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BROWNFIELD CLEANUP PROGRAM

REMEDIAL DESIGN & ENGINEERING REPORT

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

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EXECUTIVE SUMMARY

This document presents the Remedial Design and Engineering Report for the former Circle M Wood Treating (Circle M) site (New York State Department of Environmental Conservation (NYSDEC) Site #3-14-083), located in the Town of Fishkill, Dutchess County, New York. This Remedial Design is submitted pursuant to the Brownfield Site Cleanup Agreement (BCA) (Index #W3-1077-05-09) between Chelsea Waterfront Development, LLC and the NYSDEC. The Remedial Design (RD) elements, construction sequence, project schedule and supporting plans including the Community Air Monitoring Plan (CAMP), Health and Safety Plan (HASP), and Site Management Plan (SMP) are provided herein or appended hereto and are prepared in accordance with the Remedial Work Plan dated February 1, 2006 as approved by the NYSDEC. The prior investigations and evaluation of remedial alternatives were completed in compliance with the June 27, 1997 Order on Consent as reported by the September 13, 2002 Supplemental Remedial Investigation (RI) and February 10, 2005 Focused Feasibility Study (FFS).

In January 2004, Chelsea Waterfront Development, LLC purchased the approximate 58-acre Chelsea Industrial Park with the intention of demolishing the existing industrial buildings, including the Circle M facility, and constructing a multi-phase residential development. The RI investigated the nature and extent of contamination and the FFS evaluated remedial measures consistent with the intended future use. Remediation of this site, coupled with residential development, will convert an industrial property to a use that is entirely consistent with adjacent residential land uses, and will eliminate potential exposure to metal residues left behind by the former Circle M lumber treatment business that occupied one of the buildings.

Chromium, copper and arsenic are the primary constituents of chromated copper arsenate (CCA), a lumber preservative. These substances are present in surface soil beneath the former Circle M building and in adjacent outdoor areas that were used for storage of treated lumber. The Circle M lumber treatment operation resulted in spills and chronic drippage of CCA prior to 1990.

The Remedial Design and selected remedy are based on the Record of Decision (ROD) dated September 30, 2005 which provide for:

- Construction details and specifications necessary to implement the remedial program including additional sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.
- Demolition of the former treatment building.
- Excavation and on-site consolidation of contaminated soil. Soils will be consolidated within a designated area and will include the treatment building slab, which will be left in place, beneath a

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portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two (2) feet of clean fill.

- Implementation of an erosion control program in the form of grass or other vegetative cover to stabilize soils on the stream bank.

- Installation of three (3) bedrock monitoring wells (one upgradient and two downgradient) and one (1) upgradient overburden well.

- Implementation of a Site Management Plan (SMP) including institutional controls and engineering controls to: address soils that may be excavated from the consolidation area in the future; provide for the operation and maintenance of the components of the remedy; monitor groundwater; and identify any restrictions on site development or groundwater use.

- Development of an environmental easement to be recorded, which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking[1].

- The SMP will require that the property Owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.

Future development plans for the property anticipate rezoning to allow residential development and construction of a multi-phased residential development project. During the initial phase, the current tenants of Chelsea Industrial Park will be relocated as existing leases expire. Upon successful rezoning of the property and relocation of all tenants, industrial buildings will be demolished and impacted soils will be managed in accordance with the selected remedy.

During 2006, the additional monitoring well installations at the site were completed. Additionally, sediment sampling of the adjacent floodplain was completed. The RD document and appended construction drawings, specifications and plans provide the additional detail for full implementation of the remedy. The Form of Contract, Bid Form and specific contract provisions for measurement and payment of the work will be provided by the Owner. This RD and appended material serves as the technical and engineering specifications for completion of the work.

[1] The NYSDEC has clarified that use of the consolidation area for "green space" can include an athletic field (i.e., soccer, baseball, etc.). However, any equipment that may be proposed to facilitate such a recreational use, such as goalposts, bleachers/seating, piping, etc., should be careful to not disturb the integrity of the geotextile fabric that will be located on top of the consolidation area (and beneath two feet of clean fill). Further, no buildings of any kind, such as a concession stand or restroom, may be located on any portion of the consolidation area. This clarification was confirmed via the November 7, 2005 letter from Chelsea's outside counsel to the NYSDEC.

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1.0 INTRODUCTION

This document presents the Remedial Design and Engineering Report for the former Circle M Wood Treating (Circle M) site (New York State Department of Environmental Conservation (NYSDEC) Site #3-14-083), located in the Town of Fishkill, Dutchess County, New York (see Figure 1). This Remedial Design and Engineering Report sets forth the engineering design, construction plans, material specifications, construction sequence, project schedule and supporting plans including the Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP), Storm Water Pollution Prevention Plan (SWPPP), Erosion Control Plan and Site Management Plan (SMP) for the implementation of the selected remedy set forth in the NYSDEC Record of Decision (ROD) dated September 30, 2005. The remedy is based on the NYSDEC approved Remedial Work Plan dated February 1, 2006 and the previously submitted February 10, 2005 Focused Feasibility Study (FFS) and September 13, 2002 Supplemental Remedial Investigation (RI) report.

1.1 Site Description & Background

Detailed information regarding the site conditions, history, nature and extent of contamination, delineation of the site, and established remedial goals are set forth in the previously submitted Focused Feasibility Study (FFS) and September 2002 Supplemental Remedial Investigation (RI) report. Remedial contractors are instructed to review and become familiar with these documents and to fully understand the site conditions in preparing construction bids.

Prior site investigations and reports include:

- **Focused Remedial Investigation**

  In 1997, the NYSDEC issued an Order on Consent, which set forth requirements for the respondents to voluntarily undertake a Focused Remedial Investigation (FRI) and Focused Feasibility Study (FFS). The Order on Consent was effective in June 1997.

  The FRI included: 1) Installation of a monitoring well immediately south of the Circle M concrete drip pad; 2) Collection of groundwater samples from the new monitoring well and the five (5) pre-existing on-site monitoring wells; and 3) Stream sediment sampling. Results of this work are summarized in the FRI report dated September 9, 1998 (Conrad Geoscience, 1998).

  The FRI report concludes that samples from the six (6) on-site monitoring wells contained copper, chromium and arsenic at concentrations exceeding NYSDEC standards. Filtered samples from monitoring wells MW-1, MW-3 and MW-7 contained no detectable As, Cr or Cu, indicating that the majority of metals in groundwater were adsorbed to particulate matter. Stream sediments contained lower concentrations of As, Cr and Cu than previously measured, but the 1998 FRI concentrations still remained above NYSDEC standards.

  Based on measurements of static water levels in on-site monitoring wells, local groundwater flow is to the southeast, toward the small stream that runs along the eastern boundary of Chelsea Industrial Park.

- **Supplemental Field Investigations**

  In January 1999, the Focused Feasibility Study (FFS) was initiated. In a letter dated January 29, 1999, the NYSDEC stipulated that additional field investigations should be completed as part of the FFS. Supplemental field investigations included: 1) Soil sampling and analysis to delineate

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the vertical distribution of As, Cr and Cu within the uppermost six (6) feet of soil; and 2) Completion of a Biological Resource Inventory & Impact Assessment to determine whether on-site receptors, including stream flora and fauna, show signs of impact from metals. Results of these field investigations are summarized in the FFS.

In April 2000, the NYSDEC requested additional sampling, including areas not previously sampled (under the Circle M floor and all outdoor lumber storage areas) and an expanded FRI sampling plan was prepared. This Supplemental RI work plan was approved by the NYSDEC on April 26, 2001. In May 2001, additional sampling was completed on stream sediments and groundwater, concentrating on the outdoor lumber storage areas as well as soil and groundwater quality directly beneath the Circle M building. Results of these field investigations are summarized in the Supplemental RI report dated July 6, 2001. Following review of the FRI report, the NYSDEC issued a letter dated July 23, 2001 directing that the FFS be prepared.

The NYSDEC subsequently indicated that additional soil sampling was necessary in order to more fully delineate the area of Chelsea Industrial Park affected by past releases of chromated copper arsenate (CCA). Accordingly, two (2) rounds of additional soil sampling and analysis were conducted in February and April 2002. These samples were collected from within and near known outdoor lumber storage areas to determine whether residual copper, chromium or arsenic were present in shallow soils.

The results of the supplemental soil investigation are summarized in the September 13, 2002 Supplemental Remedial Investigation.

- **Focused Feasibility Study (FFS)**

The FFS evaluated various remedial options and technologies in satisfaction of program requirements. Remedial alternatives were developed and evaluated in terms of protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARARs), long-term effectiveness and permanence, reduction of toxicity, mobility, and volume through treatment, short-term effectiveness, implementability, and cost.

Alternatives were then ranked. The FFS and the recommended remedy served as the foundation for the NYSDEC's Proposed Remedial Action Plan (PRAP) and ROD.

- **Remedial Design Investigations**

During July and August 2006, six (6) new wells were installed as documented in Appendix C. These installations include the three (3) new bedrock monitoring well installations required under the approved Remedial Work Plan and the installation of various replacement wells to reestablishing prior monitoring locations which were damaged or lost.

Following installation, all wells were sampled; the results of which are also provided in Appendix C.

During July and September 2006, sediment sampling was conducted in the stream and at the eastern floodplain of the stream. The stream sampling report and associated laboratory data are provided in Appendix C.

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1.2 Program Status

The NYSDEC ROD dated September 30, 2005 sets forth the specific elements of the selected remedy for the site. The ROD, a copy of which is provided as Appendix A, provides for:

- Development of a Remedial Design (RD) program to provide the details necessary to implement the remedial program. This Remedial Design including additional sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

- Demolition of the former treatment building.

- The onsite excavation and consolidation of contaminated soil. Soil will be consolidated within a designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two (2) feet of clean fill.

- Development of an erosion control program in the form of grass or other vegetative cover to stabilize soils on the stream bank.

- Installation of three (3) bedrock monitoring wells (one upgradient and two downgradient) and one upgradient overburden well.

- Development of a Site Management Plan (SMP) for implemented, including institutional controls and engineering controls to: address soils that may be excavated from the consolidation area in the future; provide for the operation and maintenance of the components of the remedy; monitor groundwater quality; and identify any restrictions on site development or groundwater use.

- Development of an environmental easement to be recorded identifying all use restrictions. Uses in the consolidation area will be limited to green space or parking.

- The SMP will require that the property Owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.

1.3 Brownfield Site Cleanup Agreement (BCA)

The implementation of the selected remedy will be in accordance with the Brownfield Site Cleanup Agreement (BCA) signed by Chelsea Waterfront Development, LLC. A copy of the BCA is provided as Appendix B.

The BCA resulted in the development of the detailed requirements for submission of this Remedial Design, a Citizen Participation Plan, and the associated project schedule. Pursuant to the BCA, the Remedial Work Plan dated February 1, 2006 was submitted to the NYSDEC for review and was subsequently approved.

The BCA also provides for the following specific submittals to the NYSDEC:

- Remedial Design – This Remedial Design setting forth the detailed plans, specifications and contract documents which will be utilized to procure contractors and to manage the project.

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- Progress Reports – Required the 10th day of each month commencing with approval of the Remedial Work Plan.

- Environmental Easement – Must be submitted within 30 days after the NYSDEC approval of the Remedial Work Plan.

- Final Engineering Report – Prepared by the Professional Engineer with primary responsibility for the day to day performance of the activities under the Brownfield Site Cleanup Agreement (BCA) at the conclusion of all activities required by the Remedial Work Plan.

- Certificate of Completion (issued by the NYSDEC) – Issued by the NYSDEC at the acceptance of the Final Engineering Report.

- OM&M Work Plan – Operating, Maintenance & Monitoring (OM&M) Work Plan that must be submitted as part of the Remedial Work Plan.

- Annual Reports – May be required if the OM&M Work Plan requires ongoing operation, maintenance, and monitoring or institutional controls. If required, is due on the 1st day of the month following the anniversary of the start of the OM&M Work Plan.

1.4 Remedial Process

The regulatory goal specified in 6 NYCRR Part 375 is to return the site to predisposal conditions, to the extent feasible. Remedial action objectives developed for the Circle M site reflect results of the FRI and applicable regulatory requirements and guidance, resulting in the establishment of site specific cleanup objectives. Remedial objectives were selected that will be protective of human health and the environment.

1.4.1 Identification & Screening of Technologies

The screening of technology types and process options is discussed below. This screening was based on the criteria of effectiveness for treating impacted soils, and implementability.

The FFS comprehensively evaluated:

- Source Control;
- No Further Action;
- Capping and Institutional Controls;
- Excavation and Off-Site Disposal;
- In-place Treatment of Impacted Soil; and
- Hybrid of Capping/Excavation and Disposal.

These alternatives were then evaluated as specified in the EPA guidance (EPA 1988), which is accepted by the NYSDEC, and are as follows:

- Overall Protection of Human Health and the Environment
- Compliance with ARARs
- Long-Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility and Volume Through Treatment
- Short-Term Effectiveness

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- Implementability
- Cost

Surficial soil (0" – 24" depth) exhibiting elevated CCA will be excavated and relocated to a designated on-site consolidation area. In addition to capping, institutional controls will also be employed. Periodic groundwater monitoring will be conducted to demonstrate compliance with ARARs and SCGs. Groundwater monitoring will consist of quarterly sampling of all on-site wells for one (1) year, followed by semi-annual sampling for a period of two (2) years, and annual sampling thereafter.

1.4.2 Remedial Goals

The remedial action objectives for the Circle M site are established by the September 2005 Record of Decision (ROD). Specifically, Section 6 of the ROD identifies that the remedial goals for the site are to eliminate or reduce to the extent practical:

- Exposures of persons at or around the site to As, Cr, and Cu in soil and groundwater;
- Environmental exposures of flora or fauna as As, Cr, and Cu in sediment;
- The release of contaminants from soil into groundwater that may create exceedences of groundwater quality standards; and
- The release of contaminants from surface soil into air through windborne dust.

Further, the remediation goals for the site include attaining to the extent practicable:

- TAGM 4046 objectives, which in this case take into account the site related background levels for arsenic, chromium and copper of 13 ppm, 25 ppm and 25 ppm, respectively.
- Groundwater SCGs based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

Figure 6 of the ROD (contained in Appendix A) identifies the approximate horizontal and vertical limits of soil excavation in consideration of the stated remedial goals.

1.5 Selected Remedy

Implementation of the remedy will necessitate a range of pre-construction and construction related activities. Additionally, the selected remedy requires the development of an environmental easement and future use restrictions to be imposed on the remedy.

1.5.1 Initial Activities

Implementation of the remedy will necessitate the following:

1. Aerial Mapping

   Construction drawings have been prepared based on aerial photography and base mapping supplemented with various field surveys. This mapping is at a scale of 1":60' and presents the surface topography at a contour interval of two (2) feet. The construction drawings reflect

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existing conditions, and are used to show demolition plans, excavation plans, temporary and permanent storm water management controls, soil stockpile and management plans, construction details, etc. Prior to the commencement of construction, appropriate survey benchmarks and baselines will be established for use during construction.

2. Groundwater Monitoring Well Installation and Well Abandonment

In accordance with the Remedial Work Plan, Conrad Geoscience supervised the installation of four (4) new monitoring wells (MW-3D, MW-9S, MW-9D, and MW-10) and replaced two (2) pre-existing monitoring wells (MW-3RS, MW-7R).

Monitoring well MW-3RS was installed to replace the original well observed to be damaged beyond repair. MW-3S was abandoned following NYSDEC standard protocol. Monitoring well MW-7 could not be located and was therefore replaced with monitoring well MW-7R.

The remaining four wells were installed at the locations specified in the Record of Decision (ROD). Monitoring wells MW-3D, MW-9D and MW-10 are completed in bedrock and monitoring well MW-9S is completed in overburden.

Overburden monitoring wells, MW-3RS, MW-7R and MW-9S, were installed using 6.25-inch hollow stem augers to drill through the overburden. Bedrock monitoring wells, MW-3D, MW-9D and MW-10, were installed using 6.25-inch hollow stem augers to drill through the overburden into the underlying clay layer. When the clay layer was encountered, the borehole was advanced via driving and washing casing. When bedrock refusal was encountered, a 3.75-inch outside diameter wire line (HQ) diamond core bit was used to core bedrock. Water was used as a drilling fluid to wash sediment and rock fragments from the casing and to cool the diamond bit.

Monitoring wells were constructed using 2.0-inch I.D., 10-slot PVC well screens installed across the water table. Above the well screen, solid PVC tubing was installed to the surface. Surface casing was installed to anchor the top of each well and to prevent infiltration of surface water along the outer annulus of the well. Filter packs, bentonite seals, grout and well materials conform to NYSDEC/USEPA specifications. Monitoring wells were completed with steel surface casing, above grade. Well completion details and construction diagrams are provided as Appendix C.

3. Sediment Sampling

In accordance with the Remedial Work Plan, samples of stream sediment were collected and analyzed. Five (5) sampling stations have been designated as shown on Plate 4. The results from this initial round of sediment samples are provided in Appendix C. A second sampling round will be performed at the conclusion of the soil relocation activities and after implementation of the remedy.

During 2006, sediment sampling was conducted in the adjacent floodplain. A sediment sampling report and associated analytical data are provided in Appendix C.

4. Community Air Monitoring Plan (CAMP)

Site activities involving the management of impacted soils have the potential to generate dust which could migrate from the site. A CAMP has been developed consistent with New York State

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Department of Health (NYSDOH) guidance. The CAMP provides real time monitoring for total particulate with a mechanism for immediate reporting to the site where activities are causing an off-site impact. The CAMP for this project is provided as Appendix D.

5. Health and Safety Plan (HASP)

Insomuch as the project involves the remediation of a regulated site, all construction/remedial activity must be carried out in accordance with a site Health and Safety Plan (HASP). Such a plan must satisfy the requirements of 40 CFR 1910 and 1926. The HASP for the project is provided as Appendix E.

6. Site Management Plan (SMP)

A Site Management Plan (SMP) has been developed which describes the activities associated with placing soil in the consolidation area and the long term maintenance/management of the consolidation pile and cover.

The SMP also identifies the potential long term uses of the consolidation area and the steps necessary to implement such future use of this SMP is provided as Appendix F.

7. Storm Water Pollution Prevention Plan (SWPPP)

A Storm Water Pollution Prevention Plan (SWPPP) has been prepared.

Certain identified activities trigger the need to obtain State Pollutant Discharge Elimination System (SPDES) permits issued by the NYSDEC, which authorize the discharge of runoff to surface waters of the State. Specifically, owners of lands which discharge storm water associated with construction activity must apply for a permit if activities involve the disturbance of one (1) acre or more. Construction activity that results in a land disturbance of less than one (1) acre, but which is part of a larger common plan of development or sale, must also be covered by a storm water permit.

This permit is referred to as GP-02-01 "SPDES General Permit for Storm Water Discharges from Construction Activity" (Construction Activity General Permit). The Construction Activity General Permit requires the owner to implement storm water management measures for controlling pollutants in the storm water runoff.

Construction activities associated with remediation of hazardous waste sites that have a NYSDEC-approved work plan do not need to obtain coverage under the Construction Activity General Permit provided that a SWPPP meeting the substantive requirements of the Construction Activity General Permit is prepared for the project, and that a completed Notice of Intent (NOI) form is submitted to the NYSDEC prior to construction.

As described above, the SWPPP is in support of the construction activity necessary for the NYSDEC-approved remediation of the former Circle M facility, and meets the substantive requirements of the Construction Activity General Permit. As such, this SWPPP is written with specific reference to the Construction Activity General Permit, although the NYSDEC's approval of the Remedial Design is used in lieu of coverage under the Construction Activity General Permit.

A copy of the SWPPP is provided as Appendix G.

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8. Dust Control Plan

The Dust Control Plan (DCP) sets forth dust control methods that will be implemented for various remedial activities including the excavation, handling and consolidation of impacted soils at the former Circle M Wood Treating Site. The DCP follows guidelines provided in the NYSDEC Technical and Administrative Guidance Memorandum #4031 (TAGM 4031) and the NYSDOH Generic Community Air Monitoring Plan (CAMP).

A copy of the DCP is provided as Appendix H.

1.5.2 Construction Activity

All construction will be in accordance with the detailed plans, specifications and contract documents provided herein.

Pre-qualified contractors will be invited to submit proposals in accordance with this RD. Chelsea Waterfront Development, LLC will then select one or more contractors to undertake elements of the work as follows:

1. Site Work

Preliminary site work including improved security measures, construction of temporary haul roads, and drainage improvements, etc. Prior to the commencement of soil excavation, relocation and consolidation work, the selected contractor(s) will be required to make a series of "shop submittals" including but not limited to Project Schedule, Site Management Plan (SMP), Construction HASP, CAMP, etc. as required by the detailed project specifications. Construction specifications and Contract Documents for the implementation of the remedy are provided in Appendix I. Engineering drawings depicting the work are attached.

2. Building Demolition

As existing tenant leases expire, tenants of the industrial park will be relocated. Upon relocation of all tenants, the building demolition activities will commence. Building demolition activities will be consistent with established local requirements, approvals and permit programs. Generally, buildings will be subjected to pre-demolition asbestos surveys and abatement as required. Building contents will be removed and the building is pulled down. Salvageable metal and materials will be removed for reuse or recycling. Remaining masonry, brick, concrete, etc. will be crushed and used on-site as grade fill or roadbase material. Other debris not suitable for on-site use will be loaded out for off-site management.

With respect to the Circle M building, the floor slab and foundation structures will be left in place. Foundation structures are within the soil consolidation and will be covered over as part of the remedy.

Building demolition work will be separately contracted and is not included in the Contract Documents and specifications contained in Appendix I.

3. Excavation and Grading

Impacted soils will be excavated and relocated for on-site consolidation in accordance with a Site

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Management Plan (SMP), Storm Water Pollution Prevention Plan (SWPPP), detailed specifications and construction plans appended hereto.

4. Soils Management

Strict controls for on-site hauling and management of soils are proposed in order to minimize dust generation, storm water runoff and address health and safety concerns. The management of soil must also adhere to the industry standard Best Management Practices (BMPs) to control storm water runoff and generation of dust.

Upon completion of soil excavation and relocation, additional work such as utility installation and residential development may commence and can be carried out in an unrestricted fashion.

1.5.3 Post-Construction

Permanent use restrictions and institutional controls will be implemented for the soil consolidation area in accordance with the BCA. These restrictions will also prohibit the future use of impacted groundwater.

2.0 REMEDIAL DESIGN

2.1 General

This Remedial Design, and the supporting documents appended hereto, provide the detailed description of the work, engineering drawings, construction specifications and various plans necessary to implement the selected remedy. These documents collectively will be utilized by the Owner to procure the contractor services required to complete the work. The construction contract, bid forms, and specifications regarding measurement and payment of the work are being provided by the Owner.

2.2 Engineering Plans

The following list of engineering drawings (see Plates attached) have been prepared to present each element of the remedy:

Plate	Drawing
Plate 1	Existing Conditions
Plate 2	Site Preparation
Plate 3	Excavation Plan
Plate 4	Final Grading Plan
Plate 5	Cross Sections
Plate 6	Details
Plate 7	Details

These drawings will be utilized by the selected remedial contractor to complete the work.

2.3 Construction Specifications

A detailed description of the work and individual item specifications for all elements of the work have been completed and are provided in Appendix I. These include minimum specifications for all earth materials, geosynthetics, and construction products to be incorporated into the work. The specifications

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also address all earth work and construction activities at the site. The detailed specifications also provide a summary of all shop submittals, material test data, quality assurance/quality control measures, etc. required of the contractor during performance of the work and the methods and means to verify proper completion of the work.

2.4 Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan

The remedial work under this Remedial Design must be completed consistent with the State Pollutant Discharge Elimination System (SPDES) permit requirements set forth in the Construction Activity General Permit (GP-02-01). However, as part of a NYSDEC approved remedial program, General Permit coverage is not required provided the construction work is addressed by a Storm Water Pollution Prevention Plan (SWPPP) prepared under current standards and guidance. A SWPPP for the project is presented as Appendix G and is prepared to address the requirements of:

- New York State Storm Water Management Design Manual", dated August 2003
- New York State Standards and Specifications for Erosion and Sediment Control", dated August 2005

2.5 Health and Safety Plan (HASP)

In satisfaction of 40 CFR 1910 and 1926, a Health and Safety Plan (HASP) is provided as Appendix E. Contractors working on the project will be required to furnish individual HASPs prepared in accordance with Appendix E requirements.

The site HASP addresses typical general construction health and safety issues such as excavation procedures, slip/fall, confined space, etc. Additionally, it addresses the potential health and safety concerns with exposure to airborne dust and the site specific chemicals of concern (copper, chromium and arsenic). The Plan deals with the range of anticipated site activities including:

- Demolition
- Excavation and backfill
- Soil consolidation
- Restoration

2.6 Community Air Monitoring Plan (CAMP)

The Community Air Monitoring Plan (CAMP) developed for the remediation project is based on the Generic CAMP prepared by the NYSDOH. The CAMP provides for real time particulate monitoring at the upwind and downwind perimeter of the work area. The CAMP is provided as Appendix D.

2.7 Dust Control Plan (DCP)

The Dust Control Plan (DCP) establishes various Best Management Practices (BMPs) and operational standards geared to minimize dust generation. The DCP is provided as Appendix H.

2.8 Site Management Plan (SMP)

The Site Management Plan (SMP) provides for the excavation and relocation of soil to the consolidation area and includes provisions for long-term maintenance of the consolidation fill. The consolidation area will also be the subject of a Conservation Easement. Extensive prior characterization of the soils indicate

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the extent of soil excavation required. Accordingly, post-excavation sampling within the footprint of the excavation is not proposed. Additional soil/sediment sampling is proposed for the drainageway east of the proposed soil consolidation area. A copy of the SMP is provided as Appendix F.

3.0 IMPLEMENTATION SCHEDULE

The proposed remediation schedule is presented on Figure 2, the Gantt Chart.

It is anticipated the project will follow the following general sequence although a number of site activities are expected to overlap:

- Pre-Construction:

  Permits and Approvals. All necessary permits and approvals will be applied for and obtained to authorize the work. The following summarizes the anticipated approvals and permits.

Town of Fishkill	• Zone Change • Building Demolition Permit • Building Permit
NYSDEC	• Remedial Design • Site Management Plan
NYSDOH	• CAMP • HASP

  Under prevailing NYSDEC policy, a General Permit for a Construction Activity General Permit (State Pollutant Discharge Elimination System (SPDES) Permit) is not required even though more than one (1) acre of ground surface is disturbed. The authority to implement the remedy is contained in the BCA and NYSDEC's approval of the Remedial Work Plan and RD.

- Construction:

  Active management of the soil will commence following building demolition. Building demolition will be scheduled following expiration of the existing leases once individual tenants are relocated.

  The active management of soil, completion of the consolidation area and site restoration is expected to require one (1) full construction season following building demolition.

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FIGURES



MAP REFERENCE: NYSDOT WAPPINGERS FALLS QUADRANGLE, 1989.

FIGURE 1

STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road ♦ Latham, New York 12110

SITE LOCATION MAP

CHELSEA WATERFRONT DEVELOPMENT LLC

CIRCLE M WOOD TREATMENT SITE

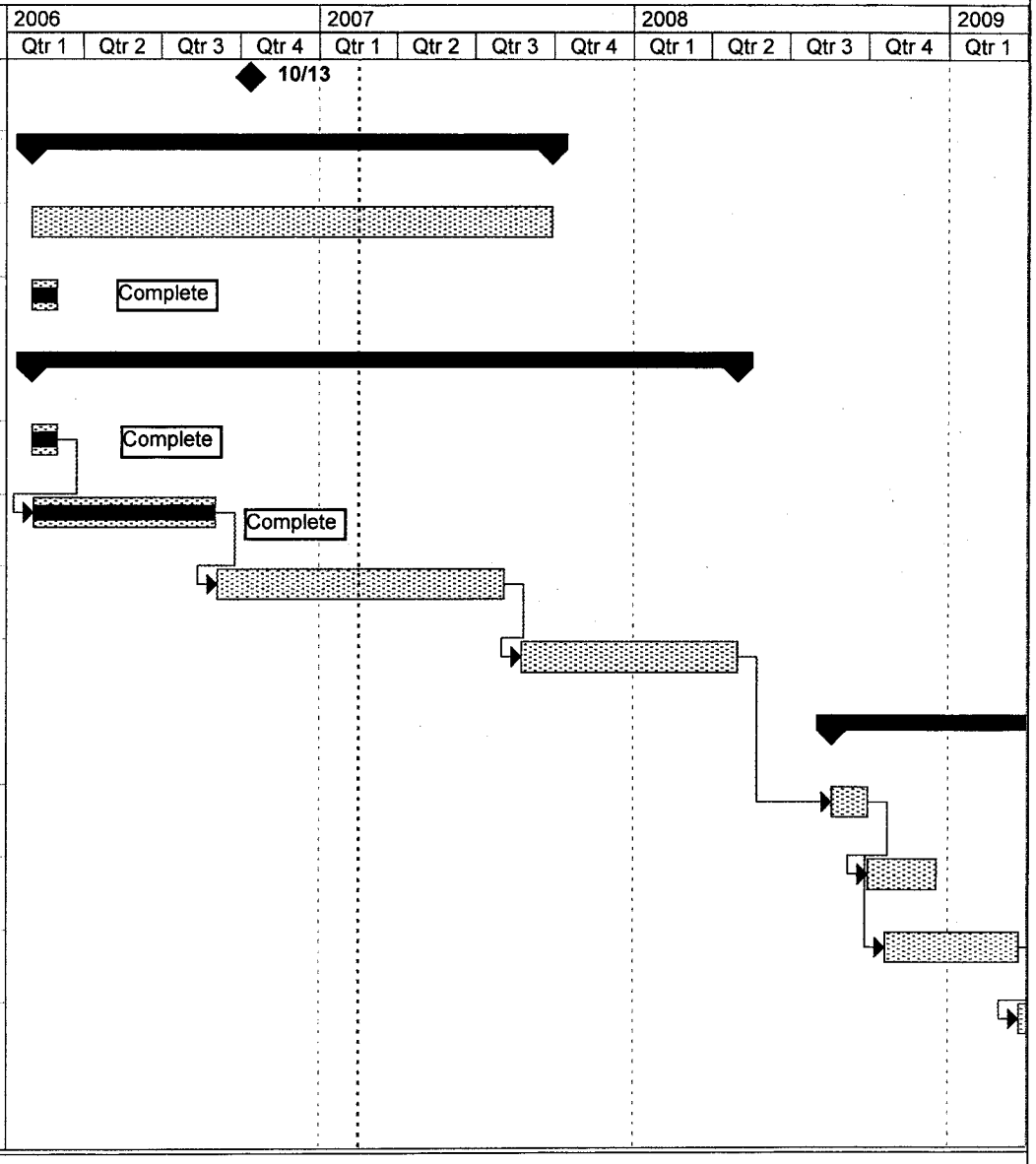
CITY OF BEACON DUTCHESS CO., N.Y.

PROJ. No.:	DATE:	SCALE:	DWG. NO.	FIGURE
21044	9-12-06	1" = 2000'	21044005	1

Fi 2

Circle M Wood Treating Site Remedial Process
Gantt Chart

ID	Task Name	Start	Finish
1	Date of Report	Fri 10/13/06	Fri 10/13/06
2	**Pre-Construction**	**Tue 1/31/06**	**Fri 9/28/07**
3	Zoning Change	Tue 1/31/06	Fri 9/28/07
4	GW Monitoring & Well Install'ns	Tue 1/31/06	Wed 3/1/06
5	**NYSDEC Review / Approval of Plans**	**Tue 1/31/06**	**Thu 5/1/08**
6	Remediation Work Plan Prep'n	Tue 1/31/06	Wed 3/1/06
7	Work Plan Review / Approval	Thu 2/2/06	Fri 9/1/06
8	Remedial Design Preparation	Mon 9/4/06	Fri 8/3/07
9	Remedial Design Rev'w / Approval	Fri 8/24/07	Thu 5/1/08
10	**Bidding and Implementation**	**Wed 8/20/08**	**Tue 5/19/09**
11	Obtain Bids	Wed 8/20/08	Tue 9/30/08
12	Final Building Demolition	Wed 10/1/08	Thu 12/18/08
13	Implement Remedy	Tue 10/21/08	Mon 3/23/09
14	Final Certification	Tue 3/24/09	Thu 5/14/09
15	Easements & Inst'Controls	Fri 5/15/09	Tue 5/19/09



Project: Circle_M_Gantt_Chart
Date: Thu 2/15/07

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

ENGINEERING DRAWINGS

APPENDIX A

RECORD OF DECISION
(ROD)

Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Circle M Wood Treating Corporation
Town of Fishkill, Dutchess County
Site Number 3-14-083

September 2005

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* DENISE SHEEHAN, *Acting Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Circle M Wood Treating Corporation
Inactive Hazardous Waste Disposal Site
Town of Fishkill, Dutchess County, New York
Site No. 3-14-083

Statement of Purpose and Basis

This Record of Decision (ROD) presents the selected remedy for the Circle M Wood Treating Corporation site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Circle M Wood Treating Corporation inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Circle M Wood Treating Corporation site and the criteria identified for evaluation of alternatives, the NYSDEC has selected on-site excavation and consolidation of the contaminated soil. The components of the remedy, which will allow 14 acres of this 20 acre site to have unrestricted use, are as follows:

- A remedial design program will be developed to provide the details necessary to implement the remedial program. This will include additional sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.
- The former treatment building will be demolished.

- Contaminated soil will be excavated and consolidated on-site. Soils will be consolidated within a designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two feet of clean fill.

- An erosion control program in the form of grass or other vegetative cover will be developed to stabilize soils on the stream bank.

- Three bedrock monitoring wells (one upgradient and two downgradient) and one upgradient overburden well will be installed.

- A site management plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soils that may be excavated from the consolidation area in the future; provide for the operation and maintenance of the components of the remedy; monitor groundwater; and identify any restrictions on site development or groundwater use.

- An environmental easement will be recorded, which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking.

- The SMP will require that the property owner complete and submit to the NYSDEC an Institutional Control/ Engineering Control (IC/EC) certification periodically.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

SEP 30 2005

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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RECORD OF DECISION

Circle M Wood Treating Corporation Site
Town of Fishkill, Dutchess County, New York
Site No. 3-14-083
September 2005

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Circle M Wood Treating Corporation site. The presence of hazardous waste has created significant threats to human health and the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, releases from past lumber treatment process and waste management practices have resulted in the disposal of chromated copper arsenate (CCA) which has constituent elements, chromium, arsenic and copper, that are deemed hazardous at certain concentrations in soil because of their leaching characteristics. The disposal of CCA has contaminated the soil and groundwater at the site. These disposal activities have resulted in:

- a significant threat to human health associated with exposure to contaminated soil and groundwater; and
- a significant environmental threat associated with the impacts of contaminants to surface soil, subsurface soil and stream sediment.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- A remedial design program will be developed to provide the details necessary to implement the remedial program. This will include additional sampling of surface water, sediment, and soil from both banks of the adjacent stream, with analysis for site-related contaminants.
- The former treatment building will be demolished.
- Contaminated soil will be excavated and consolidated on-site. Soils will be consolidated within a designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two feet of clean fill.
- An erosion control program will be developed to stabilize soils on the stream bank . The erosion control would be in the form of grass or other vegetative cover.
- Three bedrock monitoring wells (one upgradient and two downgradient) and one upgradient overburden well will be installed.

- Since the remedy will result in contamination above unrestricted levels remaining at the site, a site management plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soils that may be excavated from the consolidation area during in the future (e.g., utility repair/installation); provide for the operation and maintenance of the components of the remedy; monitor the groundwater; and identify any restrictions on site development or groundwater use.

- An environmental easement will be recorded, which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking.

- The SMP will require that the property owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The former Circle M wood treatment facility is located in the Chelsea Industrial Park at the end of Brockway Road in the Town of Fishkill, Dutchess County (see Fig. 1). Circle M occupied a 18,500 square foot building which was one of six buildings (see Fig. 2) located in the 58.6 acre Chelsea Industrial Park. The site is comprised of a 20-acre area. The site is approximately 0.25 miles east of the Hudson River at an elevation of 55 feet above mean sea level. An unnamed stream flowing north, located approximately 100 feet from the Circle M building, forms the eastern boundary of the site. Across the stream, and extending from the north to the southeast, are residential properties (see Fig. 3). The facilities at the site and most of the nearby residences are supplied with public water from off-site wells operated by the Rombout Water District. However, two private wells are reported to be within a quarter mile radius, upgradient and northeast of the site.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Circle M wood treatment facility operated from 1986 to 1990. The facility treated wood by impregnating it with chromated copper arsenate (CCA) as a preservative. Improper operational and waste management practices resulted in spills and drippage of CCA during the 1986-1990 period both indoors (from storage tanks, the treatment process, and associated piping) and outdoors (from storage of fresh batches of incompletely dried treated lumber). The metals arsenic (As), chromium (Cr) and copper (Cu) form the principal constituents of CCA. Circle M vacated the property in early 1990.

3.2: Remedial History

In 1986, Circle M was cited by the NYSDEC for Resource Conservation and Recovery Act (RCRA) violations, including the improper storage of treated wood.

Between 1987-1989, the property owner conducted two site investigations. Reports were generated dated September 1987 and January 1989.

The site was placed on the State's Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site in 1990, based on the analytical data collected. A Class 2 site is a site where hazardous waste presents a significant threat to the public health and/or the environment and action is required.

In the spring of 1990, during the repossession of leased equipment by the supplier, an accidental spill of approximately 3,000 gallons of CCA occurred, which was cleaned up by a NYSDEC spill contractor. Six months later, during an inspection of frozen pipes, another spill of approximately 1,600 gallons of CCA was discovered and also cleaned up by a NYSDEC spill contractor.

Between 1990 and 1997, several other removal activities were conducted at the site by the property owner. These included the removal and recycling of 256 drums of liquid waste and 18,000 gallons of liquid waste stored in tanks on-site.

The above on-site removal activities and subsequent regrading have altered the characterization of the extent of contamination defined by the data collected during the investigations in 1987 and 1989. Therefore, no further consideration will be given to the data obtained from these investigations, except for the metals concentrations data for the background soil samples collected from off-site locations, since these areas were not disturbed by Circle M activities. Investigations reports listed in Section 5.1 below provide more reliable data for the assessment of contamination on-site.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators and haulers.

The NYSDEC, Chelsea Industrial Park Inc. and Chemical Specialties Inc. entered into a Consent Order on June 27, 1997. The Order obligates the responsible parties to implement a Focused RI/FS remedial program. Upon issuance of the ROD the NYSDEC will approach the PRPs to implement the selected remedy under either an Order on Consent or as part of the Brownfield Cleanup Program.

SECTION 5: SITE CONTAMINATION

A focused remedial investigation/feasibility study (FRI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between September 1997 and September 2002.

The field activities and findings of the investigation are described in the September 2002 RI report entitled "Supplemental Remedial Investigation: Circle M Wood Treating Site". Findings are also documented in the following reports, which were generated in conjunction with the RI/FS:

- Remedial Investigation Report, September 1998;
- Biological Resource Inventory and Impact Assessment, October 1999;
- Focused Feasibility Study, October 1999; and
- Supplemental Remedial Investigation Report, July 2001.

The following activities were conducted during the RI:

- February 1998: Stream sediment samples were collected at three points. Groundwater samples were collected from six monitoring wells for the metals As, Cr, and Cu;
- April 1998: Groundwater was resampled for metals in monitoring wells MW-1, 3, and 7;
- January 1999: Geoprobe borings were installed to a depth of six feet with sampling in two foot intervals. In addition, six surface soil samples were collected in the 0-0.5 foot range and analyzed for As, Cr and Cu;
- March 2001: Soil samples (12 total) were collected from six locations. The samples were collected from both the 0-4 inch and 8-12 inch depth ranges, and analyzed for As, Cr, and Cu;
- May-June 2001: Sediment samples were collected from two locations and surface water samples were collected from five locations from the unnamed stream on the eastern border of the site. Additional geoprobe borings were installed to a depth of two feet and sampled in six inch intervals for As, Cr, and Cu. A total of 53 soil samples were collected and analyzed;
- February 2002: An additional 33 geoprobe borings were installed to a depth of two feet; and sampled in six inch intervals for As, Cr and Cu. A total of 142 soil samples were collected and analyzed; and
- April 2002: Ten geoprobe borings were installed to a depth of two feet; with sampling in six inch intervals for As, Cr, and Cu. A total of 44 soil samples were collected and analyzed.

To determine whether the soil and groundwater contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water and surface water SCGs are based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code;

- Soil SCGs, to be used in conjunction with the NYSDOH human health exposure assessment in Section 5.3, are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046, Determination of Soil Cleanup Objectives and Cleanup Levels"; and in this case take into account the site-related background levels. The remedial objectives selected for this site are 13 parts per million (ppm), 25 ppm and 25 ppm, for arsenic, chromium and copper respectively; and

- Sediment SCGs, to be used in conjunction with the environmental impact assessment in Section 5.4, are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI report.

5.1.1: Site Geology and Hydrogeology

The site soils are characterized by thick lacustrine deposits of silt and clay overlain by 2 to 8 feet of gravel/fill. The groundwater flow direction in the overburden soil is east-northeast (see Fig. 5). The depth to the groundwater table, allowing for seasonal changes and topography, ranges from 4-11 feet below the ground surface and is in the silt/clay layer. The well log indicates that shale was encountered at a depth of 6 feet below ground surface in some locations. Based upon the available data, rate of lateral and downward flow of groundwater, and consequently the rate of transport of contaminants, would be low.

5.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater, surface water, and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are As, Cr, Cu which are the constituents of CCA, the chemical used by Circle M as a wood preservative.

5.1.3: Extent of Contamination

This section describes the findings of the investigation for all environmental media investigated. Table 1 summarizes the degree of contamination for the contaminants of concern (i.e., the heavy metals As, Cr, and Cu) in surface soil (top six inches), subsurface soil, sediment, groundwater, and surface water. The following are the media which were investigated and a summary of the findings of the investigation.

Chemical concentrations are reported in parts per billion (ppb) for water, and parts per million (ppm) for soil and sediment. For comparison purposes, where applicable, SCGs are provided for each medium.

Surface Soil

Figure 6 depicts the areas where contamination was identified at shallow depths (0-6 inches). The locations of the highest contaminant concentrations in surface soil are as follows: As at 557 ppm at sample GB-13 (see Fig. 4) under the building; Cr at 326 ppm at GB-40, which is located northeast of the Circle M building and 100 feet west of stream, and Cu at 296 ppm at GB-40. Elsewhere on-site the contamination concentrations are at lower levels.

Subsurface Soil

The location of the highest contaminant concentrations at depths greater than six inches is GB-14 which is under the building (see Fig. 4). Contaminant concentrations were detected as follows: As at 505 ppm, Cr at 1225 ppm and Cu at 665 ppm. Elsewhere on-site, the locations where the contaminant concentrations exceed the background concentrations, were generally observed to be south of the building, west of the stream (which includes the drip pad used for drying freshly treated lumber). The maximum concentrations of As, Cr and Cu outside the building footprint are 230, 179, and 207 ppm, respectively, at location GB-40.

Sediment

Three sediment samples were analyzed in 1998 and two in 2001 (see Table 1). Arsenic was detected at 47.8 ppm, which is above the Severe Effects Level (SEL) of 33 ppm, at sample location S2. This is the only sediment sample that exceeded the SEL.

Groundwater

The groundwater quality data collected from the seven shallow monitoring wells at the site serve to assess the nature and extent of contamination in the shallow saturated zone. The results of unfiltered groundwater sample analysis provide an assessment of the suspended and dissolved metals in the sample, whereas the filtered sample analysis was conducted to quantify only the dissolved metals. The dissolved fraction better represents the potential for transport of contaminants with groundwater flow. Several factors can affect the unfiltered sample results, including the design and construction of the well; the fineness of the soil particles (which can affect turbidity); and the propensity of soil particles to adsorb metals.

The results of 26 groundwater samples collected from seven monitoring wells are summarized in Table 1. The depths of the seven existing overburden wells at the site range from 17-24 feet. Groundwater is in the range of 4-11 feet below ground surface.

None of the filtered samples analyzed during the RI exceeded the SCGs. The unfiltered results varied widely, however. For example, monitoring well MW-1 had the highest concentrations. MW-1 had 1,430 ppb of Cu in the February 1998 sample, 575 ppb in the April 1998 sample and 292 ppb in the June 2001 sample. MW-1 is located immediately west of the Circle M building. The concentration of As and Cr in samples analyzed in June 2001 from MW-1 were 24 ppb and 161 ppb, respectively. The groundwater standards for As, Cr and Cu are 25, 50 and 200, respectively. MW-1 has, among all the overburden wells, the shallowest depth to the groundwater table at about 4-5

feet below ground surface. It also has the highest groundwater table elevation. The set of unfiltered sample results is insufficient to conclusively determine the concentration trends in MW-1.

Surface Water

Five surface water samples were collected during the RI. The surface water contamination that exceeds the SCG is limited to copper. The range of copper concentrations observed in the stream were 37-48 ppb. The SCG for copper is 9 ppb. Since copper was recorded above the SCG in the furthest upstream sample, ST-1, at 43 ppb, the copper contamination in the stream is not considered to be site-related. Rather, the copper contamination in the stream is considered to be due either to a naturally high background level, or another upstream source.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

An IRM was conducted at the site during the latter part of the RI/FS, in which two abandoned petroleum underground storage tanks were excavated and removed from the site. The soil in the footprints of the excavated tanks was removed and disposed of off-site. In addition, as described in Section 3.2, several CCA spill removal actions were conducted by the NYSDEC between 1990 and 1997.

5.3: Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5.3 and Table 1 of the FS report.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population. The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway are documented. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

The following potential exposure pathways relate to on-site soil and groundwater:

- Incidental ingestion of and/or dermal contact with on-site soils is a potential pathway of exposure if the area(s) of contamination currently covered by gravel or asphalt is not maintained;

- Inhalation of particulates should the site be subject to invasive (e.g., excavation) activities without implementation of adequate monitoring and dust control measures; and

- Workers involved in site excavations may come in contact with contaminated groundwater.

5.4: Summary of Environmental Impacts

This section summarizes the existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The October, 1999 "Biological Resource Inventory and Impact Assessment" prepared for this site presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors. The following environmental exposure pathways and ecological risks have been identified:

- The potential impact of contaminated sediment on the flora and fauna in the unnamed stream on the eastern border of the site.

In 1999, a qualitative examination of the stream showed that the macroinvertebrate composition was similar to that in a nearby, uncontaminated reference stream, indicating that there were no significant impacts from the site.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- Exposures of persons at or around the site to As, Cr, and Cu in soil and groundwater;

- Environmental exposures of flora or fauna to As, Cr, and Cu in sediment;

- The release of contaminants from soil into groundwater that may create exceedences of groundwater quality standards; and

- The release of contaminants from surface soil into air through wind borne dust.

Further, the remediation goals for the site include attaining to the extent practicable:

- TAGM 4046 objectives, which in this case take into account the site related background levels for arsenic, chromium and copper of 13 ppm, 25 ppm and 25 ppm, respectively.

- Groundwater SCGs based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Circle M site were identified, screened and evaluated in the December 16, 2002 report entitled "Focused Feasibility Study: Circle M Wood Treating Site".

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The potential remedies are intended to address the contaminated soil and groundwater at the site.

