e.g. CoreLok). Air void content shall be calculated from the bulk SG and maximum theoretical SG (AASHTO T209) using ASTM D3203.

   The materials shall be combined and graded to meet the composition limits by weight as shown in Table 3.

Table 3. Porous Asphalt Mix Design Criteria

Sieve Size (inch/mm)	Percent Passing (%)
0.75/19	100
0.50/12.5	85-100
0.375/9.5	55-75
No.4/4.75	10-25
No.8/2.36	5-10
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	6 - 6.5%
Fiber Content by Total Mixture Mass	0.3% cellulose or 0.4% mineral
Rubber Solids (SBR) Content by Weight of the Bitumen	1.5-3% or TBD
Air Void Content (ASTM D6752/AASHTO T275)	16.0-22.0%
Draindown (ASTM D6390)*	< 0.3 %
Retained Tensile Strength (AASHTO 283)**	> 80 %
Cantabro abrasion test on unaged samples (ASTM D7064-04)	< 20%
Cantabro abrasion test on 7 day aged samples	< 30%

C. Porous Asphalt Mix Production

1. Mixing Plants
   Mixing plants shall meet the requirements of hot mix asphalt plants as specified in the NYSDOT.

2. Preparation of Asphalt Binder
   The asphalt material shall be heated to the temperature specified in the NYSDOT specification in a manner that will avoid local overheating. A continuous supply of asphalt material shall be furnished to the mixer at a uniform temperature.

3. Preparation of Aggregates
   The aggregate for the mixture shall be dried and heated at the mixing plant before being placed in the mixer. Flames used for drying and heating shall be properly adjusted to avoid damaging the aggregate and depositing soot or unburned fuel on the aggregate.

4. Mineral filler
   Mineral filler if required to meet the grading requirements, shall be added in a manner approved by the Engineer after the aggregates have passed through the dryer.

5. Mixing
   The above preparation of aggregates does not apply for drum-mix plants. The dried aggregate shall be combined in the mixer in the amount of each fraction of aggregate required to meet the job-mix formula and thoroughly mixed prior to adding the asphalt material.

The dried aggregates shall be combined with the asphalt material in such a manner as to produce a mixture that when discharged from the pugmill is at a target temperature in the range that corresponds to an asphalt binder viscosity of 700 to 900 centistokes and within a tolerance of ± 20 °F.

The asphalt material shall be measured or gauged and introduced into the mixer in the quantity determined by the Engineer for the particular material being used and at the temperature specified in the relevant specification.

After the required quantity of aggregate and asphalt material has been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt material throughout the aggregate is secured. The mixing time will be regulated by the Engineer.

All plants shall have a positive means of eliminating oversized and foreign material from being incorporated into the mixer.

6. QC/QA During Production

The Contractor shall provide at Contractors' expense and the Engineer's approval a third-party QA Inspector to oversee and document mix production. All mix testing results during production should be submitted to the QA Inspector.

The QC plan may be altered at the discretion of the Engineer and based on feasible testing as suggested by the asphalt producer. Certain QC testing requirements during production may not be feasible for small projects in which limited asphalt is generated. Some testing methods cannot be completed during the time needed during small batch production. The feasibility should be assessed with the Engineer and producer.

The mixing plant shall employ a Quality Control Technician (QCT). The QCT will perform QC/QA testing and will be certified in the discipline of HMA Plant Technician by the relevant certifying agency. The Contractor shall sample, test and evaluate the mix in accordance with the methods and minimum frequencies in Table 4 and the Post-Blended SBR Binder Quality Control Plan (if applicable).

Table 4. QC/QA Testing Requirements during Production

Test	Min. Frequency	Test Method
Temperature in Truck at Plant	6 times per day	
Gradation	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T30
Binder Content	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T164
Air Void Content	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	ASTM D6752
Binder Draindown	greater of either (a) 1 per 500 tons, (b) 1 per day, or (c) 1 per job	ASTM D6390

If an analyzed sample is outside the testing tolerances immediate corrective action will be taken. After the corrective action has been taken the resulting mix will be sampled and tested. If the re-sampled mix test values are outside the tolerances the Engineer will be immediately informed. The Engineer may determine that it is in the best interest of project that production is ceased. The Contractor will be responsible for all mix produced for the project.

Testing Tolerances During Production. Testing of the air void content, binder draindown, and TSR shall be within the limits set in Table 4. The paving mixture produced should not vary from the design criteria for aggregate gradation and binder content by more than the tolerances in Table 5.

Table 5. QC/QA Testing Tolerances during production

Sieve Size (inch/mm)	**Percent Passing**
0.75/19	-
0.50/12.5	±6.0
0.375/9.5	±6.0
No.4/4.75	±5.0
No.8/2.36	±4.0
No.200/0.075 (#200)	±2.0
%PGAB	+0.4, -0.2

Should the paving mixture produced vary from the designated grading and asphalt content by more than the above tolerances, the appropriate production modifications are to be made until the porous asphalt mix is within these tolerances.

Samples of the mixture, when tested in accordance with AASHTO T164 and T30, shall not vary from the grading proportions of the aggregate and binder content designated by the Engineer by more than the respective tolerances specified above and shall be within the limits specified for the design gradation.

7. Plant Shutdown and Rejection of Mix
   Should the porous asphalt mix not meet the tolerances specified in this section upon repeat testing, the Engineer may reject further loads of mix. Mix that is loaded into trucks during the time that the plant is changing operations to comply with a failed test shall not be accepted, and should be recycled at the plant.

8. Striping Paint
   Striping paint shall be latex, water-base emulsion, ready-mixed, and complying with pavement marking specifications.

PART 3 EXECUTION

3.1 INSTALLATION

A. **Porous Media Beds**

Protection of native materials from over compaction is required. Assure proper compaction as detailed below.