Alternative 1: No Action

Present Worth: $122,980
Capital Cost: $8,000
Annual OM&M: $8,000

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Excavation and Consolidation of Contaminated Soil On-site; Implementation of an Erosion Control Program for Stream Protection; Installation of Three Bedrock Monitoring Wells and Implementation of Deed Restrictions

Present Worth: $2,325,000
Capital Cost: $1,930,000
Annual OM&M: $29,250

Under Alternative 2, contaminated soil would be excavated and consolidated on-site as shown in Fig. 6. The extent and depth of the area of concern was determined after consideration of the SCGs

for As, Cr and Cu. The former Circle M wood treating building would be demolished, but the slab would be left in place within the soil consolidation area. The soil consolidation area would be covered by a two-foot soil cover consisting of clean fill. Prior to placement of the soil cover, a geotextile fabric would be installed to serve as a demarcation barrier. Also, an erosion control program would be implemented to prevent soil from washing into the stream. The erosion control would be in the form of grass or other vegetative cover.

In addition, three bedrock wells (two upgradient and one downgradient) and a shallow upgradient well would be installed. There are six former Rombout Water District supply wells near the site that were abandoned, due to problems unrelated to the site. The new bedrock wells on-site would serve as sentinel wells to warn of any potential impacts to a future re-commissioning of the abandoned wells, or installation and use of new supply wells nearby. The upgradient shallow well would enable a better assessment of the impact on the shallow groundwater at the site. This well network, which includes the existing seven shallow wells, would be sampled after the completion of the remedial action and thereafter as determined by a site management plan.

A site management plan would be developed to address residual contaminated soils that may be excavated from the site during future intrusive activity (e.g., utility repair); address the operation and maintenance components of the remedy; groundwater monitoring requirements; and identify restrictions on site development or groundwater use. Also, an environmental easement would be recorded, which limits the use of the consolidated area to green space or parking, and the property owner would be required to provide a periodic Institutional Control/Engineering Control (IC/EC) certification. This document would certify that the institutional controls and engineering controls put in place, are unchanged from the previous certification and nothing has occurred that would impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with the site management plan.

Alternative 3: Excavation and Off-Site Disposal (Excluding Sub-Floor Soil); Implementation of an Erosion Control Program for Stream Protection; Installation of Three Bedrock Monitoring Wells and Implementation of Deed Restrictions

Present Worth: *$19,873,000*
Capital Cost: *$19,038,760*
Annual OM&M: $61,750

Under Alternative 3, the soil excavated to depths ranging from 0.5-2 feet in the 10-acre excavation area outlined in Fig. 6, excluding that under existing structures, would be disposed of off-site at a permitted disposal facility, instead of being consolidated and covered. The volume of soil that would be removed is estimated to be 36,000 cubic yards. All other provisions of Alternative 2 would apply.

Alternative 4: In-Situ Soil Treatment; Implementation of an Erosion Control Program for Stream Protection; Installation of Three Bedrock Monitoring Wells; and Implementation of Deed Restrictions

Present Worth: *$4,491,800*
Capital Cost: *$3,657,500*

Annual OM&M: $61,750

Under Alternative 4, in-situ soil treatment would be used to remediate the areas of contamination depicted in Fig. 6, with the exception of the soil underneath existing structures. All other provisions of Alternative 2 would apply.

In-situ soil treatment would consist of one or more of four soil treatment technologies. These technologies include electrokinetic remediation, phytoremediation, soil flushing and solidification/stabilization. The cost estimate provided above reflects the cost for stabilization, however, pilot testing would be needed to determine the appropriate in-situ treatment.

Alternative 5: Asphalt Pavement; Sub-Floor Soil Excavation and Off-Site Disposal; Implementation of an Erosion Control for Stream Protection; Installation of Three Bedrock Monitoring Wells; Institution of a Groundwater, Surface Water, and Sediment Monitoring Program; and Implementation of Deed Restrictions

Present Worth: *$4,192,000*
Capital Cost: *$3,357,800*
Annual OM&M: $61,750

Under Alternative 5, the soil underneath the former treatment building (see Fig. 2) would be excavated and disposed of off-site. Asphalt pavement, building slab(s) or a two-foot soil cover would be installed across the balance of the contaminated area. All other provisions of Alternative 2 would apply.

Alternative 6: Excavation and Off-Site Disposal (Including Sub-Floor Soil); Implementation of an Erosion Control Program for Stream Protection; Installation of Three Bedrock Monitoring Wells; and Implementation of Deed Restrictions

Present Worth: *$21,075,000*
Capital Cost: *$20,240,800*
Annual OM&M: $61,750

Under Alternative 6, the soil in the excavation and consolidation areas outlined in Fig. 6 would be excavated, including the soil underneath the Circle M building. The excavated soil would be sent to an appropriate disposal facility. Other provisions of Alternative 2 (e.g., groundwater monitoring) would apply, but the need for restrictions on site use would be eliminated.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

7. Cost-Effectiveness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. During the public meeting on the PRAP held on March 14, 2005 and during two subsequent 30 day extensions to the comment period, concerns were raised relative to the remedy proposed by the PRAP. Concerns were voiced relative to future development of the site, the ability to maintain an effective, protective cover system, and the extent of the area to be managed by an environmental easement and site management plan. The comments received resulted in several significant modifications to the remedy, as proposed in the PRAP. The responsiveness

summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 2, Excavation and Consolidation of Contaminated Soil On-site, as the remedy for this site. The selected remedy was based upon due consideration of the comments received during the public comment period. The selected remedy will include nearly ten acres of soil excavation to depths ranging from 0.5-2 feet, with consolidation of that material into a six-acre soil consolidation area. The consolidation area will have a two-foot clean soil cover. The soil consolidation area will be subject to future use restrictions, however, the areas surrounding the consolidation area will be free of use restrictions.

Alternative 2 will include: a pre-design sampling program to confirm the limits of the remedial program, including additional sampling soil, sediment and surface water in the adjacent creek; demolition of the former treatment building; the excavation and consolidation of contaminated soil on-site, as shown in Fig. 6; installation and sampling of three bedrock wells (two upgradient and one downgradient) as well as sampling and analysis of groundwater from existing wells; an erosion control program in the form of grass or other vegetative cover, to stabilize soils on the stream bank; development of a site management plan which will dictate future site monitoring, maintenance and reporting requirements; and implementation of institutional controls.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Alternative 2 is being selected because, as described below, it will satisfy the threshold criteria and will provide the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by covering the soils that create the most significant threat to public health and the environment, which will also greatly reduce the source of contamination to groundwater. Alternatives 3, 4, 5, and 6 would also comply with the threshold selection criteria, but at a higher cost or (in the case of Alternative 4) with lower certainty.

Because Alternatives 2, 3, 4, 5, and 6 satisfy the threshold criteria, the five balancing criteria were particularly important in selecting a final remedy for the site.

Alternatives 2 (excavation with on-site consolidation), 3 (excavation, excluding Circle M building footprint), 4 (in-situ soil treatment), 5 (capping and Circle M building footprint excavation), and 6 (excavation, including Circle M building footprint) all have short-term impacts which can easily be controlled. The time needed to achieve the remediation goals are comparable for all alternatives.

Achieving long-term effectiveness would best be accomplished by excavation and removal of the contaminated overburden soils (Alternatives 3 and 6). However, the cost of these alternatives would be 4-5 times that for alternatives 2, 4, and 5. Alternative 2 will be favorable because it will result in the consolidation of all contaminated soil at the site that exceeds the site-cleanup goals for any of the metals of concern, and would cost considerably less than Alternatives 4 and 5 for similar protection.

The pilot-testing required for Alternative 4 would resolve the question of its long-term effectiveness. The other alternatives would have no question as to their long-term effectiveness, especially since

the effectiveness of the capping required by Alternatives 2 and 5 will be maintained by an environmental easement.

Alternatives 6, 3, and 5 would reduce the volume of waste on-site, in that order (i.e., 60,000, 54,000, and 6,000 tons, respectively). However, Alternative 2 will cover the contaminated soil with a two-foot cover of clean fill, while Alternative 4 would attempt to stabilize the contamination with an in-situ soil treatment process.

All alternatives would reduce the mobility of the contaminants, although the long-term effectiveness of Alternative 4 would have to be proved via pilot-testing.

The cost of the alternatives varies significantly (i.e.,$2,325,000-$21,075,000). However, Alternative 2 will be the least expensive remedy, and will provide effective protection of public health and the environment.

The estimated present worth cost to implement the remedy will be $2,325,000. The cost to construct the remedy is estimated to be $1,930,000 and the estimated average annual operation, maintenance, and monitoring costs for four or more years is $29,250.

The elements of the selected remedy will be as follows:

1. A remedial design program will be developed to provide the details necessary to implement the remedial program. This will include additional sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

2. The former treatment building will be demolished.

3. Contaminated soil will be excavated and consolidated on-site. Soils will be consolidated within a designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two feet of clean fill.

4. An erosion control program in the form of grass or other vegetative cover will be developed to stabilize soils on the stream bank.

5. Three bedrock monitoring wells (one upgradient and two downgradient) and one upgradient overburden well will be installed.

6. A site management plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soils that may be excavated from the consolidation area during in the future (e.g., utility repair/installation); provide for the operation and maintenance of the components of the remedy; monitor the groundwater; and identify any restrictions on site development or groundwater use.

7. An environmental easement will be recorded, which identifies all use restrictions. Uses in the consolidation area will be limited to green space or parking.

8. The SMP will require that the property owner complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification periodically.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A fact sheet was mailed on 2/28/05.
- A public meeting was held on 3/14/05 to present and receive comment on the PRAP.
- Notices were mailed on 3/05 and 5/05 extending the length of the public comment period.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

TABLE 1
Nature and Extent of Contamination
September 1998 - September 2002

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)	SCG (ppm)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	0.31-557	13	37 out of 81
	Chromium	4.27-326	25	35 out of 81
	Copper	4.93-296	25	62 out of 81

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)	SCG (ppm)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	0.36-505	13	39 out of 212
	Chromium	2.12-1,225	25	30 out of 212
	Copper	3.85-665	25	119 out of 212

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)	SCG (ppm)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	1.24-47.8	LEL - 6	4 out of 5
			SEL - 33	1 out of 5
	Chromium	11.1-32.6	LEL - 26	1 out of 5
			SEL -110	0 out of 5
	Copper	15.0-34.1	LEL - 16	4 out of 5
			SEL -110	0 out of 5

TABLE 1 (continued)
Nature and Extent of Contamination
September 1998 - September 2002

GROUNDWATER (Unfiltered samples)	Contaminants of Concern	Concentration Range Detected (ppb)	SCG (ppb)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	2.1-284	25	5 out of 16
	Chromium	4.2-236	50	7 out of 16
	Copper	4.8-1,430	200	4 out of 16

GROUNDWATER (Filtered samples)	Contaminants of Concern	Concentration Range Detected (ppb)	SCG (ppb)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	2.1-22	25	0 out of 10
	Chromium	4.2-14	50	0 out of 10
	Copper	9.6-49	200	0 out of 10

SURFACE WATER	Contaminants of Concern	Concentration Range Detected (ppb)	SCG (ppb)	Frequency of Exceeding SCG
Inorganic Compounds	Arsenic	0-5	150	0 out of 5
	Chromium	0-10	74	0 out of 5
	Copper	37-48	9	5 out of 5

ppb = parts per billion, which is equivalent to micrograms per liter (ug/L) in water.

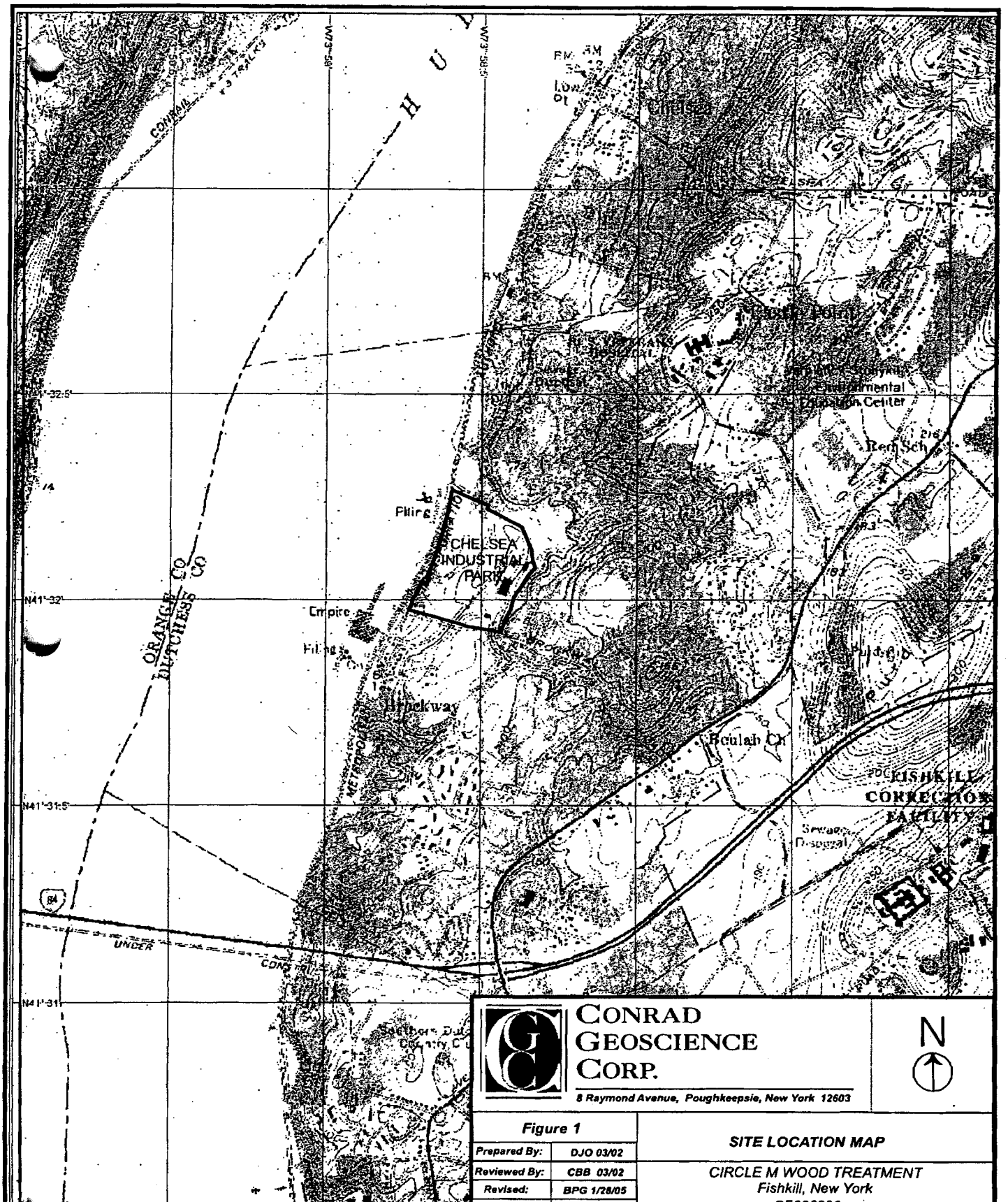
ppm = parts per million, which is equivalent to milligrams per kilogram (mg/kg) in soil.

SCG = standards, criteria, and guidance values based on unrestricted use.

LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LEL is exceeded, the impact is considered to be moderate.

TABLE 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
No Action	$8,000	$8,000	$122,980
Excavation and On-site Consolidation	$1,930,000	$29,250	$2,325,000
Excavation and Off-site Disposal (Excluding Sub-Floor Soil)	$19,038,760	$61,750	$19,873,000
In-Situ Soil Treatment	$3,657,500	$61,750	$4,491,800
Low Permeability Capping, Sub-Floor Soil Excavation and Off-site Disposal	$3,357,800	$61,750	$4,192,000
Excavation and Off-site Disposal (Including Sub-Floor Soil)	$20,240,800	$61,750	$21,075,000



CONRAD GEOSCIENCE CORP.

8 Raymond Avenue, Poughkeepsie, New York 12603

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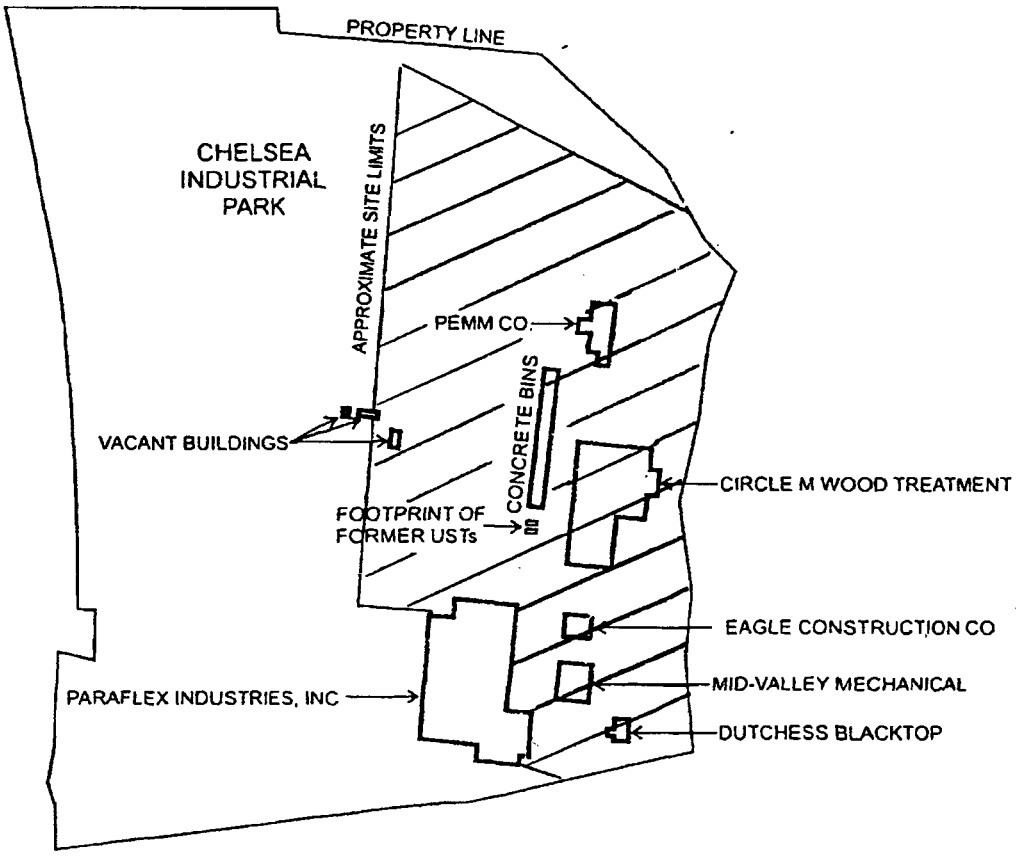
Figure 1	
Prepared By:	DJO 03/02
Reviewed By:	CBB 03/02
Revised:	BPG 1/28/05
Approved By:	JAC 1/28/05

SITE LOCATION MAP

CIRCLE M WOOD TREATMENT
Fishkill, New York
CF030290

3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

643 ft Scale: 1 : 22,400 Detail: 13-0 Datum: WGS84



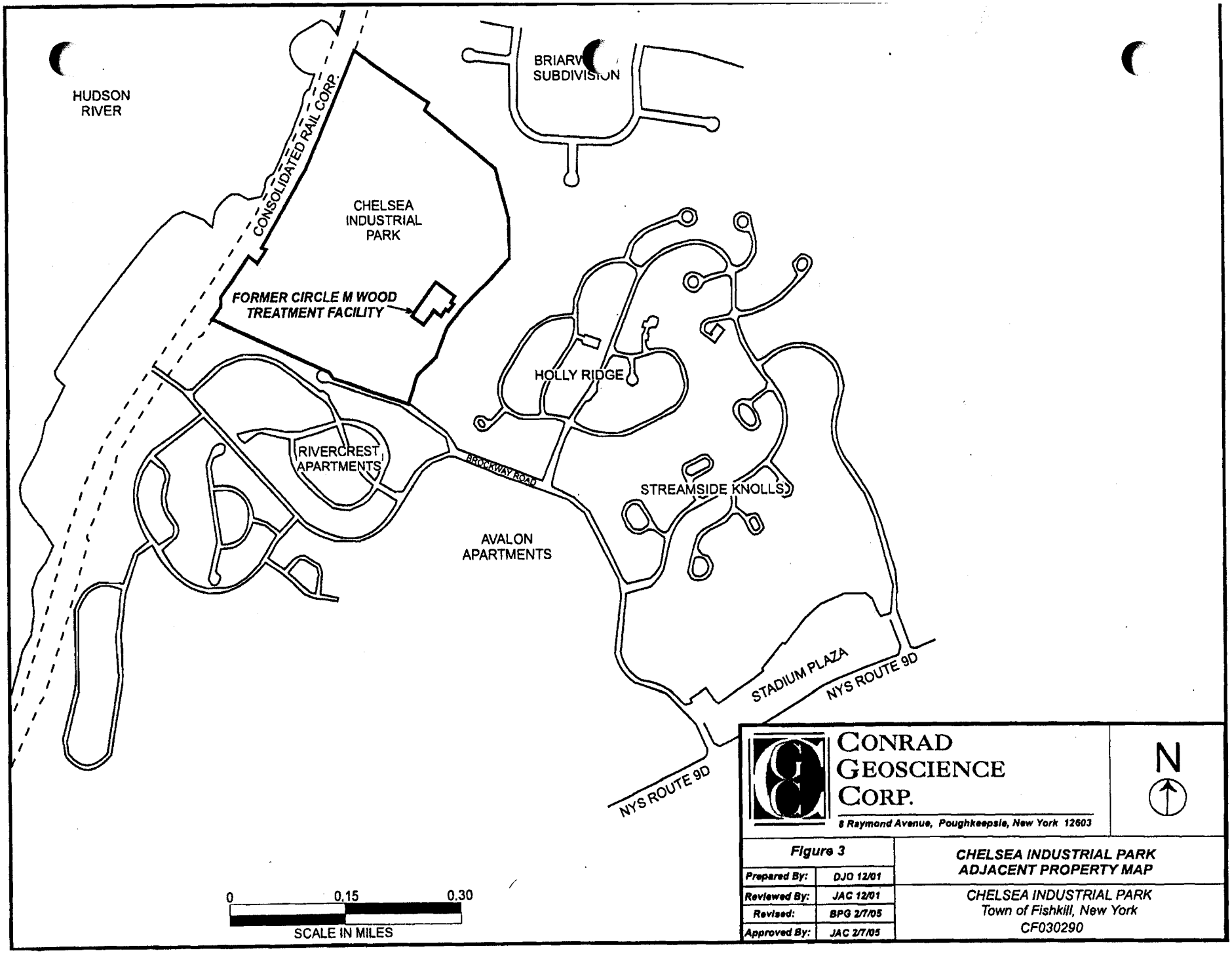
Approximate Site Limits

0 FEET 200
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8 Raymond Avenue, Poughkeepsie, New York 12603

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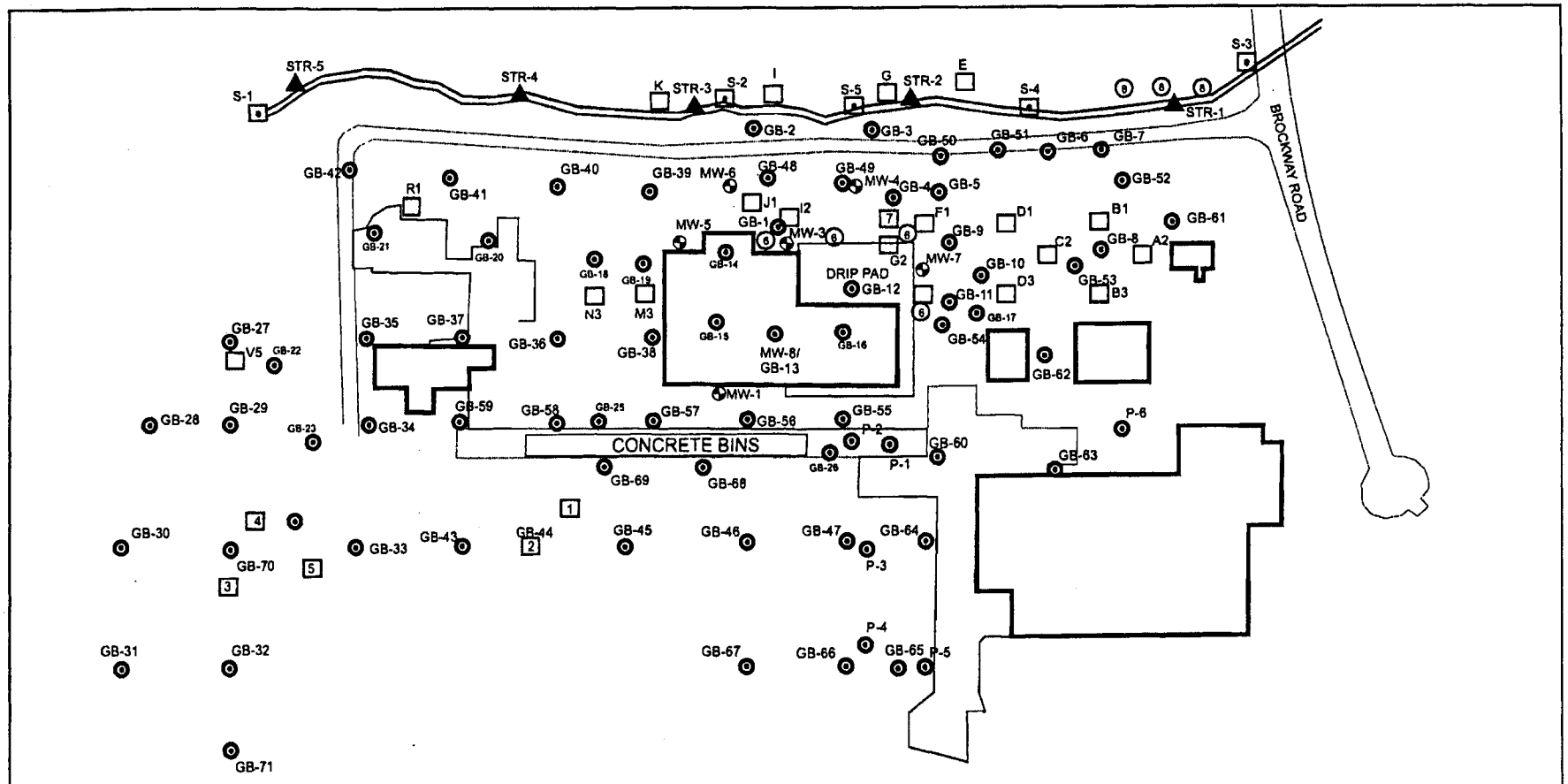
Figure 2		ONSITE STRUCTURES
Prepared By:	DJO 03/02	CIRCLE M WOOD TREATMENT Fishkill, New York CF030290
Reviewed By:	CBB 03/02	
Revised:	BPG 1/28/05	
Approved By:	JAC 1/28/05	



CONRAD GEOSCIENCE CORP.

8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 3		CHELSEA INDUSTRIAL PARK ADJACENT PROPERTY MAP
Prepared By:	DJO 12/01	
Reviewed By:	JAC 12/01	CHELSEA INDUSTRIAL PARK
Revised:	BPG 2/7/05	Town of Fishkill, New York
Approved By:	JAC 2/7/05	CF030290



LEGEND

- STREAM LOCATION
- STREAM WATER SAMPLE LOCATION
- STREAM SEDIMENT SAMPLE LOCATION
- CGC SOIL BORING LOCATION
  GB 1-12 COMPLETED JAN 99'
  GB13-26 COMP. MAY 01'
  GB 27-60 COMP. FEB 02'
  GB 60-71 COMP. APR 02'
- LBG (1987)and DUNN(1989) SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION

0 FEET 200
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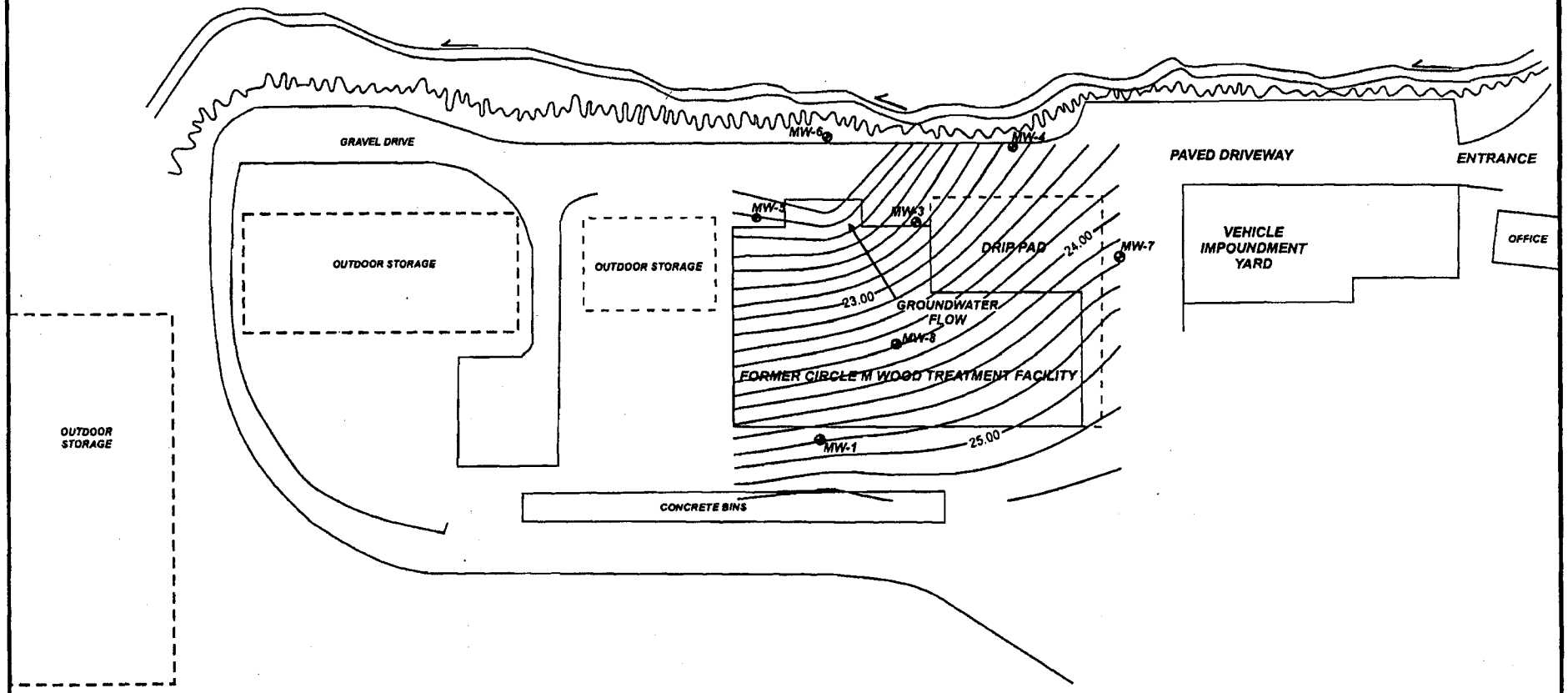
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8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 4	
Prepared By:	DJO 05/16/02
Reviewed By:	JAC 05/16/02
Revised By:	BPG 2/4/05
Approved By:	JAC 2/4/05

MONITORING WELL & SAMPLE LOCATION MAP

CHELSEA INDUSTRIAL PARK
Fishkill, New York
CF030290



LEGEND

GROUNDWATER MONITORING WELL

0 80 160

FEET

Contour Interval = 0.2'

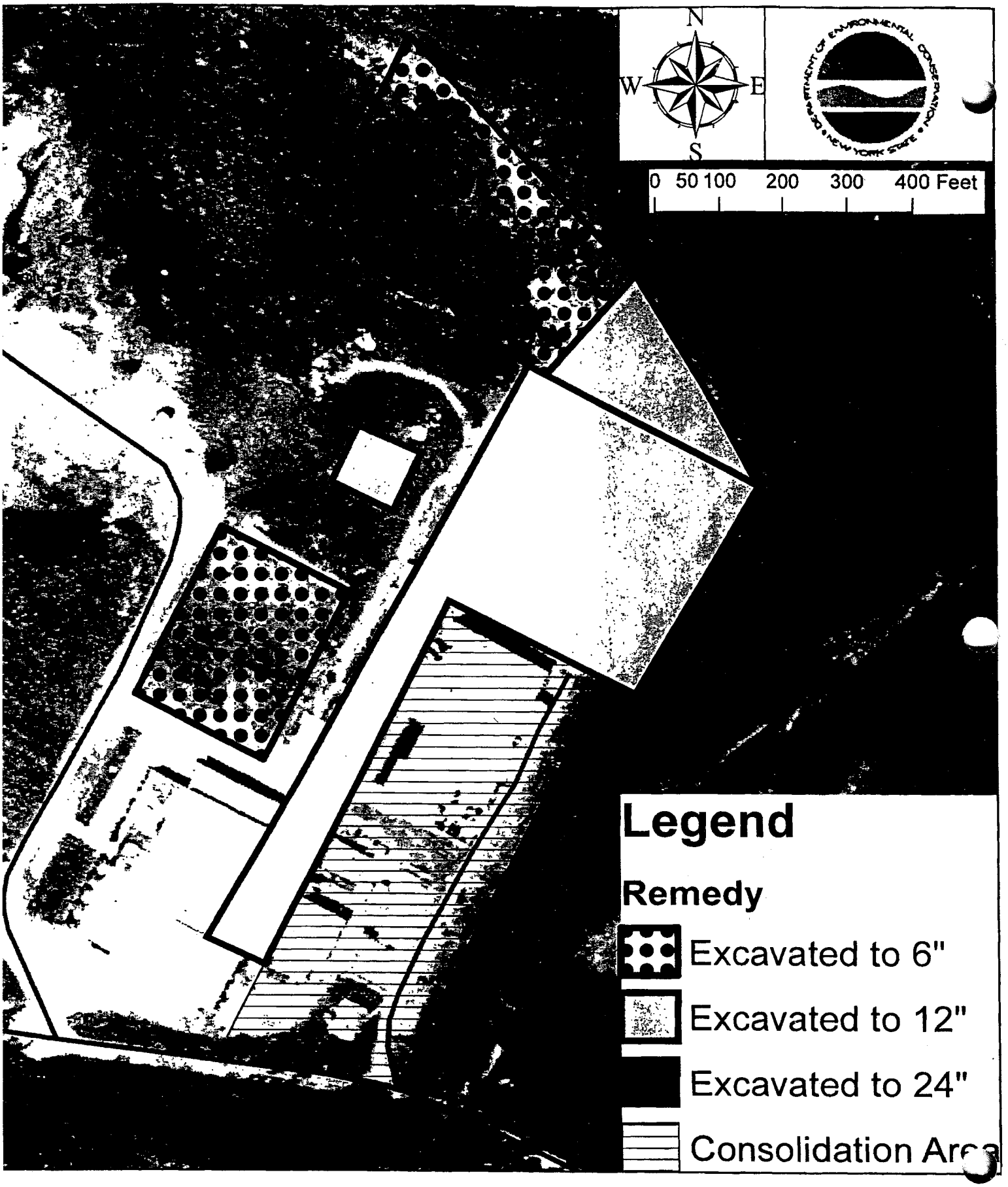
Elevations surveyed relative to local datum.

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8 Raymond Avenue, Poughkeepsie, New York 12603

N

Figure 5		GROUNDWATER CONTOUR MAP
Prepared By:	CBB 5/98	CHELSEA INDUSTRIAL PARK Fishkill, New York CF030290
Reviewed By:	JAC 5/98	
Revised By:	BPG 2/16/05	
Approved By:	JAC 2/16/05	



Circle M Wood Treatment Figure 6

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Circle M Wood Treating Corporation
Town of Fishkill, Dutchess County, New York
Site No. 3-14-083

The Proposed Remedial Action Plan (PRAP) for the Circle M Wood Treating Corporation site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 28, 2005. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Circle M Wood Treating Corporation site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 14, 2005, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on June 10, 2005.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the NYSDEC's responses:

COMMENT 1: As a resident, I have to say I am not in agreement with the proposed remedy, and I hope that the NYSDEC and the NYSDOH will take our concerns seriously and propose a more permanent and protective alternative.

RESPONSE 1: The NYSDEC and NYSDOH have evaluated the comments expressed during the comment period. In response, several significant modifications to the remedy as proposed by the PRAP have been made. These include a comprehensive removal program whereby all contaminated soils will be segregated and consolidated into a single, dedicated area of the site. Use restrictions will be placed on the consolidation area, however, other areas of the site will not be subject to such restrictions. The consolidation area will be covered with a minimum two foot clean soil cover system. Further, based on the concerns voiced, additional sampling will be conducted, including surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

COMMENT 2: How are surface soils defined?

RESPONSE 2: Surface soils were defined as the top six inches of the soil profile for this site.

COMMENT 3: What were the results of the deepest soil samples (i.e., the top six feet of the soil profile)?

RESPONSE 3: Figure 6 of the Record of Decision (ROD) depicts the excavation limits which will address the vertical and horizontal limits of the contaminants of concern (As, Cr, Cu). Although results suggest that the majority of the contamination is situated at shallow depths, the remedial

investigation did reveal contamination in soil as deep as six feet below the ground surface (concentrations up to 505 ppm As, 1,225 ppm Cr, 665 ppm Cu) in areas beneath the former treatment building slab, which will remain in place within the consolidation area.

COMMENT 4: If this property is developed and foundations are built, the two-foot cap will be torn apart. Why not make the cap as deep as the frost line, so that any further construction only occurs in the capped portion of the soil profile, and not in the soil remaining underneath the cap?

RESPONSE 4: The ROD remedy (which differs from the PRAP) calls for consolidation of contaminated soils, a two foot soil cover and a restriction on use of this area. The development on the consolidation area will be limited to green space or parking. A Site Management Plan (SMP) will be developed as a component of the remedy which will require that materials encountered beneath the cover system, due to future excavation in this area (e.g., utility repair), be managed in accordance with appropriate regulations (i.e., proper handling and disposal). The areas of the site which have no contamination, together with areas of the site from which soil will be excavated, will not be subjected to the SMP cover system, thereby allowing 14 acres of the 20 acre site to have unrestricted use.

COMMENT 5: Why not have the preferred remedy, Alternative No. 2, remove the soil underneath the footprint of the former Circle M building, since that is the location of the largest amount of the site's contaminants?

RESPONSE 5: The floor slab of the former Circle M building serves to isolate the underlying contaminants, thus the slab currently serves as an effective barrier which isolates this contamination from the environment and public. By consolidating contaminated soil in this area, the footprint of the contamination throughout the site will shrink considerably. The slab will continue to function as a barrier to the deepest contamination, and the two foot clean soil cover will serve as barrier to the consolidated material. Removal of the floor slab and excavation of this contaminated soil would only result in an increase in cost, duration of the remedy and potential for short term impacts, without providing a significant increase to the protection of human health and/or the environment.

COMMENT 6: Isn't time of the essence for this site? Otherwise, it could become the next Shenandoah Road or East Fishkill site.

RESPONSE 6: It is anticipated that this remedy will be undertaken by the site owner. In fact, the site owner has already submitted an application to the NYSDEC's Brownfield Cleanup Program. Should the owner or any other party be unwilling or unable to implement the remedial program in a timely manner, the NYSDEC will address contamination using the State Superfund. Since the contaminants of concern at this site are metals, not chlorinated solvents as is the case in Shenandoah Road and Hopewell, the groundwater contamination associated with this site will not result in vapor intrusion issues such as were associated with Shenandoah Road or Hopewell.

COMMENT 7: Some of us didn't get the Fact Sheet at the start of the comment period, so can the comment period be extended?

RESPONSE 7: The comment period was extended twice, by thirty days each time, until June 10, 2005.

COMMENT 8: The PRAP was not available at the specified public website today (3/14/05), so what can be done about this?

RESPONSE 8: PRAPs are made available to the public at document repositories, and these locations are listed on the correspondence distributed by the NYSDEC. In addition the Circle M PRAP was posted on the NYSDEC's website at: http://www.dec.state.ny.us/website/der/projects/reg3/314083.pdf

COMMENT 9: How will we know if the comment period is extended?

RESPONSE 9: All parties on the site's mailing list were notified by mail that the comment period had been extended to June 10, 2005.

COMMENT 10: A two-foot cap isn't deep enough, and maintenance of the cap requires the diligence and good faith of the property owner, so why not clean up all the contamination or send it off-site or at least go with a five-foot cap so that developers won't encounter contaminated soil?

RESPONSE 10: As detailed in Section 8, Alternative 2 was selected based upon its ability to satisfy all the remedy selection criteria. Further, as explained in Response 4, a SMP will be developed as a component of the remedy. In addition, the remedy selected in the ROD requires consolidation of contaminated material. As a result, only 6 acres will require a cover system, compared to the 20 acre area proposed in the PRAP. Please note that future uses of the capped 6 acres will be limited to green space or parking. The owner of the property will also be required to certify to the NYSDEC on a periodic basis that the cover system is in place, functioning as envisioned by the ROD, and in accordance with the SMP.

COMMENT 11: What are the plans for the site's development, and is there just one owner?

RESPONSE 11: Chelsea Waterfront Development, LLC is the site's owner. Details regarding site development should be addressed to the site owner.

COMMENT 12: What effect did the two spills at the site, totaling about 5,000 gallons of CCA spilled, have on the site?

RESPONSE 12: These spills, which were isolated, were remediated by NYSDEC spill contractors. The selected remedy will address the more widespread contamination associated with past site operations.

COMMENT 13: What is the half-life of heavy metals at the site, and can they be treated?

RESPONSE 13: The term half-life is commonly associated with radioactive decay. There are no radiological issues or concerns at this site. As clarified at the meeting, the context of the question is "How long would it take for the contaminants of concern to breakdown, or attenuate?" The contaminants of concern at this site: arsenic, chromium and copper, are in a category of compounds known as inorganics, or more commonly metals. These compounds, unlike organic compounds, are not prone to breakdown, therefore, the concentrations present in site soil will remain unless removed by physical means such as excavation or erosion. Soil stabilization is another method to

address soils contaminated with metals. This process was evaluated as Alternative No. 4 in the ROD.

COMMENT 14: Why put a cap on the site if it's going to be developed later? Doesn't this conflict with the institutional control in Alternative No. 2?

RESPONSE 14: A major difference between the remedy proposed in the PRAP and the ROD is that the area to be capped has been reduced from the entire 20 acres to a 6 acre portion of the site. Please see Response 4 and Response 10 for additional information.

COMMENT 15: One of the criteria in the PRAP for selecting a remedy was short-term effects like dust exposure. Another criteria was long-term effects like dust exposure. Since dust will occur during the upcoming development of the site, why not remove all of the contaminated soil from the site before developing the site? With the removal of contaminated soil from the site, the long-term effect of the dust is eliminated.

RESPONSE 15: During remedial activities a Health and Safety Plan (HASP), which incorporates a Community Air Monitoring Plan (CAMP), will be in effect. The HASP and CAMP address generation and control of dust from site work. Following completion of the remedy, the two-foot soil cover in the consolidation area will serve to isolate the site's contaminants. As soon as the soil cover is in place, dust is eliminated as a long-term effect. Also, the SMP will ensure that actions/activities after the remedial program (e.g., any future construction that penetrates the two-foot cap), will not increase the mobility of the site contaminants. Please note that a major difference between the proposed remedy in the PRAP and the ROD is that the size of the capped area has been reduced to 6 acres. As a result 14 acres of the site will not require use restrictions or have associated "exposure" issues.

COMMENT 16: Who do the consultants work for?

RESPONSE 16: Chelsea Industrial Park, Inc. and Chemical Specialties, Inc. entered into a Consent Order with the NYSDEC in 1997. The Order obligates the responsible parties to implement a Focused Remedial Investigation/Feasibility Study remedial program. These parties procured an engineering consultant, Conrad Geoscience, to conduct this remedial program on their behalf.

COMMENT 17: Does the NYSDEC have the authority to prevent the site from being developed at all?

RESPONSE 17: The NYSDEC, in cooperation with the NYSDOH, is responsible for selecting a remedy that is protective of human and health and the environment. The NYSDEC can not restrict development of a site but can require additional remediation if it is required. As part of a remedy, certain use restrictions may be required but the decisions relative to site development/redevelopment (e.g., zoning) are the jurisdiction of the municipal government. Often times, as part of a remedial program, site owners will agree to restrict future site uses.

COMMENT 18: What does "restricted residential" development mean?

RESPONSE 18: "Restricted residential" development means residential development where there is a common or a single owner of the property. At a minimum, restrictions include prohibition of

any vegetable gardens on a property, although community vegetable gardens may be considered with NYSDEC approval. Examples of restricted residential uses include apartment complexes; day care facilities; schools, colleges and other educational institutions; nursing homes, elder care and other long-term health care facilities; and active recreational uses, (e.g., playgrounds, picnic areas, playing fields or other public uses where there is a higher potential for soil contact). While the PRAP had contemplated restricted residential use, the ROD has modified the restrictions to parking or green space, and decreased the area affected by those restrictions to the 6 acre consolidation area.

COMMENT 19: Even if there is a single ownership entity in control of the management of the site, won't hundreds of families still be at risk?

RESPONSE 19: The ROD process is designed to select a remedy that is protective of human health and the environment. This is accomplished through the process of comparing proposed remedies against eight criteria. These criteria are: Protection of Human Health and the Environment; Compliance with New York State Standards, Criteria, and Guidance (SCGs); Short-term Effectiveness; Long-term Effectiveness; Reduction of Toxicity, Mobility, or Volume; Implementability; Cost Effectiveness; and Community Acceptance. The selected remedy best addresses these criteria.

COMMENT 20: Wouldn't it make more sense to send contaminated soil off-site, rather than to an on-site soil consolidation area?

RESPONSE 20: Off-site disposal of contaminated soil would be an effective remedy, however, as detailed in the Feasibility Study, this alternative would be accomplished at a much higher cost than the selected remedy without any corresponding increase in protection of human health or the environment. The selected remedy is protective of human health and the environment and can be accomplished with fewer short term impacts (e.g., trucking/transport of contaminated materials, etc.).

COMMENT 21: The development of the site will require water, sewer and other utility lines. If these lines are buried in contaminated soil and they break or otherwise need repair, how will the problem be handled in the context of the soil management plan and institutional controls; and who will handle the problem?

RESPONSE 21: It is not anticipated that any utilities will be installed in the soil consolidation area, but were they to be, the SMP will detail the protocols to be employed during any utility installation or maintenance activities that penetrate the two-foot soil cover. For installation of underground utilities, such measures would include backfilling utility trenches with clean fill and placement of a demarcation barrier.

COMMENT 22: If a water supply pipe breaks and it's surrounded by contaminated soil, is there a risk of drinking contaminated water?

RESPONSE 22: Generally, the installation of utilities through the consolidation area will be discouraged. In the event a water line or other utility is installed within the consolidation area, the SMP will require that the line be installed/backfilled within clean fill. This will avoid direct contact between the utility and contamination, and alleviate health and safety considerations for utility repair workers, who might otherwise come into contact with residual contamination in the future.

COMMENT 23: Was there any sampling outside of the 20-acre site boundary?

RESPONSE 23: Yes, background soil concentrations were obtained by taking eight discrete soil samples from four off-site locations (i.e., the four locations labeled "K", "I", "G", and "E") and one composite soil sample from three off-site locations (see Figure 4). Also, one sample was collected from an upstream section of the adjacent stream.

COMMENT 24: I closed on my property, which is up the hill from the site, last April. Why wasn't I informed that an inactive hazardous waste disposal site was located near my new home?

RESPONSE 24: The Circle M site has been listed on New York State's Registry of Inactive Hazardous Waste Disposal Sites since 1990. When the NYSDEC makes decisions with regard to site listing/classification, the NYSDEC announces the decision to the county clerk; the town, city or village; the site owner and adjacent property owners. This notice therefore would have been made in 1990. The Registry is available for review on the NYSDEC's website.

COMMENT 25: Shouldn't the Town of Fishkill notify each of its residents about the location of sites like Circle M?

RESPONSE 25: Publication in the State's Registry of Inactive Hazardous Waste Disposal Sites is equivalent to public notice of the status and location of the Circle M site. The Town of Fishkill has no additional legal obligation to inform its residents about such sites.

COMMENT 26: Shouldn't the Circle M site be under some sort of operating restriction right now? I'm concerned about my wife, who is five months' pregnant, and who goes to the AVR Realty office in the former Circle M building quite often.

RESPONSE 26: CCA was not used in the portion of the building occupied by AVR Realty. Also, AVR offices were newly constructed, with a raised floor, within the former Circle M building thus eliminating the possibility for contact with surfaces of the building formerly used by Circle M. Also see Comment/Response 27 below.

COMMENT 27: What about the workers in the former Circle M building? What tests have been conducted to ensure that their work area was safe, especially in light of the relatively high amount of soil contamination that lies under the building's slab foundation?

RESPONSE 27: The NYSDOH inspected the former Circle M building on October 11, 2002 and again on May 2, 2005, and determined that indoor air testing was not necessary after both inspections. Based on inspections conducted at the former Circle M facility on October 11, 2002 and May 2, 2005, areas of this site where the current on-site workforce spends their time (where soil contamination was detected during the RI) have been covered with gravel or asphalt thus significantly reducing the potential for direct contact exposures with contaminated soil. During the May 2, 2005 visit there was no observable (visual) generation of dust on-site even though wind speeds likely gusted to over 30 miles per hour (the maximum wind speed recorded at Stewart Field on May 2, 2005 was 35 mph). Since dust generation was not evident during elevated wind conditions, it is unlikely that dust migration/inhalation is a significant pathway of exposure. The majority of businesses currently operating at this site occupy areas where CCA was not used. In

addition, some of the offices are newly constructed within older on-site structures. Since contamination at this site is generally sub-surface and CCA is not a volatile substance, there is little to no potential for the inhalation of CCA vapors. Please note that as a component of the ROD buildings in the soil consolidation area will be demolished.

COMMENT 28: Is there any SMP in effect to guarantee that the floor slab in the former Circle M building isn't cracked right now? When was the last time that this slab was inspected?

RESPONSE 28: The floor slab in the former Circle M building is not inspected for cracks on a regular basis. Minor cracks would be a concern if the contaminants of concern could volatilize. However, arsenic, chromium and copper are not volatile. The slab serves to prevent direct contact with the underlying soils in this instance, so minor cracks are not of concern.

COMMENT 29: What has been done to keep the trucks and equipment that leave the site and come into our neighborhood free from contamination so that they aren't bringing this stuff into our neighborhood?

RESPONSE 29: The majority of this site is paved and observations have revealed little if any current dust problems at this site. Also, see Response 15 and Response 27.

COMMENT 30: How do we know that construction materials being used in our neighborhood haven't been contaminated from being on this site?

RESPONSE 30: The site was previously used to produce pressure treated lumber. As part of this process wood is impregnated with chromated copper arsenate (CCA). Pressure treated lumber is widely used for porches, decks and other exterior uses. It is entirely possible that some of the residences in the surrounding community have used materials from this or other wood treatment facilities.

COMMENT 31: If the contamination is left in place, why have a uniform two-foot cap? Why not make the cap thicker where the contamination is more severe, or where excavation for construction will be taking place?

RESPONSE 31: Two feet of clean soil cover is a standard barrier thickness and will serve as an effective barrier to exposure of contaminated soil. The ROD selected remedy specifies that contaminated soil will be excavated and consolidated on to 6 acres of the site (see Figure 6) and this area will be subject to use restrictions and a Site Management Plan (see Response 4). There will be no use restrictions on the (14 acre) balance of the site. Note also that during the process of excavation and consolidation it is likely that soil contamination will become fairly uniform throughout the soil to be capped.

COMMENT 32: If the most contaminated soil from all over the site is isolated under a segment of the cap, how deep will that excavation of the most contaminated soil have to be?

RESPONSE 32: Figure 6 depicts the areas to be excavated and consolidated and the estimated depths of those excavations. The actual depths will be based on confirmatory sampling during the remedial program.

COMMENT 33: Will off-site testing occur?

RESPONSE 33: Off-site testing has occurred in several locations in association with the background soil sampling program. Eight samples were collected from four off-site locations (i.e., labeled "K", "I", "G", and "E") and one composite soil sample was collected from three off-site locations (see Figure 4). In addition, as a component of the remedial design, sampling will be performed to provide the details necessary to implement the remedial program. This will include additional sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

COMMENT 34: How does this site affect the Hudson River?

RESPONSE 34: The unnamed stream located adjacent to the site discharges to the Hudson River, which is located approximately 0.25 miles west of the site. Based on the analysis of samples collected from the adjacent stream, contamination appears confined to the site, specifically the limits depicted on Figure 6. Therefore, the site is believed to have no impact on the Hudson River. However, as described in Response 33, additional sampling will be performed in the stream as a component of the remedial design.

COMMENT 35: If the proposed remedy becomes the chosen remedy in the ROD, and part of the site is set aside for recreation or parkland, would you let your kids play there?

RESPONSE 35: Please note that the ROD selected remedy differs from the propose remedy in the PRAP. The ROD selected remedy results in 14 acres of the site having no usage restrictions with a 6 acre consolidation area. The two-foot cap on the soil consolidation area serves to isolate the site's contaminants from the site's occupants. Also, the SMP would require maintenance of the cap and prevent any unauthorized excavations. Therefore, the cap and the restrictions placed on the soil consolidation area will effectively prevent exposure to any underlying contamination to children and other future site residents.

COMMENT 36: Annual certification is not sufficient to make the proposed institutional control work. More frequent certification is necessary.

RESPONSE 36: Unlike the PRAP, reliance on an institutional control for the entire site is no longer being considered. When the remedy is implemented, 14 acres of this 20 acre site will be available for unrestricted use. The document that covers the post-remediation operation, maintenance and monitoring requirements for the site is the SMP. The site owner will be obligated to adhere to this plan, including if excavation in the consolidation area is contemplated. The certification is the statutory obligation to advise the NYSDEC that the SMP is being followed and that the remedy as contemplated by the ROD, remains in effect. The certification is required no more often than annually, and in some cases less often. If the NYSDEC fails to receive this certification within the specified time frame, the NYSDEC will take appropriate action.

COMMENT 37: What if there is non-compliance with the institutional control, and how are we protected if this happens? What are the penalties, and who is responsible for enforcing the institutional control?

RESPONSE 37: The institutional control is in the form of an environmental easement, which would require compliance with the approved SMP and limit the use and development of the portion of the property where the soil consolidation will occur, as appropriate. The easement will also restrict the use of untreated groundwater as a source of potable or process water. The NYSDEC is responsible for enforcing this institutional control. In the event the site owner fails to comply with the SMP and/or does not submit the certification, appropriate action will be taken. The SMP will be available to the public and is expected to minimize non-compliance with the institutional control. The public is encouraged to report any non-compliance with the institutional control to the NYSDEC.

COMMENT 38: How does Alternative No. 2 address the criteria for dealing with minimizing the toxicity, mobility, and volume of the site's contaminants, if the contamination is being left in place?

RESPONSE 38: The volume of the contaminated material will not be reduced by the selected remedy. The remedy however, will serve to isolate the site's contaminants via consolidation and installation of a soil cover. While the toxicity is not being directly reduced, this soil cover will reduce the potential mobility of the contamination by such means as erosion and wind dispersion; and the opportunity for contact with contamination will be greatly reduced. The NYSDOH has determined the remedy to be protective of human health and the NYSDEC has determined the remedy to be protective of the environment.

COMMENT 39: I believe that the criteria that address the long-term permanence and effectiveness of the remedy and the reduction of the volume of the contamination are best achieved with Alternatives No. 5 or No. 6, and I prefer the latter.

RESPONSE 39: Each of the alternatives evaluated by the Feasibility Study satisfy the screening criteria to various degrees, however, the goal of the Feasibility Study is to select the alternative which best satisfies all of the criteria. As detailed in the Feasibility Study and discussed in Section 8 of the ROD, Alternative No. 2 best satisfies all of the criteria.

COMMENT 40: Is CCA a water-based solution? If so, could it move on the site?

RESPONSE 40: CCA is a water-based preservative containing arsenic, chromium and copper. CCA solution has a low pH to maintain metals in solution. While this CCA solution is water soluble, inorganic compounds such as arsenic, chromium and copper tend to adhere to soil particles. Also, CCA has a greater affinity for soil particles than for water. Filtered groundwater samples were collected to assess whether dissolved metals had impacted groundwater quality. The samples did not show exceedances of groundwater standards, thereby supporting the premise that the mobility of site contaminants via groundwater movement is limited. Further, a monitoring well network will be established in conjunction with the remedial program to confirm earlier findings.

COMMENT 41: Would acid rain affect the soil's pH enough to affect CCA mobility?

RESPONSE 41: No, the affects of acid rain would not be significant. Also, groundwater monitoring well samples do not indicate that CCA is migrating in groundwater. See Response 40.

COMMENT 42: The best way to achieve long-term effectiveness is Alternative No. 6, which would remove the soil contamination from the site.

RESPONSE 42: See Response 39.

COMMENT 43: If the contamination at the site isn't mobile, how come it has spread so far so fast all over the site and into the ground?

RESPONSE 43: The extent of the soil contamination is attributed to past site operations which involved transport of CCA-impregnated wood to various locations across the site to dry. Dripping of the newly treated wood was likely the source of these contaminated areas, although areas of the site have also been subject to regrading in recent years. It is also possible residual contamination from the two onsite spills contributed to the contamination.

COMMENT 44: If this is such a dangerous area, why is any use of this site being considered?

RESPONSE 44: The remedy selected for this site will effectively eliminate the potential for exposure to site-related contaminants. Also, see Response 35.

COMMENT 45: Is this site being remediated because someone wants to develop it? Why wasn't this site remediated much earlier?

RESPONSE 45: This ROD is the culmination of years of site investigation. The investigation and remediation, of the site, is not a result of developer interest. The site will be remediated regardless of developer interest.

COMMENT 46: I am very concerned about a plastic demarcation barrier being placed underneath the cap. What kind of plastic would be used to avoid dioxins leaching into the groundwater?

RESPONSE 46: The barrier employed to serve as a demarcation mechanism between the clean soil cover and the underlying contaminated soil is typically a woven geotextile fabric of the type commonly used in landscaping. This material is not a source of leachable contaminants.

COMMENT 47: If left in the ground, can heavy metals be absorbed by tree roots and get into tree leaves, and thereby create a human exposure pathway?

RESPONSE 47: While heavy metals can be absorbed by tree roots, they are not likely to move into the tree leaves in sufficient concentrations that would represent an exposure concern.

COMMENT 48: Holly Ridge is as close to the east side of the site as some of the samples that were taken towards the west side of the site. We want additional testing done to determine whether there are any off-site impacts from site-related contamination.

RESPONSE 48: As a component of the remedial design, additional sampling will be performed to provide the details necessary to implement the remedial program. This will include sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

COMMENT 49: How does Alternative No. 2 get the soil contaminant concentrations down to the SCGs shown in Table 1 in the PRAP?

RESPONSE 49: The selected remedy was revised based on public comment, and now involves the excavation of contaminated materials from the areas identified on Figure 6 and consolidation of those materials into a single, controlled area which will be situated atop the slab of the former treatment building and adjacent areas. The areas of excavation will be subject to sampling to confirm all materials above the SCGs have been removed, and the excavations will be backfilled with clean soil. The remediation of these areas outside the footprint of the consolidation area, will achieve levels which will allow unrestricted use.

COMMENT 50: Why weren't some of the six alternatives in the PRAP screened out by the eight evaluation criteria?

RESPONSE 50: Alternatives which are considered potentially viable are carried through the detailed analysis, which includes the evaluation of those alternatives against each of the criteria. This gives reviewers the opportunity to more closely scrutinize the alternatives and assess the positive and negative aspects of each remedial strategy.

COMMENT 51: In Alternatives No. 3, 5 and 6, a comment was made that the removal process could spread particles and increase exposure. But could this process be done in an enclosed container like a railroad boxcar to restrict dust, while transporting the soil contaminants off-site?

RESPONSE 51: The ROD selected remedy does not include transportation of contaminated soil off-site. Temporary structures have been used in certain instances where excavation and/or treatment is required, however, these are typically employed in instances where odor, not dust, is a concern. Odors have not been a concern at the Circle M site. Dust can be monitored and mitigated, using appropriate engineering controls, such as wetting an area to control dust. As a component of the remedial program a community air monitoring program will be implemented, which includes strict provisions for dust monitoring and mitigation, as necessary.

COMMENT 52: Should a meeting be scheduled that includes the site's owner, the Town of Fishkill and the NYSDEC to determine what needs to be done at this site?

RESPONSE 52: The remedial decision is set forth in this ROD. The NYSDEC would be willing to participate in a meeting with municipal officials, should the Town request such a meeting, to discuss implementation of the ROD.

COMMENT 53: Why is there such a rush to change the zoning on this property from industrial to residential?

RESPONSE 53: Issues concerning zoning are the jurisdiction of local government, not the NYSDEC.

COMMENT 54: How much of this site is covered right now, and why isn't there more of a concern as to what is going on at the site in terms of dust and contaminant transport by various means?

RESPONSE 54: Approximately 20 percent of the site is paved. The remedy chosen in this ROD will address the potential off-site migration of dust. Also see Response 26 and 27.

COMMENT 55: At a minimum, why aren't the hot spots on the site that were identified during testing delineated so that vehicles and employees stay away from these areas?

RESPONSE 55: Areas of this site frequented by the current on-site workforce have been covered with gravel or asphalt thus significantly reducing the potential for direct contact exposures with contaminated soil. The highest soil contaminant levels are under the slab of the former Circle M building. See Response 26 and 27.

COMMENT 56: Will there be some criteria for protecting workers in the SMP? If so, what type of oversight will there be?

RESPONSE 56: The design will include a Health and Safety Plan which addresses the controls necessary to ensure the protection of site workers during the remedial program. The NYSDEC and the NYSDOH must review and approve the remedial design documents, and the NYSDEC will oversee the remedial program. The design will also include the development of the SMP which details the measures to be employed by any worker who may have to excavate within the soil consolidation area in the future.

COMMENT 57: Are the current workers at the site being exposed to an unacceptable level of site contaminants? I am especially concerned about this, since my daughter works at the site.

RESPONSE 57: See Response 26 and 27.

COMMENT 58: Except for the soil contaminated by fuel in the vicinity of the two underground storage tanks that were removed from the site, no other soil contaminants have been removed from the site, so why aren't steps being taken to restrict the use of the property by current occupants?

RESPONSE 58: It is important to note that petroleum contamination was treated differently due to it's properties. Unlike metals, petroleum is mobile in the environment (i.e. will migrate to, and impact groundwater). Metals contamination tends to be fairly stable (i.e. it does not migrate and does not volatilize). Nevertheless, some of the most contaminated soil at the site was removed in 1990 by two separate NYSDEC spill contractors (3,000 gallon CCA spill, 1,600 gallon CCA spill - see Section 3.2 of the ROD). See also Response 26 and Response 27.

COMMENT 59: Was an indoor air monitoring sample ever taken?

RESPONSE 59: Indoor air samples were not collected since CCA is a non-volatile mixture. Also see Response 27.

COMMENT 60: What does "short term exposure" mean if the contaminated soil is removed from the site?

RESPONSE 60: The Feasibility Study assessed short term effectiveness of each of the remedial alternatives. The objective is to review potential short-term adverse impacts of the remedial action (e.g., dust controls or truck traffic leaving the site) upon the community, the workers, and the environment during remedy construction/implementation. Please refer to Section 7.2 of the ROD.

COMMENT 61: Who does the monitoring of the SMP?

RESPONSE 61: The site owner is responsible for implementing the SMP and certifying to the NYSDEC that the plan's terms have been followed. In the event the site owner fails to comply with the SMP and/or does not submit the certification, the NYSDEC will take appropriate action.

COMMENT 62: When was your most recent round of sampling done, and how do you know that they reflect current conditions?

RESPONSE 62: The most recent round of sampling was conducted in 2002, as summarized in Table 1 in the ROD. The contaminants of concern, the metals arsenic, chromium, copper tend to adhere to soil particles, and by their physical nature do not volatilize or otherwise degrade, therefore, the site conditions since that time are expected to be relatively unchanged. During the remedial design/remedial action program, additional sampling will be conducted to fully delineate the extent of contamination to be addressed by the remedy.

COMMENT 63: When dealing with construction and demolition debris, who makes the determination as to whether the media is exempt or non-exempt?

RESPONSE 63: 6 NYCRR Part 360, the regulation which governs solid waste management facilities, defines construction and demolition debris and lists certain exemptions. The party conducting the remedial program will have to detail plans for demolition and the proposed disposal facility(ies), and ultimately provide documentation as to the disposition of those materials. These plans/documents will be subject to review by the NYSDEC.

COMMENT 64: If you leave the contamination under the floor slab, what happens if the slab becomes compromised or cracked right after the annual certification?

RESPONSE 64: The SMP will detail the actions required to address any breach in the cover system. Unlike the PRAP, the ROD remedy will require the demolition of the building, as well as the covering of the slab with the consolidated soils and a two foot clean soil cover. Inspection/maintenance of the slab once buried, will not be required. Maintenance and protection of the soil cover, however, will be one of the key components of the SMP.

COMMENT 65: As a result of your soil sampling, do you have any idea as to whether there is off-site contamination?

RESPONSE 65: The findings of the remedial investigation suggest that contamination is confined to the site. To confirm this, however, additional sampling will be conducted as part of the remedial design/remedial action. This will include sampling of surface water, sediment and soil from both banks of the adjacent stream, and analysis for site-related contaminants.

COMMENT 66: In the worst-case scenario, what are the health impacts from contaminant exposure at the site?

RESPONSE 66: The contaminants of concern at the former Circle M Facility are inorganic arsenic, chromium and copper, which comprise the water based solution CCA. As with all substances, it is the amount of a substance or "dose" that an individual is exposed that will determine if there are any adverse health effects. Although exposure to the each constituent of CCA may individually

represent a health concern, based on the results of the remedial investigation, exposure to arsenic would represent the greatest concern for an adverse health effect.

Oral (ingestion) exposure to high levels of arsenic over short periods of time can irritate the stomach and the intestines, producing symptoms such as stomach ache, nausea, vomiting and diarrhea. Other effects which may occur from swallowing large amounts of arsenic include swelling of the face, decreased production of red and white blood cells, abnormal heart rhythm and impaired nervous system function resulting in a "pins and needles" sensation in the hands and feet. Long-term inhalation or oral exposure to high levels of arsenic in humans is associated with skin effects (warts, corns and darkening of the skin), nerve, liver or blood vessel damage, and an increased risk of skin, bladder or lung cancer. Chemicals, such as arsenic, that cause adverse health effects in humans after high levels of exposure may also pose a risk of adverse health effects in humans exposed to lower levels over long periods of time. The World Health Organization, the Department of Health and Human Services, and the United States Environmental Protection Agency classify inorganic arsenic as a human carcinogen.

For more information about the health effects associated with the exposure to arsenic, or the other constituents of CCA, you may contact the Agency for Toxic Substance and Disease Registry (ATSDR) by telephone at 1-888-422-8737 or through ATSDR's Internet website at http://www.atsdr.cdc.gov.

It is important to remember that if exposure to a substance is reduced or eliminated, the risk of an adverse health effect, which may be associated with that exposure, is reduced or eliminated. In evaluation of current conditions at the former Circle M Facility, the potential for exposure to site-related contamination for on-site workers has been reduced by covering contaminated areas where worker activity takes place, with gravel or asphalt. Also, since CCA is not a volatile substance, there is little to no potential for exposure to CCA vapors (see Response 26 and 27). The remedy selected for this site will effectively eliminate the potential for exposure to site-related contaminants in concentrations that may represent a health concern.

COMMENT 67: Arsenic accumulates in the body, doesn't it?

RESPONSE 67: If you are exposed to arsenic, your liver changes some of this to a less harmful organic form. Both inorganic and organic forms leave your body in urine. Most of the arsenic will be gone within several days, although some will remain in your body for several months or even longer. Also see Response 66.

COMMENT 68: Without off-site sampling, we won't know the impacts to the Streamside and Holly Ridge developments.

RESPONSE 68: See Response 33.

COMMENT 69: We are lay people and the site presents some very technical and complex issues, so can we get a technical assistance grant to bring in a third party to help us evaluate these issues?

RESPONSE 69: A technical assistance grant (TAG) of up to $50,000 (no matching contribution required) may be awarded to a community group to obtain independent technical assistance in interpreting existing information about the nature and extent of hazardous waste contamination, and

the development and implementation of a remedy at any significant threat site under the State Superfund (SSF) or Brownfield Cleanup programs (BCP). To be eligible, the community group must meet the following criteria:

- It must be a non-responsible party community group;
- It must be a domestic not-for-profit corporation exempt from taxation under section 501(c)(3) of the Internal Revenue Code;
- It must be a group whose members' health, economic well-being or enjoyment of the environment are potentially affected by a release or threatened release of contamination at the eligible site; and,
- It must be a group whose membership represents the interests of the community affected by the eligible site.

More information relative to TAGs and an application is available on the NYSDEC website at http://www.dec.state.ny.us/website/der/guidance/tag/.

COMMENT 70: While AVR is constructing the Streamside and Holly Ridge developments, what is being done to prevent contaminated equipment from being brought into these developments, which is our neighborhood? What about the trucks taking mud off of the site and into our neighborhood? Construction workers and gardeners who come to our neighborhood are coming from the AVR office, which is in the most contaminated area of the site.

RESPONSE 70: See Response 26 and 27.

COMMENT 71: A new pool is being put in at the Streamside development. Since the contractor's trucks come from the Circle M site to Streamside daily, how can we know that the pool or the associated landscaping isn't being contaminated? Certainly, the pool and other common recreation areas, including the landscaping, at the Streamside development should be checked out before we let our children play in them.

RESPONSE 71: See Response 26 and 27.

COMMENT 72: If you add new monitoring wells, I think a monitoring well needs to be placed right through the slab floor of the former Circle M building.

RESPONSE 72: A monitoring well (MW-8) currently penetrates the slab floor of the former Circle M building. Groundwater quality will be assessed at this location and others as a component of the remedial design/remedial action.

COMMENT 73: If the SCG's you are using for environmental media change in any way to more stringent levels, will you be able to enforce the more stringent levels, or will you have to enforce the SCGs listed in the ROD? In other words, could a change in any of the SCGs affect the remedy?

RESPONSE 73: Should a potential threat to the public health or the environment be identified after the issuance of the ROD and implementation of the remedy (e.g., contamination previously not identified is discovered or cleanup objectives for constituents of concern are significantly modified), the NYSDEC and NYSDOH would assess the need for further action.

COMMENT 74: Judging by the contaminants at the site, is there any chance that this site isn't developable?

RESPONSE 74: Upon implementation of the remedy, as described in the ROD, areas of the site outside the consolidation area may be developed without use restrictions. Use of the consolidation area, however, will be subject to restrictions (i.e., green space or parking)

COMMENT 75: After the comment period is over, what happens next; and what kind of time frames will the next steps entail?

RESPONSE 75: The new site owner has already submitted an application to the State's Brownfield Cleanup Program. If accepted into the BCP, the owner will be required to implement the remedy as described in the ROD. This will include the development of detailed design documents, implementation of the remedial program, and placement of the institutional controls (i.e., use restrictions, SMP, certification) and engineering controls (i.e., soil cover, groundwater monitoring program) required by the ROD. It is expected the design and construction will take one to two years to complete.

COMMENT 76: Are there any private wells in the area that could be affected by groundwater contamination from this site?

RESPONSE 76: Although there are several private wells that have been identified in the Briarwood development, approximately one-quarter mile northeast of the site, these wells are likely supplied by a bedrock aquifer that would not be affected by the site. Based on results of groundwater monitoring well samples, site-related contaminants have not contaminated groundwater and thus are not migrating off-site. However, the ROD mandates that three bedrock wells be installed so that the hydrogeology of the bedrock aquifer at the site can be better understood and monitored. The site's bedrock groundwater flows into the Hudson River; while the site's overburden groundwater flows into the stream on the eastern perimeter of the site, which eventually flows into the Hudson River also.

COMMENT 77: When the Remedial Design is being finalized, could construction be limited to winter when the ground is more frozen so that dust would be less likely?

RESPONSE 77: The construction schedule will be assessed during remedial design, however, a spring or fall project is preferred over winter work, as winter work brings with it challenges such as difficult excavation, frozen lines, etc. Note that when the remedial program is conducted, the excavation and transport of materials will be subject to a Community Air Monitoring Plan, which contains dust monitoring and mitigation controls (e.g., continuous monitoring at the upwind and downwind perimeters), designed to prevent the off-site migration of contaminants in concentrations that would represent a health concern.

COMMENT 78: So that every future buyer has adequate information about the property that they are investing in, there should be a condition in the ROD or some other legal device compelling the seller to disclose to any prospective buyer the location of any inactive hazardous waste disposal site that may have an impact on the property that is being sold.

RESPONSE 78: The consolidation area will be subject to an environmental easement. This will address in detail the use restrictions and engineering controls. The easement will be filed in the title record relating to the real property. The further issue as to whether the seller or agent has an

affirmative obligation to disclose this type of information to a buyer does not fall under the jurisdiction of the NYSDEC. Also see Response 24.

More than 90 community residents residing near the site submitted a letter dated April 27, 2005 which included the following twelve comments, plus two additional comments from a petition attached to the letter, for a total of fourteen comments:

COMMENT 79: It is requested that the review and comment period be extended an additional 60 days. Most residents were not aware of the site until they received the DEC mailing and there has not been ample time for the community to review, investigate and collectively discuss the alternative remediation measures presented in this proposal.

RESPONSE 79: The comment period was extended twice beyond the original comment period end date of March 30, 2005. The extended comment period closed on June 10, 2005.

COMMENT 80: Is the cleanup of this site being performed under the NY State Voluntary Cleanup Program (VCP) and if so, who are the principals and what are the terms of the agreement? If there is a written agreement, is it available for public review?

RESPONSE 80: The Remedial Investigation/Feasibility Study was conducted under the State Superfund Program. The NYSDEC, Chelsea Industrial Park, Inc. and Chemical Specialties, Inc. entered into a Consent Order in 1997. The Order obligated the responsible parties to implement a Focused Remedial Investigation/Feasibility Study remedial program. This Order is available for review in the site's document repositories. The site owner has submitted an application to the State's Brownfield Cleanup Program (BCP) to conduct the cleanup. The application is available for public review at the document repositories. If accepted into the BCP, the owner will be required to execute a Brownfield Cleanup Agreement which commits the owner to development of design documents, implementation of the remedial program, and emplacement of the institutional controls and engineering controls required by the ROD. The agreement will be available for review at the document repositories upon execution.

COMMENT 81: Can this cleanup be performed under the new NY State Brownfield Cleanup Program (BCP), which would provide for Technical Assistance Grants that the community could use to research and evaluate the proposed cleanup?

RESPONSE 81: See Response No. 69.

COMMENT 82: Based on the review of the PRAP and the discussions at the public meeting held on March 14, 2005, the proposed remedy of Alternative 2 will not guarantee that the goals established for protecting human health and the environment will be met. The most certain way to achieve these goals is to remove the contaminated soil and structures in a controlled manner, and place this material in an acceptable repository for this type of contamination. Alternatives 3 or 6 are the preferable choices.

RESPONSE 82: As part of the selected remedy the Circle M buildings will be removed in a controlled manner. All remedial activities will be conducted in accordance with the HASP and CAMP. Also see Response 20.

COMMENT 83: Please describe and quantify the process used to arrive at Alternative 2 for the proposed solution.

RESPONSE 83: The criteria used in the selection of a Preferred Alternative is set forth in the PRAP itself. The final, modifying criteria, is community acceptance. To ascertain the community's response to the PRAP, a Public Meeting is conducted during a public comment period.

As result of the public input, the selected remedy set forth in this ROD has been significantly modified from that in the PRAP. The rationale for the final selection is set forth in Sections 7 and 8 of the ROD.

COMMENT 84: Allowing residential units to be constructed on the site after it is covered with a cap does not make any sense. As discussed at the public meeting, the foundations and infrastructure for these buildings will require that the cap be penetrated, exposing the contaminated material during the excavation process. The contaminated material will most likely be mixed with the cap material and thus will result in additional volumes of contaminated material to manage. Please describe the process and controls that the DEC would require the developer to use to insure that the contaminated materials are segregated and maintained in a fashion to guarantee that the volume of the material does not increase and that it does not pose a continuing threat to human health and the environment. How will DEC enforce the use of these processes and controls? Will there be a DEC inspector on-site during all excavation? Will DEC require an annual certification by the developer and future owners concerning the integrity of the cap?

RESPONSE 84: See Response Nos. 4, 10, 36 and 37.

COMMENT 85: Once the cap has been installed, will there be a requirement for placards and signs to identify and caution the public about the remaining contamination? Please describe the content, size, number and placement of these signs. Will the DEC impose deed restrictions specifying the limitations on the usage of this site?

RESPONSE 85: An environmental easement will be recorded, which identifies all use restrictions and engineering controls (e.g., the soil cover). Uses in the consolidation area will be limited to green space or parking. The easement will also restrict the use of untreated groundwater as a source of potable or process water. During the design, the need for further precautions (e.g., placards or signs) will be evaluated.

COMMENT 86: The proposed alternative has an Institutional Controls (IC) that would allow the site to be used for "restricted residential". We do not agree with the proposed use of the capped property. We believe that future uses should be limited to those that do not disturb the cap, unless all the contaminated materials are removed. The developer has indicated that they plan on constructing apartments or town homes on the property. How does this stated use conform to the "restricted residential" use control? Will the DEC require that all future residents be notified of the underlying contamination? If so, please indicate the nature and extent of the required notification to the residents.

RESPONSE 86: Use of the consolidation area will be limited to green space or parking. Construction of residential units within the consolidation area will be prohibited. Also see Response 1, 78 and 85.

COMMENT 87: Please indicate other sites in NY State where CCA spills have been cleaned up. Indicate the location and remedial measures taken to insure prevention of exposure to the public. Have any of these sites been handled in the same way as proposed in Alternative 2?

RESPONSE 87: Sites contaminated with wood preservatives (CCA, pentachlorophenol, creosote) have been identified across the State. The remedies selected have varied depending on the site-specific circumstances, but have included off-site disposal (e.g., Perry Builders, Bainbridge), on-site treatment (e.g., GCL Tie and Treating, Sydney), and on-site consolidation (e.g., Camp Georgetown, Georgetown).

COMMENT 88: Was there any investigation performed to determine if the CCA reached the Hudson River and if so, what was the extent of the contamination? Is there any cleanup planned for this material?

RESPONSE 88: The unnamed stream located adjacent to the site discharges to the Hudson River, which is located approximately 0.25 miles west of the site. Based on the analysis of samples collected from the stream, contamination appears to be confined to the site, specifically the limits depicted on Figure 6. Therefore, the site is believed to have no impact on the Hudson River. However, as described in Response 33, additional sampling will be performed as a component of the remedial design. The additional sediment sampling will help determine the extent of any site-related impacts on the stream and additional groundwater sampling will help determine the extent of any site-related groundwater contamination.

COMMENT 89: Will additional sampling be performed on the adjacent property to determine the extent of CCA material transported to these properties by the developer's construction activities, which continue to take place on the Circle M site?

RESPONSE 89: See Response 33.

COMMENT 90: If the developer had knowledge concerning the classification of the site and nature of the contamination on this site prior to beginning to develop and sell the adjoining properties, was the developer required to disclose this information to the purchasers? Was the Town of Fishkill required to disclose this information?

RESPONSE 90: See Response 24, 25 and 78.

COMMENT 91: It is our intention to pursue a safer and more permanent solution by recommending excavation and removal of the contaminated area identified by the NYSDEC.

RESPONSE 91: Comment noted.

COMMENT 92: We request additional testing and monitoring soil and water samples from the entire 58.6-acre Chelsea Industrial Park facility, as well as from the surrounding residential communities, including, but not limited to, Holly Ridge, Streamside Knolls, and Avalon Apartments.

RESPONSE 92: See Response 1.

Azem (Ozzy) Albra submitted a letter dated March 20, 2005 which included the following comment:

COMMENT 93: What happens when the developer leaves or goes bankrupt? Also, there is a similar site in the City of Newburgh where contaminated soil is being removed from a commercial property. Why would you remove soil that is used for commercial use and not remove it for residential use? Finally, so you think that 2,000 families would have moved into a contaminated development knowing it was contaminated?

RESPONSE 93: As indicated in Response 6 the site owner has already submitted an application to the NYSDEC's Brownfield Cleanup Program. Should the owner or any other party be unwilling or unable to implement the remedial program in a timely manner, the NYSDEC will address contamination using the State Superfund. With regard to the comparison of the remedy selected for the Circle M versus that for a site in Newburgh, please realize remedies are selected on a site-specific basis, giving consideration to the nature of the contaminant, existing or potential exposure pathways, geologic setting, etc.

The owner of the site, Chelsea Waterfront Development, LLC, submitted a letter dated April 27, 2005 which included the following comment:

COMMENT 94: Alternative 2 should be modified to eliminate any requirement to evaluate the potential for vapor intrusion.

RESPONSE 94: References to a vapor intrusion study/mitigation have been removed from the remedy for the following reasons: contaminants at this site are metals which are not a threat to volatilize; the selected remedy will provide for a 6 acre soil consolidation area where no residential occupation will be permitted; the selected remedy will require the demolition of the currently existing Circle M Building; and the remedy will address site contamination in such a way as to make possible the unrestricted use of the remaining 14 acres of the site.

APPENDIX B

Administrative Record

Administrative Record
Circle M Wood Treating Corporation
Site No. 3-14-083

Proposed Remedial Action Plan for the Circle M Wood Treating Corporation site, dated 3/05, prepared by the NYSDEC.

Order on Consent, Index No. W3-0785-97-02, between NYSDEC and the Chelsea Industrial Park and Chemical Specialties, Inc., executed on 6/27/97.

Letter report, dated 9/24/87, prepared by Leggette, Brashears & Graham, Inc.

Letter report, dated 1/16/89, prepared by Dunn Geoscience Corporation.

Focused Remedial Investigation Workplan, dated 10/23/97, prepared by Conrad Geoscience Corp.

Remedial Investigation, dated 9/9/98, prepared by Conrad Geoscience Corp.

Biological Resource Inventory and Impact Assessment, dated 10/99, prepared by Matthew D. Rudikoff Associates, Inc.

Focused Feasibility Study, dated 10/25/99, prepared by Conrad Geoscience Corp.

Supplemental Remedial Investigation, dated 7/6/01, prepared by Conrad Geoscience Corp.

Focused Feasibility Study, 9/6/01, prepared by Sterling Environmental Engineering, P.C., with revisions submitted on 12/20/01, 12/16/02, 12/24/03, and 2/10/05, respectively.

Supplemental Remedial Investigation, dated 9/13/02, prepared by Conrad Geoscience Corp.

Citizen Participation Plan, dated 8/03.

Meeting Invitation and Fact Sheet, dated 3/05.

Notices dated 3/05 and 5/05 extending public comment period.

Letter dated 3/20/05 from Azem (Ozzy) Albra.

Letter dated 3/22/05 from Chelsea Waterfront Development, LLC.

Letter dated 4/4/05 from RPA Associates, LLC.

Letter dated 4/4/05 from Rivercrest, an AVR Community.

Letter dated 4/8/05 from Holly Ridge, an AVR Community.

Letter dated 4/27/05 from Chelsea Waterfront Development, LLC.

Letter dated 4/27/05 from more than 90 community residents residing near the site.

Letter dated 6/10/05 from Chelsea Waterfront Development, LLC.

APPENDIX B

BROWNFIELD SITE CLEANUP AGREEMENT (BCA)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of a Remedial Program for
Circle M Wood Treating Site,
Dutchess County under Article 27, Title 14 of the Environmental Conservation Law
by

Chelsea Waterfront Development, LLC

BROWNFIELD SITE
CLEANUP AGREEMENT

Index # W3-1077-05-09
Site # C314083

WHEREAS, the Brownfield Cleanup Program Act was enacted to encourage the voluntary remediation of brownfield sites for reuse and redevelopment so as to advance the policy of the State of New York to conserve, improve, and protect its natural resources and environment, and control water, land, and air pollution; and

WHEREAS, the Department of Environmental Conservation (the "Department") is authorized to administer the Brownfield Cleanup Program contained in Article 27, Title 14 of the Environmental Conservation Law ("ECL"); and

WHEREAS, by a certified application dated June 27, 2005, Chelsea Waterfront Development, LLC, a New York State limited liability company, with offices located at One Executive Boulevard, Yonkers, New York 10701 submitted a request to participate in the Brownfield Cleanup Program relative to property located on Industrial Way at the end of Brockway Road, Town of Fishkill, Dutchess County, New York; the Department has accepted the application for the real property as described in the survey map, and metes and bounds "Description of Property" (the "Site") attached as Exhibit "A"; and

WHEREAS, the current use of the property is industrial. The intended use of the property is residential; and

WHEREAS, the Department issued a Proposed Remedial Action Plan ("PRAP") for the Circle M Wood Treatment Site in February 2005 with a public comment period scheduled from March 1, 2005 to March 30, 2005 (extended to June 10, 2005). The Department held a public meeting on March 14, 2005 which provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy; and

WHEREAS, the Department issued, on September 30, 2005, a Record of Decision (the "ROD") selecting the final remedial alternative for the Circle M Wood Treatment Site and responding to all questions and comments raised during the public comment period in the Responsiveness Summary; and

WHEREAS, the Department has provided ample opportunity for public participation in the remedy selection process to date, no additional public comment period for the remedy

selection is required; and

WHEREAS, the Volunteer will implement the ROD under this Agreement; and

WHEREAS, an opportunity for public comment on Applicant's request to participate in the Brownfield Cleanup Program was provided and the Department duly considered all comments received; and

WHEREAS, upon consideration of the factors enumerated in ECL 27-1407(8) and (9), the Department made a determination, based upon the information contained in the application and the certifications made by the Applicant, as well as any public comment received, that Applicant is eligible to participate in the Brownfield Cleanup Program as a Volunteer as defined in ECL 27-1405(1)(b).

NOW, THEREFORE, IN CONSIDERATION OF AND IN EXCHANGE FOR THE MUTUAL COVENANTS AND PROMISES, THE PARTIES AGREE TO THE FOLLOWING:

I. Citizen Participation Plan

Within twenty (20) Days after the effective date of this Agreement, Volunteer shall submit a written citizen participation plan prepared in accordance with the requirements of ECL 27-1417 that, at a minimum (i) updates the names and addresses of the interested public and includes a brownfield site contact list; (ii) identifies major issues of public concern related to the Site; (iii) includes a description of citizen participation activities already performed; and (iv) includes a description and schedule of public participation activities that are either specifically required by law or are needed to address public concerns related to the Site. The Citizen Participation Plan shall be attached to and incorporated into this Agreement as Exhibit "B."

II. Development, Performance, and Reporting of Work Plans

A. Work Plan Requirements

The work plans ("Work Plan" or "Work Plans") under this Agreement shall be prepared and implemented in accordance with the requirements of ECL Article 27, Title 14 and all applicable laws, rules, regulations, and guidance documents. The Work Plans shall be captioned as follows:

1. "Remedial Investigation Work Plan" if the Work Plan provides for the investigation of the nature and extent of contamination within the boundaries of the Site;

2. "Remedial Work Plan" if the Work Plan provides for the development and implementation of a Remedial Program for contamination within the boundaries of the Site;

3. "IRM Work Plan" if the Work Plan provides for an interim remedial measure; or

4. "OM&M Work Plan" if the Work Plan provides for operation, maintenance, and/or monitoring.

B. Submission/Implementation of Work Plans

1. The first proposed Work Plan to be submitted under this Agreement shall be submitted within forty (40) Days after the effective date of this Agreement. Thereafter, the Volunteer can submit such other and additional work plans as it deems appropriate.

2. A proposed Work Plan shall be submitted for the Department's review and approval and shall include, at a minimum, a chronological description of the anticipated activities, a schedule for performance of those activities, and sufficient detail to allow the Department to evaluate that Work Plan. The Department shall use best efforts to approve, modify, or reject a proposed Work Plan within forty-five (45) Days from its receipt or within fifteen (15) Days from the close of the comment period, if applicable, whichever is later.

i) Upon the Department's written approval of a Work Plan, such Department-approved Work Plan shall be incorporated into and become an enforceable part of this Agreement as Exhibit "C" and shall be implemented in accordance with the schedule contained therein.

ii) If the Department modifies a Work Plan, the reasons for such modification shall be provided in writing. Within twenty (20) Days after receiving written notice of such modification, Volunteer shall elect in writing to (a) implement the Work Plan as modified; (b) implement any other Department-approved Work Plan(s); (c) invoke dispute resolution pursuant to Paragraph XIV; or (d) terminate this Agreement pursuant to Paragraph XIII.

iii) If the Department disapproves a Work Plan, the reasons for such disapproval shall be provided in writing. In the event the Department disapproves a Work Plan, within twenty (20) Days after receiving written notice of such disapproval, Volunteer shall elect in writing to (a) modify or expand it within thirty (30) Days of receipt of the written disapproval notice; (b) complete any other Department-approved Work Plan(s); (c) invoke dispute resolution pursuant to Paragraph XIV; or (d) terminate this Agreement pursuant to Subparagraph XIII.

3. An OM&M Work Plan, if necessary, shall be submitted in accordance with the schedule set forth in the IRM Work Plan or Remedial Work Plan.

4. During all field activities, Volunteer shall have on-Site a representative who is qualified to supervise the activities undertaken. Such representative may be an employee

or a consultant retained by Volunteer to perform such supervision.

C. Revisions to Work Plans

If revisions to a Work Plan are required to satisfy the objectives of such Work Plan, the parties will negotiate revisions which shall be attached to and incorporated into the relevant Work Plan and which shall be enforceable under this Agreement. If the parties cannot agree upon revisions to the relevant Work Plan, then unless the Volunteer invokes dispute resolution pursuant to Paragraph XIV, either party may terminate this Agreement pursuant to Paragraph XIII.

D. Submission of Final Reports

1. In accordance with the schedule contained in a Work Plan, Volunteer shall submit a Final Report that shall include but not be limited to: all data generated relative to the Site and all other information obtained as part of the implementation of the subject Work Plan; all of the assessments and evaluations required by the subject Work Plan; a statement of any additional data that must be collected; and "as-built" drawings.

i) The Final Report for an Investigation Work Plan shall comply with the requirements set forth at ECL 27-1411(1) and shall contain a certification by the person with primary responsibility for the day to day performance of the activities under this Agreement that those activities were performed in full accordance with the Investigation Work Plan. If such Final Report concludes that no remediation is necessary, and the Site does not meet the requirements for Track 1, Volunteer shall submit an Alternatives Analysis prepared in accordance with ECL 27-1413 that supports such determination.

ii) A Final Engineering Report certifying that remediation of the Site has been performed in accordance with this Agreement shall be prepared by a Professional Engineer with primary responsibility for the day to day performance of the activities under this Agreement. The Report shall be prepared in accordance with the requirements of ECL 27-1419(1) and (2) and shall contain a certification that all such activities were performed in accordance with the Department approved Work Plan. The Department shall review such Report, the submittals made pursuant to the Agreement, and any other relevant information regarding the Site and make a determination as to whether the goals of the remedial program have been or will be achieved in accordance with established timeframes; if so, a written Certificate of Completion will be issued in accordance with ECL 27-1419. Such Certificate of Completion may be modified or revoked, after notice and an opportunity for hearing, upon a finding that either Volunteer or Volunteer's successors or assigns has (a) failed to comply with this Agreement; (b) made a misrepresentation of material fact in connection with the Application or any certification that cleanup levels required by this Agreement were reached; or (c) good cause exists for such modification or revocation.

iii) All other Work Plan Final Reports shall contain a certification by a Professional Engineer (or other expert approved by the Department) with primary responsibility for the day to day performance of the activities under this Agreement that all such activities were performed in full accordance with the Department approved Work Plan.

2. Within sixty (60) Days of the Department's approval of a Final Report, Volunteer shall submit such additional Work Plans as it proposes to implement. Failure to submit any additional Work Plans within such period shall, unless other Work Plans are under review by the Department or being implemented by Volunteer, result in the termination of this Agreement pursuant to Paragraph XIII.

E. Review of Submittals other than Work Plans

1. The Department shall timely notify Volunteer in writing of its approval or disapproval of each submittal other than a Work Plan. All Department-approved submittals shall be incorporated into and become an enforceable part of this Agreement.

2. If the Department disapproves a submittal covered by this Subparagraph, it shall specify the reasons for its disapproval and may request Volunteer to modify or expand the submittal. Within twenty (20) Days after receiving written notice that Volunteer's submittal has been disapproved, Volunteer shall elect in writing to either (i) modify or expand it within thirty (30) Days of receipt of the written notice of disapproval; (ii) complete any other Department-approved Work Plan(s); (iii) invoke dispute resolution pursuant to Paragraph XIV; or (iv) terminate this Agreement pursuant to Paragraph XIII. If Volunteer submits a revised submittal and it is disapproved, the Department and Volunteer may pursue whatever remedies may be available under this Agreement or under law.

F. Department's Determination of Need for Remediation

The Department shall determine upon its approval of each Final Report dealing with the investigation of the Site whether remediation, or additional remediation as the case may be, is needed for protection of public health and the environment.

1. If the Department makes a preliminary determination that remediation, or additional remediation, is not needed for protection of public health and the environment, the Department shall notify the public of such determination and seek public comment in accordance with ECL 27-1417(3)(f). The Department shall provide timely notification to the Volunteer of its final determination following the close of the public comment period.

2. If the Department determines that additional remediation is not needed and such determination is based upon use restrictions, Volunteer shall cause to be filed an Environmental Easement in accordance with Paragraph X within sixty (60) Days of receipt of the Department's determination.

3. If the Department determines that remediation, or additional remediation, is needed, Volunteer may elect to submit for review and approval a proposed Remedial Work Plan (or a revision to an existing Work Plan for the Site) for a remedy selected upon due consideration of the factors set forth in ECL 27-1415(3). A proposed Remedial Work Plan addressing the Site's remediation will be noticed for public comment in accordance with ECL 27-1417(3)(f) and the Citizen Participation Plan developed pursuant to Paragraph I of this Agreement. If the Department determines following the close of the public comment period that revisions are needed, Volunteer agrees to negotiate revisions to the proposed Remedial Work Plan in accordance with Paragraph II.C. If Volunteer elects not to develop a Work Plan under this Subparagraph or if either party concludes that a mutually acceptable Work Plan under this Subparagraph cannot be negotiated, then this Agreement shall terminate in accordance with Subparagraph XIII.