1. Grade Control

   a. Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks and free of puddle forming low spots. All areas must drain freely. Excavation elevations should be within +/- 0.1 ft.

   b. If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

   c. The Engineer shall be notified at least 24 hours prior to all porous media bed and porous pavement work.

B. **Porous Asphalt Pavement Installation**

1. Mixing Plant

   The mixing plant, hauling and placing equipment, and construction methods shall be in conformance with NAPA IS 131 and applicable sections of the NYSDOT's specification for asphalt mixes.

2. Hauling Equipment.

   The open graded mix shall be transported in clean vehicles with tight, smooth dump beds that have been sprayed with a non-petroleum release agent or soap solution to prevent the mixture from adhering to the dump bodies. Mineral filler, fine aggregate, slag dust, etc. shall not be used to dust truck beds. The open graded mix shall be covered during transportation with a suitable material of such size sufficient to protect the mix from the weather and also minimize mix cooling and the prevention of lumps. When necessary, to ensure the delivery of material at the specified temperature, truck bodies shall be insulated, and covers shall be securely fastened. Long hauls, particularly those in excess of 25 miles may result in separation of the mix and its rejection.

3. Placing Equipment.

   The paver shall be a self-propelled unit with an activated screed or strike-off assembly, capable of being heated if necessary and capable of spreading and finishing the mixture without segregation for the widths and thicknesses required. The screed shall be adjustable to provide the desired cross-sectional shape. The finished surface shall be of uniform texture and evenness and shall not show any indication of tearing, shoving, or pulling of the mixture. Pavers shall be equipped with the necessary attachments, designed to operate electronically, for controlling the grade of the finished surface.

Pavers shall be equipped with a sloped plate to produce a tapered edge at longitudinal joints.

The sloped plate shall be attached to the paver screed extension. The sloped plate shall produce a tapered edge having a face slope of 1:3 (vertical:horizontal). The plate shall be so constructed as to accommodate compacted mat thickness from 1 1/4 to 4 inches. The bottom of the sloped plate shall be mounted 3/8 to 1/2 inch above the existing pavement. The plate shall be interchangeable on either side of the screed.

Pavers shall also be equipped with a joint heater capable of heating the longitudinal edge of the previously placed mat to a surface temperature of 200 °F, or higher if necessary, to achieve bonding of the newly placed mat with the previously placed mat. This shall be done without undue breaking or fracturing of aggregate at the interface. The surface temperature shall be measured immediately behind the joint heater. The joint heater shall be equipped with automated controls that shut off the burners when the pavement machine stops and reignite them with the forward movement of the paver. The joint heater shall heat the entire area of the previously placed wedge to the required temperature. Heating shall immediately precede placement of the asphalt material.

4. Rollers.
   Rollers shall be capable of reversing without backlash, and operated at speeds slow enough to avoid displacement of the asphalt mixture. The weight of the rollers shall be sufficient to compact the mixture to the required density without crushing of the aggregate.

   Rollers shall be Porous equipped with tanks and sprinkling bars for wetting the rolls. Rollers shall be two-axle tandem rollers with a gross weight of not less than 8 tons and not more than 12 tons and shall be capable of providing a minimum compaction effort of 250 pounds per inch of width of the drive roll. All rolls shall be at least 42 inches in diameter. A rubber tired roller will not be required on the open graded asphalt friction course surface.

5. Conditioning of Existing Surface.
   Contact surfaces such as curbing, gutters, and manholes shall be painted with a thin, uniform coat of Type RS-1 emulsified asphalt immediately before the asphalt mixture is placed against them.

6. Temperature Requirements.
   The temperature of the asphalt mixture, at the time of discharge from the haul vehicle and at the paver, shall be between 275 to 325°F, within 10 °F of the compaction temperature for the approved mix design.

7. Spreading and Finishing.
   The Porous Asphalt shall be placed either in two lifts. Care must be taken to insure that the porous asphalt layers join completely. Keep the time between layer placements minimal; keep the first layer clear from dust and moisture, and minimize traffic on the first layer.

   The Contractor shall protect all exposed surfaces that are not to be treated from damage during all phases of the pavement operation.

The asphalt mixture shall be spread and finished with the specified equipment. The mixture shall be struck off in a uniform layer to the full width required and of such depth that each course, when compacted, has the required thickness and conforms to the grade and elevation specified. Pavers shall be used to distribute the mixture over the entire width or over such partial width as practical. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture shall be spread and raked by hand tools.

No traffic will be permitted on material placed until the material has been thoroughly compacted and has been permitted to cool to below 100 °F. The use of water to cool the pavement is not permitted. The Engineer reserves the right to require that all work adjacent to the pavement, such as guardrail, cleanup, and turf establishment, is completed prior to placing the wearing course when this work could cause damage to the pavement. On projects where traffic is to be maintained, the Contractor shall schedule daily pavement operations so that at the end of each working day all travel lanes of the roadway on which work is being performed are paved to the same limits. Suitable aprons to transition approaches, where required, shall be placed at side road intersections and driveways as directed by the Engineer.

8. Compaction.
Immediately after the asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The compaction objective is 16% - 19% in place void content (Corelock). Breakdown rolling shall occur when the mix temperature is between 275 to 325°F. Intermediate rolling shall occur when the mix temperature is between 200 to 275°F.

Finish rolling shall occur when the mix temperature is between 150 to 200°F.
The cessation temperature occurs at approximately 175°F, at which point the mix becomes resistant to compaction. If compaction has not been done at temperatures greater than the cessation temperature, the pavement will not achieve adequate durability. The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

Rollers or oscillating vibratory rollers, ranging from 8-12 tons, shall be used for compaction. The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition.