G. Submission of Annual Reports, if required

In the event that the remedy for the Site, if any, or any Work Plan for the Site requires operation, maintenance, and monitoring (OM&M), including reliance upon institutional or engineering controls, Volunteer shall file a report annually (unless a different frequency is specified in an approved Work Plan) on the 1st day of the month following the anniversary of the start of the OM&M and continuing until the Department notifies Volunteer in writing that such report may be discontinued. Such report shall be signed by a Professional Engineer or by an expert approved by the Department to perform that function and certified under penalty of perjury that the institutional and/or engineering controls are unchanged from the previous certification and that nothing has occurred that would impair the ability of such controls to protect public health and the environment or constitute a violation or failure to comply with the approved OM&M Plan. Volunteer shall notify the Department within twenty-four (24) hours of discovery of any upset, interruption, or termination of one or more controls without the prior approval of the Department. Further, Volunteer shall take all actions required by the Department to maintain conditions at the Site that achieve the objectives of the remedy and/or the Work Plan and are protective of public health and the environment. An explanation of such upset, interruption, or termination of one or more controls and the steps taken in response shall be included in the foregoing notice and in the report required by this Subparagraph as well as in any progress reports required by Paragraph XI. Volunteer can petition the Department for a determination that the institutional and/or engineering controls may be terminated. Such petition must be supported by a Professional Engineer or other expert approved by the Department stating that such controls are no longer necessary. The Department shall not unreasonably withhold its approval of such petition.

III. Enforcement

This Agreement shall be enforceable as a contractual agreement under the laws of the State of New York. Volunteer shall not suffer any penalty or be subject to any proceeding or action if it cannot comply with any requirement of this Agreement as a result of a Force Majeure

Event provided it notifies the Department in writing within ten (10) Days of when it obtains knowledge of any such event. Volunteer shall include in such notice the measures taken and to be taken to prevent or minimize any delays and shall request an appropriate extension or modification of this Agreement. Volunteer shall have the burden of proving by a preponderance of the evidence that an event qualifies as a Force Majeure Event pursuant to this Paragraph.

IV. Entry upon Site

A. Volunteer hereby agrees to provide access to the Site and to all relevant information regarding activities at the Site in accordance with the provisions of ECL 27-1431.

B. The Department shall have the right to periodically inspect the Site to ensure that the use of the property complies with the terms and conditions of this Agreement.

V. Payment of State Costs

A. Within forty-five (45) Days after receipt of an itemized invoice from the Department, Volunteer shall pay to the Department a sum of money which shall represent reimbursement for State Costs for negotiating this Agreement, and all costs associated with this Agreement up to and including the date upon which the Certificate of Completion is issued, the Department approves the Final Report relative to OM&M, or this Agreement is terminated pursuant to Paragraph XIII, whichever is later.

B. Personal service costs shall be documented by reports of Direct Personal Service, which shall identify the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (*e.g.*, supplies, materials, travel, contractual) and shall be documented by expenditure reports. The Department shall not be required to provide any other documentation of costs, provided however, that the Department's records shall be available consistent with, and in accordance with, Article 6 of the Public Officers Law.

C. Such invoice shall be sent to Volunteer at the following address:

Thomas F. Perna
Partner
Chelsea Waterfront Development, LLC
One Executive Boulevard
Yonkers, New York 10701

with copy to:

Robert R. Tyson, Esq.
Bond, Schoeneck & King, PLLC
One Lincoln Center
Syracuse, New York 13201

D. Each such payment shall be made payable to the Department of Environmental Conservation and shall be sent to:

Bureau of Program Management
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7012

E. Each party shall provide written notification to the other within ninety (90) Days of any change in the foregoing addresses.

F. Volunteer may contest, in writing, invoiced costs under this Agreement if it believes (i) the cost documentation contains clerical, mathematical, or accounting errors; (ii) the costs are not related to the State's activities reimbursable under this Agreement; or (iii) the Department is not otherwise legally entitled to such costs. If Volunteer objects to an invoiced cost, Volunteer shall pay all costs not objected to within the time frame set forth in Subparagraph V.A and shall, within thirty (30) Days of receipt of an invoice, identify in writing all costs objected to and identify the basis of the objection. This objection shall be filed with the Director of the Bureau of Program Management ("BPM Director") who shall have the authority to relieve Volunteer of the obligation to pay invalid costs. Within forty-five (45) Days of the Department's determination of the objection, Volunteer shall pay to the Department the amount which the BPM Director or the BPM Director's designee determines Volunteer is obligated to pay or commence an action or proceeding seeking appropriate judicial relief.

G. In the event any instrument for the payment of money due under this Agreement is not honored when presented for payment, Volunteer shall be in violation of this Agreement, provided (i) the Department gives Volunteer written notice of such failure of collection, and (ii) the Department does not receive from Volunteer a certified check or bank check within fourteen (14) Days after the date of the Department's written notification.

VI. Liability Limitation

Subsequent to the issuance of a Certificate of Completion pursuant to this Agreement, Volunteer shall be entitled to the Liability Limitation set forth at ECL 27-1421, subject to the terms and conditions stated therein. A Notice of the Liability Limitation shall be filed with the recording officer of the county in which the Site is located within thirty (30) Days of (i) the effective date of the Certificate of Completion or (ii) the date Volunteer acquires title to the Site,

whichever is later.

VII. Reservation of Rights

A. Except as provided in Subparagraph VII.B, Volunteer reserves all rights and defenses under applicable law to contest, defend against, dispute, or disprove any action, proceeding, allegation, assertion, determination, or order of the Department, including any assertion of remedial liability by the Department against Volunteer, and further reserves all rights including the rights to notice, to be heard, to appeal, and to any other due process respecting any action or proceeding by the Department, including the enforcement of this Agreement. The existence of this Agreement or Volunteer's compliance with it shall not be construed as an admission of any liability, fault, wrongdoing, or violation of law by Volunteer, and shall not give rise to any presumption of law or finding of fact which shall inure to the benefit of any third party.

B. Notwithstanding the foregoing, Volunteer hereby waives any right it may have to make a claim pursuant to Article 12 of the Navigation Law with respect to the Site and releases the State and the New York Environmental Protection and Spill Compensation Fund from any and all legal or equitable claims, suits, causes of action, or demands whatsoever with respect to the Site that Volunteer may have as a result of Volunteer's entering into or fulfilling the terms of this Agreement.

VIII. Indemnification

Volunteer shall indemnify and hold the Department, the Trustee, the State of New York, and their representatives and employees harmless from any claim, suit, action, and cost of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Agreement by Volunteer prior to the Termination Date except for those claims, suits, actions, and costs arising from the State's gross negligence or willful or intentional misconduct by the Department, the State of New York, and/or their representatives and employees during the course of any activities conducted pursuant to this Agreement. The Department shall provide Volunteer with written notice no less than thirty (30) Days prior to commencing a lawsuit seeking indemnification pursuant to this Paragraph.

IX. Change of Use

Volunteer shall notify the Department at least sixty (60) Days in advance of any change of use, as defined in ECL 27-1425, which is proposed for the Site. In the event the Department determines that the proposed change of use is prohibited, the Department shall notify Volunteer of such determination within forty-five (45) Days of receipt of such notice.

X. Environmental Easement

A. Within thirty (30) Days after the Department's approval of a Remedial Work Plan which relies upon one or more institutional and/or engineering controls, or within thirty (30) Days after the Department's determination pursuant to Subparagraph II.F.2 that additional remediation is not needed based upon use restrictions, Volunteer shall submit to the Department for approval an Environmental Easement to run with the land in favor of the State which complies with the requirements of ECL Article 71, Title 36. The submittal shall be substantially similar to Exhibit "D." Volunteer shall cause such instrument to be recorded with the recording officer for the county in which the Site is located within thirty (30) Days after the Department's approval of such instrument. Volunteer shall provide the Department with a copy of such instrument certified by the recording officer to be a true and faithful copy within thirty (30) Days of such recording (or such longer period of time as may be required to obtain a certified copy provided Volunteer advises the Department of the status of its efforts to obtain same within such thirty (30) Day period).

B. Volunteer or the owner of the Site may petition the Department to modify or extinguish the Environmental Easement filed pursuant to this Agreement at such time as it can certify that the Site is protective of human health and the environment without reliance upon the restrictions set forth in such instrument. Such certification shall be made by a Professional Engineer or other expert approved by the Department. The Department will not unreasonably withhold its consent.

XI. Progress Reports

Volunteer shall submit a written progress report of its actions under this Agreement to the parties identified in Subparagraph XII.A.1 by the 10th day of each month commencing with the month subsequent to the approval of the first Work Plan and ending with the Termination Date, unless a different frequency is set forth in a Work Plan. Such reports shall, at a minimum, include: all actions relative to the Site during the previous reporting period and those anticipated for the next reporting period; all approved activity modifications (changes of work scope and/or schedule); all results of sampling and tests and all other data received or generated by or on behalf of Volunteer in connection with this Site, whether under this Agreement or otherwise, in the previous reporting period, including quality assurance/quality control information; information regarding percentage of completion; unresolved delays encountered or anticipated that may affect the future schedule and efforts made to mitigate such delays; and information regarding activities undertaken in support of the Citizen Participation Plan during the previous reporting period and those anticipated for the next reporting period.

XII. Communications

A. All written communications required by this Agreement shall be transmitted by United States Postal Service, by private courier service, or hand delivered.

1. Communication from Volunteer shall be sent to:

Ramanand Pergadia, P.E.
Division of Environmental Remediation, Region3
New York State Department of Environmental Conservation
21 South Putt Corner
New Paltz, New York 12561-1696
Note: four copies (one unbound) of work plans are required to be sent.

Gary Litwin
Bureau of Environmental Exposure Investigation
New York State Department of Health
Flanigan Square
547 River Street
Troy, New York 12180-2216
Note: two copies of work plans are required to be sent, and

Rosalie K. Rusinko
Senior Attorney
New York State Department of Environmental Conservation
200 White Plains Road, 5th Floor
Tarrytown, New York 10591-5805
Note: copy of correspondence only, with electronic copy of other documents as provided for in Par. XV.E

2. Communication from the Department to Volunteer shall be sent to:

Thomas F. Perna
Partner
Chelsea Waterfront Development, LLC
One Executive Boulevard
Yonkers, New York 10701

with copy to:

Robert R. Tyson, Esq.
Bond, Schoeneck & King, PLLC
One Lincoln Center
Syracuse, New York 13201

B. The Department and Volunteer reserve the right to designate additional or different addressees for communication on written notice to the other.

C. Each party shall notify the other within ninety (90) Days after any change in the addresses listed in this Paragraph XII or in Paragraph V.

XIII. Termination of Agreement

Volunteer may terminate this Agreement at any time by providing written notification to the parties listed in Subparagraph XII.A.1. The Department may terminate this Agreement at any time pursuant to Subparagraph XV.A or in the event Volunteer fails to substantially comply with the Agreement's terms and conditions. The Department shall provide written notification to Volunteer setting forth the basis for termination of the Agreement. The termination shall be effective the 5th Day after the non-terminating party's receipt of such written notification, except that such termination shall not affect the provisions contained in Paragraphs V, VII.B, and VIII.

XIV. Dispute Resolution

A. In the event disputes arise regarding any notice of disapproval of a submittal, proposed Work Plan or Final Report, or during the implementation of any Work Plan, or in connection with any notice from the Department pursuant to Paragraph IX that a proposed Change of Use is prohibited, Volunteer may, within thirty (30) Days of receipt of such notice, request in writing informal negotiations with the Department in an effort to resolve the dispute. The Department and Volunteer shall consult together in good faith and exercise best efforts to resolve any differences or disputes without resort to the procedures described in Subparagraph XIV.B. The period for informal negotiations shall not exceed thirty (30) Days from Volunteer's request for informal negotiations. If the parties cannot resolve a dispute by informal negotiations during this period, the Department's position shall be considered binding unless Volunteer notifies the Department in writing within thirty (30) Days after the conclusion of the thirty (30) Day period for informal negotiations that it invokes the dispute resolution provisions provided under Subparagraph XIV.B.

B. 1. Volunteer shall file with the Office of Hearings and Mediation ("OH&M") a request for formal dispute resolution and a written statement of the issues in dispute, the relevant facts upon which the dispute is based, factual data, analysis, or opinion supporting its position, and all supporting documentation upon which Volunteer relies (hereinafter called the "Statement of Position"). A copy of such request and written statement shall be provided contemporaneously to the Director of the Division of Environmental Remediation ("DER Director") and to the parties listed under Subparagraph XII.A.1.

2. The Department shall serve its Statement of Position no later than twenty (20) Days after receipt of Volunteer's Statement of Position.

3. Volunteer shall have the burden of proving by substantial evidence that the Department's position does not have a rational basis and should not prevail. The OH&M can conduct meetings, in person or via telephone conferences, and request additional information from either party if such activities will facilitate a resolution of the issues.

4. The OH&M shall prepare and submit a report and recommendation to the DER Director who shall issue a final decision resolving the dispute in a timely manner. The final decision shall constitute a final agency action and Volunteer shall have the right to seek judicial review of the decision pursuant to Article 78 of the CPLR provided that Volunteer notifies the Department within thirty (30) Days after receipt of a copy of the final decision of its intent to commence an Article 78 proceeding and commences such proceeding within sixty (60) Days after receipt of a copy of the Director's final decision. Volunteer shall be in violation of this Agreement if it fails to comply with the final decision resolving this dispute within sixty (60) Days after the date of such final decision, or such other time period as may be provided in the final decision, unless it seeks judicial review of such decision within the sixty (60) Day period provided. In the event that Volunteer seeks judicial review, Volunteer shall be in violation of this Agreement if it fails to comply with the final Court Order or settlement within thirty (30) Days after the effective date of such Order or settlement, unless otherwise directed by the Court. For purposes of this Subparagraph, a Court Order or settlement shall not be final until the time to perfect an appeal of same has expired.

5. The invocation of dispute resolution shall not extend, postpone, or modify Volunteer's obligations under this Agreement with respect to any item not in dispute unless or until the Department agrees or a Court determines otherwise. The invocation of the procedures set forth in this Paragraph XIV shall constitute a waiver of any and all other administrative remedies which may otherwise be available to Volunteer regarding the issue in dispute.

6. The Department shall keep an administrative record of any proceedings under this Paragraph XIV which shall be available consistent with Article 6 of the Public Officers Law.

7. Nothing in this Paragraph XIV shall be construed as an agreement by the parties to resolve disputes through administrative proceedings pursuant to the State Administrative Procedure Act, the ECL, or 6 NYCRR Part 622 or Section 375-2.1.

XV. Miscellaneous

A. If the information provided and any certifications made by Volunteer are not materially accurate and complete, this Agreement, except with respect to Volunteer's obligations pursuant to Paragraphs V, VII.B, and VIII, shall be null and void *ab initio* fifteen (15) Days after the Department's notification of such inaccuracy or incompleteness or fifteen (15) Days after issuance of a final decision resolving a dispute pursuant to Paragraph XIV, whichever is later, unless Volunteer submits information within that fifteen (15) Day time period indicating that the

information provided and the certifications made were materially accurate and complete. In the event this Agreement is rendered null and void, any Certificate of Completion and/or Liability Limitation that may have been issued or may have arisen under this Agreement shall also be null and void *ab initio*, and the Department shall reserve all rights that it may have under law.

B. Volunteer shall allow the Department to attend, and shall notify the Department at least seven (7) Days in advance of, any field activities to be conducted pursuant to this Agreement, as well as any pre-bid meetings, job progress meetings, substantial completion meeting and inspection, and final inspection and meeting; nothing in this Agreement shall be construed to require Volunteer to allow the Department to attend portions of meetings where privileged matters are discussed.

C. The Department may exempt Volunteer from the requirement to obtain any state or local permit or other authorization for any activity conducted pursuant to this Agreement that (i) is conducted on the Site or on different premises that are under common control or contiguous to or physically connected with the Site and such activity manages exclusively hazardous waste and/or petroleum from such Site, and (ii) satisfies all substantive technical requirements applicable to like activity conducted pursuant to a permit, as determined by the Department.

D. Volunteer shall use "best efforts" to obtain all Site access, permits, easements, rights-of-way, rights-of-entry, approvals, institutional controls, or authorizations necessary to perform Volunteer's obligations under this Agreement. If, despite Volunteer's best efforts, any access, permits, easements, rights-of-way, rights-of-entry, approvals, institutional controls, or authorizations required to perform this Agreement are not obtained, Volunteer shall promptly notify the Department, and include a summary of the steps taken to obtain access. The Department may, as it deems appropriate and within its authority, assist Volunteer in obtaining same. If an interest in property is needed to implement an institutional control required by a Work Plan and such interest cannot be obtained, the Department may require Volunteer to modify the Work Plan pursuant to Subparagraph II.C of this Agreement to reflect changes necessitated by the lack of access and/or approvals.

E. All approved Work Plans, Final Reports, and other documents required under this Agreement shall be submitted to the Department in an electronic format acceptable to the Department within thirty (30) Days of approval. If any document cannot be converted into electronic format, Volunteer shall so advise the Department and, if the Department concurs, submit such document in an alternative format acceptable to the Department.

F. Volunteer shall provide a copy of this Agreement to each contractor hired to perform work required by this Agreement and shall condition all contracts entered into for the obligations identified in this Agreement upon performance in conformity with the terms of this Agreement. Volunteer or its contractor(s) shall provide written notice of this Agreement to all subcontractors hired to perform any portion of the work required by this Agreement. Volunteer shall nonetheless be responsible for ensuring that Volunteer's contractors and subcontractors

perform the work in satisfaction of the requirements of this Agreement.

G. The paragraph headings set forth in this Agreement are included for convenience of reference only and shall be disregarded in the construction and interpretation of any provisions of this Agreement.

H. 1. The terms of this Agreement shall constitute the complete and entire agreement between the Department and Volunteer concerning the implementation of the activities required by this Agreement. No term, condition, understanding, or agreement purporting to modify or vary any term of this Agreement shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department shall be construed as relieving Volunteer of Volunteer's obligation to obtain such formal approvals as may be required by this Agreement. In the event of a conflict between the terms of this Agreement and any Work Plan submitted pursuant to this Agreement, the terms of this Agreement shall control over the terms of the Work Plan(s) attached as Exhibit "C." Volunteer consents to and agrees not to contest the authority and jurisdiction of the Department to enter into or enforce this Agreement.

2. i. Except as set forth herein, if Volunteer desires that any provision of this Agreement be changed, other than a provision of a Work Plan or a time frame, Volunteer shall make timely written application to the Commissioner with copies to the parties listed in Subparagraph XII.A.1.

ii. Changes to the Work Plan shall be accomplished as set forth in Subparagraph II.C of this Agreement.

iii. Requests for a change to a time frame set forth in this Agreement shall be made in writing to the Department's project attorney and project manager; such requests shall not be unreasonably denied and a written response to such requests shall be sent to Volunteer promptly.

I. 1. If there are multiple parties signing this Agreement, the term "Volunteer" shall be read in the plural, the obligations of each such party under this Agreement are joint and several, and the insolvency of or failure by any Volunteer to implement any obligations under this Agreement shall not affect the obligations of the remaining Volunteer(s) under this Agreement.

2. If Volunteer is a partnership, the obligations of all general partners (including limited partners who act as general partners) under this Agreement are joint and several and the insolvency or failure of any general partner to implement any obligations under this Agreement shall not affect the obligations of the remaining partner(s) under this Agreement.

3. Notwithstanding the foregoing Subparagraphs XV.I.1 and 2, if multiple

parties sign this Agreement as Volunteers but not all of the signing parties elect to implement a Work Plan, all Volunteers are jointly and severally liable for each and every obligation under this Agreement through the completion of activities in such Work Plan that all such parties consented to; thereafter, only those Volunteers electing to perform additional work shall be jointly and severally liable under this Agreement for the obligations and activities under such additional Work Plan(s). The parties electing not to implement the additional Work Plan(s) shall have no obligations under this Agreement relative to the activities set forth in such Work Plan(s). Further, only those Volunteers electing to implement such additional Work Plan(s) shall be eligible to receive the Liability Limitation referenced in Paragraph VI.

J. Volunteer shall be entitled to contribution protection to the extent authorized by ECL 27-1421(6).

K. Volunteer shall not be considered an operator of the Site solely by virtue of having executed and/or implemented this Agreement.

L. Volunteer and Volunteer's agents, grantees, lessees, sublessees, successors, and assigns shall be bound by this Agreement. Any change in ownership of Volunteer including, but not limited to, any transfer of assets or real or personal property, shall in no way alter Volunteer's responsibilities under this Agreement.

M. Unless otherwise expressly provided herein, terms used in this Agreement which are defined in ECL Article 27 or in regulations promulgated thereunder shall have the meaning assigned to them under said statute or regulations. Whenever terms listed in the Glossary attached hereto are used in this Agreement or its Exhibits, the definitions set forth in the Glossary shall apply. In the event of a conflict, the definition set forth in the Glossary shall control.

N. Volunteer's obligations under this Agreement represent payment for or reimbursement of response costs, and shall not be deemed to constitute any type of fine or penalty.

O. This Agreement may be executed for the convenience of the parties hereto, individually or in combination, in one or more counterparts, each of which shall be deemed to have the status of an executed original and all of which shall together constitute one and the same.

P. The effective date of this Agreement is the date it is signed by the Commissioner or the Commissioner's designee.

DATED:

DEC 12 2005

DENISE M. SHEEHAN
~~ACTING~~ COMMISSIONER
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND TRUSTEE OF THE STATE'S NATURAL RESOURCES

By:

Dale A. Desnoyers, Director
Division of Environmental Remediation

CONSENT BY VOLUNTEER

Volunteer hereby consents to the issuing and entering of this Agreement, waives Volunteer's right to a hearing herein as provided by law, and agrees to be bound by this Agreement.

Chelsea Waterfront Development, LLC

By: _____
Thomas F. Perna

Title: Partner

Date: 11/3/05

STATE OF NEW YORK)
) ss:
COUNTY OF Westchester)

On the 3rd day of Nov, in the year 2005, before me, the undersigned, personally appeared Thomas F. Perna, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Penny Perlman
Signature and Office of individual taking acknowledgment

PENNY PERLMAN
Notary Public State of New York
No. 60-8328450
Qualified in Westchester County
Commission Expires Oct. 31, 20 6

Glossary of Terms

The following terms shall have the following meanings:

"Day": a calendar day. In computing any period of time under this Agreement, if the last day would fall on a Saturday, Sunday, or State holiday, the period shall run until the close of business of the next working day.

"Force Majeure Event": an event which is brought on as a result of fire, lightning, earthquake, flood, adverse weather conditions, strike, shortages of labor and materials, war, riot, obstruction or interference by adjoining landowners, or any other fact or circumstance beyond Volunteer's reasonable control.

"IRM": an interim remedial measure which is a discrete set of activities which can be undertaken without extensive investigation and evaluation to prevent, mitigate, or remedy environmental damage or the consequences of environmental damage attributable to a Site.

"OM&M": operation, maintenance, and monitoring.

"Professional engineer": an individual registered as a professional engineer or otherwise authorized in accordance with Article 145 of the New York State Education Law. If such individual is a member of a firm, that firm must be authorized to offer professional engineering services in the State of New York in accordance with Article 145 of the New York State Education Law.

"State Costs": all the State's expenses including, but not limited to, direct labor, fringe benefits, indirect costs, travel, analytical costs, and contractor costs incurred by the State of New York for negotiating, implementing, and administering this Agreement. Approved agency fringe benefit and indirect cost rates will be applied.

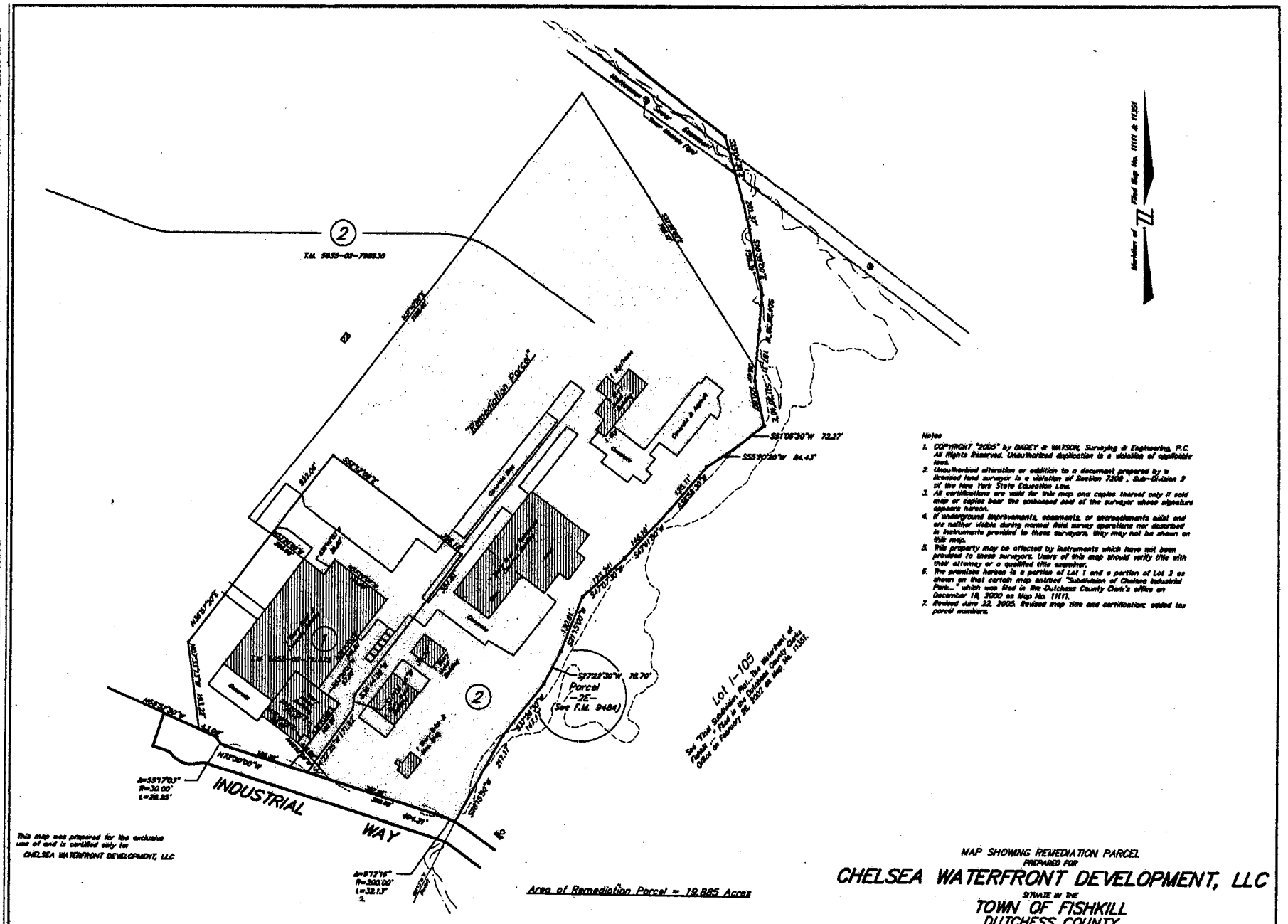
"Termination Date": the date upon which (i) the Department issues the Certificate of Completion or approves the Final Report relative to the OM&M at the Site, whichever is later, or (ii) the Agreement terminates pursuant to Paragraph XIII or Subparagraph XV.A,.

"Trustee": the Trustee of New York State's natural resources.

"Work Plan": a Department-approved work plan, as may be modified, that Volunteer shall implement and that is attached to this Agreement.

EXHIBIT "A"

Survey Map & "Description of Property"



Notes

1. COPYRIGHT "2005" by BADEY & WATSON, Surveying & Engineering, P.C. All Rights Reserved. Unauthorized duplication is a violation of applicable laws.
2. Unauthorized alteration or addition to a document prepared by a licensed land surveyor is a violation of Section 7209, Sub-Division 2 of the New York State Education Law.
3. All certifications are valid for this map and copies thereof only if said map or copies bear the embossed seal of the surveyor whose signature appears hereon.
4. If underground improvements, easements, or encroachments exist and are neither visible during normal field survey operations nor described in instruments provided to these surveyors, they may not be shown on this map.
5. This property may be affected by instruments which have not been provided to these surveyors. Users of this map should verify title with their attorney or a qualified title examiner.
6. The premises hereon is a portion of Lot 1 and a portion of Lot 2 as shown on that certain map entitled "Subdivision of Chelsea Industrial Park..." which was filed in the Dutchess County Clerk's office on December 18, 2000 as Map No. 11113.
7. Revised June 22, 2005. Revised map title and certification; added tax parcel numbers.

This map was prepared for the exclusive use of and is certified only to:
CHELSEA WATERFRONT DEVELOPMENT, LLC

MAP SHOWING REMEDIATION PARCEL
PREPARED FOR
CHELSEA WATERFRONT DEVELOPMENT, LLC
SITUATE IN THE
TOWN OF FISHKILL
DUTCHESS COUNTY
NEW YORK

SCALE 1 in. = 100 ft. JUNE 17, 2005
Revised June 22, 2005. See Note 7.

BADEY & WATSON, Surveying & Engineering, P.C.
1000 Route 9
Cold Spring, New York 10516
(845) 265-4127
(845) 265-2512
(914) 424-3468 Toll-Free
(914) 265-1259
(845) 265-4485 (Fax)
(914) 765-2577

BADEY & WATSON
SURVEYING & ENGINEERING, P.C.
By
NEW YORK STATE LICENSED LAND SURVEYOR
LICENSE No. 49789

FILE No. 89-139

File No. 86-129
W.O. No. 17323

Doc. No. RP17JN5D.lwp
Created: June 17, 2005
Revised: June 22, 2005
Printed: June 22, 2005
Figure No(s.) 1010
Author: SRM

DESCRIPTION OF PROPERTY
prepared for
Chelsea Waterfront Development, LLC.
Description of Remediation Parcel
(Portions of Fishkill Tax Map Parcels 5955-02-798930 & 5955-02-791875)

ALL that certain parcel of land situate in the Town of Fishkill, County of Dutchess and State of New York that is a portion of Lot 1 and a portion of Lot 2 as shown on that certain map entitled "Subdivision of Chelsea Industrial Park..." which was filed in the Dutchess County Clerk's Office on December 18, 2000 as Map No. 11111 that is bounded and described as follows:

BEGINNING at a point in the northerly line of Industrial Way at the southwesterly terminus of the division line between the property herein described on the west and Lot I-105 as shown on that certain map entitled "Final Subdivision Plat... The Waterfront at Fishkill..." which was filed in the Dutchess County Clerk's Office on February 26, 2002 as Map No. 11351 on the east. **THENCE** from the said point of beginning along the northerly line of Industrial Way

> on a curve to the left, the center of which bears S 26°42'16" W, the central angle of which is 9°12'16", the radius of which is 200.00 feet for 32.13 feet and

N 72°30'00" W 256.00 feet

to a point. Thence running through Lot 2, through Lot 1 and through Lot 2 again, as said lots are shown on that certain map entitled "Subdivision of Chelsea

Industrial Park..." which was filed in the Dutchess County Clerk's Office on December 18, 2000 as Map No. 11111

N 40°52'00" W 108.00 feet
N 36°40'00" E 23.60 feet
S 53°20'00" E 20.10 feet
N 36°40'00" E 100.20 feet
N 53°20'00" W 57.00 feet
N 36°40'00" E 246.80 feet
N 53°20'00" W 141.40 feet
S 36°40'00" W 39.60 feet
N 53°20'00" W 205.00 feet
N 37°40'00" E 1,188.00 feet and
S 32°28'00" E 709.12 feet

to a point in the westerly line of Lot I-105 as shown on the aforementioned Filed Map No. 11351. Thence along the same

S 04°28'30" W 26.47 feet
S 11°20'40" E 100.80 feet
S 51°06'20" W 72.27 feet
S 55°20'20" W 84.43 feet
S 38°58'30" W 125.11 feet
S 42°41'50" W 146.16 feet
S 47°07'30" W 123.75 feet
S 21°15'00" W 130.61 feet
S 27°22'30" W 78.70 feet
S 37°26'30" W 147.17 feet and
S 28°15'50" W 217.17 feet

to the point or place of beginning, containing 19.885 acres, more or less.

Prepared by
BADEY & WATSON
Surveying & Engineering, P.C.
U.S. Route 9
Cold Spring, New York 10516
(845)265-9217(V)
(845)265-4428(F)

File U:\86-129B\RP17JN5D.lwp

EXHIBIT "B"

Citizen Participation Plan

EXHIBIT "C"

Approved Work Plans

EXHIBIT "D"

Environmental Easement

ENVIRONMENTAL EASEMENT

THIS INDENTURE made this ____day of _____, 200__, between ***Owner(s)*** _____ residing at (or having an office at) _____(the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("brownfield sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

Draft

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of environmental easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and of ensuring the potential restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that environmental easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a brownfield site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and;

WHEREAS, Grantor, is the owner of real property located in the City/Town/Village of _____, _____County, New York known and designated on the tax map of the _____ of _____ as tax map parcel number_____, section ___block ___ lot____ , being the same as that property conveyed to Grantor by deed on _____, and recorded in the Land Records of the _____ County Clerk at page ____, liber _____ of Deeds, comprised of approximately ____ acres, and hereinafter more fully described in Schedule A attached hereto and made a part hereof (the " Controlled Property"); and;

Attach an adequate legal description of the property subject to the easement, or reference a recorded map. If the easement is on only a part of a parcel of land which is not subdivided into encumbered and unencumbered portions, a legal description needs to be created by a survey bearing the seal and signature of a licensed land surveyor with reference to a metes and bounds description.

WHEREAS, the Commissioner does hereby acknowledge that the Department accepts this Environmental Easement in order to ensure the protection of human health and the environment and to achieve the requirements for remediation established at this Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36;and

NOW THEREFORE, in consideration of the covenants and mutual promises contained herein and the terms and conditions of **Brownfield Cleanup Agreement Number**_____ /State **Assistance Contract Number**_____ **/Order on Consent Number**_____, Grantor grants, conveys and releases to Grantee a permanent Environmental Easement pursuant to Article 71, Title 36 of the ECL in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

Draft

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the potential restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The following controls apply to the use of the Controlled Property, run with the land are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees, and any person using the Controlled Property:

A. The Controlled Property may be used for

residential
commercial
industrial
use as long as the following long-term engineering controls are employed:

B. The Controlled Property may not be used for a higher level of use such as **unrestricted/ residential / commercial** use and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant of Title 36 to Article 71 of the Environmental Conservation Law.

C. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

D. Grantor covenants and agrees that it shall annually, or such time as NYSDEC may allow, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury that the controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls employed at the Controlled Property were approved by the NYSDEC, and that nothing has occurred that would impair the ability of such control to protect the public health and environment or constitute a violation or failure to comply with any Site Management Plan for such controls and giving access to such Controlled Property to evaluate continued maintenance of such controls.

Draft

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Controlled Property, including:

1. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

2. The right to give, sell, assign, or otherwise transfer the underlying fee interest to the Controlled Property by operation of law, by deed, or by indenture, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This environmental easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this environmental easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person intentionally violates this environmental easement, the Grantee may revoke the Certificate of Completion provided under ECL Article 27, Title 14, or the Satisfactory Completion of Project provided under ECL Article 56, Title 5 with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach. Grantor shall then have a reasonable amount of time from receipt of such notice to cure. At the expiration of said second period, Grantee may commence any proceedings and take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement in accordance with applicable law to require compliance with the terms of this Environmental Easement.

Draft

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar its enforcement rights in the event of a subsequent breach of or noncompliance with any of the terms of this Environmental easement.

6. Notice. Whenever notice to the State (other than the annual certification) or approval from the State is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing its County tax map number or the Liber and Page or computerized system tracking/ identification number and address correspondence to:

Division of Environmental Enforcement
Office of General Counsel
New York State Department of Environmental Conservation
625 Broadway
Albany New York 12233-5500

Such correspondence shall be delivered by hand, or by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. This environmental easement may be amended only by an amendment executed by the Commissioner of the New York State Department of Environmental Conservation and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This environmental easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Grantor's Name

Draft

By:_____

Title:_____

Date:_____

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation

By: _____
Denise M. Sheehan, Acting Commissioner

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _____ day of _____, in the year 200_, before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public - State of New York

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _____ day of _____, in the year 200_, before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Draft

_____
Notary Public - State of New York

APPENDIX C

SUPPLEMENTAL INVESTIGATIONS:

Monitoring Well Completion and Construction Details

Sediment Sampling Report

CONRAD GEOSCIENCE CORP.
Environmental Scientists
www.conradgeo.com
8 Raymond Avenue, Poughkeepsie, New York 12603 • 845/454-2544 • fax: 845/454-2655

RECEIVED
OCT 12 2006
STERLING ENVIRONMENTAL ENGINEERING, P.C.

October 9, 2006

John J. Rashak
New York State Department of Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561-1620

Re: **Baseline Groundwater Monitoring and Stream Water and Sediment Sampling Report;**
Former Circle M Wood Treatment Facility, Fishkill, New York;
NYSDEC Site #3-14-083;
Conrad Geoscience File #CF030290

Dear Mr. Rashak:

Between July and September 2006, Conrad Geoscience Corp. began implementation of the NYSDEC-approved Remedial Work Plan dated February 1, 2006, accepted June 15, 2006, at the Former Circle M Wood Treatment Facility (Figure 1). Initial activities included installation of three bedrock monitoring wells, one overburden monitoring well, and reinstallation of two overburden monitoring wells; baseline groundwater sampling of on-site monitoring wells; and stream water and sediment sampling.

MONITORING WELL INSTALLATION

In accordance with the Remedial Work Plan, Conrad Geoscience supervised the installation of four new monitoring wells (MW-3D, MW-9S, MW-9D, and MW-10) and replaced two pre-existing monitoring wells MW-3RS, MW-7R (Figure 2).

Monitoring Well MW-3RS was re-installed because the original well was damaged beyond repair. After re-installation, MW-3S was abandoned following NYSDEC standard protocol. Monitoring well MW-7 could not be located and replaced with Monitoring Well MW-7R.

The four remaining wells were installed as specified in the Record of Decision (ROD). Monitoring Wells MW-3D, MW-9D and MW-10 are the three monitoring wells completed in bedrock and Monitoring Well MW-9S is completed in overburden.

Overburden Monitoring Wells, MW-3RS, MW-7R and MW-9S, were installed using 4.25-inch hollow stem augers to drill through the overburden.

Bedrock monitoring wells, MW-3D, MW-9D and MW-10, were installed using 4.25-inch hollow stem augers to drill through the overburden into the underlying clay layer. When the clay

layer was encountered, the borehole was advanced by driving and washing casing. When bedrock refusal was encountered, a 3.75-inch outside diameter wire line (HQ) diamond core bit was used to core bedrock. Water was used as a drilling fluid to wash sediment and rock fragments from the casing and to cool the bit.

Monitoring wells were constructed using 2.0-inch I.D., 10-slot PVC well screens installed across the water table. Above the well screen, solid PVC tubing was installed to the surface. Surface casing was installed to anchor the top of each well and to prevent infiltration of surface water along the outer annulus of the well. Filter packs, bentonite seals, grout and well materials conform to NYSDEC/USEPA specifications. Monitoring wells were completed with steel surface casing, above grade. Well construction diagrams are attached.

Upon completion of well installation, the top-of-casing elevations for the eleven on-site monitoring wells were surveyed by a New York State licensed surveyor relative to a local datum.

Between August 2 and 4, 2006, Conrad Geoscience developed Monitoring Wells MW-3RS, MW-3D, MW-7R, MW-9S, MW-9D, and MW-10 in order to remove suspended sediment and to induce flow of representative formation water into the wells. Wells were developed by surging and removing water and suspended sediment using submersible pumps. Water temperature, pH, conductivity and turbidity were monitored during well development, and turbidity was reduced below 50 nephelometric turbidity units (NTUs).

BASELINE GROUNDWATER MONITORING

Baseline groundwater monitoring was conducted on August 9 and 10, 2006. Groundwater samples were collected from Monitoring Wells MW-1, MW-3RS, MW-3D, MW-4, MW-5, MW-6, MW-7R, MW-8, MW-9S, MW-9D, and MW-10 (Figure 2). Depth-to-water measurements were recorded from the top of each well casing, and groundwater contour maps were prepared based on these measurements (Figures 3 and 4).

Prior to sampling, Conrad Geoscience purged each monitoring well following the USEPA protocol for low-flow (minimal draw-down) groundwater sampling until physical parameters stabilized. Water quality parameters were monitored using an In-Situ® Troll 9500 water quality meter. Water samples were collected from bedrock monitoring wells using a bladder pump and from overburden monitoring wells using a peristaltic pump and dedicated polyethylene tubing and dispensed into laboratory provided containers. Due to the high turbidity from the overburden clay layer, unfiltered and filtered groundwater samples were collected from the overburden monitoring wells.

Samples were labeled, packed on ice, and shipped via overnight delivery for analysis of arsenic, chromium and copper via USEPA Method SW846 6010.

STREAM WATER AND SEDIMENT SAMPLING

Stream water and sediment sampling was conducted on September 12, 2006. Stream samples were collected from five stations, ST-1, ST-2, ST-3, ST-4, and ST-5 (Figure 5). Each station was spaced approximately 300 feet apart from up-stream to down-stream, beginning approximately 25 feet north of Industrial Way.

Four samples were collected at each station: Two stream bank soil samples (east and west banks); one surface water sample; and one stream sediment sample (Figure 5). The following samples were collected from each station:

- SURFW — Stream surface water
- STRSED — Sediment from the stream bottom
- STRBNKW — Sediment from the western stream bank
- STRBNKE — Sediment from the eastern stream bank.

The stream boundary and each sampling station were surveyed by a New York State licensed surveyor (Figure 5).

Samples were labeled, packed on ice, and shipped via overnight delivery for analysis of arsenic, chromium and copper via USEPA Method SW846: 3050, 6010 and USEPA Method 200.7.

RESULTS

Baseline Groundwater Monitoring

Sample results are summarized in Table 1. Analytical reports are attached. Arsenic was detected in 10 of the 11 monitoring wells sampled. Only Monitoring Well MW-6 contained arsenic at concentrations exceeding NYSDEC standards, in both the unfiltered and filtered samples (0.052 mg/L and 0.052 mg/L, respectively). Chromium was detected in one of the eleven wells sampled, MW-6, in the unfiltered sample, at a concentration below NYSDEC standards (0.020 mg/L). Copper was detected in two of the eleven wells sampled, MW-3RS, in the unfiltered and filtered samples, and MW-7R, in the filtered sample, at concentrations below NYSDEC standards (0.012 mg/L, 0.013 mg/L, and 0.012 mg/L, respectively).

Stream Water Sampling

Sample results are summarized in Table 2. Analytical reports are attached. Arsenic, chromium, and copper were not detected in any of the five surface water samples.

Stream Sediment Sampling

Sample results are summarized in Table 3. Analytical reports are attached. Samples from four of the five stations contained arsenic at concentrations above the lowest effect level, as defined by the NYSDEC Division of Fish, Wildlife and Marine Resources Technical Guidance for Screening Contaminated Sediments: ST-2, ST-3, ST-4, and ST-5. Only one sample contained chromium at a concentration above the lowest effect level, ST-5: STRBNKE. All five stations contained samples with copper at concentrations above the lowest effect level. None of the samples exceeded the severe effect level for arsenic, chromium or copper.

DISCUSSION

Baseline Groundwater Monitoring

The baseline groundwater monitoring data indicates that the bedrock aquifer has not been impacted from releases of wood-preservative solution from past site operations.

Seven of the eight overburden monitoring wells contained concentrations of arsenic below NYSDEC standards. Monitoring Well MW-6 contained arsenic in both the unfiltered and filtered samples at a concentration slightly above NYSDEC standards. Copper was detected in Monitoring Wells MW-3RS and MW-7R at concentrations below NYSDEC standards. Monitoring Well MW-6 was the only well which contained chromium, also at a concentration below NYSDEC standards.

Periodic groundwater monitoring will be conducted following construction activities.

Stream Water Sampling

All five stream surface water samples contained no detectable concentrations of arsenic, chromium or copper. There is no apparent impact to the stream surface water.

Additional stream water sampling will be conducted during and following construction activities.

Stream Sediment Sampling

According to NYSDEC standards, if a sample exceeds the lowest effect level criterion, the impact is considered moderate. This moderate impact is present at every station for at least one metal.

Arsenic exceeds the lowest effect level in stream bottom sediments at stations ST-3, ST-4 and ST-5; and copper exceeds the lowest effect level in stream bottom sediments at ST-2, ST-3 and ST-4. Chromium does not appear to have impacted stream bottom sediments at any station.

Arsenic exceeds the lowest effect level in at least one stream bank sample at stations ST-2, ST-3, ST-4 and ST-5; chromium exceeds the lowest effect level in at least one stream bank sample at ST-5; and copper exceeds the lowest effect level in at least one stream bank sample at ST-1, ST-2, ST-3, ST-4 and ST-5.

None of the sediment samples contained arsenic, chromium or copper above the severe effect level.

Results from baseline stream sediment sampling conducted in September 2006 are consistent with results of previous stream sediment sampling conducted between September 1998 and September 2002.

Additional stream water sampling will be conducted during and following construction activities.

If you have any questions, please do not hesitate to contact me.

Sincerely,

CONRAD GEOSCIENCE CORP.

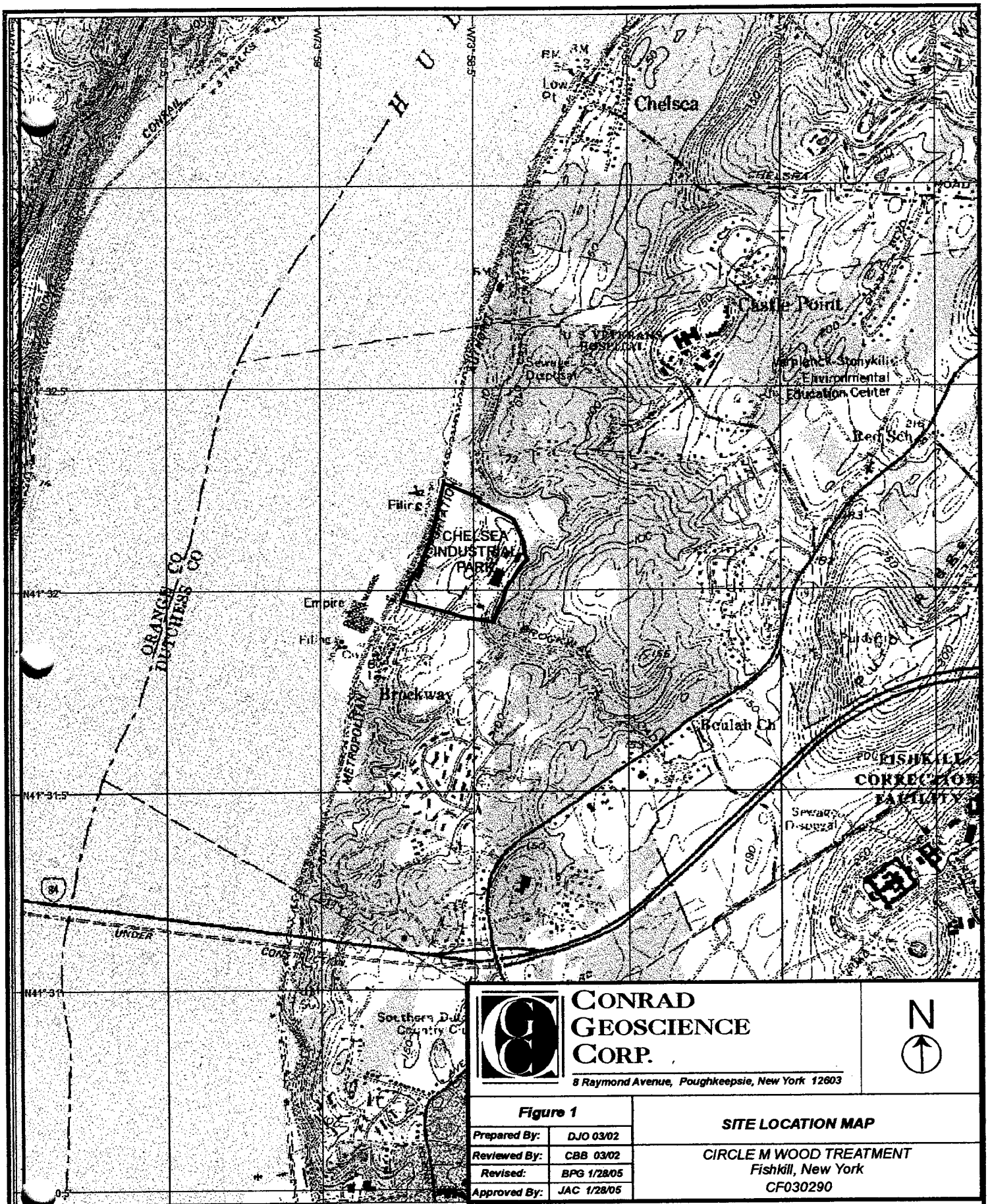
Brian P. Goodwin

Brian P. Goodwin
Geologist

BPG/seg

attachments

cc: Mark Millspaugh
Daniel Simone
Robert Tyson



CONRAD GEOSCIENCE CORP.

8 Raymond Avenue, Poughkeepsie, New York 12603

N

Figure 1		SITE LOCATION MAP
Prepared By:	DJO 03/02	CIRCLE M WOOD TREATMENT Fishkill, New York CF030290
Reviewed By:	CBB 03/02	
Revised:	BPG 1/28/05	
Approved By:	JAC 1/28/05	

3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 643 ft Scale: 1 : 22,400 Detail: 13-0 Datum: WGS84

LEGEND

STREAM BOUNDARY

ST-4 STREAM SAMPLING STATION LOCATION

ST-5

STREAM FLOW

ST-4

CONCRETE BINS

FORMER CIRCLE M WOOD TREATMENT FACILITY

ST-3

ST-2

PARAFLEX

STREAM FLOW

ST-1

0 80

FEET

N

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Figure 5		STREAM SAMPLING STATION LOCATION MAP
Prepared By:	BPG10/3/06	
Reviewed By:		FORMER CIRCLE M WOOD TREATMENT FACILITY Fishkill, NY CF030290
Revised By:		
Approved By:	BPG10/3/06	

LEGEND

STREAM BOUNDARY

MW-10 18.16' — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION

CONCRETE BINS

FORMER CIRCLE M WOOD TREATMENT FACILITY

PARAFLEX

MW-9D -6.56'

MW-3D 20.16'

MW-10 18.16'

STREAM FLOW

STREAM FLOW

-2
0
5
10
15
20

0 80
FEET

GROUNDWATER CONTOUR INTERVAL = 1 FOOT
GROUNDWATER ELEVATIONS COLLECTED 8-9-06
ELEVATIONS RELATIVE TO LOCAL DATUM

CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

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Figure 4	BEDROCK GROUNDWATER CONTOUR MAP
Prepared By: BPG10/3/06	
Reviewed By:	FORMER CIRCLE M WOOD TREATMENT FACILITY
Revised By:	Fishkill, NY
Approved By: BPG10/3/06	CF030290

LEGEND

STREAM BOUNDARY

MW-1 25.98' — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION

STREAM FLOW

CONCRETE BINS

FORMER CIRCLE M WOOD TREATMENT FACILITY

MW-1 25.98'

MW-5 26.19'

MW-6 22.25'

MW-9S 24.75'

MW-3RS 26.14'

MW-7R 26.12'

MW-4 20.7'

26.1

25.6

24.1

23.1

PARAFLEX

0 80

FEET

GROUNDWATER CONTOUR INTERVAL = 0.5 FEET
GROUNDWATER ELEVATIONS COLLECTED 8-9-06
ELEVATIONS RELATIVE TO LOCAL DATUM

CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

N

Figure 3	OVERBURDEN GROUNDWATER CONTOUR MAP
Prepared By: BPG10/3/06	FORMER CIRCLE M WOOD TREATMENT FACILITY
Reviewed By:	Fishkill, NY
Revised By:	CF030290
Approved By: BPG10/3/06	

LEGEND

STREAM BOUNDARY

MW-1 MONITORING WELL LOCATION

CONCRETE BINS

FORMER CIRCLE M WOOD TREATMENT FACILITY

PARAFLEX

MW-1
MW-3D
MW-3RS
MW-4
MW-5
MW-6
MW-7R
MW-8
MW-9D
MW-9S
MW-10

STREAM FLOW

STREAM FLOW

0 80
FEET

N

CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 2		MONITORING WELL LOCATION MAP
Prepared By:	BPG10/3/06	
Reviewed By:		FORMER CIRCLE M WOOD TREATMENT FACILITY Fishkill, NY CF030290
Revised By:		
Approved By:	BPG10/3/06	

Table 1. **Metals in Baseline Groundwater Monitoring Samples;** USEPA Method SW846 6010; collected **August 9 and 10, 2006;** Chelsea Industrial Park, Town of Fishkill, New York;
Conrad Geoscience File #CF030290

Sample Identification	Chemical Constituent		
	Arsenic (0.025*)	Chromium (0.050*)	Copper (0.200*)
Metals			
MW-1 UF	0.006	ND < 0.010	ND < 0.010
MW-1 F	0.007	ND < 0.010	ND < 0.010
MW-3RS UF	0.006	ND < 0.010	0.012
MW-3RS F	ND < 0.005	ND < 0.010	0.013
MW-3D	0.010	ND < 0.010	ND < 0.010
MW-4 UF	0.015	ND < 0.010	ND < 0.010
MW-4 F	0.005	ND < 0.010	ND < 0.010
MW-5 UF	0.015	ND < 0.010	ND < 0.010
MW-5 F	0.013	ND < 0.010	ND < 0.010
MW-6 UF	**0.052**	0.020	ND < 0.010
MW-6 F	**0.052**	ND < 0.010	ND < 0.010
MW-7R UF	0.007	ND < 0.010	ND < 0.010
MW-7R F	0.007	ND < 0.010	0.012
MW-8 UF	0.009	ND < 0.010	ND < 0.010
MW-8 F	0.008	ND < 0.010	ND < 0.010
MW-9S UF	ND < 0.005	ND < 0.010	ND < 0.010
MW-9S F	ND < 0.005	ND < 0.010	ND < 0.010
MW-9D	0.009	ND < 0.010	ND < 0.010
MW-10	0.006	ND < 0.010	ND < 0.010

Notes:
* - Standards are for groundwater according 6NYCRR Part 700-705; Class GA Groundwater;
Boldface type designates those compounds detected at concentrations exceeding NYSDEC standards;
All units are in mg/L;
UF = Unfiltered;
F = Filtered;
D = Deep/bedrock monitoring well;
S = Shallow/overburden monitoring well;
R = Replacement monitoring well;
ND = Not detected, detection limit listed.

Table 2. **Metals in Baseline Stream Surface Water Samples;** USEPA Method 200.7; collected **September 12, 2006;** Chelsea Industrial Park, Town of Fishkill, New York; Conrad Geoscience File #CF030290

Sample Identification	Chemical Constituent		
	Arsenic (0.150*)	Chromium (0.074*)	Copper (0.009*)
Metals			
ST-1: SURFW	ND < 0.005	ND < 0.010	ND < 0.009
ST-2: SURFW	ND < 0.005	ND < 0.010	ND < 0.009
ST-3: SURFW	ND < 0.005	ND < 0.010	ND < 0.009
ST-4: SURFW	ND < 0.005	ND < 0.010	ND < 0.009
ST-5: SURFW	ND < 0.005	ND < 0.010	ND < 0.009

Notes:
* - Standards are for groundwater according to September 2005 Record of Decision;
Stream is classified as a Class C, Type A(C);
Boldface type designates those compounds detected at concentrations exceeding NYSDEC standards;
All units are in mg/L;
ND = Not detected, detection limit listed.

Table 3. **Metals in Baseline Stream Sediment and Stream Bank Samples;**
USEPA Method SW846 3050, 6010; collected **September 12, 2006;**
Chelsea Industrial Park, Town of Fishkill, New York;
Conrad Geoscience File #CF030290

Sample Identification	Chemical Constituent					
	Arsenic		Chromium		Copper	
	Lowest Effect Level*	Severe Effect Level*	Lowest Effect Level*	Severe Effect Level*	Lowest Effect Level*	Severe Effect Level*
	6.0	33.0	26.0	110.0	16.0	110.0
Metals						
ST-1: STRSED	4.01		9.94		11.9	
ST-1: STRBNKW	5.06		12.7		**21.0**	
ST-1: STRBNKE	4.07		14.9		**20.4**	
ST-2: STRSED	2.65		14.1		**16.2**	
ST-2: STRBNKW	4.78		14.7		**18.7**	
ST-2: STRBNKE	**9.84**		12.2		**16.3**	
ST-3: STRSED	**7.64**		14.4		**20.5**	
ST-3: STRBNKW	**7.21**		14.2		**16.4**	
ST-3: STRBNKE	**6.26**		11.0		15.5	
ST-4: STRSED	**6.75**		12.2		**16.8**	
ST-4: STRBNKW	**6.43**		10.9		11.5	
ST-4: STRBNKE	**7.06**		15.4		**21.8**	
ST-5: STRSED	**6.73**		17.9		14.0	
ST-5: STRBNKW	**7.03**		17.0		15.8	
ST-5: STRBNKE	**12.5**		**30.6**		**20.5**	

Notes:
* - Standards are for soil according to NYSDEC Division of Fish, Wildlife and Marine Resources Technical Guidance for Screening Contaminated Sediments, January 25, 1999;
A sample is considered contaminated if either criterion is exceeded. If both criterion are exceeded, the sediment is considered to be severely impacted. If only the Lowest Effect Level criterion is exceeded, the impact is considered moderate.
Boldface type designates those compounds detected at concentrations exceeding NYSDEC standards;
All units are in mg/kg;
ND = Not detected, detection limit listed.

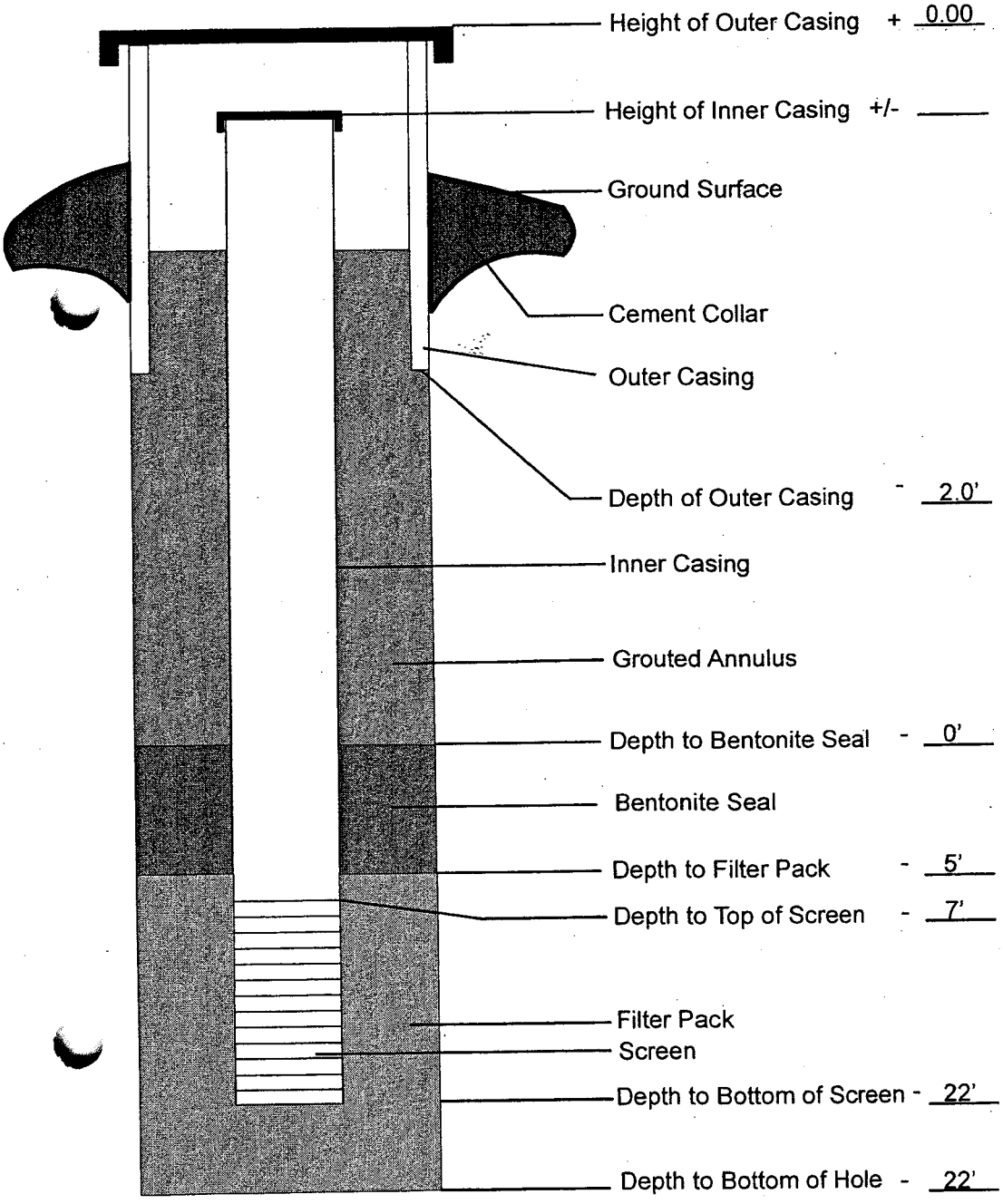
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: 4 1/4" Hollow Stem Auger
Drilling Fluid: None

Well # MW-3RS
Site: Chelsea Industrial Park
Date Start: 7-13-2006
Date Finish: 7-13-2006

Location/Coordinates:
Elevation of Outer Casing (LD):
Elevation of Inner Casing (LD):
Elevation of Ground Surface:
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	6.0"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

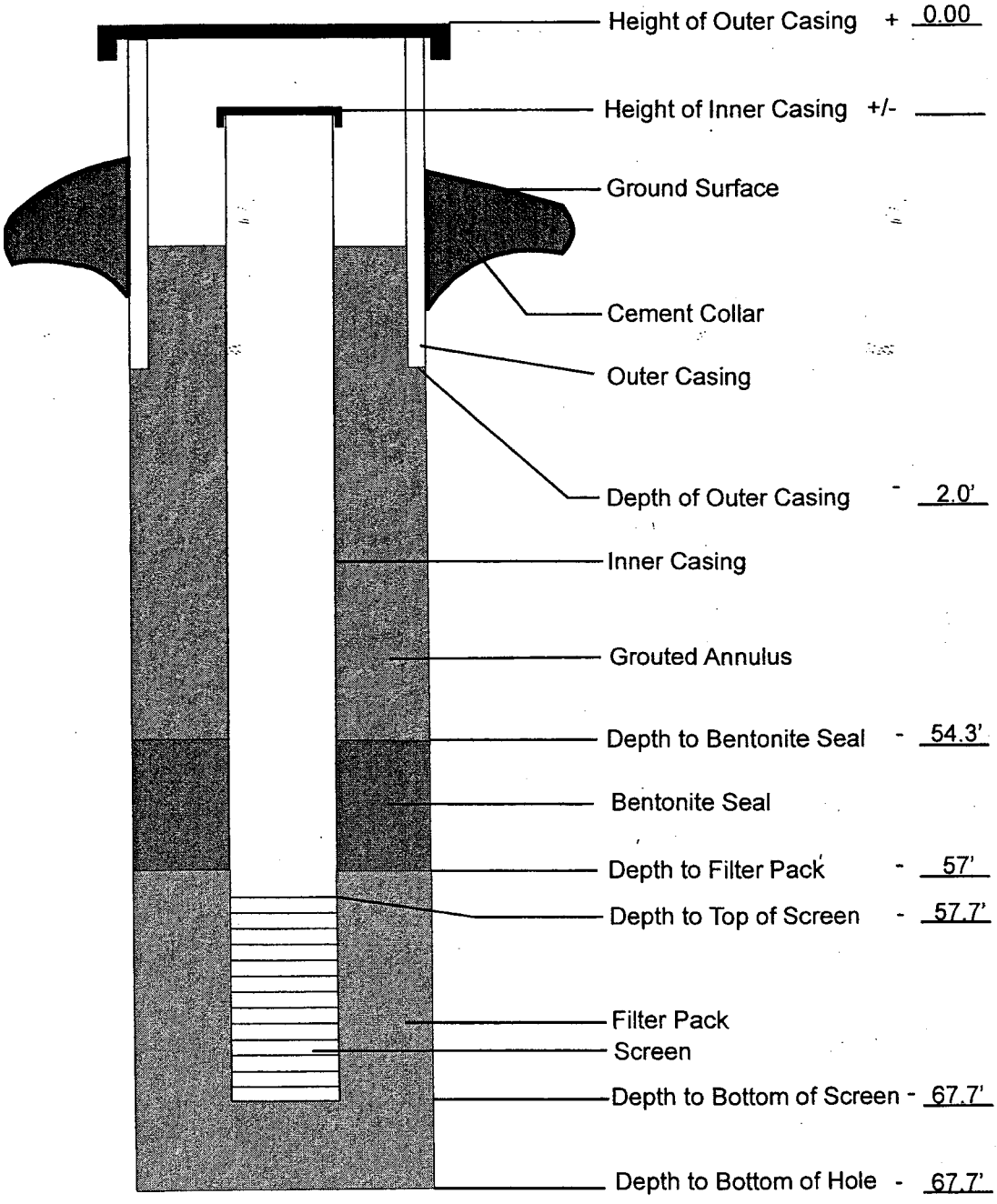
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: Drive & Wash Casing & HQ Core
Drilling Fluid: Water

Well # MW-3D
Site: Chelsea Industrial Park
Date Start: 7-19-2006
Date Finish: 7-20-2006

Location/Coordinates:
Elevation of Outer Casing (LD):
Elevation of Inner Casing (LD):
Elevation of Ground Surface:
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	3.875"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

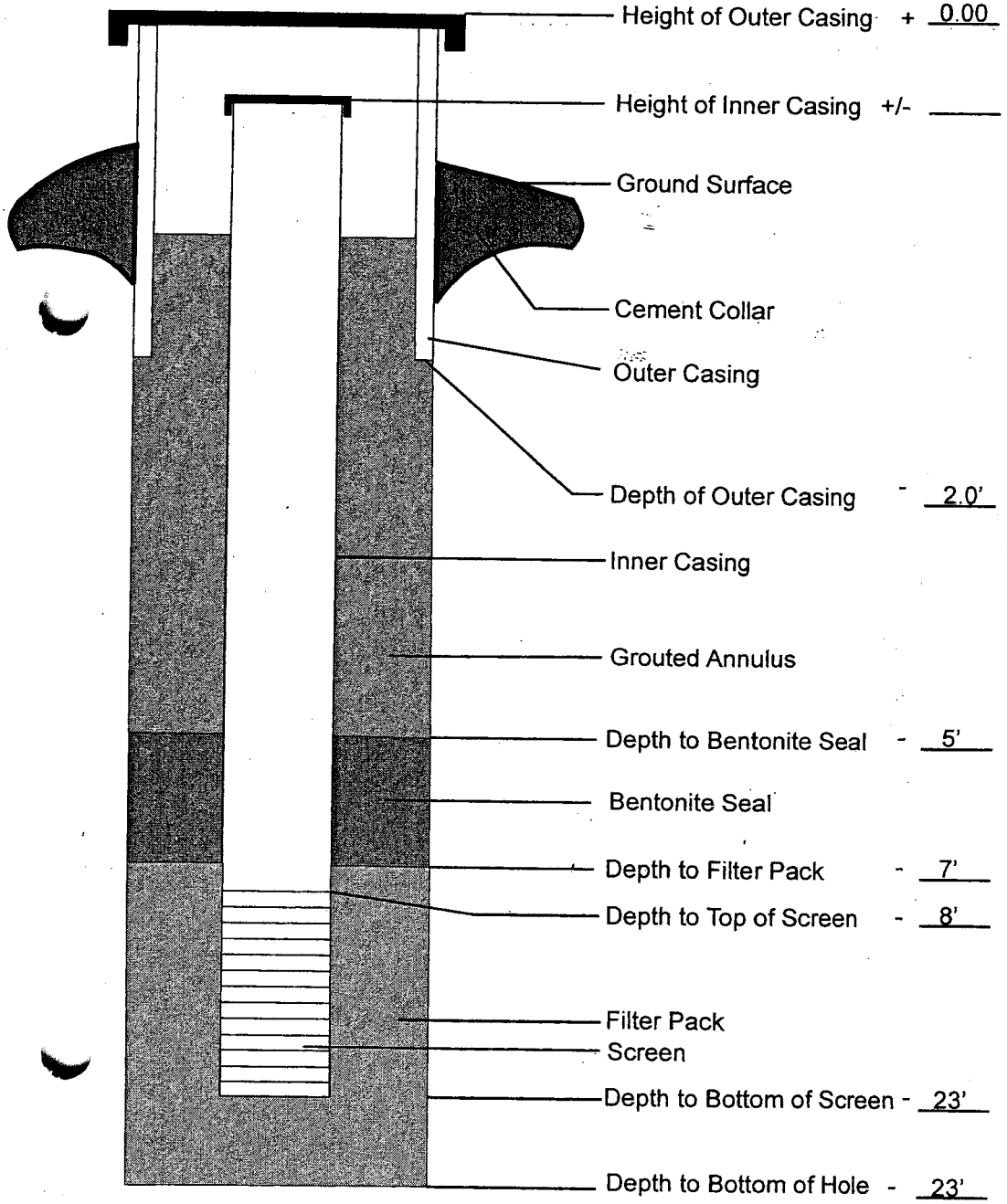
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: 4 1/4" Hollow Stem Auger
Drilling Fluid: None

Well # MW-7R
Site: Chelsea Industrial Park
Date Start: 7-13-2006
Date Finish: 7-13-2006

Location/Coordinates: _____
Elevation of Outer Casing (LD): _____
Elevation of Inner Casing (LD): _____
Elevation of Ground Surface: _____
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	6.0"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

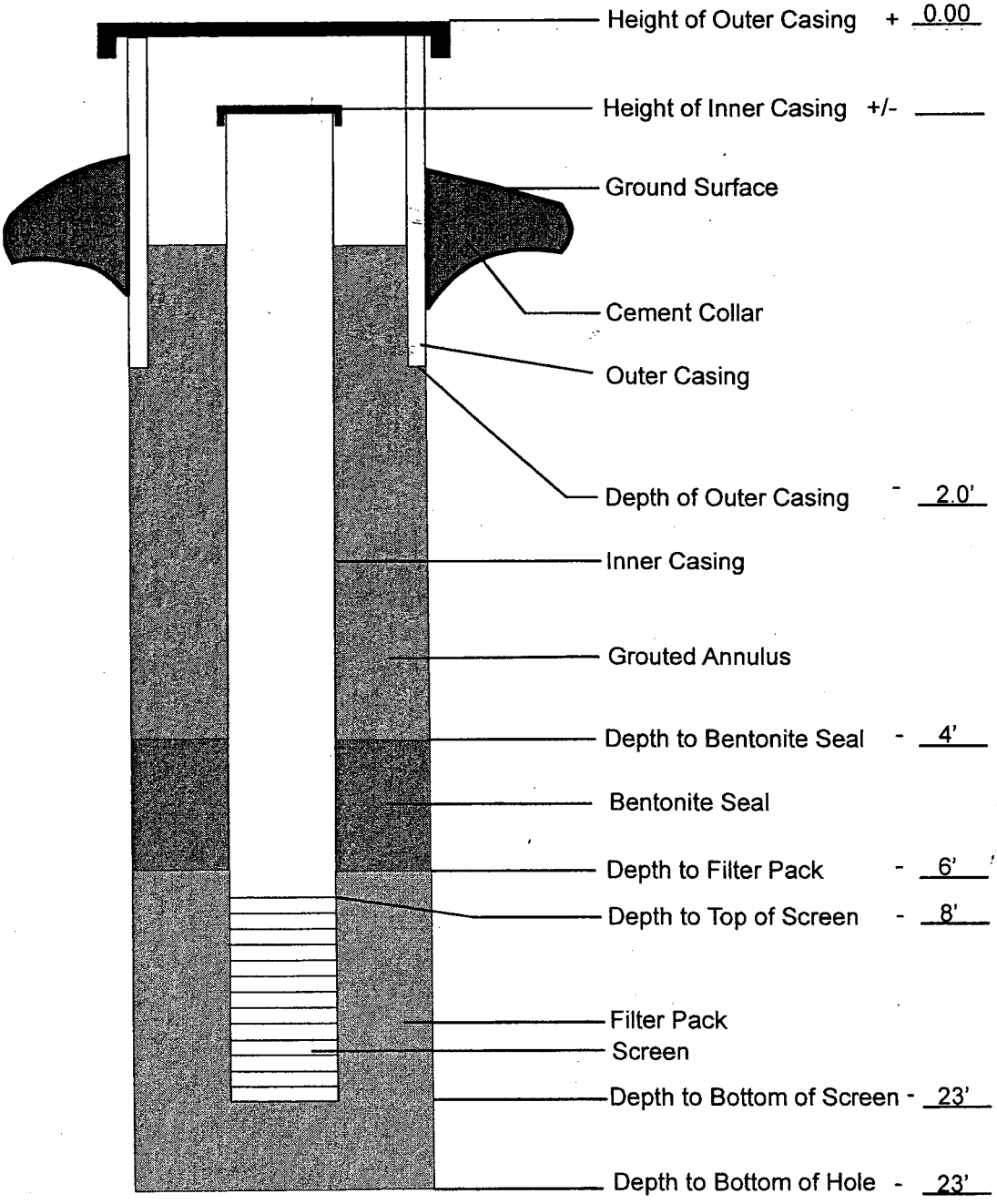
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: 4 1/4" Hollow Stem Auger
Drilling Fluid: None

Well # MW-9S
Site: Chelsea Industrial Park
Date Start: 7-10-2006
Date Finish: 7-10-2006

Location/Coordinates:
Elevation of Outer Casing (LD):
Elevation of Inner Casing (LD):
Elevation of Ground Surface:
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	6.0"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

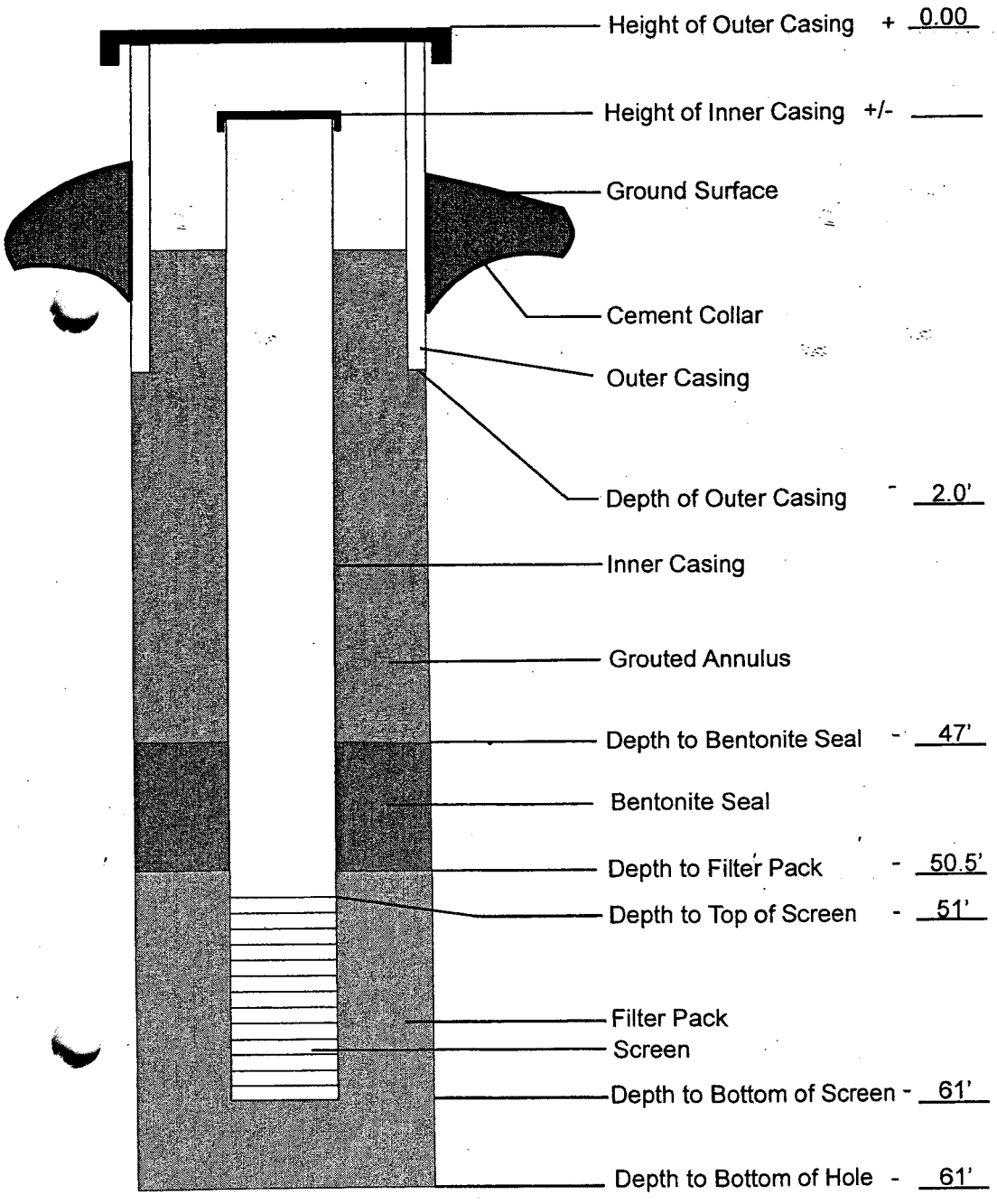
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: Drive & Wash Casing & HQ Core
Drilling Fluid: Water

Well # MW-9D
Site: Chelsea Industrial Park
Date Start: 7-11-2006
Date Finish: 7-14-2006

Location/Coordinates:
Elevation of Outer Casing (LD):
Elevation of Inner Casing (LD):
Elevation of Ground Surface:
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	3.875"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

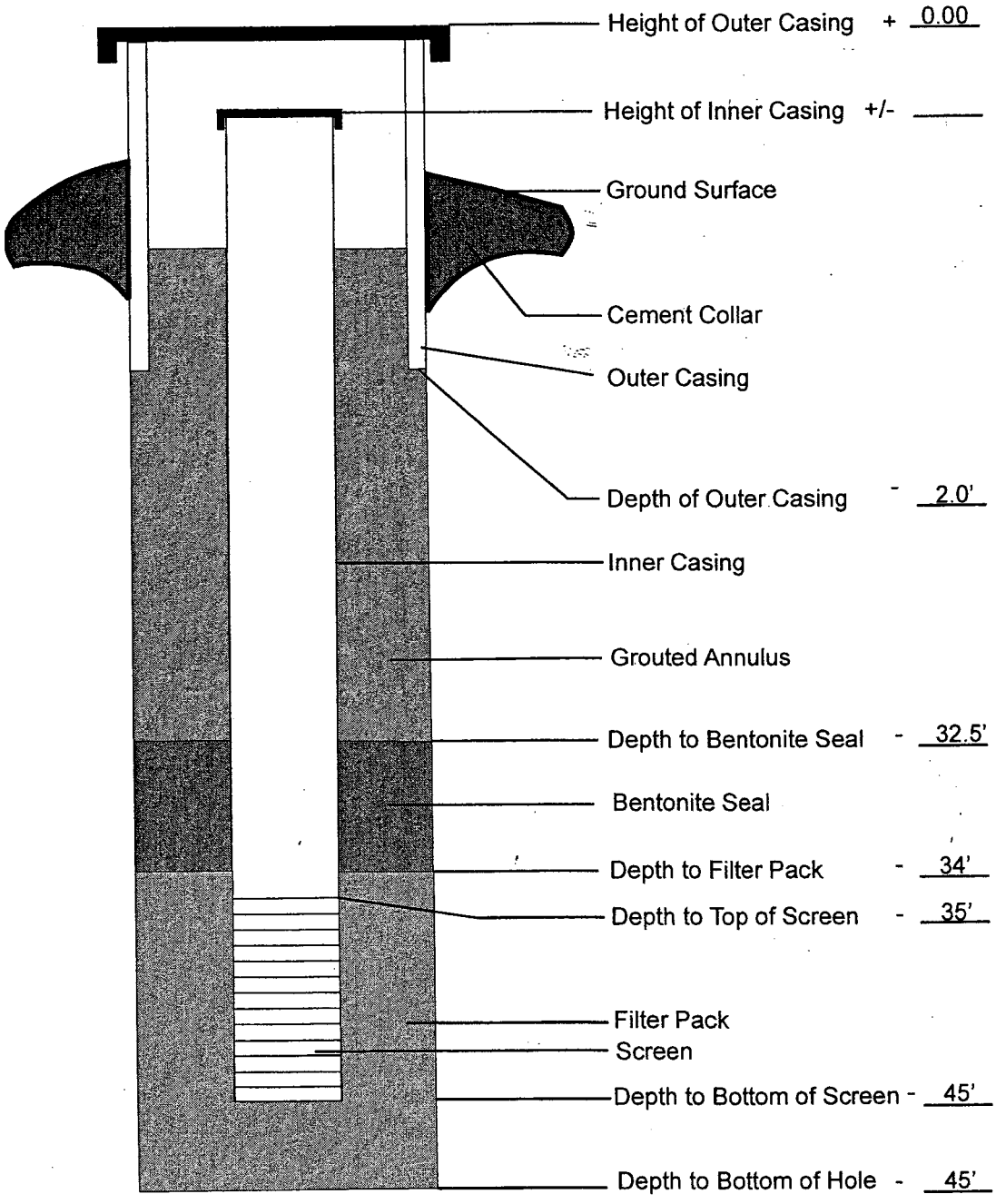
CONRAD GEOSCIENCE CORP.

Monitoring Well Construction Diagram

Project # CF030290
Driller: Northstar Drilling
Drilling Method: Drive & Wash Casing & HQ Core
Drilling Fluid: Water

Well # MW-10
Site: Chelsea Industrial Park
Date Start: 7-17-2006
Date Finish: 7-18-2006

Location/Coordinates:
Elevation of Outer Casing (LD):
Elevation of Inner Casing (LD):
Elevation of Ground Surface:
Geologist: Brian Goodwin



Elevations Relative To Land Surface

Borehole Diameter	3.875"
Outer Casing Diameter	4.0"
Outer Casing Material	Steel
Inner Casing Diameter	2.0"
Inner Casing Material	PVC
Grout Type	Portland
Bentonite Type	3/8" Chips
Filter Pack Type	#0 Silica
Screen Type	10 Slot

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: Conrad Geoscience

Client Job Site: Chelsea Industrial Park
Fishkill, NY

Client Job No.: CF030290

Lab Project No.: 06-2780

Sample Type: Soil
Method: SW 846: 3050, 6010

Date(s) Sampled: 09/12/2006
Date Received: 09/14/2006
Date Analyzed: 09/18/2006

Laboratory Report for Solid Analysis

Lab Sample No.	Field ID No.	Field Location	Arsenic Result (mg/kg)	Chromium Result (mg/kg)	Copper Result (mg/kg)
9208	N/A	ST-5:STRBNKE	12.5	30.6	20.5
9209	N/A	ST-5:STRBNKW	7.03	17.0	15.8
9210	N/A	ST-5:STRSED	6.73	17.9	14.0
9212	N/A	ST-4:STRBNKE	7.06	15.4	21.8
9213	N/A	ST-4:STRBNKW	6.43	10.9	11.5
9214	N/A	ST-4:STRSED	6.75	12.2	16.8
9216	N/A	ST-3:STRBNKE	6.26	11.0	15.5
9217	N/A	ST-3:STRBNKW	7.21	14.2	16.4
9218	N/A	ST-3:STRSED	7.64	14.4	20.5
9220	N/A	ST-2:STRBNKE	9.84	12.2	16.3
9221	N/A	ST-2:STRBNKW	4.78	14.7	18.7

ELAP ID No.: 10958

RECEIVED
SEP 28 2006
CONRAD GEOSCIENCE

Comments:

Approved By: Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

File ID : 062780.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: Conrad Geoscience

Client Job Site: Chelsea Industrial Park
Fishkill, NY

Client Job No.: CF030290

Lab Project No.: 06-2780

Sample Type: Soil
Method: SW 846: 3050, 6010

Date(s) Sampled: 09/12/2006
Date Received: 09/14/2006
Date Analyzed: 09/18/2006

Laboratory Report for Solid Analysis

Lab Sample No.	Field ID No.	Field Location	Arsenic Result (mg/kg)	Chromium Result (mg/kg)	Copper Result (mg/kg)
9222	N/A	ST-2:STRSED	2.65	14.1	16.2
9224	N/A	ST-1:STRBNKE	4.07	14.9	20.4
9225	N/A	ST-1:STRBNKW	5.06	12.7	21.0
9226	N/A	ST-1:STRSED	4.01	9.94	11.9

ELAP ID No.: 10958

Comments:

Approved By: _____
Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

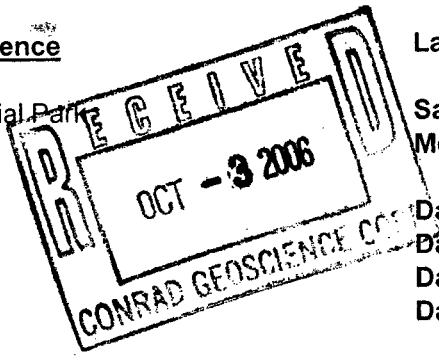
File ID : 062780.xls

PARADIGM ENVIRONMENTAL SERVICES, INC.
9 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

Client: Conrad Geoscience

Client Job Site: Chelsea Industrial Park
Fishkill, NY

Client Job No.: CF030290



Lab Project No.: 06-2780

Sample Type: Water
Method: EPA 200.7

Date(s) Sampled: 09/12/2006
Date Received: 09/14/2006
Date Analyzed: 09/18/2006
Date Reisued: 09/26/2006

Laboratory Report for Metals Analysis in Water

Lab Sample No.	Field ID No.	Field Location	Arsenic (mg/L)	Chromium (mg/L)	Copper * (mg/L)
9211	N/A	ST-5:SURFW	<0.005	<0.010	<0.009
9215	N/A	ST-4:SURFW	<0.005	<0.010	<0.009
9219	N/A	ST-3:SURFW	<0.005	<0.010	<0.009
9223	N/A	ST-2:SURFW	<0.005	<0.010	<0.009
9227	N/A	ST-1:SURFW	<0.005	<0.010	<0.009

ELAP ID No.: 10958

Comments: * Reported down to MDL per client.

Approved By: _____
Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

CHAIN OF CUSTODY

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 • (800) 724-1997
FAX: (585) 647-3311

EE 9/12/06

REPORT TO		INVOICE TO	
COMPANY:	Conrad Geoscience	COMPANY:	Same
ADDRESS:	8 Raymond Ave.	ADDRESS:	
CITY:	Poughkeepsie STATE: NY ZIP: 12603	CITY:	STATE: ZIP:
PHONE:	845-454-2544 FAX: -2655	PHONE:	FAX:
ATTN:	Brian Goodwin	ATTN:	
COMMENTS:	Please return cooler		

LAB PROJECT #: 06-2580 | CLIENT PROJECT #: CF030290

TURNAROUND TIME: (WORKING DAYS) — STD [X] 5 | OTHE [ ]

QUOTE #:

PROJECT NAME/SITE NAME: Chelsea Industrial Park Fishkill, NY

Page 1 of 2

REQUESTED ANALYSIS

DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	Copper	Chromium	Arsenic	REMARKS	PARADIGM LAB SAMPLE NUMBER
1 9-12-06	10:42		X	ST-5: STRBNKE	soil	1	X	X	X		9209 8
2	10:42		X	ST-5: STRBNKW	soil	1	X	X	X		9209 9
3	10:40		X	ST-5: STRSED	soil	1	X	X	X		9210 0
4	10:35		X	ST-5: SURFW.	water	1	X	X	X		9210 1
5	1110		X	ST-4: STRBNKE	soil	1	X	X	X		9210 2
6	1105		X	ST-4: STRBNKW	soil	1	X	X	X		9210 3
7	1108		X	ST-4: STRSED	soil	1	X	X	X		9210 4
8	1100		X	ST-4: SURFW.	water	1	X	X	X		9210 5
9	11:28		X	ST-3: STRBNKE	soil	1	X	X	X		9210 6
10	11:31		X	ST-3: STRBNKW	soil	1	X	X	X		9210 7

LAB USE ONLY BELOW THIS LINE

Sample Condition: Per NELAC/ELAP 210/241/242/243/244

Receipt Parameter	NELAC Compliance	
Container Type:	Y [X]	N [ ]
Comments:		
Preservation:	Y [X]	N [ ]
Comments:		
Holding Time:	Y [X]	N [ ]
Comments:		
Temperature:	Y [ ]	N [X]
Comments: 7°C iced		

Brian P. Goodwin 9-12-06/14:00
Sampled By Date/Time

Brian P. Goodwin 9-12-06/15:00
Relinquished By Date/Time

Received By Date/Time

Elizabeth A. Honch 9/14/06 0930
Received @ Lab By Date/Time

Total Cost:

P.I.F.

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 • (800) 724-1997
FAX: (585) 647-3311

REPORT TO

COMPANY: Conrad Geoscience
ADDRESS: 8 Raymond Ave
CITY: Poughkeepsie STATE: NY ZIP: 12603
PHONE: 845-454-2549 FAX: -2655
ATTN: Brian Goodwin
COMMENTS: Please return cooler

INVOICE TO:

COMPANY: Same
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN:

LAB PROJECT #: 06-2580
CLIENT PROJECT #: CF030290

TURNAROUND TIME: (WORKING DAYS)
STD [X] 5 OTHER [ ]
[ ] 1 [ ] 2 [ ] 3

PROJECT NAME/SITE NAME: Chelsea Industrial Park Fishkill, NY

Page 2 of 2

REQUESTED ANALYSIS

DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER OF CONTAINERS	Copper	Chromium	Arsenic	REMARKS	PARADIGM LAB SAMPLE NUMBER
9-12-06	11:26		X	ST-3: STRSED	Soil	1	X	X	X		9218
2	11:24		X	ST-3: SURFW	water	1	X	X	X		9219
3	1155		X	ST-2: STRBNKE	Soil	1	X	X	X		9220
4	1156		X	ST-2: STRBNKW	soil	1	X	X	X		9221
5	1152		X	ST-2: STRSED	soil	1	X	X	X		9222
6	1147		X	ST-2: SURFW	water	1	X	X	X		9223
7	1220		X	ST-1: STRBNKE	Soil	1	X	X	X		9224
8	1222		X	ST-1: STRBNKW	soil	1	X	X	X		9225
9	1216		X	ST-1: STRSED	soil	1	X	X	X		9226
10	1215		X	ST-1: SURFW	water	1	X	X	X		9227

"LAB USE ONLY BELOW THIS LINE"

Sample Condition: Per NELAC/ELAP 210/241/242/243/244

Receipt Parameter	NELAC Compliance	
Container Type:	Y [X]	N [ ]
Comments:		
Preservation:	Y [X]	N [ ]
Comments:		
Holding Time:	Y [X]	N [ ]
Comments:		
Temperature:	Y [ ]	N [X]
Comments: 7°C iced		

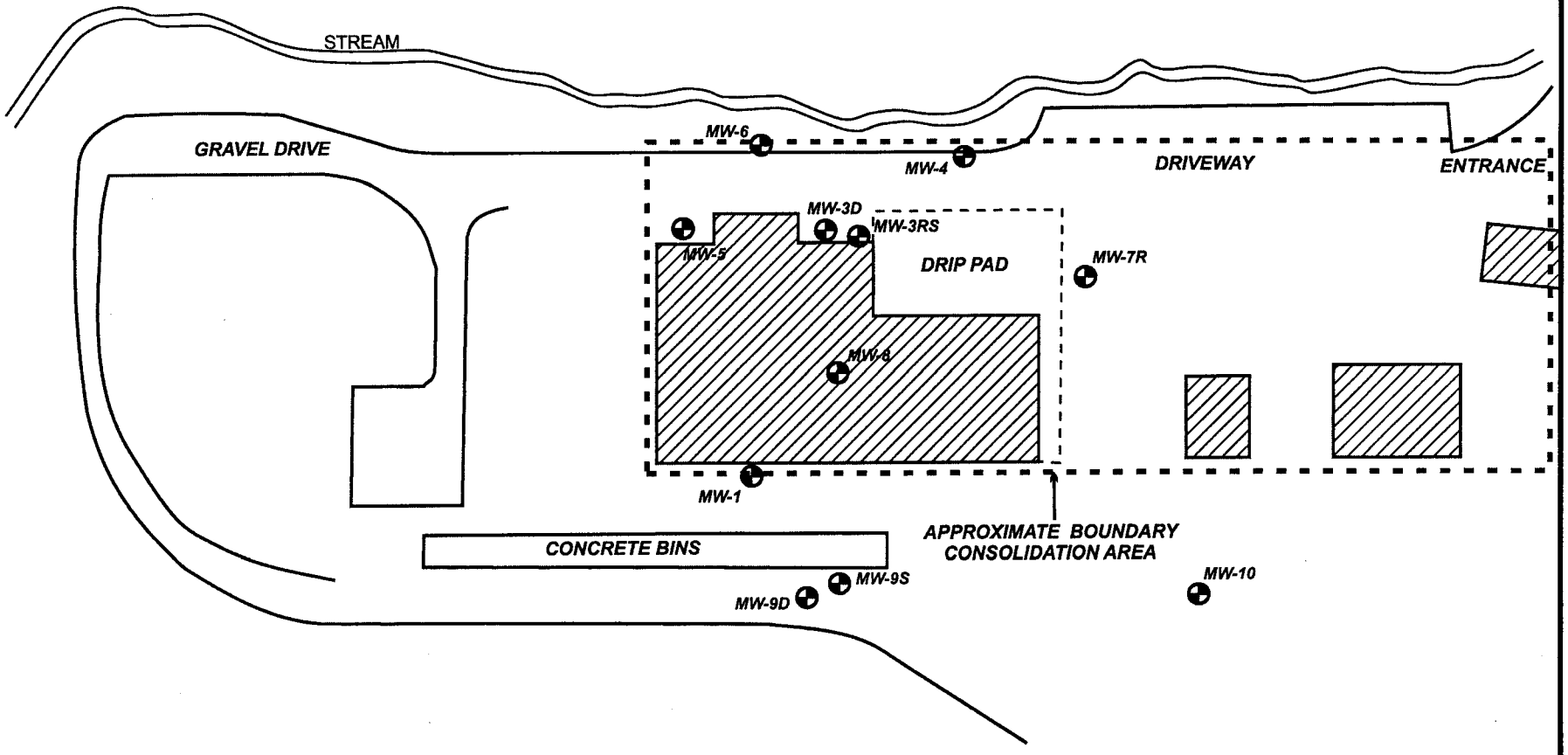
Brian P. Goodwin 9-12-06/14:00
Sampled By Date/Time

Brian P. Goodwin 9-12-06/15:00
Relinquished By Date/Time

Received By Date/Time
Elizabeth A. Hench 9/14/06 0930
Received @ By Date/Time

Total Cost:

P.I.F.