To prevent adhesion of the mixture to the rolls, rolls shall be kept moist with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot or lightly oiled hand tampers, smoothing irons or with mechanical tampers. On depressed areas, either a trench roller or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Other combinations of rollers and/or methods of compacting may be used if approved in writing by the Engineer, provided the compaction requirements are met.

Unless otherwise specified, the longitudinal joints shall be rolled first. Next, the Contractor shall begin rolling at the low side of the pavement and shall proceed towards the center or high side with lapped rollings parallel to the centerline. The speed of the roller shall be slow and uniform to avoid displacement of the mixture, and the roller should be kept in as continuous operation as practical. Rolling shall continue until all roller marks and ridges have been eliminated.

Rollers will not be stopped or parked on the freshly placed mat.

It shall be the responsibility of the Contractor to conduct whatever process control the Contractor deems necessary. Acceptance testing will be conducted by the Engineer using cores provided by the Contractor.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture. The mixture shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of binder shall be removed and replaced. These replacements shall be at the Contractor's expense.

If the Engineer determines that unsatisfactory compaction or surface distortion is being obtained or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment.

The Contractor assumes full responsibility for the cost of repairing all damages that may occur to roadway or parking lot components and adjacent property if vibratory compaction equipment is used. After final rolling, no vehicular traffic of any kind shall be permitted on the surface until cooling and hardening has taken place, and in no case within the first 48 hours. For small batch jobs, curing can be considered to have occurred after the surface temperature is less than 100 ºF. Curing time is preferably one week, or until the entire surface temperature cools below 100 ºF. Provide barriers as necessary at no extra cost to the Owner to prevent vehicular use; remove at the discretion of the Engineer.

9. Joints.
   Joints between old and new pavements or between successive day's work shall be made to ensure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

   Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline, at locations approved by the Engineer. The Engineer will determine locations by using a straightedge at least 16 feet long. The butt joint shall be thoroughly coated with Type RS-1 emulsified asphalt just prior to depositing the pavement mixture when pavement resumes.

   Tapered joints shall be formed by tapering the last 18 to 24 inches of the course being laid to match the lower surface. Care shall be taken in raking out and discarding the coarser aggregate at the low end of the taper, and in rolling the taper. The taper area shall be thoroughly coated with Type RS-1 emulsified asphalt just prior to resuming pavement.

As the paver places new mixture on the taper area, an evenly graduated deposit of mixture shall complement the previously made taper. Shovels may be used to add additional mixture if necessary. The joint shall be smoothed with a rake, coarse material discarded, and properly rolled.

Longitudinal joints that have become cold shall be coated with Type RS-1 emulsified asphalt before the adjacent mat is placed. If directed by the Engineer, joints shall be cut back to a clean vertical edge prior to applying the emulsion.

10. Surface Tolerances.
The surface will be tested by the Engineer using a straightedge at least 16 feet in length at selected locations parallel with the centerline. Any variations exceeding 1/8 inch between any two contact points shall be satisfactorily eliminated. A straightedge at least 10 feet in length may be used on a vertical curve. The straightedges shall be provided by the Contractor.

Work shall be done expertly throughout, without staining or injury to other work. Transition to adjacent impervious asphalt pavement shall be merged neatly with flush, clean line. Finished pavement shall be even, without pockets, and graded to elevations shown on drawing.

Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.

11. Repair of Damaged Pavement.
Any existing pavement on or adjacent to the site that has been damaged as a result of construction work shall be repaired to the satisfaction of the Engineer without additional cost to the Owner.

12. Striping Paint
Vacuum and clean surface to eliminate loose material and dust.

Paint parking striping and traffic lane striping in accordance with layouts of plan. Apply paint with mechanical equipment to produce uniform straight edges. Apply in two coats at manufacturer's recommended rates. Provide clear, sharp lines using white traffic paint

C. **QC/QA for Paving Operations**

1. The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gpm over the surface, using a hose or other distribution devise. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. Sufficient water volume shall be provided to thoroughly test all paved areas. All applied water shall infiltrate directly without large puddle formation or surface runoff, and shall be observed by the Engineer.

2. Testing and Inspection: Employ at Contractor's expense an inspection firm acceptable to the Engineer to perform soil inspection services, staking and layout control, and testing and inspection of site grading and pavement work. Inspection and list of tests shall be

reviewed and approved in writing by the Engineer prior to starting construction. All test reports must be signed by a licensed Engineer.

3. Test in-place base and surface course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable work as directed by the Engineer.

4. Surface Smoothness: Test finished surface for smoothness using a 10 foot straightedge applied parallel with and at right angles to the centerline of the paved area. Surface will not be accepted if gaps or ridges exceed 3/16 of an inch.

5. QC/QA requirements during paving are summarized in TABLE 6.

Table 6. QC/QA Requirements During Paving

Activity	Schedule/ Frequency	Tolerance
Inspect truck beds for pooling (draindown)	every truck	NA
Take surface temp behind joint heater	each pull	10°F of compaction temp
Consult with Engineer to determine locations of butt joints	as needed	NA
Test surface smoothness & positive drainage with a 10 ft straightedge	after compaction	3/16"
Consult with Engineer to mark core locations for QA testing	after compaction	NA
Hose test with at least 5 gpm water	after compaction	immediate infiltration, no puddling

SECTION 32 13 13

CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK:

A. General
   1. Extent of cement concrete paving is shown on drawings for all walks.
   2. Prepared subbase is specified in Division 31 Section 312000 Earthwork.