ALL LOCATIONS ARE APPROXIMATE

LEGEND

MW-1 — MONITORING WELL LOCATION

BUILDING FOOTPRINTS

0 — 160

FEET

N

CONRAD GEOSCIENCE CORP.

8 Raymond Avenue, Poughkeepsie, New York 12603

Figure 1

MONITORING WELL LOCATION MAP

Prepared By:	CBB 5/98
Reviewed By:	JAC 5/98
Revised By:	BPG 8/21/06
Approved By:	CBB 1/30/06

CHELSEA INDUSTRIAL PARK
Fishkill, New York
CF030290

Table **Monitoring Well and Groundwater Elevations**; collected **August 9 and 10, 2006**; Former Circle M Wood Treating Corp., Industrial Way, Fishkill, New York; Conrad Geoscience File #CF030290

Monitoring Well ID	Top of PVC Casing Elevation	Ground Elevation	Depth to Groundwater	Static Water Elevation
MW-1	32.21	29.63	6.23	25.98
MW-3RS	32.95	30.64	6.81	26.14
MW-3D	32.25	30.27	12.09	20.16
MW-5	33.22	31.11	7.03	26.19
MW-7R	31.87	29.97		
MW-8		29.86	3.37	
MW-9S	30.98	28.81	6.23	24.75
MW-9D	30.68	28.77	37.24	6.56
MW-10	32.06	30.05	13.9	18.16

Notes:
Elevations relative to a local datum
Measurements in feet.

CONRAD GEOSCIENCE CORP. www.conradgeo.com
Environmental Scientists One Civic Center Plaza, Suite 501, Poughkeepsie, New York 12601 • 845/454-2544 • fax: 845/454-2655

January 9, 2007

John J. Rashak
New York State Department of Environmental Conservation
Division of Environmental Remediation
21 South Putt Corners Road
New Paltz, New York 12561-1620

Re: **Stream Flood Plain Sampling Report;**
Former Circle M Wood Treatment Facility, Fishkill, New York;
NYSDEC Site #3-14-083;
Conrad Geoscience File #CF030290

Dear Mr. Rashak:

Between July and September 2006, Conrad Geoscience Corp. began implementation of the NYSDEC-approved Remedial Work Plan dated February 1, 2006, accepted June 15, 2006, at the Former Circle M Wood Treatment Facility (Figure 1). Initial activities included installation of three bedrock monitoring wells, one overburden monitoring well, and reinstallation of two overburden monitoring wells; baseline groundwater sampling of on-site monitoring wells; and stream water and sediment sampling. As requested by NYSDOH, samples of sediment have been collected from the streams eastern flood plain. Summarized below are a description of field activities and sample results.

FLOOD PLAIN SEDIMENT SAMPLING

Flood plain sediment sampling was conducted on December 19, 2006. One flood plain sample was collected from each of the nine locations, FP-1, FP-2, FP-3, FP-4, FP-5, FP-6, FP-7, FP-8 and FP-9 (Figure 2). Locations FP-1 through FP-6 were spaced approximately 100 feet apart from up-stream to down-stream, beginning approximately 8 feet east of Stream Station ST-2 (Figure 2). Locations FP-7 through FP-9 were spaced approximately 100 feet apart from up-stream to down-stream, beginning approximately 95 feet east of FP-3. Each sampling location was surveyed by a New York State licensed surveyor.

Samples were labeled, packed on ice, and shipped via overnight delivery for analysis of arsenic, chromium and copper via USEPA Method SW846: 3050 and 6010.

RESULTS

Sample results are summarized in Table 1. Analytical reports are attached. None of the nine samples contained arsenic or chromium at concentrations above the Standards, Criteria and Guidance (SCGs), as defined by the September 2005 NYSDEC Record of Decision (ROD). Seven of the nine samples (FP-3 through FP-9) contained copper at a concentration exceeding the SCGs.

DISCUSSION

Arsenic and chromium concentrations in flood plain samples do not exceed site specific standards. Copper was detected in several flood plain samples at concentrations slightly above site specific standards.

Based on analytical data, the arsenic, chromium, and copper concentrations detected in the December 2006 flood plain samples are consistent with the results found in the January 1989 Dunn Geoscience report (attached).

If you have any questions, please do not hesitate to contact me.

Sincerely,

CONRAD GEOSCIENCE CORP.

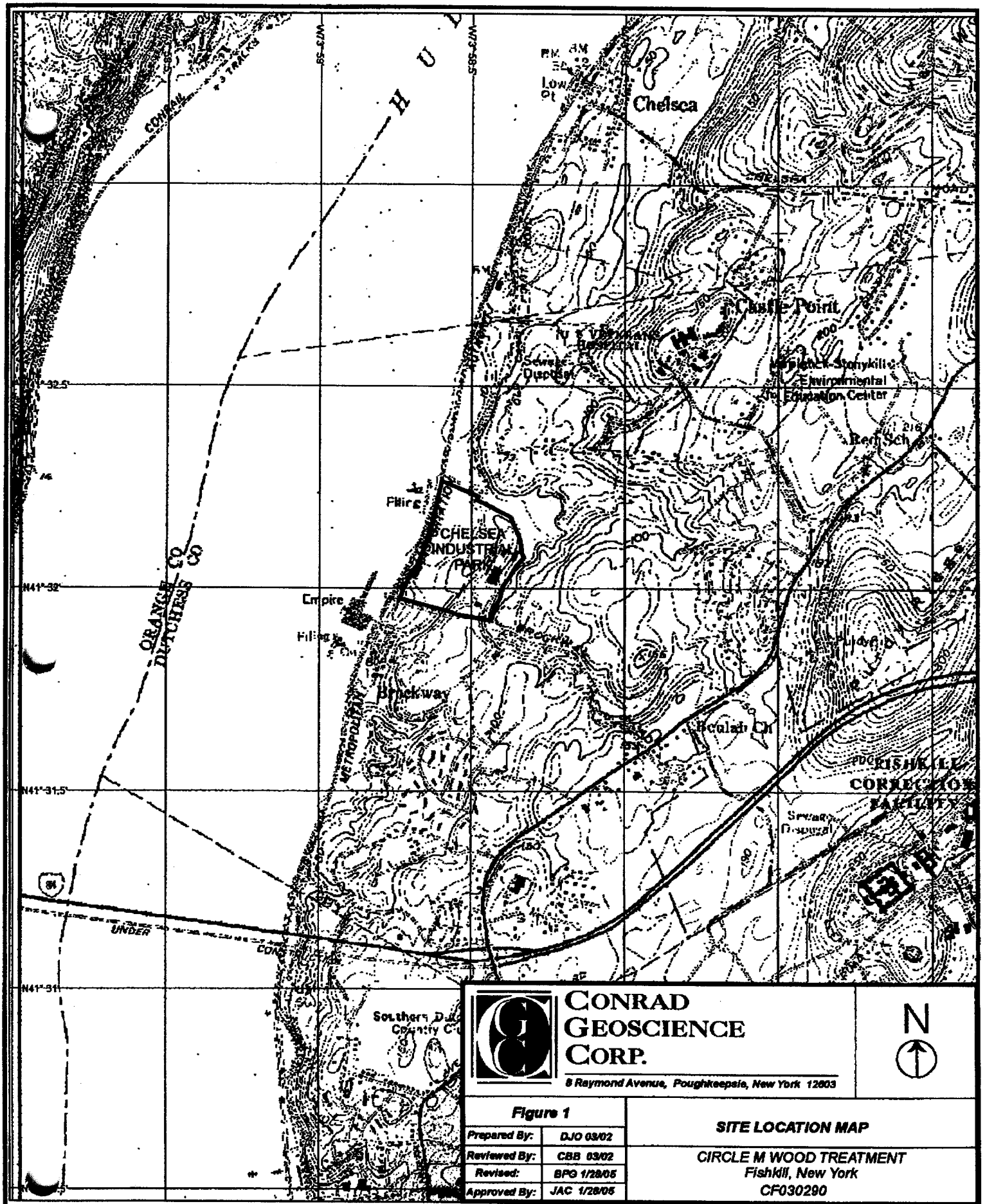
Brian P. Goodwin

Brian P. Goodwin
Geologist

BPG/seg

attachments

cc: Mark Millspaugh
Daniel Simone
Robert Tyson
Joseph Crua



CONRAD GEOSCIENCE CORP.

8 Raymond Avenue, Poughkeepsie, New York 12603

N

Figure 1	
Prepared By:	DJO 03/02
Reviewed By:	CBB 03/02
Revised:	BPG 1/28/05
Approved By:	JAC 1/28/05

SITE LOCATION MAP

CIRCLE M WOOD TREATMENT
Fishkill, New York
CF030290

3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS

643 ft Scale: 1 : 22,400 Detail: 13-0 Datum: WGS84

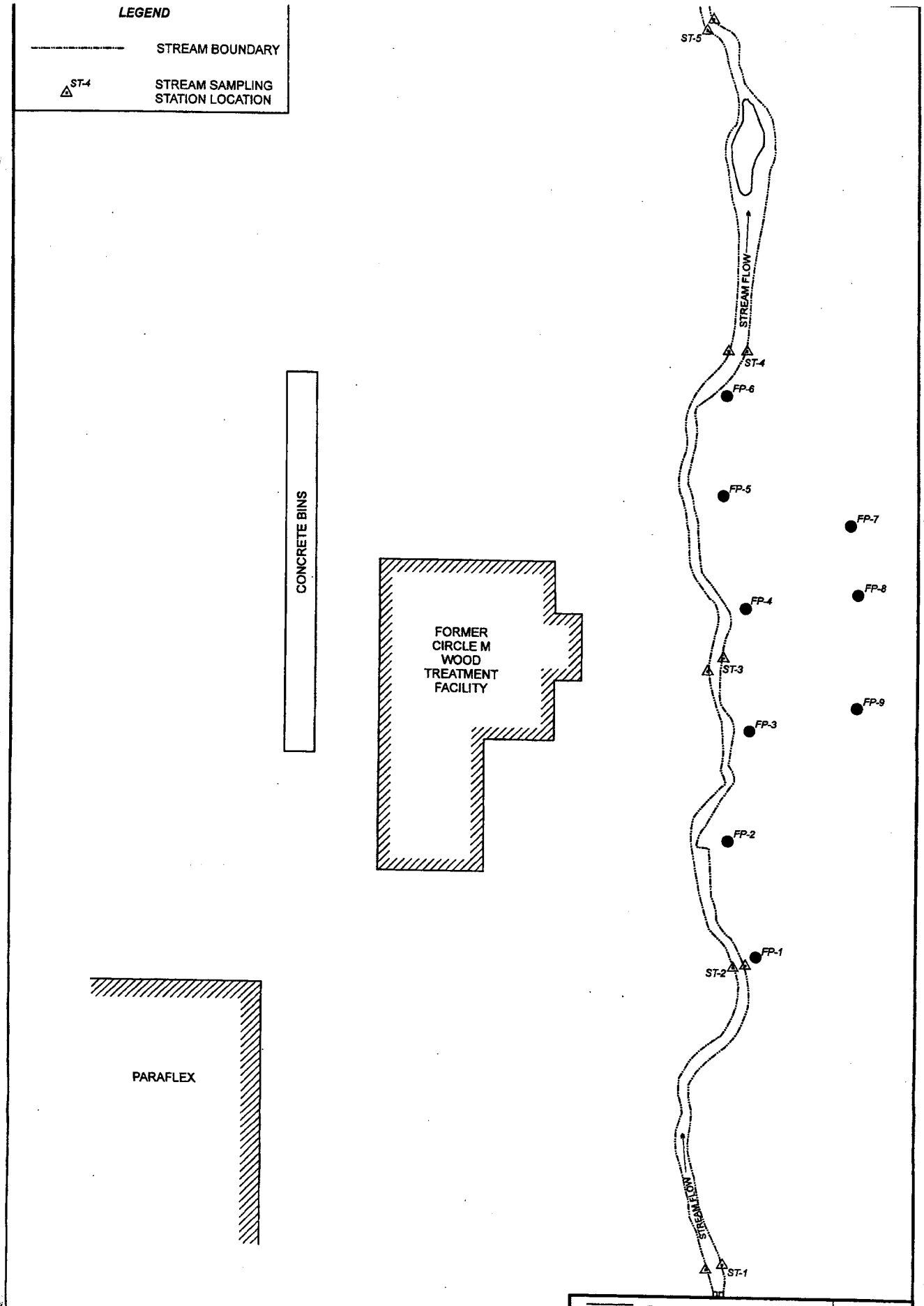

LEGEND
STREAM BOUNDARY
ST-4
STREAM SAMPLING STATION LOCATION
ST-5
STREAM FLOW
ST-4
FP-6
FP-5
FP-7
FP-8
FP-4
ST-3
FP-9
FP-3
FP-2
FP-1
ST-2
CONCRETE BINS
FORMER CIRCLE M WOOD TREATMENT FACILITY
PARAFLEX
STREAM FLOW
ST-1
0
80
FEET
N
CONRAD GEOSCIENCE CORP.
8 Raymond Avenue, Poughkeepsie, New York 12603
Figure 2
STREAM STATION AND FLOOD PLAIN SAMPLING LOCATION MAP
Prepared By: BPG10/3/06
Reviewed By:
Revised By: BPG1/8/07
Approved By: BPG1/8/07
FORMER CIRCLE M WOOD TREATMENT FACILITY
Fishkill, NY
CF030290

Table 1. **Metals in Flood Plain Samples;** USEPA Method SW846 3050 and 6010; collected **December 19, 2006;**
Chelsea Industrial Park, Town of Fishkill, New York;
Conrad Geoscience File #CF030290

Sample Identification	Chemical Constituent		
	Arsenic 13*	Chromium 25*	Copper 25*
Metals			
FP-1	6.18	15.3	22.4
FP-2	6.15	12.9	21.7
FP-3	8.18	16.6	27.0
FP-4	10.6	19.7	34.9
FP-5	7.63	17.7	41.4
FP-6	8.70	17.4	25.7
FP-7	8.66	18.4	29.9
FP-8	8.59	18.2	29.0
FP-9	9.18	20.2	30.3

Notes:
* - Standards are for soil according to NYSDEC Record of Decision, September 2005;
Boldface type designates those compounds detected at concentrations exceeding NYSDEC standards;
All units are in mg/kg.

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

lient: Conrad Geoscience

lient Job Site: Circle M - Fishkill

lient Job No.: CF030290

Lab Project No.: 06-3861

Sample Type: Soil

Method: SW 846: 3050, 6010

Date(s) Sampled: 12/19/2006

Date Received: 12/20/2006

Date Analyzed: 12/28/2006

Laboratory Report for Solid Analysis

Lab Sample No.	Field ID No.	Field Location	Arsenic Result (mg/kg)	Chromium Result (mg/kg)	Copper Result (mg/kg)
12826	N/A	FP-1	6.18	15.3	22.4
12827	N/A	FP-2	6.15	12.9	21.7
12828	N/A	FP-3	8.18	16.6	27.0
12829	N/A	FP-4	10.6	19.7	34.9
12830	N/A	FP-5	7.63	17.7	41.4
12831	N/A	FP-6	8.70	17.4	25.7
12832	N/A	FP-7	8.66	18.4	29.9
12833	N/A	FP-8	8.59	18.2	29.0
12834	N/A	FP-9	9.18	20.2	30.3

ELAP ID No.: 10958

:omments:

pproved By: _____

Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

File ID : 063861.xls

ENVIRONMENTAL SERVICE, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 • (800) 724-1997
FAX: (585) 647-3311

REPORT TO:

COMPANY: CONRAD GEOSCIENCE
ADDRESS: ONE CIVIC CENTER PLAZA SUITE 501
CITY: POUGHKEEPSIE STATE: NY ZIP: 12601
PHONE: 845 454 2544 FAX: 845 454 2655
ATTN: B GOODWIN
COMMENTS: Please return Cooler.

INVOICE TO:

ANY: SAME
ADDRESS:
CITY: STATE: ZIP:
PHONE: FAX:
ATTN: C. BROWN

LAB PROJECT #: 06-3861
T PROJECT #: CF030290

TURNAROUND TIME: (WORKING DAYS)

STD ☒ 5 | OTHER ☐ | 1 ☐ | 2 ☐ | 3 ☐

QUOTE #:

PROJECT NAME/SITE NAME: CIRCLE M- FISHKILL ~~CF030290~~

REQUESTED ANALYSIS

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER OF CONTAINERS	As, Cr, Cu	REMARKS	PARADIGM LAB SAMPLE NUMBER
1	12-19-06	1047		✓	FP-1	S	1	✓		128266
2		10:58		✓	FP-2		1	✓		128267
3		1109		✓	FP-3		1	✓		128268
4		1135		✓	FP-4		1	✓		128269
5		11:32		✓	FP-5		1	✓		128270
6		1201		✓	FP-6		1	✓		128271
7		11:54		✓	FP-7		1	✓		128272
8		11:44		✓	FP-8		1	✓		128273
9		1125		✓	FP-9		1	✓		128274
10										

****LAB USE ONLY BELOW THIS LINE****

Sample Condition: Per NELAC/ELAP 210/241/242/243/244

Receipt Parameter	NELAC Compliance	
Container Type:	Y ☒	N ☐
Comments:		
Preservation:	Y ☒	N ☐
Comments:		
Holding Time:	Y ☒	N ☐
Comments:		
Temperature: 7°C iced	Y ☐	N ☒
Comments:		

Brian P. Goodwin 12-19-06 12:05
Sampled By Date/Time

Brian P. Goodwin 12-19-06 17:00
Relinquished By Date/Time

Received By Date/Time

Elizabeth A. Hanch 12/20/06 1655
Received @ Lab By Date/Time

Total Cost:

P.I.F. ☐

EOSCIENCE CORP

METRO PARK RD.
ALBANY, NEW YORK 12205
(518)458-1313
FAX 518/458-2472

January 16, 1989

Mr. Kenneth M. Stenger
Vergilis, Stenger, Viglotti & Lucia
266 Main Street
Fishkill, New York 12524

RE: Circle M, Chelsea Industrial Park

Dear Mr. Stenger:

Dunn Geoscience Corporation (DUNN) has completed its review of the soil, groundwater and stream sediment analytical data you recently submitted for our evaluation. We understand that soil and sediment samples were collected by Kartiganer Associates (New Windsor, New York); soil samples were collected at the surface (0 inches) and six inches below grade, and sediment samples were collected only at the surface of the stream bed. The only exception was soil sample J1 which was collected at a depth of 10-12 inches.

Groundwater samples were collected by Camo Laboratory (Poughkeepsie, New York), and laboratory chemical analyses of all samples for all matrices were performed by Camo (a New York State Department of Health (NYSDOH) approved laboratory under the state's Environmental Laboratory Approval Program (ELAP), and technically acceptable to the New York State Department of Environmental Conservation (NYSDEC)). Figure 1 shows the location of all sampling points.

All samples were analyzed for total matrix (i.e. total content) chromium, copper and arsenic. In addition, soil and sediment samples were analyzed for the same three metals by EPA's Extraction Procedure Toxicity (EP Tox) Characteristic test, and indicator of the leachability of a substance, as well as a criterion used to assess a substance as hazardous. Tables 1 through 4 summarize, respectively, off-site soil data, on-site soil data, stream sediment data, and groundwater data.

COPY

All soil sampled during the investigation is considered non-hazardous based on low EP Tox results. All levels were well below the EPA maximum allowable limits:

	Maximum EP Tox Value (mg/L)	EP Tox Limit (mg/L)
Chromium	1.25	5.0
Copper	9.10	100.0*
Arsenic	2.5	5.0

*No EP Tox limit established. Value based on EPA model (i.e, 100x drinking water standard) used to determine limits for applicable metals.

There is no indication of any groundwater impact or contamination from Circle M activities, and thus no potential for any off-site groundwater contaminant migration. This is supported by the very low leachability characteristic (i.e, low EP Tox results) of these metals in the soil, as evidenced by the significant attenuation in metals concentrations between surface and sub-surface samples.

There is also no apparent impact on off-site soils as described in my letter of January 10, 1989 and reiterated herein. The concentrations of the three metals in the off-site soil samples are typical of normal, background conditions and fall within the ranges reported in surveys shown in Table 5.

Based on an EPA-derived assumption of soil intake through oral and dermal routes, maximum Acceptable Soil Concentrations (ASC) were derived (Table 6) considering the industrial use of the site as a wood treatment facility. Typical ASC established for non-industrial areas are converted to industrial applications by a factor of five established by the Centers for Disease Control. No copper levels and only one chromium level (J1) exceeded these industrial site applied ASC.

The toxicological data available for arsenic is based on exposure by ingestion resulting in potential skin carcinogenesis. Since such skin cancer is treatable, does not result in loss of functional abilities, and because trace arsenic may be commonly considered an essential human micronutrient, this low dose (i.e., reference dose, RfD) is highly controversial even within the EPA. The reference dose for arsenic has been set extremely low by EPA, resulting in an ASC well below natural background levels at this site. Prudent scientific judgement cannot consider this to be realistically significant for this review since such a low level cannot be achieved in this area because of the naturally occurring background levels of arsenic.

Therefore, a more realistic indicator of arsenic impact for this site should be background conditions. When evaluating the on-site data against this criterion, it is observed that almost all surface "soil" arsenic concentrations exceed background, but only two areas (I2 and J1) exceed it at the subsurface level. This problem represents a technically simplistic remediation situation that can easily be coordinated with a site clean-up that would involve no major interruption in current site activities.

Based on our recent site visit and observations of present site practices, we see no potential for any future problem greater than that which currently exists. Site modifications and management practices such as isolation of the drip pad, berming, improved storm water management and recycling have resulted in minimal potential for operations to impact soil and groundwater. Based on current operations, we perceive no significant environmental threat from the facility necessitating immediate action or a shut down of facility operations.

We are confident that a relatively simple, remedial program acceptable to regulatory agencies can be applied to the Circle M site without disturbing on-going work activities. Should you desire our assistance in considering possible remedial options, please contact us.

Please do not hesitate to call us if you have any questions or comments regarding this letter.

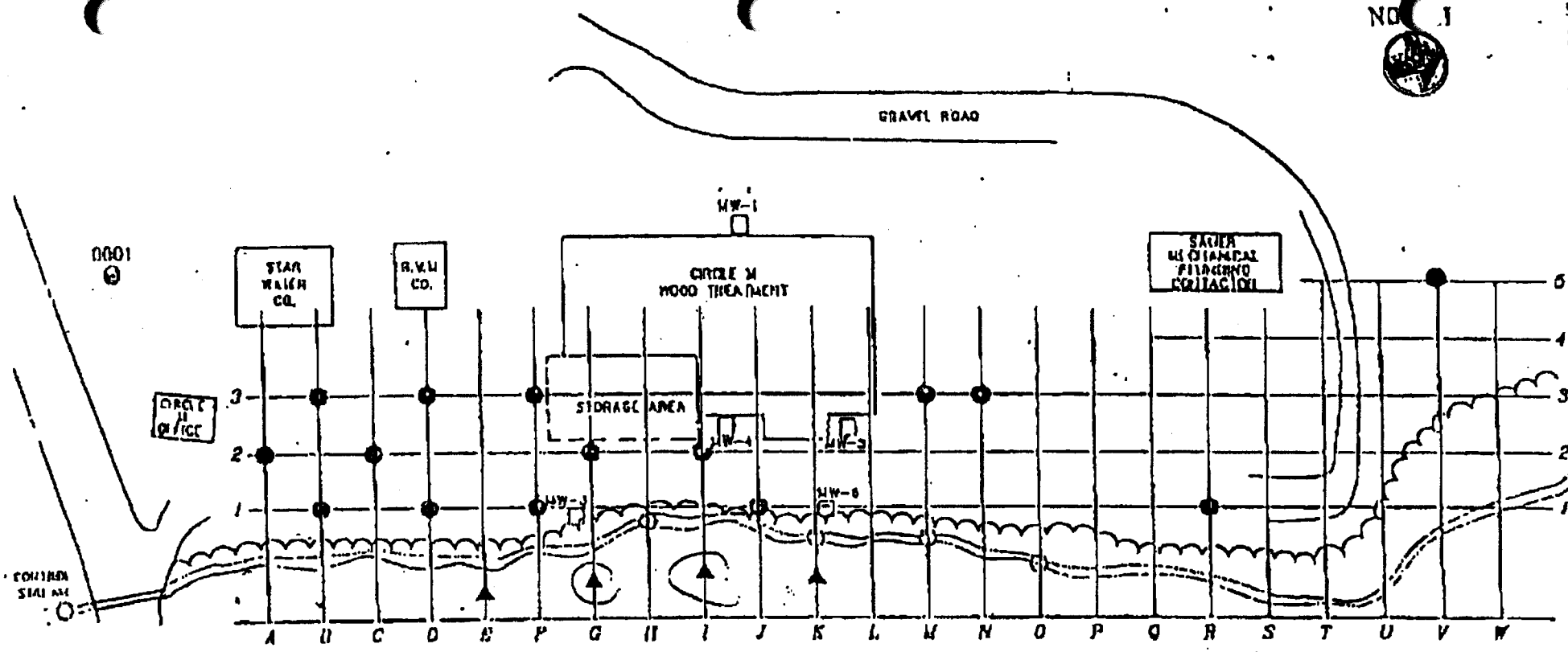
Very truly yours,

Sander I. Bonvell

Sander I. Bonvell
Manager, Chemistry & Sampling Services

Frank L. Mink, Ph. D.
Manager, Toxicology & Risk Assessment Services

SIB/FLMcls
1/16/89



LEGEND

- SOIL, ON-SITE
- SOIL, OFF-SITE
- STREAM BED SEDIMENT
- GROUNDWATER MONITORING WELL
- EXISTING VEGETATION
- STREAM

SCHEMATIC
SAMPLE LOCATIONS

CIRCLE M
Wood Treatment Facility
Chelsea Industrial Park
Town of Fishkill
Dutchess County, New York

Figure 1

11/08/00 WED 12:08 FAX 845 452 8855 CGC
03/11/05 FRI 10:43 FAX 8454542855 BUK ENV EAST ANNEX

Table 1

CIRCLE M
OFF-SITE SOIL SAMPLES
ANALYTICAL RESULTS

SAMPLE I.D.	CHROMIUM	ARSENIC	COPPER
E-0"	13/<0.03*	18/<0.005	21/0.03
E-6"	9/<0.03	11/<0.005	21/0.05
G-0"	16/<0.03	24/<0.005	32/0.03
G-6"	11/<0.03	14/<0.005	18/0.02
I-0"	15/<0.03	25/0.007	25/0.04
I-6	8/<0.03	9/<0.005	12/0.03
K-0"	12/<0.03	15/<0.005	30/0.03
K-6"	12/<0.03	17/<0.005	35/0.04

* Total matrix values (mg/kg)/EP Toxicity values (mg/L)

Table 2

CIRCLE M
SUBSURFACE-SURFACE SOIL
ANALYTICAL RESULTS

SAMPLE I.D.	CHROMIUM (PPM)	ARSENIC (PPM)	COPPER (PPM)
A2: 0"	140/0.07	360/0.15	173/0.89
6"	4/<0.03	6/0.005	26/0.01
B1: 0"	140/0.09	400/0.023	181/1.71
6"	8/<0.03	25/<0.005	48/0.02
B3: 0"	240/0.29	620/0.28	200/2.03
6"	7/<0.03	18/0.007	43/0.02
C2: 0"	150/0.06	420/0.005	201/0.87
6"	16/<0.03	24/0.006	39/0.01
D1: 0"	440/1.25	3500/2.5	582/5.76
6"	21/<0.03	30/0.010	35/0.01
D3: 0"	265/0.15	690/<0.005	295/2.11
6"	16/<0.03	41/0.005	33/0.06
F1: 0"	400/0.28	2600/1.1	408/3.47
6"	11/<0.03	23/0.011	52/0.02
FE: 0"	225/0.21	630/0.009	269/1.78
6"	9/<0.03	11/0.006	16/0.01
G2: 0"	215/0.12	580/0.014	334/2.22
	76/<0.03	40/<0.005	99/0.02
I3: 0"	108/0.09	290/0.005	168/1.01
6"	110/0.19	230/0.008	95/0.09
J1: 10"-12"	2270/0.10	2000/0.18	1130/9.10
M3: 0"	97/<0.03	275/<0.005	165/0.50
	7/<0.03)	13/0.006	43/0.02
N3: 0"	102/0.03	245/0.014	162/0.39
6"	8/<0.03	24/<0.005	33/0.03
R1: 0"	137/0.03	29/0.013	199/0.60
6"	19/<0.03	38//0.015	80/0.07

Table 2
(cont'd)

SAMPLE I.D.		CHROMIUM (PPM)	ARSENIC (PPM)	COPPER (PPM)
V5:	0"	42/0.04	10/0.080	70/0.23
	6"	8/<0.03	<5/0.005	31/0.01
0001:	0"	10/<0.03	14/0.008	131/0.02
	6"	14/<0.03	<5/<0.005	147/0.10

Key

Total Matrix (mg/kg)/EP Tox (mg/L)

Table 3

CIRCLE M
STREAM SEDIMENT
ANALYTICAL RESULTS

SAMPLE I.D.	CHROMIUM	ARSENIC	COPPER
K	61/0.03	*46/0.011	32/0.05
H	9/<0.03	13/<0.005	22/0.01
M	83/<0.03	155/<0.005	156/<0.01
O	7/<0.003	9/<0.005	17/0.01
Stream Control	11/<0.03	17/0.005	33/<0.01

All results expressed in mg/kg
* Total Matrix/E.P. Tox

Table 4

CIRCLE M
GROUNDWATER ANALYTICAL RESULTS

WELL	CHROMIUM	ARSENIC	COPPER
MW-1	<0.03	<0.005	0.01
MW-3	<0.03	<0.005	0.01
MW-4	<0.03	<0.005	0.02
MW-5	<0.03	<0.005	0.05
MW-6	<0.03	<0.005	0.02
Groundwater Standards	0.050	0.025	1.0

All values expressed in mg/L

Table 5

BACKGROUND COMPARISONS

Metal	Sample Range (mg/kg)	Survey Range (mg/kg)
Arsenic	9-25	0.1 -80[a]/0.1-73[b]/0.1-45[d]
Chromium	8-16	1-1000[b]/5-1500[c]/1-100[d]
Copper	12-35	<1-700[b]/2-250[d]

a Walsh, L.M. and Keeney, D.R. 1975. Behavior and phytotoxicity of inorganic arsenicals in soils. In: Arsenic- Pesticides, ACS Symp. Series 7, Am. Chem. Soc., Washington, D.C. p.35.

b Shacklette, H.T. and Boerngen, J.G. 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional Paper 1270. U.S. Government Printing Office, Washington, D.C.

c Carey, E.E. 1982. Chromium in air, soil and natural waters. In: Langard S., ed. Topics In Environmental Health 5 (Biol. Envir. Aspects Chromium) New York, NY: Elsevier; p.49-64.

d McGovern, C.E. Undated, but not before 1987. Background concentrations of 20 elements in soils with specific regard for New York State. Wildlife Pathology Unit, Wildlife Resource Center, NYSDEC. Delmar, New York.

APPENDIX D

COMMUNITY AIR MONITORING PLAN (CAMP)

STERLING
Sterling Environmental Engineering, P.C.

COMMUNITY AIR MONITORING PLAN
(CAMP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

Prepared for:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

Prepared by:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

February 20, 2007

COMMUNITY AIR MONITORING PLAN
(CAMP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

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Appendix 1 Particulate Concentrations Air Monitoring Form
Appendix 2 Exceedance and Action Form

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1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) sets forth the air monitoring methods and procedures to be implemented over the range of construction activities conducted to complete the remediation of the former Circle M Wood Treating Site in the Town of Fishkill, Dutchess County, New York. This CAMP is to be utilized in coordination with the Health and Safety Plan (HASP) and Dust Control Plan (DCP) established for the project. Actions and requirements to protect the health and safety of on-site workers from airborne contaminants are included in the HASP.

1.1 Site Description and Background

Chelsea Industrial Park consists of an approximate 58.6-acre parcel at the end of Brockway Road (see Figure 1). Detailed information regarding the site is contained in the Remedial Investigation (RI), Supplemental Remedial Investigation (SRI), and the Focused Feasibility Study (FFS). The former Circle M Wood Treating facility is located within Chelsea Industrial Park, and occupies approximately eight (8) acres of the industrial park. For the purposes of the Brownfield Cleanup Program, an area of approximately 19.885 acres has been designated as "the Site", which includes the former Circle M building and surrounding acreage.

This CAMP applies to work to be performed during site remediation by Chelsea Waterfront Development, LLC and its contractors. The subject site contains chromated copper arsenate (CCA) from past lumber treatment process and waste management practices. CCA constituent elements are chromium, arsenic, and copper which are deemed hazardous in the Site soils because of their concentration levels and leaching characteristics.

The Remedial Design and Engineering Report and materials appended thereto provide the full detail and specifications for the remedial project.

2.0 AIR MONITORING METHODS AND LIMITS

The New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP) was used as a model in preparing this site specific CAMP. The CAMP provides the specific requirements for monitoring air downwind of the project site for airborne and dust related contaminant releases occurring as a direct result of remedial work activities.

The NYSDOH Generic CAMP requires real time monitoring for particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The intent of this Generic CAMP is to provide a measure of protection for the downwind community, including off-site receptors, residences and businesses, as well as on-site workers not directly involved with the subject work activities. The action levels established in the CAMP require increased monitoring, corrective actions to abate emissions, and/or work shutdown under certain circumstances. Additionally, the CAMP will provide confirmation that work activities will not spread contamination off-site.

The CAMP monitoring conditions presented below are sufficient to address the known and anticipated risks of this site. Reliance on the CAMP should not preclude simple, Best Management Practices (BMPs) and common-sense measures to keep dust generation at a minimum in and around the work areas. Due to the nature of known contaminants (arsenic, chromium, and copper), real time air monitoring for particulate levels at the perimeter of the work area is appropriate.

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Continuous monitoring during working hours will be required for all ground intrusive and soil handling activities. Such activities include, but are not limited to, soil excavation and handling, test pitting or trenching, and placement of soil in the consolidation area.

2.1 Particulate Monitoring, Response Levels and Actions

Particulate concentrations will be monitored continuously during working hours at the upwind and downwind perimeter of the work zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment meeting the following minimum performance standards (as suggested in NYSDEC Draft DER-10 Appendix 1B: Fugitive Dust & Particulate Monitoring):

a) Object to be measured: dust, mists, aerosols size range: <0.1 to 10 microns;
b) Sensitivity: 0.001 mg/m3;
c) Range: 0.001 to 10 mg/m3;
d) Overall accuracy: ± 10% as compared to gravimetric analysis of stearic acid or reference dust;
e) Operating conditions: Temperature: 0 to 40°C;
f) Humidity: 10 to 99% Relative Humidity;
g) Power: Battery operated with a minimum capacity of eight hours continuous operation Automatic alarms are suggested; and
h) Particulate levels will be monitored immediately downwind at the working site and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary averaging hardware to accomplish this task.

Air monitoring will monitor particulate matter less than 10 microns (PM-10).

Calibration will be in accordance with the HASP and the instrument manufacturer's recommendations. The instrument must be provided with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

A wind sock will be located at the site for determining wind direction. The upwind sampling station will be situated upwind of the largest dust producing activity occurring at the site at the boundary of the work zone. Similarly, the downwind sampling station will be directly downwind of the largest dust producing activity at the boundary of the work zone.

The sampling locations will be periodically adjusted to account for observed changes in wind direction.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for a 15-minute period or if persistent airborne dust is observed leaving the work area, appropriate dust suppression techniques will be employed, as specified in the DCP. Work may continue with dust suppression techniques applied provided downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be suspended and a re-evaluation of dust control activities will be initiated. Work can resume provided dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All measurements must be recorded and be available for NYSDEC and NYSDOH personnel to review on

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request.

3.0 FORMS FOR MONITORING AND RESPONSE

Air monitoring of particulate concentrations will be documented using the air monitoring form provided in Appendix 1. This form is to be filled out on a daily basis and records of this form must be made available for NYSDEC and NYSDOH review.

Response action to observed exceedances will be documented using the form provided in Appendix 2. This form must also be made available for NYSDEC and NYSDOH review.

21044/CAMP/CAMP_txt.doc

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FIGURE 1



MAP REFERENCE: NYSDOT WAPPINGERS FALLS QUADRANGLE, 1989.

FIGURE 1

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24 Wade Road ♦ Latham, New York 12110

SITE LOCATION MAP

CHELSEA WATERFRONT DEVELOPMENT LLC

CIRCLE M WOOD TREATMENT SITE

CITY OF BEACON DUTCHESS CO., N.Y.

PROJ. No.:	21044	DATE:	9-12-06	SCALE:	1" = 2000'	DWG. NO.	21044005	FIGURE	1

Appendix 1

Particulate Concentrations
Air Monitoring Form

Former Circle M Wood Treating Site

Air Monitoring Form

Name _____ **Weather Conditions** _____
Date _____ **Wind Direction** _____

Distance upwind from work area _____
Distance downwind from work area _____

Particulate Concentrations (mg/m^3)

UPWIND

Time	Concentration

Appendix 2

Exceedance and Action Form

Former Circle M Wood Treating Site

Exceedances and Actions Taken

Name _____ **Date** _____

Time _____ **Weather Conditions** _____

Location of Exceedance _____ **Wind Direction** _____

Type of Exceedance:

Action Taken:

APPENDIX E

HEALTH AND SAFETY PLAN (HASP)

STERLING
Sterling Environmental Engineering, P.C.

HEALTH AND SAFETY PLAN
(HASP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
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Prepared for:

Chelsea Waterfront Development, LLC
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February 20, 2007

HEALTH AND SAFETY PLAN (HASP)
FORMER CIRCLE M WOOD TREATING SITE
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1.0 PURPOSE & APPLICABILITY

This site-specific Health and Safety Plan (HASP) is prepared in conformance with Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120(b) and applies to the soil excavation and relocation aspects of the work. This HASP does not apply to building demolition work or future site development. The HASP establishes health and safety responsibilities, personnel protection standards, training requirements, mandatory safety practices and procedures, and provides for potential operational contingencies.

This HASP applies to work conducted at the Former Circle M Wood Treating Site (see Figure 1) by Chelsea Waterfront Development, LLC and its contractors. The subject site contains releases from past lumber treatment process and waste management practices that resulted in surficial soils impacted with chromated copper arsenate (CCA). The constituent elements, chromium, arsenic, and copper are hazardous at certain concentrations in soil because of their leaching characteristics.

The following emergency information applies to this project.

Emergency Contacts

In the event of an emergency, the following numbers are to be called for assistance as appropriate:

Contact	Person or Agency	Telephone	Mobile Phone
Police	Town of Fishkill Police Headquarters	911 or (845) 831-1110	NA
Fire	Town of Fishkill Fire Department	911 or (845) 896-6613	NA
Ambulance/EMS	Beacon Volunteer Ambulance	911 or (845) 831-4540	NA
Hospital	St. Luke's Hospital or St. Francis Hospital	(845) 561-4400 or (845) 431-8220	NA
Poison Control	Poison Control Center	(800) 222-1222	NA
Chemical Emergency Advice	CHEMTREC	(800) 424-9300	NA
Site Supervisor	To Be Assigned	TO BE PROVIDED	TO BE PROVIDED
Health and Safety Manager	To Be Assigned	TO BE PROVIDED	TO BE PROVIDED
Site Safety Officer (Field Supervisor)	To Be Assigned	TO BE PROVIDED	TO BE PROVIDED
Competent Person For Trenching and Excavating	To Be Assigned	TO BE PROVIDED	TO BE PROVIDED

Location of Hospital/Clinic

Name: St. Luke's Hospital

Address: 70 Dubois Street, Newburgh, NY 12550

Route:
1. Start at Brockway Road
2. Turn Right on RT-9D - go 0.8 mi
3. Bear Right onto I-84 WEST toward NEWBURGH - go 2.5 mi

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4. Take exit #10S/RT-32 onto N PLANK RD[RT-32] toward NEWBURGH - go 0.4 mi
5. Turn Right to follow RT-32 - go 0.1 mi
6. RT-32 becomes US-9W - go 0.1 mi
7. Turn Left on PLANK RD - go 0.2 mi
8. Continue on NORTH ST - go 0.1 mi
9. Turn Right on POWELL AVE - go 0.6 mi
10. POWELL AVE becomes DUBOIS ST - go 0.4 mi
11. Arrive at 70 DUBOIS ST, NEWBURGH, on the Left

See Appendix A for the route to Saint Luke's Hospital.

Name: St. Francis Hospital

Address: 1 Webster Avenue, Poughkeepsie, NY 12601

Route:
1. Start at BROCKWAY ROAD, WAPPINGERS FALLS going toward INDUSTRIAL WAY – Go 0.6 Mi
2. Turn Left on RT-9D - Go 5.0 Mi
3. Turn Right on MIDDLEBUSH RD - Go 0.8 Mi
4. Turn Left on US-9 NORTH - Go 9.5 Mi
5. Turn Right on MARIST DR[RT-9G] - Go 0.1 Mi
6. Bear Left on NORTH RD - Go 0.1 Mi
7. Turn Right on W CEDAR ST - Go 0.3 Mi
8. Turn Right on GARDEN ST EXT - Go 0.1 Mi
9. Turn Right on WEBSTER AVE - Go 0.0 Mi
10. Arrive at 1 WEBSTER AVE, POUGHKEEPSIE

See Appendix A for the route to St. Francis Hospital.

More detail regarding emergency information and response procedures is contained in Section 5.0.

1.1 Notification of Emergency Responders

The local Emergency Management Service (EMS) and Fire Department will be notified by Sterling Environmental Engineering, P.C. (STERLING) one (1) week in advance of work and upon completion of work.

1.2 Applicability of HASP

This site specific HASP for Chelsea Waterfront Development, LLC establishes the health and safety procedures to minimize any potential risk to Chelsea Waterfront Development, LLC personnel, retained consultants, contractor and subcontractor personnel implementing investigations or remedial actions at the former Circle M Wood Treating Site.

The provisions of the plan are mandatory for all on-site personnel engaged in managing potentially hazardous material including, but not limited to, initial site reconnaissance, preliminary field investigations, mobilization, project operations, and demobilization. This plan has been developed based on United States Environmental Protection Agency (USEPA) guidelines and complies with applicable regulations, including OSHA standards [29 CFR 1910 and 1926].

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1.3 Signature and Acknowledgement

All persons working at or visiting the Site (visitors are only allowed outside of the Support Zone and of all zones of delineated contamination) must acknowledge by signing a copy of this HASP that the contents of this HASP have been reviewed. All personnel involved in hazardous waste operations, such as in areas that have been determined to be contaminated, must also acknowledge that they participate in a medical surveillance program and have been trained in accordance with 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response standard) (see Section 2.2, Medical Surveillance). Each person agrees that he/she has read and understands this HASP and agrees to comply with the policies and procedures in this HASP.

Furthermore, the following health and safety requirements apply:

- All persons must have training appropriate to assigned tasks and potential exposures and risks. This without fail applies to all personnel who may enter hazardous areas.

- Personnel working in hazardous areas must have an annual physical (or physician's waiver for biennial physical) and be certified "fit for duty" and "fit for respirator use," if necessary, by a qualified physician. This medical surveillance will become absolutely mandatory where and if the conditions set forth in 1926.65(f)(2)(i-iv) are attained.

- Proof of employee training and physical exam must be submitted to the Site Safety Officer three (3) business days before site work in hazardous areas and must be accepted by the Site Safety Officer prior to initiation of site work in hazardous areas.

- Personnel must have the appropriate personal protective equipment (PPE) for the specific job. At a minimum, personnel will have the following equipment, and this equipment must be inspected by the Site Safety Officer:

    - Hard Hat
    - Safety Shoes
    - Gloves
    - Goggles/Safety Glasses
    - Hearing Protection, if appropriate
    - Safety Vest or Shirt, and
    - Other equipment as specified by the HASP.

- Heavy equipment and field operations must meet applicable safety standards and satisfy the field inspection. Unsafe equipment or operations will necessitate shutdown of the job at a cost to the subcontractor.

The Health and Safety Manager will provide every contractor and subcontractor entering the Site with a copy of its HASP, but this is not a substitute for an independent plan prepared by the contractor/subcontractor. Acknowledgment of review of this HASP must be indicated by signature on the appropriate form by each contractor and subcontractor.

The contractor or subcontractor must agree to comply with at least the minimum requirements of its own site-specific HASP, be responsible for the health and safety of its own employees, and sign the Contractor/Subcontractor Statement of Compliance (see Appendix B) for all on-site employees before beginning site work. The contractor or subcontractor also must agree that it will take any additional

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measures it deems necessary to meet at least minimum applicable health and safety standards if unforeseen circumstances arise.

The contractor or subcontractor will utilize at least minimum safety equipment as required by the site-specific HASP. When respirators are necessary, as required by 29 CFR 1910.134, the contractor or subcontractor must conduct a respirator fit test on each of its employees and a physician's "fit for respirator use" declaration must be submitted by each employee.

2.0 PERSONNEL AND ORGANIZATIONAL RESPONSIBILITIES

2.1 List of Project Personnel

The organization roles in this Health and Safety Plan (HASP) are the following:

1. Site Supervisor
2. Health and Safety Manager
3. Site Safety Officer (Field Supervisor)
4. Competent Person
5. Field Personnel

Each role is described below.

2.1.1 Site Supervisor

The Site Supervisor is responsible for the health and safety of everyone at or affected by the project, and fulfills this responsibility by ensuring the requirements of this HASP are implemented. More specifically, the Site Supervisor is responsible for:

- Assuring that all persons covered under this HASP read and have available a copy of this HASP.
- Providing the Health and Safety Manager and contractor with accurate, up to date information regarding the site, the hazards, and the site scope of work.
- Communicating regularly with the Health and Safety Manager and the Site Safety Officer.
- Coordinating the activities of all contractors/subcontractors and informing them of the pertinent health and safety requirements of this project.

2.1.2 Health and Safety Manager

The Health and Safety Manager is responsible for the preparation, interpretation and modification of this HASP. The Health and Safety Manager must approve any modification to the HASP that may result in less stringent requirements. More specifically, the Health and Safety Manager is responsible for:

- Writing, approving and amending the HASP for this project.
- Providing interpretations and advice to the Site Supervisor and the Site Safety Officer.
- Recommending engineering controls to eliminate or mitigate site risks and exposures.

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- Recommending correct personal protective equipment (PPE) and air monitoring instruments to protect personnel and off-site individuals from site risks and exposures.

- Maintaining contact with the Site Supervisor and Site Safety Officer regarding site conditions and discoveries that might require modification to the HASP.

2.1.3 Site Safety Officer (Field Supervisor)

The Site Safety Officer is responsible for ensuring this HASP is implemented during all remedial site activities. The Site Safety Officer has the authority and must immediately correct every situation where non-compliance with this HASP is observed or known and must stop work when an immediate danger is present. More specifically, the Site Safety Officer is responsible for:

- Obtaining a completed copy of the HASP acknowledgement form from every person covered by this HASP.

- Ensuring that every person covered by this HASP has attended an introductory site safety and health meeting before entering the work area.

- Checks with the contractor's Project Manager or his/her designee to ensure that assigned personnel have correct Fit for Duty medical authorization.

- Ensuring that necessary PPE and air monitoring instruments are available and used in the appropriate areas of the site.

- Performing or closely supervising the air monitoring and ensuring correct calibration of air monitoring equipment and proper recording and filing of results.

- Setting up and maintaining work zones and ensuring the required decontamination is occurring to all affected personnel and equipment.

- Notifying the Site Supervisor of all instances of non-compliance with the HASP.

- Stopping work in the event of an immediate danger.

- Monitoring the compliance with the HASP requirements.

- Provides on-going review of the protection level needs as project work is performed, and informs the Chelsea Waterfront Development, LLC Project Manager and Corporate Health and Safety Director of the need to upgrade or downgrade protection levels.

- Requires correction of unsafe or potentially unsafe working conditions, or stops work in emergencies until such conditions are corrected.

- Obtains a copy of contractor and subcontractor HASP.

- Conducting a health and safety meeting with all key personnel prior to the commencement of work.

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- Initiating emergency response procedures as required by Section 5.0-Emergency Information of this HASP.

- Immediately reporting accidents or unsafe conditions to the Health and Safety Manager and preparing accident/incident reports and other forms.

2.1.4 Competent Person

According to OSHA, a competent person is someone who is:

- Capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and authorized to take prompt corrective measures to eliminate hazardous conditions.

Trenching and excavation work is dependent on these specialized employees as the technical nature, and inherent hazards, require a greater level of training and experience.

2.1.5 Field Personnel

Field Personnel, including all contractor and subcontractor personnel covered by this HASP, are responsible for following the HASP and for accomplishing their work in a safe and responsible manner. More specifically, the Field Personnel are responsible for:

- Reading and understanding the entire HASP prior to working at the site.

- Completing fully and submitting a HASP acknowledgment form.

- Documenting their completion of required training to the Site Supervisor prior to their starting work.

- Ensuring that the Site Safety Officer and site workers are aware of any relevant medical conditions.

- Attending a health and safety meeting prior to the start of work.

- Asking any questions or concerns or lack of understanding of the HASP to the Site Supervisor, Health and Safety Manager, or Site Safety Officer.

- Performing only those tasks that they believe they can do safely.

- Reporting all accidents, injuries, illnesses, unsafe conditions, or deviations from this HASP to the Site Safety Officer.

- Complying with the HASP, except when specifically directed by the Site Safety Officer.

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2.2 Medical Surveillance

2.2.1 General

Employees participating in field activities meeting the following criteria will be included in each consultant, contractor or subcontractor Medical Surveillance Program:

- All employees who may be exposed to hazardous substances or health hazards at or above permissible exposure limits, without regard to the use of respirators, for 30 days or more per year, as required by 1926.65(f)(2)(i-iv).
- All employees who wear a respirator for 30 days or more every year as required by 1926.62(f)(2)(i-iv).
- All employees who are injured because of overexposure from an incident involving hazardous substances or health hazards.

2.2.2 Frequency of Medical Exams

Medical examinations and consultations will be made available to the employees discussed above on the following schedules:

- Prior to assignment to the work site, if any of the criteria noted in Section 2.2.1 are anticipated to occur.
- At least once every 12 months, unless the physician believes a longer interval (not greater than biennially) is appropriate.
- As soon as possible upon notification that the employee has developed signs or symptoms indicating possible overexposure.

2.3 Employee Training Assignments

2.3.1 General

All employees working on-site who are exposed to hazardous substances, health hazards, or safety hazards; their supervisors; and the management responsible for the site must receive training before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances or safety or health hazards. Employees will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

2.3.2 Initial Training

Workers regularly on-site will receive a pre-entry orientation to site health hazards, a review of the established Hazard Communication Program, and a copy of this HASP. Site workers who enter the Exclusion Zone or Contamination Reduction Zone must possess 40-hour Hazardous Waste Operations training in accordance with OSHA's Hazardous Waste Operations and Emergency Response Rule, 29 CFR 1910.120. In addition, site personnel who enter these areas must also have a valid annual eight (8) hour refresher class, after one (1) year from their 40-hour Hazardous Waste Operations (HWO) training.

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2.3.3 Management and Supervisor Training

On-site management and supervisors directly responsible for, or who supervise employees engaged in, activities that may expose workers to health hazards will receive 24 hours of initial training, three (3) days of supervised field experience, and at least eight (8) additional hours of specialized supervisory training in accordance with OSHA's Hazardous Waste Operations and Emergency Response Rule, 29 CFR 1910.120.

2.3.4 Refresher Training

Managers and supervisors will receive eight (8) hours of refresher training annually.

2.3.5 Health and Safety Orientation Meeting

Prior to commencing work at the site, the Health and Safety Manager shall conduct an orientation meeting to familiarize all site workers with the site-specific HASP. All consultants, contractors and subcontractors scheduled to be on-site must attend. If, in the judgment of the Health and Safety Manager, there has been sufficient turnover in workers to endanger anyone, the meeting will be repeated with the attendance to include workers arriving since the first meeting.

2.3.6 Site Safety Meetings

Brief site safety meetings will be conducted at a minimum of once per week, more if appropriate.

3.0 SITE CHARACTERIZATION AND HAZARD ANALYSIS

3.1 History of Site Activities and Regulatory/Commercial Context and Goals of the Current Work

The prior investigations and evaluation of remedial alternatives are summarized by the September 13, 2002 Supplemental Remedial Investigation (RI) and February 10, 2005 Focused Feasibility Study (FFS).

The substances of concern (copper, chromium and arsenic) are present in surface soil beneath the former Circle M building and in adjacent outdoor areas that were used for storage of treated lumber. Chromium, copper and arsenic are the primary constituents of chromated copper arsenate (CCA), a lumber preservative. The Circle M lumber treatment operation resulted in spills and chronic drippage of CCA prior to 1990.

Based on the FFS analysis and intended use of the property, the New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) on September 30, 2005 which provides that the selected remedy for the site consists of demolition of the former treatment building and excavation and on-site consolidation of impacted soil.

- Soils will be consolidated within a designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two (2) feet of clean fill.

- To facilitate the work, a Site Management Plan (SMP) will be developed and implemented. The SMP will include institutional controls and engineering controls to: address soil that may be excavated from the consolidation area in the future; provide for the operation and maintenance of

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the components of the remedy; monitor groundwater; and identify any restrictions on site development or groundwater use.

3.2 Scope of Work

3.2.1 Scope of Work With Contractors

The site remedial work to be performed by contractors will include the following tasks:

- Excavate contaminated soil and deposit in consolidation area.
  - Identify underground utilities in excavation areas.
  - Install erosion control measures.
  - Strip uncontaminated organic material, such as trees and brush, from the consolidation area and properly dispose.
  - Remove uncontaminated debris and organic material, such as trees and brush, from the excavation area.
  - Excavate contaminated surficial soil and relocate in the consolidation area.
- Stabilize the disturbed soils.
- Cover the consolidation area with geotextile fabric and two feet of clean fill.
- Implement erosion control measures on the stream bank.

The site history and prior investigations do not indicate that substances of concern other than copper, chromium and arsenic are present at levels constituting a hazard. Accordingly, this hazard assessment and HASP focus on the remediation of soils impacted with copper, chromium and arsenic.

Contamination by other chemicals while presently unknown cannot be ruled out. Accordingly, this HASP includes standard provisions regarding hazard recognition and response activities for a range of site conditions.

3.3 Chemical Hazards

The following table identifies the chemical hazards for the project.

Table 1: Summary of Site Chemical Hazards

Contaminants (Metals)	PEL/TLV (ppm)	LEL (%)	IDLH (ppm)
Arsenic	0.1/0.01	NA	5
Chromium	1/0.5	NA	250
Copper	1/1	NA	100

NA: Not Applicable

PEL/TLV: Permissible Exposure Limit (PEL) set as a legal limit by the Occupational Safety and Health Administration (OSHA). Threshold Limit Value (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) as maximum average concentration for an eight (8) hour work day and forty (40) hour work week.

LEL: Lower Exposure Limit - the concentration of a compound in air at and above which the mixture with air will catch fire at an explosive rate.

IDLH: Immediately Dangerous to Life and Health - this is the concentration which could be escaped in thirty (30) minutes without symptoms or irreversible effects.

3.3.1 Arsenic

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Arsenic is a silver-gray or tin-white, brittle, odorless solid. Exposure occurs by inhalation of dust, by ingestion and through dermal contact. Arsenic produces skin irritation and irritation of the mucous membranes of the nose. Overexposure may also cause lung and skin cancer. Symptoms of exposure include skin rashes, runny nose, and thickened skin, sometimes accompanied by cracking and gastrointestinal problems. The OSHA PEL for arsenic is 0.01 mg/m^3. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a TLV of 0.01 mg/m^3 due to its ability to cause skin and lung cancer as well as other effects of the lung. The highest observed concentration of arsenic in soils in areas to be excavated is 3,500 ppm.

3.3.2 Chromium

Chromium is a blue-white to steel-grey lustrous brittle solid. Exposure to chromium may cause irritation of the eyes and skin. The ACGIH has set the TLV of Chromium III compounds at 0.5 mg/m^3 based on its irritant effects and ability to cause dermatitis.

Exposure to hexavalent chromium may produce irritation of the mucous membranes of the upper respiratory tract, nose and mouth. Symptoms of exposure include nosebleeds and perforation of the nasal septum. Overexposure may also result in contact dermatitis. Hexavalent chromium is a known lung carcinogen. The PEL for hexavalent chromium is 0.1 mg/m^3. The ACGIH recommends a TLV of 0.01 mg/m^3 for insoluble hexavalent chromium compounds due to its irritant effects and its carcinogenicity and 0.05 mg/m^3 for soluble compounds based on its effects on the liver kidney and respiratory system.

The maximum observed concentration of chromium in areas to be excavated is 2,270 ppm.

3.3.3 Copper

Copper is a reddish, lustrous, malleable, odorless solid. Symptoms of exposure include irritated eyes, nose and throat, perforation of the nasal septum, metallic taste and dermatitis. The ACGIH has set the TLV of copper dust at 1 mg/m^3 based on irritation and gastrointestinal effects.

The highest observed concentration of copper in areas to be excavated is 16,871 ppm.

3.3.4 Unknown Chemicals or Containers

Encountering unknown chemicals or containers is not anticipated but cannot be ruled out. In the event unknown chemicals or containers are encountered during the work, field activities shall be temporarily halted to allow the nature of the chemical or container encountered to be assessed. If warranted, this HASP will be revised as appropriate to address the identified chemical.

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3.4 Assessment of Risks for Exposure to Chemical Hazards

A moderate potential to encounter chemical hazards from the metals contamination will exist during activities that disrupt or contact site soils. Such hazards include dust inhalation or skin contact with dusts and soils. Contaminants of concern have a high enough concentration in these media to create an inhalation hazard for workers in the field during debris removal, excavation, transport, relocation and compaction of contaminated soil.

3.5 Physical Hazards and Controls

The excavation and general construction hazards include overhead utilities, cave ins, slope failures, and land slides, moving equipment, hazardous atmospheres, dusts, vehicular traffic, water accumulation, material handling equipment, noise, heat and cold stress, cuts and lacerations, and slip, trip, fall hazards (see Table 2 below).

Table 2: Task and Operation Hazards

Work Activity	Potential Hazards	Preventive or Corrective Measures
Contaminated Soil Excavation, Handling, Re-Deposition, Cover Soil Placement	Struck by or Against Equipment, Tools or Vehicles	Back up alarms, spotter, reflective vests (29 CFR 1926.201, 600)
	Caught In or Between Objects (Pinch Points)	Maintain safe distances, wear proper work gloves (29 CFR 1910.100, 120)
	Slips, Trips and Falls	Housekeeping, material storage (29 CFR 1926.250)
	Inhalation of Airborne Contaminants	Engineering Controls (water misting) Air Monitoring (29 CFR 1910.1000, 120)
	Contact with Contaminated Dust and Water	PPE, skin protection (29 CFR 1910.132, 120)
	Electrical Shock	Maintain safe distances, de-energize power lines, use double insulated or grounded power tools (29 CFR 1926.400, 401)
	Noise	Hearing protection (29 CFR 1926.102)
	Eye and Face Injuries	Safety glasses/face shield (29 CFR 1926.102)
	Thermal Stress	Training on symptoms and control measures
	Excavation Safety	• No cuts more than four (4) feet in depth. • Have competent person in charge and determine soil type. • Conform the slope into trench or excavation according to soil type.

3.5.1 Hazard Analysis for Site Tasks

The remedial investigation and pre-design sampling identified the following contaminants in soil and groundwater samples collected at the site that exceed NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 Recommended Soil Cleanup Criteria:

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Metals

- Chromium
- Copper
- Arsenic

The potential for exposure to soil and groundwater contaminants is considered low during non-intrusive operations based on current information.

Potential exposures that may exist at the site include:

- Skin contact with contaminated soil or water;
- Inhalation of dusts; and
- Ingestion of contaminated soil dusts, especially if poor personal hygiene is practiced.

Contact with skin by contaminated soil or groundwater will be minimized by wearing personal protective clothing when necessary as determined by the Health and Safety Manager. Inhalation of vapors and dusts during construction activities will be minimized by the use of dust controls and the use of respiratory protection when action levels are exceeded. Ingestion of contaminated materials will be minimized by practicing good personal hygiene during decontamination procedures.

Level D PPE (Tyvek, coverall boots, gloves) or higher will be required to perform site-intrusive work where the potential exists for contact with contaminated soil or groundwater, or as determined by the Health and Safety Manager. This applies to personnel on the ground; not heavy equipment operators or others that do not have the potential to come in contact with contaminated materials.

Tables 2 and 3 provide air monitoring methods, action levels and protective equipment required for on-site contractor activities.

3.5.2 Fire and Explosion Hazards

There are no known sources of flammable or explosive gases at the site. Accordingly, routine monitoring for these gases and vapors is not proposed. Should confined space entry by required, continuous monitoring with a 4-gas (LEL, oxygen (O_2), hydrogen sulfide (H_2S), carbon monoxide (CO)) combustible gas indicator (CGI) and a photo-ionization detector (PID) will be conducted.

In addition, flammable liquids and gases may be located at the site during construction. Such materials may include diesel and gasoline for heavy machinery and acetylene gas used for welding and cutting. These materials are extremely flammable and proper safety precautions in accordance with OSHA requirements must be followed when handled.

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3.5.3 Physical Hazards

Physical hazards may cause slips, trips and falls. Workers must be aware of these hazards to avoid tripping, especially when uneven terrain is present. Falls become more serious with height. Extra precautions must be taken whenever guardrails or railings are absent. Ladders used for access to a high place will be securely lashed with tight straps or otherwise fastened at the top to prevent sliding and the ladder feet must be on a firm and level base. Workers can be struck by vehicles at the site. While driving in a reverse direction, the operator usually has a more limited field of view than while driving forward and must use extra caution. Vehicles that are large and with limited vision when backing up, such as dump trucks, tractor trailers, and excavators, must be equipped with a backup alarm to warn workers as required by law.

3.5.4 Material Handling

Most accidents in the handling of materials result primarily from unsafe working habits: improper lifting, carrying too heavy a load, incorrect grasping, or failing to wear personal protective equipment (PPE). Many of these can be avoided by testing the weight of an object before attempting to lift and carry it. If the load is too heavy, get help, and if possible, use mechanical lifting aids.

The proper method for lifting is:

- Get a good footing.
- Place feet about shoulder width apart.
- Bend knees before picking up load. Never bend from waist.
- Keep back straight.
- Get a firm hold. Grasp opposite corners of the load, if possible.
- Keep the weight as close to the body as possible.
- Keep the back as upright as possible.
- Lift gradually by straightening the legs – do not jerk the load.
- When changing directions, turn the entire body without twisting, including the feet.

3.5.5 Biological Hazards

Bloodborne pathogen risk will be minimized by providing for the protection of employees through training, universal precautions, PPE, waste handling procedures and other precautions. Potential exposure to bloodborne pathogens is posed primarily through two types of work related activities. First, employees providing emergency first aid and/or CPR to victims of accidents at field locations may be exposed. Secondly, those employees that participate in field activities where there is the presence of medical waste or other waste that has been contaminated with blood or body fluids may be exposed. A written Bloodborne Pathogen Exposure Control Plan as required under OSHA 29 CFR 1910.1030 for on-site use if solid waste potentially containing medical waste is discovered or in the event of a first aid situation involving blood is contained in Appendix E.

3.5.6 Electrical Hazards

Related Electrical Hazard Job Activities:

- The use of industrial trucks, cranes, and excavating equipment in the vicinity of overhead power lines or underground electrical lines;

- Use of electrical hand-held tools;

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- Contact with overhead power lines by personnel hoist(s), excavators, and cranes; and
- Lightning.

Electrical hazards can exist because of downed power lines or improper use of electrical equipment. The presence of underground electric lines must be checked for and marked before any excavating. When using cranes or material handlers, care must be taken that the machinery does not come in contact with any elevated energized lines. There should be a 10-foot clearance between a crane and electric power lines (up to 34 kilovolts (KV)) unless the lines have been de-energized. Higher kilovolt lines require greater separation distances. Shock is the primary hazard from electrical tools. When using electrically powered tools on the construction site, ground fault circuit interrupters (GFCI) are required.

A mark-out of utilities must occur at least 72 hours prior to starting any subsurface work. The retained contractor will be responsible to contact Dig Safe Systems, Inc. and have such utilities marked. No work will commence until the required utility clearances have been completed.

Within the site many or most of the utility lines may not be readily identified. The retained contractor, as a matter of due diligence, will be responsible to use best efforts to identify the location of any private utility lines at the site. The retained contractor will consult as-built drawings that may exist, perform a line locating survey, identify no-dig/drill zones and hand dig if there is insufficient data to determine the exact location of utility lines.

In advance of thunder and lightning, the work should be suspended and all on-site personnel should take cover.

3.5.7 Heat Stress Hazards

Workers may be required to wear protective clothing and this clothing may prevent the body from cooling naturally, causing a rise in body temperature. High body temperatures can result in heat fatigue, physical discomfort, and potentially fatal heat stress. Heat stress is a significant hazard to workers and must be monitored.

3.5.8 Cold Stress/Frostbite and Hypothermia Prevention

Cold stress disorders are potential physical hazards at the site. Two common cold stress disorders and treatment methods are described below.

3.5.8.1 Frostbite

Local injury resulting from cold is usually described as frostbite. Frostbite is the freezing of tissue and typically is divided into several stages based upon the degree of injury. Frostbite results from an extremity losing heat faster than it can be replaced by the circulating blood and internal metabolism. Most commonly it affects the toes, fingers, and face. Frostbite may result from direct exposure to extreme cold or high wind, as can happen to the nose, ears, and hands. Damp feet may suffer frostbite more easily because of the conduction of heat away from the skin's surface.

Frostbite of the extremities can occur in approximately three stages:

- Frost nip or incipient frostbite characterized by sudden blanching or whitening of skin.
- Superficial frostbite characterized by skin with a waxy or white appearance and is firm to the

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touch, but the tissue beneath is resilient.

- Deep frostbite is characterized by tissues that are cold, pale or darkened, and solid.

3.5.8.2 Hypothermia

Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 99°. While many hypothermia cases are caused by extremely cold temperatures, most cases develop in air temperatures between 30°F and 50°F, especially when compounded with water immersion or soaking, and windy conditions.

Symptoms of hypothermia can include one or more of the following. Remember that the victim of hypothermia may not know, or refuse to admit, that he or she is undergoing signs of hypothermia. All personnel must be observant for the following signs in themselves and in or by other team members.

- Uncontrolled fits of shivering.
- Vague, slow, slurred speech.
- Irrational actions.
- Memory lapses.
- Incoherence.
- Fumbling hands, frequent stumbling, and lurching gait.
- Apathy, listlessness, and sleepiness; inability to get up after a rest. Unconsciousness, glassy stare, slow pulse, and slow respiration.

If left untreated, hypothermia can result in death.

Below the critical body core temperature of 95°F, the victim cannot produce enough body heat to recover. At this point, emergency measures must be taken to reverse the drop in core temperature.

The victim can slip into hypothermia in a matter of minutes, and can die in less than two (2) hours after the first signs of hypothermia are detected.

Treatment and medical assistance is critical (see Section 4.10).

3.5.9 Noise Hazards

Related Noise Hazard Job Activities:

- Operation of heavy equipment; and
- Operation of power tools.

Hearing protection is required for the following personnel when conducting the indicated activities:

- Operator of heavy equipment;
- Workers in "close proximity" of heavy equipment; and
- Workers utilizing power tools.

A good rule of thumb is a worker is in "close proximity" if it is necessary to raise his or her voice when trying to carry on a conversation with someone at three (3) feet away or if snapping fingers cannot be heard while working around the heavy equipment. In such case hearing protection is required. OSHA 29 CFR 1910.95 states that the permissible noise level is 90 dBA for an eight (8) hour work day and requires

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that the employer reduce exposure below this level by use of feasible engineering and administrative controls.

Engineering controls for noise are muffling of the source, proper maintenance, and barriers, if required. Administrative controls include logical decision making in response to the use of equipment that create elevated noise levels, and proper scheduling of personnel within the area of elevated noise levels to minimize the number of employees exposed. Personal noise protection equipment in the form of ear muffs or disposable earplugs will be provided for all site personnel.

3.5.10 Task Related Equipment Hazards

Related Equipment Hazard Job Activities:

- Use of jackhammer, chainsaw, welding torch, and other hand-held equipment.

Moving machinery may cause lacerations and contusions (cuts and bruises) to personnel. Injury will be minimized by wearing protective clothing, safety glasses, hard hats, steel-toed boots, and using mechanical assists whenever possible. Loose clothing is prohibited and hair will be secured when working around and with equipment that has moving parts or any other potentially hazardous piece of equipment. All moving and rotating machinery must be properly guarded, and guarding must remain in place.

3.5.11 Life Safety Hazards

Related Life Safety Hazard Job Activities:

- Entering confined spaces, working in excavations, and working from elevated surfaces. These activities pose a significant threat to the life of workers. Strict safety guidelines will be enforced during these activities.

Employees potentially subject to falls from heights of six (6) feet or greater while not protected by fixed scaffolding, guardrails, or safety nets, shall be secured by safety belts and lanyards (pigtails).

Safety nets must be provided when working surfaces are more than 25 feet above the ground or water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts is determined to be impractical.

All equipment requirements for safety belts, lifelines, lanyards and safety nets shall be in accordance with 29 CFR Subpart M.

3.5.12 Moving Machinery Hazards

Related Moving Machinery Hazard Job Activities:

- Use of excavation equipment, and other vehicles.

All on-site personnel must be aware of the hazards associated with the use of heavy equipment such as track loaders and backhoes. A hand signal system must be utilized by personnel working around such heavy equipment. All backup alarms must be functioning on the types of vehicles that must have backup alarms, which are vehicles that are large and with limited vision when backing up, such as dump trucks, tractor trailers, and excavators.

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3.5.13 Slip, Trip and Fall Hazards

Related Slip, Trip and Fall Hazard Job Activities:

- Site terrain;
- Use of ladders; and
- Falling from personnel hoist or material hoist.

Good housekeeping must be maintained.

Physical hazards such as slips, trips and falls may occur. Workers must walk cautiously at a site to avoid tripping, especially when uneven terrain is present. Falls are more serious when they occur from heights. Extra precautions must be taken if guardrails or railings are absent. Ladders used for access to a high place must be securely lashed with tight straps or otherwise fastened at the top to prevent sliding, and the feet must be on a firm and level base, and these ladders must extend at least three (3) feet above the level to which they allow access.

All personnel are instructed to and must keep back three (3) feet from the top edge of excavation faces, unless operating equipment that is designed to safely cross the excavation face.

3.5.14 Visibility Hazards

Related Visibility Hazard Job Activities:

- Heavy equipment and/or high winds creating high levels of dust in air.

This condition is addressed by the Dust Control Plan (DCP) and Community Air Monitoring Plan (CAMP).

3.5.15 Welding Hazards

Related Welding Hazard Job Activities:

- Miscellaneous Field Welds

All welding equipment and operations shall be in accordance with OSHA standards. For more information, refer to Section 4.10.4.

3.5.16 Excavation/Shoring/Sloping

While no deep excavations are proposed, an excavation at or greater than five (5) feet in depth will be shored or sloped in accordance with OSHA regulations if personnel enter the excavation.

3.5.17 Insects and Vermin

Ticks, snakes, insects, and rodents may be encountered. The best protection is to provide adequate skin protection (i.e., long sleeve shirt and pants).

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4.0 RISK CONTROL AND SAFETY MEASURES

4.1 Introduction

4.2 Posting of Notice

Under provisions of 29, CFR Part 1903.2(a)(1), employers must post a notice, furnished by OSHA, informing employees of the protection and obligations provided for in the OSHA Act of 1970.

This notice must be posted in a conspicuous place or places where notices to employees are customarily placed, such as a field trailer or other daily gathering location.

4.3 Engineering Controls

4.3.1 Site Control

4.3.1.1 General

Site control is meant to minimize potential contamination of workers and to protect the public from potentially hazardous conditions. Site control is especially important during emergency situations. Several site control procedures will be implemented to reduce public exposure, as well as worker exposure, to chemical, physical, biological, and safety hazards.

4.3.1.2 Site Work Zones

To prevent the accidental spread of hazardous substances from a contaminated area to a clean area, zones will be delineated where various operations will occur on the site. The site will be divided into a minimum of three zones, as depicted in Plates 2, 3 and 4 of the Remedial Design and described as follows:

- **The Exclusion Zone**

  The area where contamination is either known or likely to be present or, because of the nature of the activity, it may potentially harm personnel. Entry into the Exclusion Zone requires the use of PPE. Therefore, these work areas will initially be considered Exclusion Zones until site controls can isolate potential contaminants, or when analytical results of existing soils and groundwater indicate concentrations below the NYSDEC Recommended Soil Cleanup Criteria, and the results of personnel air sampling (when performed) indicate concentrations less than the Permissible Exposure Limit (PEL). The size of the Exclusion Zone will vary depending on the activity.

- **The Contamination Reduction Zone**

  The area where personnel and equipment are decontaminated. It is essentially a buffer zone between contaminated areas and clean areas. Activities to be conducted in this zone will require personal protection as defined in Section 4.8. An opening in the barricade at the support zone will serve as the personnel and equipment entry and exit point.

- **The Support Zone**

  The area situated in clean areas where the likelihood of encountering hazardous materials or conditions is expected to be minimal; therefore, PPE is not required.

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No unauthorized individuals are permitted in the Exclusion Zone, and the Health and Safety Manager has the authority to deny any person access into the Exclusion Zone if, in his/her judgment, the person does not meet entry requirements.

The Exclusion Zone will be established based upon the visual and olfactory observations, PID screening results, analytical results of soil samples collected in the effort to delineate the proper Exclusion Zone, and the air monitoring conducted by the Health and Safety Manager.

In addition, all three zones described above must remain flexible based upon the results of the soil and air monitoring. The delineation of these zones may change during the work day as required based on these daily monitoring results. The identification of the Exclusion Zone will determine the location of the Contamination Reduction Zone and the Support Zone. Therefore, an exact location of each of the three zones is strongly suggested at this time, but may be revised based on field conditions.

4.3.1.3 Standard Safe Work Practices

4.3.1.4 General

The following general safe work practices apply:

- No eating, drinking (see other requirements to drink) in unauthorized manners, chewing gum and/or smoking is allowed in contaminated or potentially contaminated areas, or where there is a possibility for the transfer of contamination. As fluid intake is important to worker health, endurance and productivity, means of drinking uncontaminated fluids must be provided at appropriately selected locations.

- Contact with potentially contaminated substances should be avoided. Puddles, pools, mud, etc. should be avoided. Kneeling, leaning, or sitting on equipment or the ground should be avoided. Monitoring equipment and tools should not be placed on a potentially contaminated surface, such as the ground.

- Spillage should be prevented, to the extent possible. In the event that a spillage occurs, the liquid should be contained, if possible.

- Splashing of contaminated materials should be prevented.

- Field crew members should use all their senses to alert themselves to potentially dangerous situations.

- Field crew members should be familiar with the physical characteristics of on-site operations, including:

  - Wind direction in relation to the Exclusion and Contamination Reduction Zones;
  - Accessibility to associates, equipment, and vehicles;
  - Communications;
  - Exclusion Zones (areas of known or suspected contamination);
  - Site access;
  - Nearest water sources; and
  - Routes and procedures to be used during emergencies.

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- A minimum number of personnel and equipment should be in the contaminated area, but only to the extent consistent with work force requirements of safe site operations.

- All waste generated during contractor or subcontractor activities at the site must be disposed of as directed by the Project Manager.

- No one wearing contact lenses or having a beard will be permitted in the work area when Level C or higher protection is required.

4.3.1.5 Buddy System

Workers will conduct all site activities with a buddy who is able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the Site Supervisor if emergency help is needed.
- Use prearranged hand signals or other emergency communication signals such as:
  - Hand gripping throat: out of air, can't breathe.
  - Gripping partner's wrist or placing both hands around waist: leave area immediately, no debate.
  - Hands on top of head: need assistance.
  - Thumbs up: okay, I'm alright, I understand.
  - Thumbs down: no, negative.
  - Arms waving upright: send backup support.

4.3.2 Chemical Exposure Control

Potential exposures that may exist at the site include:

- Skin contact with contaminated soil or water;
- Inhalation of dusts (metals, such as arsenic, chromium and copper do not form vapors at the temperatures and pressures that will exist at the site);
- Ingestion of contaminated soil dusts, especially if poor personal hygiene is practiced.

Contact with skin by contaminated soil or groundwater will be minimized by wearing personal protective clothing when necessary as determined by the Health and Safety Manager. Inhalation of dusts during construction activities will be minimized by the use of dust controls, including optimization of excavation practices to minimize the area of disturbed ground, periodic misting of the uncovered distorted areas of contaminated soils and uncovered contaminated soil stockpiles, and promptly stabilizing disturbed areas. These measures will be implemented as deemed appropriate by the Health and Safety Manager. Respiratory protection will be used by the site workers if action levels are exceeded despite the implementation of dust control measures. Ingestion of contaminated materials will be minimized by practicing good personal hygiene during decontamination procedures.

4.4 Hazard Communication

4.4.1 General

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The Hazard Communication Program for the former Circle M Wood Treating Site complies with the OSHA Hazard Communication Standard (HCS) found in 29 CFR 1910.1200 and 29 CFR 1926.59, which applies to any chemical present in the workplace in such a manner that employees may be exposed under normal conditions of use of in a foreseeable emergency. Although waste materials are excluded from the OSHA requirement, decontamination chemicals for sampling apparatus or protective clothing (such as acetone or trisodium phosphate) and calibration standards (such as isobutylene gas) require Material Safety Data Sheets (MSDSs).

The principle of communicating the hazards of materials used in the workplace to employees applies broadly to activities throughout the project organization. It is also important for personnel to have an awareness of Hazard Communication due to Federal, State, and local regulations directly affecting certain activities. The Hazardous Communication Program for the former Circle M Wood Treating Site is attached as Appendix C.

4.4.2 Compliance Requirements

In order to comply with Hazard Communication Standard (29 CFR 1910.1200), the following must occur:

- All containers of hazardous chemicals must be appropriately labeled or tagged to identify what they contain, the hazard, and provide information on effects and appropriate protective measures.
- Labels, tags or signs must be properly affixed and visible at all times while a hazard is present and removed promptly when the hazard no longer exists.
- Written information (MSDS) on hazardous chemicals in the workplace must be available to employees working with the substance.
- Appropriate MSDS will be available to any contractor or subcontractor employees working at the site.
- Hazard Communication Training should be provided to the retained contractor employees.

4.4.2.1 Material Safety Data Sheets (MSDS)

MSDS will be available at the site such as at a field trailer or other daily gathering location. MSDS will be available for gasoline, diesel, and Portland Cement at a minimum.

4.5 Monitoring

4.5.1 General

Air monitoring for the hazards presented in Table 1 will be conducted to ensure proper selection of engineering controls, work practices, and PPE so that employees are not exposed to levels that exceed permissible exposure limits or published exposure levels for hazardous substances. Air monitoring will be performed to identify Immediately Dangerous to Life and Health (IDLH) conditions, exposure over permissible exposure limits or published exposure levels, or other dangerous conditions such as the presence of flammable atmospheres or oxygen-deficient environments. Before entry to any hazardous area occurs, monitoring of the atmosphere will be conducted to ensure that a safe working atmosphere exists. Continuous air monitoring will be conducted in the following areas:

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- Monitoring will be conducted at all intrusive activities.
- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.

4.5.2 Monitoring Requirements

Equipment necessary for site monitoring consists of a particulate monitor. The types of monitoring instruments specified by the hazard, as well as the action levels to upgrade personal protection, are shown on Table 3. All ambient measurements taken to evaluate employee exposures must be taken in the individual's breathing zone.

4.5.3 Instrument Calibration

All the utilized instruments will be calibrated prior to use. Readings will be recorded on the Daily Instrument Calibration Record Sheet provided in Section 6.0.

4.5.4 Background Readings

Before any field activities commence in an area of known contamination, background levels at that site must be read and noted. These daily background readings must be conducted away from and upwind of areas of potential contamination. Monitoring personnel must avoid potential interference, such as engine exhaust.

4.5.5 Air Monitoring Frequency

All site readings must be noted on the Daily Air Monitoring Data Sheet provided in Section 6.0, along with the date, time, background level, weather conditions, wind direction and speed, and the location where the background level was recorded. Continuous monitoring during work activities with a potential to produce dust will be conducted in hazardous areas as required, with results logged on an hourly basis at a minimum.

4.6 Hazardous Material Shipping

4.6.1 Basic Requirements

The United States Department of Transportation (USDOT) regulates the packaging, marking, labeling, and transport of hazardous materials in commerce. Personnel may become involved in transporting hazardous materials through laboratory, sampling, decontamination, or other activities. For example, concentrated acid may be taken to a field site to fix a sample; samples gathered for laboratory analysis could contain concentrations adequate to fulfill one or more hazard class definitions and therefore be considered hazardous; or calibration gas may have to be shipped to a field location. The USDOT allows the use of International Civil Aviation Organization (ICAO) technical instructions, or International Air Transportation Association (IATA) air shipping regulations; some air carriers (e.g., Federal Express) follow IATA regulations instead of USDOT domestic regulations.

Note that USEPA hazardous waste regulations do not apply to samples taken from hazardous waste sites due to the exclusion in the Resource Conservation and Recovery Act (RCRA) (40 CFR 261.4) that exempts samples obtained for laboratory analysis from USEPA manifesting, transportation, and storage requirements. However, classification and packaging of the samples as hazardous material, if such is the case, is still required.

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Whether the hazardous materials are samples, reagents, or other materials, USDOT hazardous materials regulations apply, and civil and criminal penalties are possible for noncompliance. In particular, the person who offers hazardous materials for shipment or transports non-exempt quantities of hazardous materials must sign a manifest declaring that the materials are properly packaged, marked, and labeled.

Personnel involved in the transportation of any hazardous materials, whether preservatives, decontamination or calibration chemicals, or USDOT hazardous samples, must be trained. The website at **http://hazmat.dot.gov/training/trainingreq.htm** summarizes this USDOT requirement.

4.6.2 Shipping Identified Hazardous Materials

The Hazardous Materials Transportation Table (49 CFR 172.101) or the IATA List of Dangerous Goods is the starting point for handling hazardous materials properly. By following the instructions in the appropriate table and accompanying regulations, the proper container, packaging, marking, labeling, and manifesting requirements will be met. Those who will be packaging or transporting hazardous materials should obtain a copy of the pertinent regulations. What follows is information specifically on samples, since sample shipping decisions can be difficult unless sample constituents are identified through USDOT-related testing in a laboratory.

Samples that fulfill hazard class definitions have the same transportation requirements as other hazardous materials; however, a problem arises when samples are presumed hazardous but the constituents are unknown. For such cases, the following guidance has been developed. Any manifest, whether for identified hazardous materials or for samples considered hazardous, should have:

- The emergency response telephone number.
- The emergency response guide number next to each Proper Shipping Name.
- The letters "RQ" at the beginning of the Proper Shipping Name, when applicable.

4.6.3 Shipping Samples

The following general guidelines have been developed to aid in determining whether a sample should be considered hazardous for compliance with the USDOT and International Air Transport Association (IATA) shipping regulations. Samples may not frequently meet the USDOT or IATA definition of a hazardous material; however, the following guidelines should be considered when shipping samples to prevent inadvertent shipment of hazardous samples as non-hazardous.

Samples should be considered hazardous when any of the following conditions have been met:

- Samples of neat chemicals collected from drums or containers, of free product, or of hazardous waste streams that are listed in the hazardous materials tables and meet the USDOT or IATA definition of a hazardous material.

- Liquid samples that have a pH of less than two (2) or greater than 12.5. Samples preserved in accordance with SW-846 or 40 CFR 136 that are preserved with acids or bases are not considered to be USDOT hazardous by reason of low or high pH; but this does not preclude the sample from being hazardous due to its other characteristics.

- Samples that are believed to contain hydrocarbons (including chlorinated hydrocarbons) and exhibit a headspace reading of 10 parts per million (ppm) or greater.

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- Samples that contain radioactive materials with an activity of greater than 0.002 microCuries/gram.

- Samples containing pesticides in concentrations that may potentially approach the percentage concentrations listed in Table 3.6D of the IATA regulations. Note that most pesticides listed in this table must be at a concentration of 10,000 ppm or greater to be considered hazardous.

Samples that do not meet the criteria of a hazard class or division are not considered hazardous and do not have to be shipped as a hazardous material.

It is believed most contaminated soil and water samples that exhibit headspace readings in excess of the above criteria will have Proper Shipping Names of "Environmentally hazardous substance, liquid, n.o.s. UN 3082" or "Environmental hazardous substance, solid, n.o.s. UN 3077." The packing group associated with this Proper Shipping Name is always Packing Group III. This will not be the case when samples collected exhibit significant amounts of free product, the sample is saturated with product, or immiscible liquids are present that meet the definition of a hazardous material. Such samples should be called "Flammable liquid, n.o.s. UN 1993" or whatever Proper Shipping Name best applies to the specific conditions. The Packing Group for these materials will generally fall into the Packing Group II category, or whichever Packing Group is associated with that Proper Shipping Name, unless that material does not meet the criteria of the assigned Packing Group.

4.7 Drum and Container Handling Procedures

Drums or containers are not known or suspected to be present at the site. However, if any are encountered, the procedures set forth in Table 5 and Appendix F will be followed.

4.8 Personal Protective Equipment (PPE)

4.8.1 General

PPE will be used to protect employees from the hazards and potential hazards likely to be encountered during site activities. PPE selection is based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task specific conditions and duration, and the hazards and potential hazards identified at the site. The level of protection provided will be increased when site conditions dictate that a change is necessary to reduce employee exposures to below permissible exposure limits and published levels for hazardous substances.

4.8.2 Levels of Protection

All field activities will be initiated at Level D, or as directed by the Health and Safety Manager. Intrusive activities will utilize Level D except D+ modified PPE (Tyvek suit, gloves, boots with no respirator) will be utilized in areas where visual or olfactory observations, or PID readings indicate that soil contamination exists. If the action levels specified in Table 1 are exceeded, an upgrade will be made to Level C, as described in Table 3.

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4.8.3 Respiratory Protection

If air purifying respirators are required, full face piece respirators, with combination organic vapor and high efficiency dust and mist cartridges, will be used. Respirators belong to, and are only used and maintained by, the individual to whom they have been issued. Each retained contractor and subcontractor employee who is required to wear respiratory equipment, must be trained, fit tested and declared medically fit.

4.9 Decontamination

4.9.1 Standard Procedures

1. A personnel decontamination station (PDS) will be established in a mobile trailer to avoid concerns with wind direction.

2. All personnel leaving the Exclusion or Contamination Reduction Zones will proceed through the appropriate contamination reduction sequence upon leaving the contamination area.

3. All protective gear will be left on-site during any lunch break following decontamination procedures.

4. Material Safety Data Sheets (MSDSs) for chemicals used during decontamination procedures will be made available to those who are potentially exposed to these chemicals (see also Section 4.4, Hazard Communication (above)).

5. See Section 5.1.3.5, Exposure to Bloodborne Pathogens, for decontamination involving body fluids.

4.9.2 Decontamination of Equipment

To the extent possible, measures should be taken to prevent contamination of sampling and monitoring equipment. Sampling devices may become contaminated; however, monitoring instruments, unless they are splashed, usually do not become contaminated. Once contaminated, it is difficult to clean instruments without damaging them. Certain delicate instruments that cannot be decontaminated easily should have a bag taped and secured around them. Openings should be made in the bag for sample intake in accordance with manufacturer's recommendations.

4.9.3 Sampling Devices

Sampling devices often require special cleaning. Decontamination of all sampling equipment should be performed in accordance with any approved quality assurance plans and with manufacturer's instructions and recommendations.

4.9.4 Tools

Wooden tools often absorb chemicals and therefore consideration will be given to retention in the Exclusion Zone handling only by protected workers, and appropriate disposal.

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4.9.5 Respirators

Certain parts of contaminated respirators, such as the harness assembly and cloth components, require careful decontamination. If grossly contaminated by absorbable compounds, such may need to be discarded. However, soil containing copper, chromium and arsenic does not generally contain such absorbable compounds. Rubber components can be soaked in soap and water and scrubbed with a brush. Persons responsible for decontaminating respirators will be thoroughly trained in respirator maintenance.

4.9.6 Heavy Equipment

Bulldozers, trucks, backhoes, and other heavy equipment must be fully decontaminated. Generally, such items, whenever possible, will be washed with water under high pressure and/or their accessible parts will be scrubbed with detergent/water solution under pressure. In some cases, shovels, scoops, and lifts must be sand blasted or steamed. Particular care must be given to those components in direct contact with contaminants, such as tires and scoops.

Heavy equipment will be retained within the Exclusion Zone to minimize the number of cleanings required for decontamination. Heavy equipment that must depart the Exclusion Zone will be cleaned within the Contamination Reduction Zone utilizing a power washer and hand tools (shovels and scrapers) to remove soil accumulated on the vehicle within the Exclusion Zone. The decontamination area for heavy equipment will consist of a stone pad located immediately adjacent to the border for the Exclusion Zone. Since contaminated water, if any, should not exceed current contamination levels as previously described in the site characterization, water generated during the decontamination process will be directed back into the Exclusion Zone. Potentially contaminated soil removed from heavy equipment during the decontamination process will be collected and placed into the consolidation area.

4.9.7 Sanitizing of Personal Protective Equipment

Respirators, reusable protective clothing, and other personal articles must be decontaminated before personal reuse and must be sanitized prior to use by another worker. The inside of masks and clothing becomes soiled because of exhalation, body oils, and perspiration. The manufacturer's instructions should be followed to sanitize the respirator mask. If practical, protective clothing should be machine washed after a thorough decontamination; otherwise, it must be cleaned by hand.

4.9.8 Persistent Contamination

In some instances, clothing and equipment will become contaminated with substances that cannot be removed by normal decontamination procedures. A strong detergent (industrial grade) may be used to remove such contamination from equipment if it does not destroy or degrade the protective material. If persistent contamination is expected, disposable garments or over-garments should be used.

4.9.9 Disposal of Contaminated Materials

All materials and equipment used for decontamination must be disposed of properly, or properly decontaminated prior to leaving the Contamination Reduction Zone. Clothing, tools, buckets, brushes, and all other equipment that is contaminated must be secured in drums or other containers and labeled. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the site.

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Contaminated wash and rinse solutions should be contained by using step-in containers (e.g., plastic wading pool) to hold spent solutions, and should be properly disposed in municipal sewers (with prior approval by the municipality or at off site liquid treatment disposal facilities.

4.9.10 Minimal Decontamination

Less extensive procedures for decontamination can be established under the following conditions: when disposable clothing and equipment are used, the type and degree of contamination become known, or the potential for transfer of contaminated soil is judged to be minimal by the Health and Safety Manager in consultation with the Project Manager. This includes the use of Modified Level D PPE (Tyvek suit, gloves, boots with no respirator). The decontamination procedure Modified Level D would be the following:

Standard Measures for Modified Level D Decontamination

Station 1 - Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in plastic-lined containers. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool down station may be setup within this area.

Station 2 - Boot and Glove Wash

Scrub boots and gloves with decon solution or detergent and water.

Station 3 – Boot Wash and Glove Rinse

Rinse off decon solution from Station 2 using as much water as necessary.

Station 4 - Tape Removal

Remove tape from around boots and gloves and deposit it in the plastic-lined container.

Station 5 - Boot Cover Removal

Remove disposable boots and deposit them in the plastic-lined container. If non-disposable boots are utilized, store for later use.

Station 6 - Outer Glove Removal

Remove outer gloves and deposit them in the plastic-lined container.

Station 7 - Remove Tyvek Suit

Deposit used Tyvek suit in plastic-lined container.

Station 8 - Inner Glove Wash

Wash inner gloves with decon solution, if necessary.

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Station 9 - Remove Inner Gloves

Remove inner gloves and deposit them in the plastic-lined container.

4.9.11 Closure of the Personnel Decontamination Station

All disposable clothing and plastic sheeting used during the operation should be double bagged, labeled, and either contained on site or removed to a client approved disposal facility. Cloth items should be bagged and removed from the site for final cleaning. All wash tubs, pails, containers, etc. should be thoroughly washed, rinsed, and dried prior to removal from the site.

4.9.12 Level C Decontamination

The maximum decontamination layout for Level C is described and will take place in a linear fashion in the decontamination trailer as depicted on Plates 2, 3 and 4 of the Remedial Design.

Standard Measures for Level C Decontamination

Station 1 - Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in plastic-lined containers. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool down station may be setup within this area.

Station 2 - Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent and water.

Station 3 - Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using as much water as necessary.

Station 4 - Tape Removal

Remove tape from around boots and gloves and deposit it in the plastic-lined container.

Station 5 - Boot Cover Removal

Remove boot covers and deposit them in the plastic-lined container.

Station 6 - Outer Glove Removal

Remove outer gloves and deposit them in the plastic-lined container.

Station 7 - Suit and Boot Wash

Wash splash suit, gloves, and safety boots. Scrub with long-handled scrub brush and decon solution.