1.03 QUALITY ASSURANCE:

A. Codes and Standards
   1. Comply with local governing regulations if more stringent than herein specified.

B. Submittals
   1. Furnish samples, manufacturer's product data, test reports and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

1.04 JOB CONDITIONS:

A. No concrete shall be placed in the work when the temperature is below 32^{o}F or when the temperature is likely, in the opinion of the Owner's Representative, to drop to 32^{o}F within the next 24 hours, except with the prior approval of the Owner's Representative and under special protective measures approved by the Owner's Representative.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Forms
   1. Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms free of distortion and defects.
   2. Use flexible spring steel forms or laminated boards to form radius bends as required.
   3. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

B. Welded Wire Mesh
   1. Welded plain cold-drawn steel wire fabric, ASTM A 185.

C. Reinforcing Bars
1. Deformed steel bars, ASTM A 615, Grade 40.

D. Concrete Materials
1. Comply with requirements applicable for concrete materials, admixtures, bonding materials, curing materials and others as required.

E. Expansion Joint Materials
1. Comply with requirements for preformed expansion joint fillers and sealers.

PART 3 - EXECUTION

3.01 CONCRETE MIX, DESIGN AND TESTING:

A. General
1. Comply with requirements applicable for concrete mix design, sampling and testing, and quality control, and as herein specified.
1. Design mix to normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (super-plasticizer), air-entraining admixture and water to produce the following properties:
   a. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated.
   b. Slump Range: 4 inches for concrete containing HPWR admixture (super-plasticizer); 4 inches for other concrete.
   c. Air Content: 4.5 to 7.5 percent.

3.02 SURFACE PREPARATION:

A. General
1. Remove loose material from compacted subbase surface immediately before placing concrete.
2. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

3.03 FORM CONSTRUCTION:

A. General
1. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
2. Check completed formwork for grade and alignment to following tolerances:
   a. Top of forms not more than 1/8 inch in 10 feet.
   b. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
3. Clean forms after each use, and coat with form release agent as often as required to ensure separation from concrete without damage.

3.04 REINFORCEMENT:

A. General
1. Locate, place and support reinforcement as shown on details, unless otherwise indicated.

3.05 CONCRETE PLACEMENT:

A. General
   1. Comply with requirements for mixing and placing concrete and as herein specified.
   2. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
   3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator.
   4. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
   5. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.

3.06 JOINTS:

A. General
   1. Construct expansion, weakened-plane (contraction) and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
   2. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints
   1. Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.

C. Expansion Joints
   1. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.
   2. Locate expansion joints at 20 feet o.c. maximum, unless otherwise indicated.
   3. Extend joint fillers full-width and depth of joint, recessed 1/2 inch below finished concrete surface.
   4. Furnish joint fillers in one-place lengths for full width being place.
   5. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

D. Fillers and Sealants
   1. All joints shall receive joint sealants. Comply with requirements for preparation of joints, materials, installation and performance.

3.07 CONCRETE FINISHING:

A. General
   1. Protect and cure finished concrete paving as specified on the plans and details. Use membrane-forming curing and sealing compound or approved moist-curing methods.

B. Anti-Spalling Treatment

1. A second coat of curing and sealing compound may be used or an anti-spalling compound applied over concrete cured by continuous moist curing methods. Apply compounds to concrete surfaces no sooner than 28 days after placement, to clean, dry concrete free of oil, dirt and other foreign material. Apply curing and sealing compound at a maximum coverage rate of 300 square feet per gallon. Apply anti-spalling compound in two sprayed applications. First application at rate of 40 square yards per gallon; second application, 60 square yards per gallon. Allow complete drying between applications.

3.08 REPAIRS AND PROTECTIONS:

A. General

1. Repair or replace broken or defective concrete, as directed by Owner's Representative.
2. Drill test cores where directed by Owner's Representative when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
3. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
4. Sweep concrete pavement and wash free of stains, discolorations, dirt and foreign material just prior to final inspection.

END OF SECTION 32 13 13

SECTION 32 13 73

PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Cold-applied joint sealants.
   2. Hot-applied joint sealants.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Pavement-Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
   3. Joint-sealant formulation.
   4. Joint-sealant color.

D. Product Certificates: For each type of joint sealant and accessory, from manufacturer.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.

1.05 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer [or are below 40˚F (5˚C)].
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

2.02 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

2.03 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance. All expansion and isolation joints including work adjacent to structures and other materials shall receive a joint sealant.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place joint sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

D. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
   1. Remove excess joint sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

E. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.04 CLEANING

A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.06 PAVEMENT-JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Joints within cement concrete pavement.
   1. Joint Location:
      a. Expansion and isolation joints in cast-in-place concrete pavement.
      b. Contraction joints in cast-in-place concrete slabs.
      c. Other joints as indicated.

B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.
   1. Joint Location:
      a. Joints between concrete and asphalt pavement.
      b. Joints between concrete curbs and asphalt pavement.
      c. Other joints as indicated.

END OF SECTION 32 13 73

SECTION 32 16 00

CONCRETE CURB

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK:

A. General
   1. Perform all the work required to provide and install concrete curbing shown on the Drawings and/or mentioned in the Specifications.

1.03 QUALITY ASSURANCE:

A. Codes and Standards
   1. Comply with state and/or local governing regulations if more stringent than herein specified.

B. Submittals
   1. Furnish samples, manufacturer's product data, test reports and materials' certifications as required in referenced sections for concrete and joint fillers and sealers.

1.04 JOB CONDITIONS:

A. General
   1. No concrete shall be placed in the work when the temperature is below 32^{o}F or when the temperature is likely, in the opinion of the Owner's Representative, to drop to 32^{o}F within the next 24 hours, except with the prior approval of the Owner's Representative and under special protective measures approved by the Owner's Representative.
   2. No installation of curbing shall be performed prior to installation of all underground utilities in the area.
   3. No excavation under new curbing shall be performed unless approved by the Owner's Representative. Any curb damaged shall be replaced by the Contractor at no cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Forms
   1. Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

2. Use flexible spring steel forms or laminated boards to form radius bends as required.
3. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.

B. Concrete Materials
1. Comply with requirements applicable for concrete materials, admixtures, bonding materials, curing materials and others as required.

C. Expansion Joint Materials
1. Comply with requirements for preformed expansion joint fillers and sealers.

PART 3 - EXECUTION

3.01 CONCRETE MIX, DESIGN AND TESTING:

A. General
1. Comply with requirements applicable for Class "A" concrete mix design, sampling and testing, and quality control, and as herein specified.
   a. Strength: 4,000 psi at 28 days.
   b. Air entrainment: Total air contact shall be 6.5 percent by volume.
   c. Slump: 3.5 inches

3.02 SURFACE PREPARATION:

A. General
1. Remove loose material from compacted subbase surface immediately before placing concrete.
2. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin work until such conditions have been corrected and area ready to receive curbing.

3.03 FORM CONSTRUCTION:

A. General
1. Set forms to required grades and lines, rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
2. Check completed formwork for grade and alignment to following tolerances:
   a. Top of forms not more than 1/8 inch in 10 feet.
   b. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
3. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

3.04 REINFORCEMENT:

A. General
1. Locate, place and support reinforcement as shown on detail, unless otherwise indicated.

3.05 CONCRETE PLACEMENT:

A. General

1. Comply with requirements for mixing and placing concrete and as herein specified.
2. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator.
4. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. At driveways and other places as directed, the curb shall be depressed so as to give a 1½ inch front face and the ends and top of the depressed section shall be dressed with uniform slope as shown on the plans. Curbing shall be molded in place in sections 6 feet long with provision made at each joint for expansion of 1/8 inch.
6. Where curbing is to be removed or laid adjacent to existing pavement or sidewalks that are to remain, the Contractor shall line cut said pavements or sidewalks to provide a clean, uniform edge with a minimum disturbance to the remaining pavement.

B. Premolded Joints
1. Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects. Locate expansion joints at 20 feet o.c. maximum, unless otherwise indicated. Extend joint fillers full-width and depth of joint, recessed 1/2 inch below finished concrete surface. Furnish joint fillers in one-piece lengths for full width being placed. Provide joint sealants at all expansion joints.

C. Molding
1. In molding, the section shall be completely separated by steel sheet templates set perpendicular to the face and top of the curb. These templates shall be 1/8 inch in thickness and not less than 2 inches longer than the depth of curbing. These templates shall be set carefully during the placing of the concrete and allowed to remain in place until the concrete has set sufficiently to hold its shape.

D. Formwork
1. All forms shall be set true to line grade and held rigidly in position. They shall be of metal and such construction that a smooth surface shall be provided. Wood forms may be used only with authorization from the Engineer. On curves, all forms must be bent to meet the required curvature; the use of short chords will not be permitted. All forms shall be cleaned thoroughly and greased or soaped before concrete is placed against them. Forms which have become worn, bent or broken shall not be used.

E. Compaction
1. The concrete shall be compacted by means of an approved immersion type mechanical vibrator of a size and weight sufficient to thoroughly vibrate the entire mass. It shall vibrate at not less than 5,000 impulses per minute. Operational stand-by mechanical vibrators shall be made available for substitution in case of mechanical breakdown during concreting operations. The form shall be left in place at least 24 hours after concrete has set sufficiently so that, when ordered by the Engineer, they can be removed without injury to the curbing.

3.06 CONCRETE FINISHING:

A. General

1. Protect and cure finished concrete curb. Use membrane-forming curing and sealing compound or approved moist-curing methods.

B. Anti-Spalling Treatment
   1. A second coat of curing and sealing compound may be used or an anti-spalling compound applied over concrete cured by continuous moist curing methods. Apply compounds to concrete surfaces no sooner than 28 days after placement to clean, dry concrete free of oil, dirt and other foreign material. Apply curing and sealing compound at a maximum coverage rate of 300 square feet per gallon. Apply anti-spalling compound in two sprayed applications. First application at rate of 40 square yards per gallon; second application, 60 square yards per gallon. Allow complete drying between applications.

3.07 REPAIRS AND PROTECTIONS:

A. General
   1. Repair or replace broken or defective curbing, as directed by Owner's Representative.
   2. Drill test cores where directed by Owner's Representative when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory curbing with Portland cement concrete.
   3. Protect concrete from damage until acceptance of work. Exclude traffic from curbing for at least 14 days after placement. When construction traffic is permitted, maintain curbing as clean as possible by removing surface stains and spillage of materials as they occur.
   4. Sweep curbing and wash free of stains, discolorations, dirt and foreign material just prior to final inspection.

END OF SECTION 32 16 00

SECTION 32 94 00

TURF AND GRASSES AND PLANTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. Related sections include but are not limited to:
   1. Division 02 Section 024120 Site Demolition
   2. Division 31 Section 311000 Site Clearing
   3. Division 31 Section 312000 Earthwork

1.02 DESCRIPTION OF WORK:

A. Work in this Section includes but is not limited to:
   1. Supply and install slope stabilization measures.
   2. Fine grade, fertilize, seed and mulch or sod disturbed areas within the contract limits unless indicated to be treated otherwise.
   3. **Maintain, water, and protect** plantings until Final Acceptance by Owner.
   4. Plant material replacement, if required.
   5. Maintenance of planted material until Final Acceptance by the Owner.

1.03 DEFINITIONS

A. "Nursery-grown" shall mean grown in the nursery from liners or collected and then grown in a nursery not less than two years.

B. "Healthy, vigorous condition" shall mean live foliage out to the tips of all branches and stems, and a trunk caliper that is bigger, one year after planting, than at planting.

1.04 REFERENCE STANDARDS

A. ANSI Z60.1 American Nursery and Landscape Association, "American Standard for Nursery Stock", most recent edition.

B. American Joint Committee on Horticultural Nomenclature.

C. Horticultural Standards of the American Associates of Nurserymen.

D. "Pruning Standards For Shade Trees" published by the National Arborists Association.

1.05 SUBMITTALS

A. Samples: Provide the following:
   1. Mulch – One quart bag with name and address of supplier.
   2. Grass Seed - One typical seed bag tag.

3. Requests for Approved Equals.

B. Seed Mix Certificate: Provide copies of material certificates signed by the supplier certifying that the seed mixes comply with specified requirements. The certificate shall identify botanical and common names, percent by weight of each species and variety, and percent of purity, germination and weed seed.

C. Fertilizer Specifications: Submit label or identify brands to be used and their chemical compositions.

D. Maintenance instructions: The Landscape Subcontractor shall be responsible for providing two copies of written instructions recommending procedures to be established by the Owner for the maintenance of the landscape work for one full year.

1.06 QUALITY ASSURANCE

A. Perform Work with experienced personnel under the direction of a skilled foreman with a minimum of five years' experience with similar type and size landscape projects.

D. Topsoil and Other Planting Media
1. Topsoil and other planting media is to be furnished and installed by the Landscape Subcontractor as shown on the plans or as required by these specifications.

1.07 DELIVERY, STORAGE AND HANDLING

A. Remove unacceptable plant material immediately from the Job Site.

B. Seed: Deliver seed in original containers showing guaranteed analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging and location of packaging. Damaged packages are not acceptable.

C. Deliver herbicides to the job site in original, new and unopened packages and containers bearing manufacturer's name and label.

D. Store and handle herbicides at the job site only as permitted by local, state and federal laws.

1.08 JOB CONDITIONS

A. The Landscape Subcontractor must examine the subgrade, verify the elevations, observe the conditions under which work is to be performed, and notify the Landscape Architect and/or the Owner's Representative of unsatisfactory conditions. The Landscape Subcontractor is not to proceed with the work until the unsatisfactory conditions have been corrected in a manner acceptable to the Landscape Subcontractor.

B. Utilities: Determine the location of underground utilities and perform the work in a manner which will avoid possible damage. Hand excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by all parties.

C. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, immediately notify the Landscape Architect and/or the Owner's Representative and wait for approval before planting.

1.09 COORDINATION AND SCHEDULING

A. Do not plant until major construction operations are completed and approved by the Owner.

B. Install plant material after the installation of any underground irrigation system.

C. Plant groundcovers after final grades are established and prior to planting of lawns, unless otherwise acceptable to the Landscape Architect or Owner's Representative. If planting of trees, shrubs and groundcovers occurs after such lawn work, protect lawn areas and promptly repair any damage to lawns from planting operations.

1.10 GUARANTEE

A. Guarantee groundcover and other planted material against defects including death and unsatisfactory growth for a period of one year from the date of Final Acceptance of the planted material, except for defects resulting from neglect by the Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond the Landscape Subcontractor's control. Final decisions regarding replacement of planted material shall be made by the Landscape Architect. The Landscape Subcontractor, if not maintaining the property during the guarantee period shall be responsible for making monthly inspections and issuing written reports to the Owner detailing any maintenance practices he observes which would in any way negate his guarantee obligation so that corrective measures may be taken.
   1. Replacement plants under this guarantee shall be guaranteed for one full growing season from date of installation.
   2. Repair damage to other plants or lawns during plant placement or replacement at no cost to Owner.

C. All seeded areas must have 100 percent cover of seeded forbs or grasses at end of first full growing season.

PART 2 – PRODUCTS

2.01 SEED MATERIALS

2.02 MISCELLANEOUS MATERIALS

A. Anti-Desiccant: "Wilt-Pruf" or equal, approved by Landscape Architect. Delivered in manufacturer's containers and used according to manufacturer's instruction.

B. Compost: Compost shall be stable, humus-like organic material produced by the biological and biochemical decomposition of source-separated compostable materials, separated at the point of waste generation that may include, but are not limited to leaves and yard trimmings, food scraps, food processing residuals, manure and/or other agricultural residuals, forest residues and bark, and soiled or non-recyclable paper. Compost shall not be altered by the addition of materials such as sand, soil and glass. Compost shall contain no substances toxic to plants and shall not contain more than 0.1 percent by dry mass of man-made foreign matter.

C. Erosion Control Blanket: Landlok CS2 coconut/straw blend blanket as manufactured by Contech Construction Products, Inc., West Chester, OH (800) 338-1122 or ECSC-2B double net straw/coconut biodegradable rolled erosion control product as

manufactured by East Coast Erosion Control Blankets, LLC, Bernville, PA (800) 582-4005 or approved equal.

D. Mulch
   1. Seeded Areas - Stalks of oats, wheat, rye or other approved crops free from seed or noxious weeds.
   2. Plant beds and tree pits – 100 percent double shredded hardwood bark mulch with fibrous texture, natural (no dye) color.

E. Topsoil/Planting Media: As specified in Division 32 Section 329000 Planting Media Preparation and Placement. Topsoil shall be used as backfill when installing plants in all areas.

F. Planting Fertilizer: Commercial, controlled release 20-10-5 (N-P-K) with 21 gram controlled release fertilizer tablets, such as Agriform or approved substitute by Owner's Representative.

G. Seeded Area Fertilizer: Standard brand agricultural product such as 10-10-10 (N-P-K) fertilizer or as recommended by soil tests and approved by Owner's Representative.

H. Top Dressing: Starter Fertilizer, commercial, partially organic.

I. Weed Barrier Fabric: Rot-resistant polypropylene fabric, water and air permeable; Mscape by Mirafi or equal.

J. Lime: Agricultural lime.

PART 3 – EXECUTION

3.01 TIME OF WORK

A. Do not commence work of this Section until preparation and placement of topsoil and other planting media as specified in Division 32 Section 329000 Planting Media Preparation and Placement is complete and accepted. The Contractor shall be responsible for establishing the required project subgrade. The Landscape Subcontractor shall be responsible for accepting or rejecting the subgrade conditions prior to starting his work, the work of this section. Commencement of the work of this section by the Landscape Subcontractor constitutes acceptance of the subgrade prepared by the Contractor.
   1. Plant during normal season, subject to approval of Landscape Architect or Owner's Representative.
   2. Perform actual planting only when weather and soil conditions are suitable and in accordance with locally accepted practice.

3.02 PREPARATION

A. Protection
   1. Take care in performing landscaping work to avoid conditions which will create hazards. Post signs or barriers as required.
   2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.
   3. Keep site well drained and landscape excavations dry.

4. Layout and physically delineate plant beds and landscape elements. Secure Landscape Architect's acceptance before proceeding with the landscape installation. Make minor adjustments as may be requested.

3.03 PRUNING PLANTS

A. Prune in accordance with ANSI A300 tree pruning standards to preserve the natural character of the plant.

B. Remove all dead wood or suckers, all broken or badly bruised branches, and any crossing or rubbing branches.

3.04 MAINTAINING PLANTS

A. Maintenance Period: Begin maintenance immediately after planting landscape material and continue to maintain the installed plant material until Final Acceptance by the Owner. Plantings installed after November 1st shall be maintained until the following Spring's leafing.

B. Extension of Maintenance Period: Continue the maintenance period at no additional cost to the Owner until all previously noted deficiencies have been corrected, at which time the Final Inspection will be made.

C. All plant materials shall be watered immediately upon planting and then watered, fertilized, pruned, weeded, and maintained as required to keep plant material in a healthy, vigorous condition.

D. Provide all equipment and means for proper application of water to installed plant material for the duration of the maintenance period.

E. **Fertilize plants in spring and fall**.

F. Adjust or replace stakes, guying materials and tree wrap as necessary to securely anchor and protect plants throughout the maintenance period.

G. Protect all planted areas against damage from erosion, wildlife (including deer), trespassing and other means by providing and maintaining proper safeguards until acceptance.

H. Reset settled plants to proper grade and position. **Restore soil berm and 3-inch mulch layer as necessary. Keep mulch surface weed-free**.

3.05 REPLACEMENT OF PLANTS

A. Dead or declining plant material shall be removed immediately and replaced as soon as possible with a new and healthy plant of the same type and size as specified, without additional cost to the Owner. Replacement plants shall be maintained for a minimum of 60 days and guaranteed for one year from time of replacement.

B. All plant material required under this contract, deemed by the Owner's Representative to be unsightly, unhealthy, or excessively pruned, during and at the end of the Guarantee Period, shall be replaced or added as soon as conditions permit.

C. Replacements required because of vandalism are not part of the Contract.

D. For Final Acceptance by the Owner, all plant material shall be in a healthy, vigorous growing condition.

3.06 APPLYING SEED MIXES

A. Scope
   1. Disturbed, unpaved areas which are not otherwise planted shall be seeded.
   2. Seed unpaved areas within Contract Limit lines which have been disturbed by construction unless otherwise noted.

B. Site Tolerances: Final grade of soil after seeding of grassed areas is complete shall be one inch below top of adjacent pavement of any kind.

C. Seeding: After grassed areas are graded, sow seed with adequate equipment at time when little or no wind is blowing.

D. Season of the year for seeding subject to approval by Owner's Representative. Do not seed when high wind, drought, excessive moisture, ice or other conditions are such that specified results are not likely to be obtained.

E. Fine Grading
   1. Remove all stones 1 1/2 inches in diameter and larger, roots, rubbish and all other foreign matter.
   2. Disk, harrow or rototill to minimum 6 inches depth all areas where seed is to be installed.
   3. Apply lime to the topsoil as required in conformance with the approved soil amendment procedure. Work the lime lightly into the top 3 inches of the topsoil.
   4. Grade to exact, well-draining grades indicated.

F. Fertilizer: Evenly distribute as per soil test recommendations. Work lightly into top 3 inches of soil.

G. Seed
   1. Rake immediately before seeding until surface is smooth, friable and of uniform fine texture. Roll. Rake out undulations shown by roller.
   2. Apply top dressing of starter fertilizer to prepared seedbed at a rate that will provide one pound of actual nitrogen (N) per 1,000 square feet.
   3. Uniformly spread seed at rate indicated on plans or as recommended by seed supplier in two passes at 90 degrees to each other. Rake lightly and roll with 200 pound roller.
   4. Mulch all seeded areas immediately after seeding. Hand or machine spread to form a continuous blanket 2-inches uniform thickness, loose measurement. Anchorage to hold mulch in place may be employed at Contractor's option, subject to approval by Owner's Representative.
   5. **Protect all seeded areas, at Contractor's expense, with snow fences, wire farm fences or similar structures.** Remove upon final acceptance.
   6. **Where ground slope is 1 in 2.5 or steeper or as indicated on Drawings (other slopes at Contractor's option), install erosion control blanket immediately after seeding and before mulching.** Remove pins or stakes visible after uniform stand of grass is attained.

3.07 MAINTAINING SEEDED AREAS

A. Begin maintenance of seeded and sodded lawn areas immediately upon completion of seeding and mulching and continue for a minimum of 60 days or longer as required to establish uniform stand of specified grasses and until Final Acceptance. Maintain seeded and sodded areas by watering, fertilizing, weeding, mowing, trimming and other operations such as regrading and replanting as required to establish a smooth acceptable lawn, free of eroded bare areas, all to the acceptance of the Landscape Architect.

B. Water immediately after mulching and laying sod to saturate the soil to 1/2 inch depth. Thereafter, water all seeded and sodded areas to 1-inch depth soil saturation no less than two times per week and more often during periods of drought or high winds, until final acceptance.

C. Provide all equipment and means for proper application of water to the seeded areas.

D. Maintain mulch daily or more often as required. Contain mulch on site and clean up any areas where mulch is blown by wind.

E. Rerake, reseed, resod and remulch as necessary. Reseed grass and herbaceous plant material as needed to achieve 85 percent survival and coverage at the time of inspection for Final Acceptance.

F. Three to four weeks after germination, fertilize turf with either a second application of starter fertilizer or another complete fertilizer that has a ratio of 4-1-2. Apply fertilizer at a rate to deliver one pound nitrogen per 1,000 square feet.

3.08 INSPECTION AND FINAL ACCEPTANCE OF SEEDED AREAS

A. The Contractor and/or the Landscape Subcontractor shall request inspection by the Landscape Architect and/or Owner's Representative after establishment of uniformly germinated grassed areas for the purpose of Final Acceptance.

B. Seeded areas will be accepted at the time of inspection if:
1. Seeded and sodded areas are properly established.
2. Grassed areas are free of bare and dead spots and without weeds
3. A uniform stand of grass at least 3-inches tall has been obtained.
4. No surface soil is visible when grass has been cut to height of 3 inches.

C. Areas seeded after November 1st will not be accepted until the following spring (on or about May 1st) approximately one month after the start of growing season if the above specified conditions have been met.

D. The maintenance responsibility of the lawn areas shall become the Owner's responsibility upon Final Acceptance.

E. Prior to Final Acceptance, the Landscape Subcontractor shall provide the Owner with two copies of written instructions recommending procedures to be established by the Owner for the maintenance of the landscape work for one full year.

3.09 CLEAN UP

A. Immediately cleanup soil or debris spilled onto the pavement and dispose of deleterious materials.

B. Dispose of excess material and debris resulting from planting work off-site. Leave work area clean and neat upon completion of the Work. Repair any damage done to the existing site improvements as a result of the Work of this Section.

3.10 PROTECTION OF THE WORK

A. Protect planted areas against traffic or other use immediately after planting is completed by placing adequate warning signs and barricades.

B. Provide adequate protection of planted areas against trespassing, erosion, and damage of any kind. Remove this protection after planted areas have been accepted by Landscape Architect.

END OF SECTION 32 94 00

SECTION 33 41 00

STORM DRAINAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Westchester County Health Care Corporation General Conditions and any Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Pipe and Fittings.
   2. Catch Basins

1.03 DEFINITIONS

A. HDPE: High Density Poly-Ethylene Pipe.

1.04 GRAVITY-FLOW, NONPRESSURE, DRAINAGE-PIPING PRESSURE RATING: 10-Foot Head of Water. Pipe joints shall be at least silt-tight, unless otherwise indicated.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:
   1. Catch Basins: Include plans, elevations, sections, details, frames, covers, and grates. Include design calculations, and concrete design-mix report for cast-in-place catch basins and drain inlets.

C. Field quality-control reports.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect pipe, pipe fittings, and seals from dirt and damage.

B. Handle catch basins, and other precast concrete drainage structures according to manufacturer's written rigging instructions.

1.07 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
   1. Notify Owner no fewer than two weeks in advance of proposed interruption of service.
   2. Do not proceed with interruption of service without Owner's written permission.

PART 2 - PRODUCTS

2.01 HIGH DENSITY POLYETHYLENE PIPE

A. All double wall high density polyethylene pipe, with smooth inner liner:
   1. Corrugated polyethylene pipe (12" to 30"), AASHTO M 294-94.

B. Pipe shall be joined with a watertight gasketed integral bell and spigot joint, ASTM D3212, ASTM F477.

2.02 CATCH BASINS

A. Precast Concrete Catch Basins: Provide as detailed on plans and all assemblies shall provide for H-20 Loading.
   1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
   2. Base Section: 8-inch minimum thickness for floor slab and 5-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
   3. Riser Sections: 5-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
   4. Top Section: Flat-slab-top type is indicated.
   5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
   6. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
   7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include flat grate with small square or short-slotted drainage openings.

2.03 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/ cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
   1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
      a. Invert Slope: 1 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.
   a. Slope: In accordance with plan invert elevations.

D. Ballast and Pipe Supports: Portland cement design mix, 4000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
   1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
   2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 deformed steel.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 31 Section 312000 Earthwork.

3.02 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install gravity-flow, nonpressure drainage piping according to the following:
   1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.
   2. Install piping with 24-inch minimum cover, unless noted otherwise on the plans.

3.03 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:
   1. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.04 CATCH BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated on plans.

B. Set frames and grates to elevations indicated on plans.

3.05 IDENTIFICATION

A. Pipe backfill and bedding materials and their installation are specified in Division 31 Section 312000 Earthwork. Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
   1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.06 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24-inches of backfill is in place, and again at completion of Project.
   1. Submit separate reports for each system inspection.
   2. Defects requiring correction include the following:
      a. Alignment: Less than full diameter of inside of pipe is visible between structures.
      b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
      c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
      d. Infiltration: Water leakage into piping.
      e. Exfiltration: Water leakage from or around piping.
   3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
   4. Reinspect and repeat procedure until results are satisfactory.

B. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.07 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

END OF SECTION 33 41 00