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Station 8 - Suit, Boot, and Glove Rinse

Rinse off decontamination solution using water. Repeat as many times as necessary.

Station 9 - Cartridge or Mask Change

If worker leaves the Exclusion Zone to change cartridges (or mask), this will be the last step in the decon procedure. After worker's cartridges are exchanged, new outer gloves and boot covers donned, and joints taped, worker returns to duty.

Station 10 - Safety Boot Removal

Remove safety boots and deposit them in the plastic-lined container.

Station 11 - Splash Suit Removal

With assistance from the helper, remove splash suit. Deposit it in the plastic-lined container.

Station 12 - Inner Glove Wash

Wash inner gloves with decon solution.

Station 13 - Inner Glove Rinse

Rinse inner gloves with water.

Station 14 - Face-Piece Removal

Remove face-piece and deposit it in the plastic-lined container. Avoid touching face with fingers.

Station 15 - Inner Glove Removal

Remove inner gloves and deposit them in the plastic-lined container.

Station 16 - Inner Clothing Removal

Remove clothing soaked with perspiration and place it in the plastic-lined container. Do not wear inner clothing off-site because there is a possibility that small amounts of contaminants might have been transferred in removing the fully encapsulating suit.

Station 17 - Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

Station 18 - Re-Dress

Put on clean clothes.

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4.10 Standard Operating Procedures

4.10.1 Heat Stress/Cold Stress

If site work is to be conducted during the winter, cold stress is a concern to the health and safety of personnel. Because disposable clothing such as Tyvek do not "breathe" as much as normal work attire, perspiration does not evaporate and the suits can become wet. Wet clothes combined with cold temperatures can lead to hypothermia. If the air temperature is less than 40 degrees Fahrenheit (°F) and employee perspires, the employee must change to dry clothes.

Wearing PPE also puts a worker at a considerable risk for developing heat stress. This can result in health effects ranging from heat fatigue to serious illness or death. Consequently, regular monitoring and other precautions are vital. Table 4 outlines the suggested frequency of physiological monitoring for workers.

Signs and Symptoms of Cold Stress

- **Incipient frostbite** is a mild form of cold stress characterized by sudden blanching or whitening of the skin.

- **Chilblain** is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a recurrent localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.

- **Second-degree frostbite** is manifested by skin which has a white, waxy appearance and is firm to the touch. Individuals with this condition are generally not aware of its seriousness, because the underlying nerves are frozen and unable to transmit signals to warm the body. Immediate first aid and medical treatment are required.

- **Third-degree frostbite** will appear as blue, blotchy skin. This tissue is cold, pale and solid. Immediate medical attention is required.

- **Hypothermia** develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

    - Involuntary shivering;
    - Irrational behavior;
    - Slurred speech; and
    - Sluggishness.

Signs and Symptoms of Heat Stress

- **Heat rash** may result from continuous exposure to heat and humid air.

- **Heat cramps** are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

    - Muscle spasms;
    - Pain in the hands, feet and abdomen.

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- **Heat Exhaustion** occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

  - Pale, cool, and moist skin;
  - Heavy sweating;
  - Dizziness, fainting, and nausea.

- **Heat Stroke** is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

  - Red, hot, and unusually dry skin;
  - Lack of or reduced perspiration;
  - Dizziness and confusion;
  - Strong, rapid pulse and coma.

1. Train workers to recognize, identify, and treat heat stress.

2. Have workers drink 16 ounces (0.5 liter) of fluid (preferably water or diluted drinks) before beginning work. Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight. Weigh workers before and after work to determine if fluid replacement is adequate.

3. Encourage workers to maintain an optimal level of physical fitness. Where newly arrived workers' prior work and activity levels have been lower than encountered at the work site, acclimatize workers to site work conditions by requiring more frequent breaks, lighter duty work and reduced daily hours. Then taper over a period of several days toward the frequencies and levels of acclimated workers.

4. Provide cooling devices to aid natural body heat exchange during prolonged work or severe heat exposure.

For workers wearing standard work clothes, recommendations for monitoring and work/rest schedules are those approved by American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute of Occupational Safety and Health (NIOSH). Workers wearing semi-permeable PPE or impermeable PPE should follow the rest pattern given in Table 4 when the temperature in the work area is above 70°F. To monitor the worker, the following should be measured:

- **Heart Rate** - The radial pulse should be counted during a 30-second period as early as possible in the rest period by the subject worker.

  - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, the next work cycle should be shortened by one-third and the rest period should be kept the same.

  - If the heart rate still exceeds 110 beats per minute at the next rest period, the following work cycle should be shortened by one-third.

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If signs of heat stress are evident, monitoring of the heart rate of affected personnel by the Site Safety Officer should be instituted or the following measures should be taken.

- **Oral temperature** - A clinical thermometer (3 minutes under the tongue) or similar device should be used to measure the oral temperature at the end of the work period (before drinking).
    - If the oral temperature exceeds 99.6°F (37.6 degrees Celsius (°C)) the next work cycle should be shortened by one-third, without the rest period being changed.
    - If the oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, the following work cycle should be shortened by one-third.
    - A worker should not be permitted to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6°F (38.1°C).

Initially, the frequency of monitoring depends on ambient temperature. The length of the work cycle is determined by the frequency of physiological monitoring described above.

Proper training and preventive measures will help avert serious illness and loss of work productivity.

- Work schedules should be adjusted.
- Shelter or shaded areas should be provided to protect personnel during rest periods.
- When heavy sweating occurs, the worker should be encouraged to drink more. The following strategies may be useful:
    - Water temperature should be maintained at 50°F to 60°F (10°C to 15.6°C).
    - Small disposable cups that hold approximately 4 ounces (0.1 liter) should be provided.

4.10.2 Use of Hand Tools and Portable Power Tools

Hand tools should be kept in good condition and used only for their designated purposes. Proper protective eye wear should be worn when using hand tools and portable power tools. Unguarded sharp edged or pointed tools will not be carried in employees' pockets.

The use of tools with mushroomed heads, split or defective handles, worn parts, or other defects will not be permitted. Tools that have become unsafe will be reconditioned before reissue or discarded.

Throwing or dropping of tools from one level to another will not be permitted; rather, containers and hand lines should be used for transporting tools from one level to another.

Non-sparking tools will be used in atmospheres where sources of ignition may cause fire or explosion.

Electric powered shop and hand tools will be of the double insulated, shock-proof type or be effectively grounded. Power tools should be operated only by designated employees who are familiar with their use.

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Portable grinding tools will not be used without properly installed safety guards. Guards and tool rests should be maintained in proper adjustment. Grinding wheels should not be operated at speeds in excess of the manufacturer's safe ratings. Cracked or defective wheels will not be used.

Portable circular saws should be equipped with guards that automatically enclose the cutting edges. Cracked or defective blades will not be used. Also, power saws will not be left running when unattended.

Portable pneumatic tools should be inspected periodically to ensure good mechanical condition. Pneumatic impact tools will be operated with safety clips or retainers installed to prevent the tools from accidentally being discharged from the chuck. Air hoses should not be disconnected from equipment until the pressure has been shut off and exhausted from the line. Safety lashing will be provided at all hose and tool connections on air lines over 0.5 inch in diameter. Leaking or defective hoses should be replaced.

When not in use, tools will not be left on scaffolds, ladders or overhead working spaces. Containers should be provided to hold tools and prevent them from falling.

4.10.3 Use of Ropes, Chains, and Accessories

The use of ropes and chains will be governed by the instructions on usage and safety limits as recommended by the manufacturer. Ropes and chains should be inspected before use, and their loading should not exceed the manufacturer's safety limits.

Hooks, used in hoisting personnel or in hoisting loads over or in the immediate vicinity of workers, should be made of forged steel and equipped with safety keepers. When shackles are used under these conditions, they should be of the locking type or the pin should be secured to prohibit turning.

Load lifting accessories, such as sheaves, shackles, hooks, headache balls, etc., should be obtained from a reputable manufacturer. The use of job-fabricated lifting accessories is expressly prohibited. Load-lifting accessories that show excessive wear or have been bent, twisted, or otherwise damaged will be removed from service.

Slings

When in use, slings should be inspected daily for signs of overloading, excessive wear, or damage. Defective slings should be removed from service and repaired or replaced before reuse.

Proper storage should be provided for slings to prevent damage that would impair their strength. They should be protected from sharp, rough, or square corners to prevent cutting or breaking of fibers, strands or chain links.

Wire Rope

The safe performance of wire rope or cables can be ensured by rigid periodic inspection and by proper use and care.

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The maximum allowable load for wire hoisting rope must not exceed the safe working load prescribed by the manufacturer or the ultimate strength of the rope divided by the safety factor. Commercial end-fastenings, clips, and zinc sockets must be properly applied to develop maximum strength. Wire rope should be removed from hoisting or load-carrying service when kinked or when any one of the following conditions is observed:

- The existence of 12 randomly distributed broken wires in one rope lay, or four broken wires in a single strand in one rope lay.
- Evidence of corrosion or heat damage.
- One broken wire, rust, or corrosion adjacent to a socket or end-fitting (this requires removal from service or re-socketing).
- Distortion, stretching, elongation, or abnormal reduction in diameter.

Wire rope found to be defective for hoisting or load-carrying should be plainly marked as being unfit for such use.

Running lines of hoisting equipment located within eight (8) feet of the ground or working level will be guarded: or access to the operating area will be restricted.

Rope clips attached with U-bolts should have the U-bolts on the dead end of the rope. When a wedge-socket fastening is used, the dead or short end of the cable should be clipped to the live cable with a U-bolt or another approved fastener.

Fiber and Synthetic Fiber Rope

In selecting fiber and synthetic fiber ropes for load carrying purposes, only the best quality rope should be used, with size and application in accordance with the manufacturer's recommendations. These ropes should be inspected frequently to ensure safe performance.

Proper care must be given to ropes to maintain good condition and high strength capacity. Fiber ropes should not be allowed to freeze after becoming wet, but should be cleaned carefully and dried in loose coils. Ropes should not be stored close to cement, lime, acids, or alkalis. Ropes that have been exposed to these materials should be removed from service.

Chains

Extreme care is necessary in the use and maintenance of all load carrying chains. They should be inspected by a competent person after each installation and regularly thereafter. Chains must not be subjected to a load greater than their rated safe loading, which is determined from capacity tables issued by the chain manufacturer.

Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or by passing one link through another and inserting a bolt or a nail to hold it, is prohibited.

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Hoists

If a ball bearing type hoisting swivel is used to hoist drill rods, swivel bearings should be inspected and lubricated on a daily basis to ensure that the swivel freely rotates under load. If a rod-slipping device is used to hoist drill rods, the drill rods should not be drilled or rotated through the slipping device. No more than one (1) foot (0.3 meter) of the drill rod column should be hoisted above the top of the mast (derrick). A rod column with loose tool joints should not be hoisted while the rod column is being supported by a slipping device. If drill rods slip back into the borehole, an attempt should not be made to break the fall of the rods with your hands.

Most sheaves on drill rigs are stationary, with a single part line. The manufacturer of the drill rig should be consulted before the number of line parts in increased. Wire ropes must be properly matched with each sheave.

Tool handling hoists should only be used for vertical lifting of tools (except when angle hole drilling). Tool handling hoists should not be used to pull on objects away from the drill rig; however drills may be moved by using the main hoist as the wire rope is spooled through proper sheaves, according to the manufacturer's recommendations.

When tools or similar loads cannot be raised with a hoist, the hoist line should be disconnected and the tools connected directly to the feed mechanism of the drill. Hydraulic leveling jacks should not be used for added pull to the hoist line or the feed mechanism of the drill.

When attempting to pull out a mired vehicle or drill rig, only a winch on the front or rear of the vehicle or drill rig should be used and workers should stay as far away as possible from the wire rope. Tool hoists should not be used to pull out a mired vehicle or drill rigs. The following rules also apply:

- The shock loading of a wire rope can be minimized by smooth and steady application of loads.
- Wire rope should be protected from sharp corners or edges.
- Clutches and breaks of hoists should be periodically inspected and tested.
- Gloves should always be worn when handling wire ropes.
- Following the installation of a new wire rope, a light load should be lifted first to allow the wire rope to adjust.
- A load should never be hoisted above someone's head, body, or feet, or left suspended in the air when the hoist is unattended.
- Hands should be kept away from hoists, wire ropes, hoisting hooks, sheaves, and pinch point when the slack is being taken up, and when the load is being hoisted. Hands should not be used to guide wire ropes on hoist drums.

4.10.4 Welding, Cutting and Heating

Employers must instruct employees in the safe use of welding equipment. Proper precautions (isolating welding and cutting, removing fire hazards from the vicinity, providing a fire watch, etc.) for fire prevention must be taken in areas where welding or other "hot work" is being done. No welding, cutting, or heating will be done where the application of flammable paints or the presence of other flammable compounds or heavy dust concentrations create a fire hazard.

Arc welding and cutting operations must be shielded by non-combustible or flame-proof shields to protect employees from direct arc rays. When electrode holders are to be left unattended, the electrodes must be

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removed, and the holders must be placed or protected so that they cannot make electrical contact with employees or conducting objects.

All arc welding and cutting cables must be completely insulated and be capable of handling the maximum current requirements for the job. There must be no repairs or splices within seven (7) feet of the electrode holder, except where splices are insulated equal to the insulation of the cable. Defective cable must be repaired or replaced.

Fuel gas and oxygen hose must be easily distinguishable and must not be interchangeable. Hoses must be inspected at the beginning of each shift and must be repaired or replaced if defective.

General mechanical or local exhaust ventilation or air line respirators must be provided, as required, when welding, cutting, or heating:

- Zinc, lead, cadmium, mercury or beryllium bearing based or coated materials in enclosed spaces;
- Stainless steel with inert-gas equipment;
- In confined spaces;
- Where an unusual condition can cause an unsafe accumulation of contaminants.

When welding, cutting or heating metals coated with lead-bearing paint, the employer must provide local exhaust ventilation or protect employees with airline respirators.

The employer also must ensure that the paint is stripped back at least four (4) inches from the area of heat application, or protect the employees with airline respirators. Proper eye protective equipment must be provided to prevent employee exposure. This work, and any hot work involving open flames or producing heat and sparks, must receive a Hot Work Permit prior to the work from the retained engineer (see the retained engineer for forms and procedures).

4.10.5 Excavation

4.10.5.1 General Requirements

Whenever possible, the Project Manager will be the competent person as identified in Section 1.0 and Section 2.0 and will be provided by the retained contractor or by a retained consultant as selected by Chelsea Waterfront Development, LLC and in conformance with the requirements of this HASP and OSHA regulations. The Project Manager will also be responsible for proper mark-out of underground utilities.

The following general requirements should be followed for excavation:

- Site conditions, as described in the Contract Specifications, consider excavations to be hazardous, as previously defined. Work within these areas will proceed with appropriate PPE, as determined by the Health and Safety Manager, for all workers who may come in contact with contaminated soil or groundwater. Work in the area of stockpiled excavated soils will be considered similar to excavation conditions.

- Excavations shall be conducted in strict accordance with OSHA 29 CFR 1926.650 Subpart P regulations, which cover open excavations and define excavation to include trenches.

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- The regulations require protection of employees in excavations against cave-ins, except when the excavation is in stable rock, less than five (5) feet deep and deemed safe by a competent person.

- Workers must be protected from loose rock or soil and material or equipment that may fall into the excavation.

- Underground utility installations must be identified and located.

- Inspection of the site by a competent person is required daily, or following a natural or man-made event that may alter conditions. If there is evidence of possible cave-ins, protective system failure, hazardous atmospheres, or other hazardous conditions, employees at risk must be removed until corrective steps have been taken.

- Safe and accessible means of access and egress must be provided.

- Warning systems for mobile equipment are required, such as barricades, hand or mechanical signals, or stop logs.

- The regulations require testing for hazardous atmospheres and controls, including daily inspection by a competent person.

- Any of four options for sloping and benching systems may be implemented for stability of adjacent structures. These include:

    - A slope of 34 degrees or less in lieu of soil classification.

    - Maximum allowable slopes according to Appendices A and B of the OSHA standard.

    - Sloping or benching designs in accordance with stated criteria.

    - Excavations designed by a registered professional engineer.

- Any of four options may be implemented for support and shield systems. These include:

    - Designs for timber shoring in trenches in accordance with set criteria.

    - Designs using manufacturers' tabulated data in accordance with set criteria.

    - Designs using other tabulated data.

    - Other designs approved by a registered professional engineer.

- Excavation shall stop during inclement weather, such as high winds, heavy rainfall, lightning, etc.

Preliminary Inspection

Prior to excavation, the site should be thoroughly inspected to determine conditions that require special safety measures. The location of underground utilities, such as sewer, telephone, gas, water, and electric lines, must be determined and plainly staked. Necessary arrangements must be made with the utility company or owner for the protection, removal, or relocation of the underground utilities. In such

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circumstances, excavation will be done in a manner that does not endanger the employees engaged in the work or the underground utility. Utilities left in place should be protected by barricading, shoring, suspension, or other measures, as necessary.

Protection of the Public

Necessary barricades, walkways, lighting, and posting should be provided for the protection of the public prior to the start of excavation. Excavation operations on or near State, county, or local streets, access ways, or other locations where there is extensive interface with the public and/or motorized equipment will not start until all of the following actions have been taken:

- The contractor has contacted the authority having jurisdiction and obtained written permission to proceed with protective measures required.
- The contractor, using the authority's instructions and these standards, has developed an extensive and detailed standard operating plan.
- The plan has been discussed with affected employees, and applicable protective measures are in place and functioning.

Access and Lighting

Safe access will be provided for employees, including installation of walkways, stairs, ladders, etc. When operations are conducted during hours of darkness, adequate lighting will be provided at the excavation, borrow pits, and waste areas.

Where employees are required to enter excavations over four (4) feet in depth, stairs, ladders, or ramps must be provided, so as to require no more than 25 feet of lateral travel. When access to excavations exceeds 20 feet vertically, ramps, stairs, or personnel hoists should be provided. Ladders extending from the bottom of the trench to at least three (3) feet above the top must be placed within 25 feet of workers in the trench.

Personal Protective Equipment

PPE will be provided and used in accordance with the specific requirements set forth in the plan. Site personnel must wear approved safety goggles or safety glasses with side shields, hearing protection, hard hats, and safety shoes.

Removal of Trees, Brush and Obstacles

Prior to excavation, trees, brush, boulders, and other surface obstacles that present a hazard to employees should be removed.

Side Prevention and Trenching Requirements

All trench excavations over five (5) feet in depth must be sloped to the angle of repose from the bottom of the trench, but never less than ¾ horizontal to 1 vertical (i.e., 34 degrees from vertical), or supported by structures designed by a professional engineer. Excavations should be inspected following rainstorms or other hazardous events. Additional protection against possible slides or cave-ins shall be provided, as necessary.

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Angle of Repose

The determination of the angle of repose and design supporting systems should be based on a thorough evaluation of all pertinent factors, including depth of cut; possible variation in water content of the material; anticipated changes in the material from exposure to air, sun, water, or freezing; loading imposed by structures, equipment, or overlying or stored material; and vibrations from sources such as traffic, equipment, and blasting. The angle of repose for all excavations, including trenching, should be determined by a professional engineer, but in no event should the slope be less than ¾ horizontal to 1 vertical (i.e., 34 degrees from vertical) from the bottom of the excavation.

Support Systems

Materials used for support systems, such as sheeting, piling, cribbing, bracing, shoring, and underpinning should be in good serviceable condition, and timbers should be sound and free of large or loose knots. The design of support systems should be based on calculations of the forces and their directions, with consideration for surcharges, the angle of internal friction of materials, and other pertinent characteristics of the material to be retained.

When tight sheeting or sheet piling is used, full loading due to the groundwater table should be assumed unless relieved by weep holes, drains, or other means. Cross braces and trench jacks should be placed in true horizontal position and secured to prevent sliding, falling, or kick-outs. Additional stringers, ties, and bracing should be provided to allow for any necessary temporary removal of individual supports. Support systems should be planned and designed by a professional engineer competent in the field.

Backfilling and removal of trench support systems should progress together from the bottom of the trench. Jacks or braces should be released slowly. In unstable soil, ropes or other safe means will be used to remove the braces from the surface after workers have left the trench.

Special precaution must be taken in sloping or shoring the sides if excavations are adjacent to a previously backfilled excavation or fill area. The use of compacted backfill as back-forms on slopes that are steeper than the angle of repose of the compacted material in its natural state is prohibited.

Structural Foundations and Footings

Except in hard rock, excavations below the level of the base of any foundation, footing, or retaining wall will not be permitted unless the wall is underpinned and all necessary precautions are taken to ensure the stability of adjacent walls. If the excavation endangers the stability of adjacent buildings or structures, shoring, bracing, or underpinning designed by a qualified person will be installed. Such supporting systems must be inspected at least daily by the qualified persons to ensure that protection is adequate and effectively maintained.

Small diameter footings that workers are required to enter, including bell-bottomed footings over four (4) feet deep, must be provided with a steel casing or support system of sufficient strength to support the earth walls and prevent cave-ins. The casing or support system shall be provided for the full depth, except for the bell portion of bell footings.

Fixed or portable ladders must be provided for access. A lifeline, securely attached to a shoulder harness, should be worn by every employee entering the footing. The lifeline should be manned from above and should be separate from any line used to raise or lower materials.

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Vertical Cuts and Slopes

Before a slope or vertical cut is undercut, the residual material must be adequately supported and the undercutting method and support system must be inspected.

When exposed to falling, rolling, or sliding rocks, earth, or other materials, employees working below or on slopes or cuts should be protected in the following manner:

- By effective scaling performed prior to exposure and at intervals necessary to eliminate the danger.
- By installation of rock bolting, wire mesh, or equivalent support if the material continues to ravel and fall after scaling.
- By the installation of protective timber or wire mesh barricades at the slope of the cut and at necessary intervals down the slope. Wherever practical, benching sufficient to retain falling material may be used in lieu of barricades.
- By ensuring that personnel do not work above one another where there is danger of falling rock or earth. Personnel performing work on vertical cuts or slopes where balance depends on a supporting system must wear appropriate safety equipment.

Groundwater:

Groundwater should be controlled. At this site the risk of encountering groundwater is low as the deepest excavation is 24 inches. The greatest probability is most likely at the stream bank. In the event deeper excavations are necessary, freezing, pumping, draining, and other major control measures should be planned and directed by a competent professional engineer. Full consideration should be given to the existing moisture balance in surrounding soil and the effects on foundations and structures if it is disturbed. When continuous operation of groundwater control equipment is necessary, an emergency power source should be provided.

Surface Water:

The accumulation of surface water in excavations must not be permitted and should be controlled by diversion ditches, dikes, dewatering sumps, or other effective means.

Excavated Materials:

Excavated materials should be placed and retained at least two (2) feet from the depth of the excavation, or at a greater distance when required to prevent hazardous loading on the face of the excavation.

Protective Devices:

Guardrails, fences, barricades, and warning lights or other illumination systems will be maintained from sunset to sunrise on excavations adjacent to walkways, driveways, and other pedestrian or vehicle thoroughfares. Walkways or bridges that are protected by standard guardrails should be provided where employees are required or permitted to cross over excavations.

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Wells, holes, pits, shafts, and all similar hazardous excavations must be effectively barricaded or covered and posted. All temporary excavations of this type should be backfilled as soon as possible. When mobile equipment is permitted adjacent to excavations with steep slopes or cuts, substantial stop-logs or barricades should be installed.

Equipment Operation:

Equipment that is operated on loading or waste areas must be equipped with an automatic backup alarm. Additionally, when employees are on foot or otherwise endangered by equipment in dumping or waste areas, a competent signalman should be used to direct traffic. The signalman must have no other assignment that interferes with signaling duties. If the equipment or truck cab is not shielded, the operator should stand clear of the vehicle during loading. Excavating or hoisting equipment should not be allowed to raise, lower, or swing loads over workers unless effective overhead protection is provided.

Drilling Operations:

When drilling in rock or other dust-producing material, the dust should be controlled within the OSHA Permissible Exposure Limits (PELs). Except in shaft and tunnel excavation, dust control devices are not required on jackhammers as long as the operators wear approved dust respirators.

4.10.6 Confined Space Entry

In January 1993, OSHA promulgated a comprehensive Federal standard (29 CFR 1910.146) entitled "Permit Required Confined Spaces" specifically to protect workers who enter confined spaces.

The purpose of this section is to establish safety practices for work conducted within confined spaces; however, compliance with these requirements does not preclude or preempt other standards.

Entry into confined spaces for this project is not anticipated. This section has been provided as guidance if this need arises. Any site personnel who are scheduled to enter a confined space must have training in accordance with 29 CFR 1910.146.

Definition of a Confined Space:

To be considered a confined space requiring a permit for entry, the space must meet the following four criteria:

- The space must be large enough and so configured that an employee can enter it and perform assigned work.
- The space must have limited or restricted means for entry and exit. In many cases, the entrances are smaller and contortion of the body is necessary for passage. In other instances, the entrance may be large, but removal of a disabled employee may be difficult. A common attribute of a confined space is that retrieval of a suddenly disabled employee presents a challenge.
- The space is not designated for continuous employee occupancy. Most confined spaces are designed to hold or enclose materials, processes, etc.

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- The space may be hazardous or become hazardous due to one or more of the following conditions:

    - Contains or has the potential to contain hazardous atmosphere;
    - Contains a material which could engulf a person inside the space;
    - Is configured internally such that an entrant could be trapped or asphyxiated inside the space; or
    - Contains or may contain any recognized serious safety or health hazard.

Confined spaces include, but are not limited to, the following:

- Storage tanks, tank cars, process vessels, bins, tank trailers, and other tank-like compartments, usually with one or more manholes for entry.

- Open-topped spaces of more than four (4) feet in depth, such as bins, silos, pits, vats, tubs, vaults, vessels, or floating storage tanks.

- Ventilation or exhaust ducts, manholes, sewers, tunnels, pipelines, and similar structures.

- Ovens, furnaces, kilns, and similar enclosed structures.

Hazards of Confined Spaces:

The following is a list of the most common hazards found in association with confined spaces:

- **Oxygen Deficiency** – Atmospheres that contain less than 19.5% oxygen. Normal fresh air contains 20.9% oxygen.

- **Oxygen Enriched** - An atmosphere with oxygen in excess of 23.5%. These types of atmospheres are considered a potential fire or explosion hazard.

- **Combustible Gases and Vapors** - Atmospheres that may explode or ignite if a source of ignition is present in or introduced to the environment.

- **Toxic Gases and Vapors** - Atmospheres that contain contaminants, including asphyxiates and irritants, that even in low concentration can cause serous injury or death.

- **Mechanical Hazards** - Confined spaces can make it difficult to avoid contact with such machinery or electrical components that are located within the space.

- **Engulfment Hazards** - Engulfment in confined spaces occurs when the victim is immersed in liquid or trapped and enveloped by finely divided, dry bulk materials. Bulk materials can either be aspirated into the respiratory system or their weight can crush the torso.

- **Noise Hazards -** Scaling, chipping, grinding, hammering, riveting, power scrubbing, the use of power and pneumatic tools, and air line leaks can all create hazardous noise levels. Noise inside a tank or vessel can be amplified within the confines of the space.

- **Heat Stress Hazards** - The sun on a metal tank or lack of air circulation can contribute to a hot environment, in addition to the use of protective clothing and equipment.

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- **Cold Stress Hazards** - In cold weather, the metal of a tank can result in a cold environment inside the space.

One should anticipate that any combination of the above atmospheric conditions might exist in tunnels, utility manholes, vaults, sewers, sun-cellars, excavations, railroad tank cars, sump pits, silos, open tanks, rooftop mechanical penthouses, cold storage facilities, ship's holds, stacks and chimneys, duct work, brewer's vats, mine tunnels, abandoned wells, sewage treatment plants, and sanitary landfills. Hazards also may appear unexpectedly in normal situations because of inappropriate industrial waste disposal or leakage of toxic substances into earth strata or conduits.

Training Requirements

All site personnel who will be participating in confined space entry activities must demonstrate proof of Confined Space Entry training before their initial assignment to such work. At least one team member will be currently certified in first aid and CPR. The space entrant cannot be the sole entry team member certified in first aid/CPR.

Confined Space Entry Permit

A confined space entry permit is a written or printed document that is provided by the employer to allow and control the entry into a permit-required space. The use of a permit in OSHA cases is required. A confined spaces policy exists as a dedicated document, and a copy of a blank permit is attached as Appendix D. The following minimum information must be provided on the permit:

- Identification of the space to be entered.
- Purpose of the entry.
- Date and authorized duration of the entry permit.
- Authorized entrants within the permit space.
- Personnel serving as attendants.
- Individual serving as the supervisor.
- Hazards of the permit space.
- Measures used to isolate the permit space and to eliminate and control permit space hazards before entry.
- Acceptable entry conditions.
- Results of initial and periodic tests performed, accompanied by the name of the tester and indication of when the tests were performed.
- Rescue and emergency services that will be utilized and the means for initiating or summoning those services.

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- Communication procedures used by authorized entrants and attendants to maintain contact during entry.

- Equipment used during the operation.

- Any other information whose inclusion is necessary.

- Any additional permits that have been issued to authorize work in the permit space; for example, a welding or hot work permit.

No one is to enter a permit-required confined space unless a permit, authorized for the specific site, has been completed by a health and safety professional (see Appendix D for further discussion of confined spaces and for the Confined Space Entry Permit procedure).

4.10.7 Biological Hazards

4.10.7.1 Insect Bites and Stings

Flying Insects

Bees and wasps are common to the northeastern United States. Bees include both honey bees and bumblebees. Wasps include yellow-jackets, paper wasps, bald-faced hornets and European hornets.

All of the bees and wasps will sting when pinched between crushing surfaces and in defense of their hives or nests. Honeybees are the least aggressive to humans. The two that are known to be more aggressive to humans are the yellow-jacket and the bald-faced hornets. Of these, the bald-faced hornet have a large paper nest shaped like an upside-down pear, usually hanging from branches or eaves. The yellow-jacket have small umbrella-shaped papery combs as nests that hang horizontally in protected spaces such as attics, eaves or within soil cavities.

Spiders

Spiders in the United States are generally harmless, with two notable exceptions: the Black Widow spider (Latrodectus Mactans) and the Brown Recluse or Violin spider (Lox Osceles Reclusa).

The symptoms of such a spider bite are: slight local reaction, severe pain produced by nerve toxin, profuse sweating, nausea, painful cramps in abdominal muscles, and difficulty in breathing and speaking. Victims recover in almost all cases, but an occasional death is reported. The bite of a Black Widow spider is the more painful and often the more deadly of the two.

Field personnel should exercise caution when lifting covers off manholes or sumps or rummaging through wood, rock or brush piles, etc. since both the Black Widow and Brown Recluse spiders are typically found in these areas.

General First Aid for Poisonous Insect Bites and Stings

1. Minor Bites and Stings

    - Cold applications.
    - Soothing lotions, such as calamine.

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2. Severe Reactions

- Give artificial respiration if indicated.
- Apply a constricting band above the injection site on the victim's arm or leg (between the site and the heart). Do not apply tightly. You should be able to slip your index finger under the band when it is in place.
- Keep the affected part down, below the level of the victim's heart.
- If medical care is readily available, leave the band in place; otherwise, remove it after 30 minutes.
- Apply ice contained in a towel or plastic bag, or cold cloths, to the site of the sting or bite.
- Give home medicine, such as aspirin, for pain.
- If the victim has a history of allergic reactions to insect bites or is subject to attacks of hay fever or asthma, or if he or she is not promptly relieved of symptoms, call a physician or take the victim immediately to the nearest location where medical treatment is available. In a highly sensitive person, do no wait for symptoms to appear, since delay can be fatal.
- In case of a bee sting, remove and discard the stinging apparatus and venom sac.

4.10.7.2 Tickborne Diseases

Lyme Disease

Lyme disease is an illness caused by a bacterium which may be transmitted by the bite of a tick (Ixodes Dammini), commonly referred to as the "Deer Tick." The tick is about the size of a sesame seed, as distinguished from the Dog Tick, which is significantly larger. The Deer Tick is principally found along the Atlantic coast, living in grassy and wooded areas, and feeds on mammals such as mice, shrews, birds, raccoons, opossums, deer, and humans. Not all ticks are infected with the bacterium, however. When an infected tick bites, the bacterium is passed into the bloodstream of the host, where it multiplies. The various stages and symptoms of the disease are well recognized and, if detected early, can be treated with antibiotics.

Removal of ticks is best accomplished using small tweezers. Do not squeeze the tick's body. Grasp it where the mouth parts enter the skin and tug gently, but not firmly, until it releases its hold on the skin. Save the tick in a jar labeled with the date, body location of the bite, and the place where it may have been acquired. Wipe the bite thoroughly with an antiseptic and seek medical attention as soon as possible.

The illness typically occurs in the summer and is characterized by a slowly expanding red rash, which develops a few days to a few weeks after the bite of an infected tick. This may be accompanied by flu-like symptoms along with headache, stiff neck, fever, muscle aches, and/or general malaise. At this stage treatment by a physician is usually effective; but, if left alone, these early symptoms may disappear and more serious problems may follow. The most common late symptom of the untreated disease is arthritis.

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Other problems which may occur include meningitis and neurological and cardiac abnormalities. It is important to note that some people do not get the characteristic rash but progress directly to the later manifestations. Treatment of later symptoms is more difficult than early symptoms and is not always successful.

When in an area suspected of harboring ticks (grassy, bushy, or woodland area), the following precautions can minimize the chances of being bitten by a tick:

1. Wear long pants and long-sleeved shirts that fit tightly at the ankles and wrists.
2. Wear light colored clothing so ticks can be easily spotted.
3. Wearing tick repellents may be useful.
4. Inspect clothing frequently while in tick habitat.
5. Inspect your head and body thoroughly when you return from the field.
6. Remove any attached ticks by tugging with tweezers where the tick's mouth parts enter the skin. Do not squeeze or crush it.

Rocky Mountain Spotted Fever

In the eastern and southern United States this tickborne disease is transmitted by the infected Dog Tick (Dermacentor Variabilis). It is important to note that the Dog Tick is significantly larger than the Deer Tick. Nearly all cases of infection occur in the spring and summer, generally several days after exposure to infected ticks. The onset of illness is abrupt and often accompanied by high fever, headache, chills, and severe weakness. After the fourth day of fever, victims develop a spotted pink rash that usually starts on the hands and feet and gradually extends to most of the body. As with Lyme disease, early detection and treatment significantly reduces the severity of illness. The disease responds to antibiotic therapy with tetracycline or chloramphenicol.

Other Tickborne Diseases

Ticks transmit several other diseases, most of which are rare and occur only in specific areas. Babesiosis occurs mainly in the Cape Cod area and eastern Long Island. Colorado tick fever is similarly regional and occurs only among those who live or work at altitudes above 4,000 feet.

4.10.7.3 Poisonous Plants

Characteristic Reactions

The majorities of skin reactions following contact with offending plants are allergic in nature and are characterized by general symptoms of headache and fever, itching, redness, and a rash.

Some of the most common and most severe allergic reactions result from contact with plants of the Poison Ivy group including Poison Oak and Poison Sumac. The most distinctive features of Poison Ivy and Poison Oak are their leaves, which are composed of three (3) leaflets each. Both plants also have greenish-white flowers and berries that grow in clusters. Such plants produce a severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim can also develop a high fever and become very ill. Ordinarily, the rash begins within a few hours after exposure, but it may be delayed for 24 to 48 hours.

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First Aid Procedure

1. Remove contaminated clothing.
2. Wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol.
3. Apply calamine or other soothing skin lotion if the rash is mild.
4. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.

4.10.7.4 Bloodborne Pathogens

Appendix E provides the Bloodborne Pathogen Exposure Control Plan developed to eliminate or minimize employee exposure. Where occupational exposure remains after instituting these controls, PPE shall also be used.

5.0 EMERGENCY INFORMATION

5.1 Emergency Contacts

In the event of an emergency, the following numbers are to be called for the applicable assistance:

Contact	Person or Agency	Telephone	Cell
Police	Town of Fishkill Police Headquarters	911 or (845) 831-1110	NA
Fire	Town of Fishkill Fire Department	911 or (845) 896-6613	NA
Ambulance/EMS	Beacon Volunteer Ambulance	911 or (845) 831-4540	NA
Hospital	St. Luke's Hospital or St. Francis Hospital	(845) 561-4400 or (845) 431-8220	NA
Poison Control	Poison Control Center	(800) 222-1222	NA
Chemical Emergency Advice	CHEMTREC	(800) 424-9300	NA
Site Supervisor	To Be Assigned	To Be Provided	To Be Provided
Health and Safety Manager	To Be Assigned	To Be Provided	To Be Provided
Site Safety Officer (Field Supervisor)	To Be Assigned	To Be Provided	To Be Provided
Competent Person	To Be Assigned	To Be Provided	To Be Provided

5.1.1 Location of Site Resources

Water Supply: Potable water supply to be identified.
Telephone: Field Trailer/Cell phones with supervisory staff.

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5.1.2 Location of Hospital/Clinic

Location of Hospital/Clinic

Name: St. Luke's Hospital

Address: 70 Dubois Street, Newburgh, NY 12550

Route:

1. Start at Brockway Road
2. Turn Right on RT-9D - go 0.8 mi
3. Bear Right onto I-84 WEST toward NEWBURGH - go 2.5 mi
4. Take exit #10S/RT-32 onto N PLANK RD[RT-32] toward NEWBURGH - go 0.4 mi
5. Turn Right to follow RT-32 - go 0.1 mi
6. RT-32 becomes US-9W - go 0.1 mi
7. Turn Left on PLANK RD - go 0.2 mi
8. Continue on NORTH ST - go 0.1 mi
9. Turn Right on POWELL AVE - go 0.6 mi
10. POWELL AVE becomes DUBOIS ST - go 0.4 mi
11. Arrive at 70 DUBOIS ST, NEWBURGH, on the Left

See Appendix A for the route to Saint Lukes Hospital.

Name: St. Francis Hospital

Address: 1 Webster Avenue, Poughkeepsie, NY 12601

Route:

1. Start at BROCKWAY ROAD, WAPPINGERS FALLS going toward INDUSTRIAL WAY – Go 0.6 Mi
2. Turn Left on RT-9D - Go 5.0 Mi
3. Turn Right on MIDDLEBUSH RD - Go 0.8 Mi
4. Turn Left on US-9 NORTH - Go 9.5 Mi
5. Turn Right on MARIST DR[RT-9G] - Go 0.1 Mi
6. Bear Left on NORTH RD - Go 0.1 Mi
7. Turn Right on W CEDAR ST - Go 0.3 Mi
8. Turn Right on GARDEN ST EXT - Go 0.1 Mi
9. Turn Right on WEBSTER AVE - Go 0.0 Mi
10. Arrive at 1 WEBSTER AVE, POUGHKEEPSIE
11. 1 Webster Ave Poughkeepsie NY 12601

See Appendix A for the route to Saint Francis Hospital.

More detail regarding emergency information and response procedures is contained in Section 5.0.

5.1.3 Emergency Response Plan

This section describes contingencies and emergency planning procedures to be implemented at the Site. This Emergency Response Plan is compatible with local, State, and Federal disaster and emergency management plans, as appropriate. The list of appropriate emergency contacts is given in Section 5.0 above.

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5.1.3.1 Pre-Emergency Planning

An emergency evacuation route(s) will be chosen immediately upon arrival at the Site. During the periodic site briefings, all workers will be trained in provisions of the Emergency Response Plan, communication systems, and evacuation routes. The plan will be reviewed and revised, if necessary, on a regular basis by the Health and Safety Manager (Site Safety Officer) to ensure that the plan is adequate and consistent with prevailing Site conditions.

5.1.3.2 Personnel Roles and Lines of Authority

The Project Manager has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of Site personnel and the public, such as evacuation of personnel and adjacent residents. The Project Manager must also ensure that corrective measures have been implemented, appropriate authorities have been notified, and follow-up reports have been completed. The Health and Safety Manager may be called upon to act on behalf of the Project Manager and will direct responses to any medical emergency.

The individual contractor organizations are responsible for assisting the Project Manager's mission within the parameters of the scope of work set forth in the subcontract.

5.1.3.3 Emergency Recognition

Tables 1 and 2 provide listings of chemical and health hazards on-site. Personnel should be familiar with techniques of hazard recognition from pre-assignment training and site-specific briefings. The Health and Safety Manager must ensure that the proper prevention devices or equipment are available to personnel.

In an emergency, personnel should proceed to the closest exit and go to the safe distance area associated with the evacuation route. Personnel should remain at that area until the entry alarm is sounded or further instructions are provided by an authorized individual.

5.1.3.4 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in a contaminated work zone must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be attempted. First aid should be administered while awaiting an ambulance or paramedics. First aid kits will have gloves and artificial airways to protect against bloodborne pathogens, and personnel who have come into contact with bodily fluids such as blood or saliva will immediately confer with the STERLING Medical Monitoring Program Manager to determine whether inoculation or other action is necessary. All injuries and illnesses must be reported immediately to the Project Manager.

Personnel who accompany individuals transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the Site. This information is included in Table 1.

Any vehicle used to transport contaminated personnel will be decontaminated, as necessary.

5.1.3.5 Exposure to Bloodborne Pathogens

If exposure to blood, bodily fluids, or tissues occurs, the chance of contracting a bloodborne disease will be reduced by following the plan set forth in Appendix E.

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5.1.3.6 Fire or Explosion

In the event of a fire or explosion, the local fire department should be notified immediately. The Health and Safety Manager or a designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-site.

If it is safe to do so, site personnel may:

- Use fire fighting equipment available on-site to control or extinguish the fire.
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

5.1.3.7 Spills or Leaks

Containers shall be inspected and their integrity assured prior to being moved. Operations on-site will be organized so as to minimize the amount of container movement. Where spills, leaks or ruptures may occur, adequate quantities of spill containment equipment (absorbent pillows, etc.) will be stationed in the immediate area. The spill containment program must be sufficient to contain and isolate the entire volume of hazardous substances being transferred. Drums or containers that cannot be moved without failure shall be over-packed. Fire extinguishing equipment shall be on hand and ready to use if needed to control incipient fires.

In the event of a spill or a leak, site personnel will:

- Inform their supervisor immediately.
- Locate the source of the spillage and stop the flow if it can be done safely.
- Begin containment and recovery of the spilled materials.

5.1.4 Reporting of Accidents and Unsafe Conditions

If an accident occurs, the Health and Safety Manager is to complete an Accident/Exposure Form for submittal to the Site Supervisor within 24 hours of the event. The Project Manager, acting on recommendations from the Health and Safety Manager, must ensure that follow-up action is taken to correct the situation that caused the accident. Immediate actions must be taken within one (1) hour and may be interim measures. Permanent measures may follow interim measures.

6.0 FORMS

The following forms presented in Appendix B will be provided to the Health and Safety Manager for use at the job site:

- Authorized Site Personnel
- Accident/Exposure Form
- Daily Air Monitoring Data Sheet
- Daily Instrument Calibration Record Sheet
- Exclusion Zone Daily Log
- Exposure to Bloodborne Pathogens Incident Report
- Project Exposure History Form

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- Signature and Acknowledgement of Review of HASP
- Site Safety Briefing Form / On-Site Safety Meeting
- Subcontractor Statement of Compliance

In addition, the following documents will be provided to the Health and Safety Manager:

- Appendix C Hazard Communication Program
- Appendix D Confined Space Entry Permit
- Appendix E Bloodborne Pathogen Exposure Control Plan

ALL COMPLETED FORMS SHOULD BE RETURNED TO THE FIELD OFFICE FOR RETENTION IN PROJECT FILES.

21044/HASP_txt.doc

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FIGURES

Figure 1 Site Location Map



MAP REFERENCE: NYSDOT WAPPINGERS FALLS QUADRANGLE, 1989.

FIGURE 1

STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road ♦ Latham, New York 12110

SITE LOCATION MAP

CHELSEA WATERFRONT DEVELOPMENT LLC

CIRCLE M WOOD TREATMENT SITE

TOWN OF FISHKILL DUTCHESS CO., N.Y.

PROJ. No.:	21044	DATE:	9-12-06	SCALE:	1" = 2000'	DWG. NO.	21044005	FIGURE	1

TABLES 3 - 5

Table 3 Air Monitoring Methods, Action Levels & Protective Measures

Table 4 Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers

Table 5 Flow Chart for Drum and Container Handling Procedures

(**Note:** Tables 1 and 2 are presented in the HASP Report)

TABLE 3

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

AIR MONITORING METHODS, ACTION LEVELS, AND PROTECTIVE MEASURES

At this site the monitoring for dust is the only method that will be routinely conducted. The other monitoring methods will be conducted if confined space entry becomes required or other contaminants are discovered which means the monitoring method is required.

Hazard	Monitoring Method	Action Level	Monitoring Schedule	Protective Measures
Organic Vapors	PID	Up to 5 ppm above background in the breathing zone	Periodically (every 30 minutes) during invasive field activities.	Level D
		5-25 ppm above background in the breathing zone	Continuous (every 30 minutes) during invasive field activities.	Level C
		>25 ppm above background in the breathing zone	Periodically (every 30 minutes) during invasive field activities.	Level B or EVACUATE AREA
Oxygen-Deficient Atmosphere	Crowcon or Equivalent	20.9%	Continue operations.	
		<20.9%	Continuous monitoring.	
		<19.5%	Do not enter. Ventilate and determine if supplied air is required. Consider that any low O^2 readings are suspect or false.	STOP WORK EVACUATE AREA
		>23.5%	Fire explosion hazard; withdraw from area immediately.	Allow to vent or eliminate source.
Explosion (LEL)	Crowcon or Equivalent	<10% LEL	Continue working.	
		10-20% LEL	Continue monitoring with caution as high levels are encountered.	Issue Warning
		>20% LEL	Explosion hazard	EVACUATE AREA Return when <10% LEL
Dust	Particulate Monitor Miniram or Equivalent	Up to 2.8 mg/m^3 above background in the breathing zone.	Periodically (every 30 minutes) during invasive field activities.	Level D
		2.8-10 mg/m^3	Periodically (every 30 minutes) during invasive field activities.	Level C
		>10 mg/m^3	Periodically (every 30 minutes) during invasive field activities.	Level B or EVACUATE AREA
Hydrogen Sulfide (H_2S)	Crowcon or Equivalent	<10 ppm	Continuous in hazardous areas; continue working	Level D

TABLE 3 (continued)

Hazard	Monitoring Method	Action Level	Monitoring Schedule	Protective Measures
Hydrogen Sulfide (H_2S)		10-20 ppm	WARNING. Evaluate and implement engineering controls to lower concentration <10 ppm.	Level C (if cannot decrease concentrations)
		>20 ppm	EVACUATE; STOP WORK	Return to work <10 ppm
Carbon Monoxide (CO)	Crowcon or Equivalent	<35 ppm	Continuous in hazardous areas.	Level D
		>35 ppm	EVACUATE; STOP WORK	Evaluate and implement mitigative measures

TABLE 4

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATIZED WORKERS

Heat Index (Calculated in the manner of the National Weather Service)	**National Work Ensemble [1]**	**Tyvek Ensemble**	**Impermeable Ensemble**
90°F (32.2°C) or above	After each 45 minutes of work	After each 30 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 45 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 minutes of work	After each 75 minutes of work	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 minutes of work	After each 105 minutes of work	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 minutes of work	After each 135 minutes of work	After each 120 minutes of work

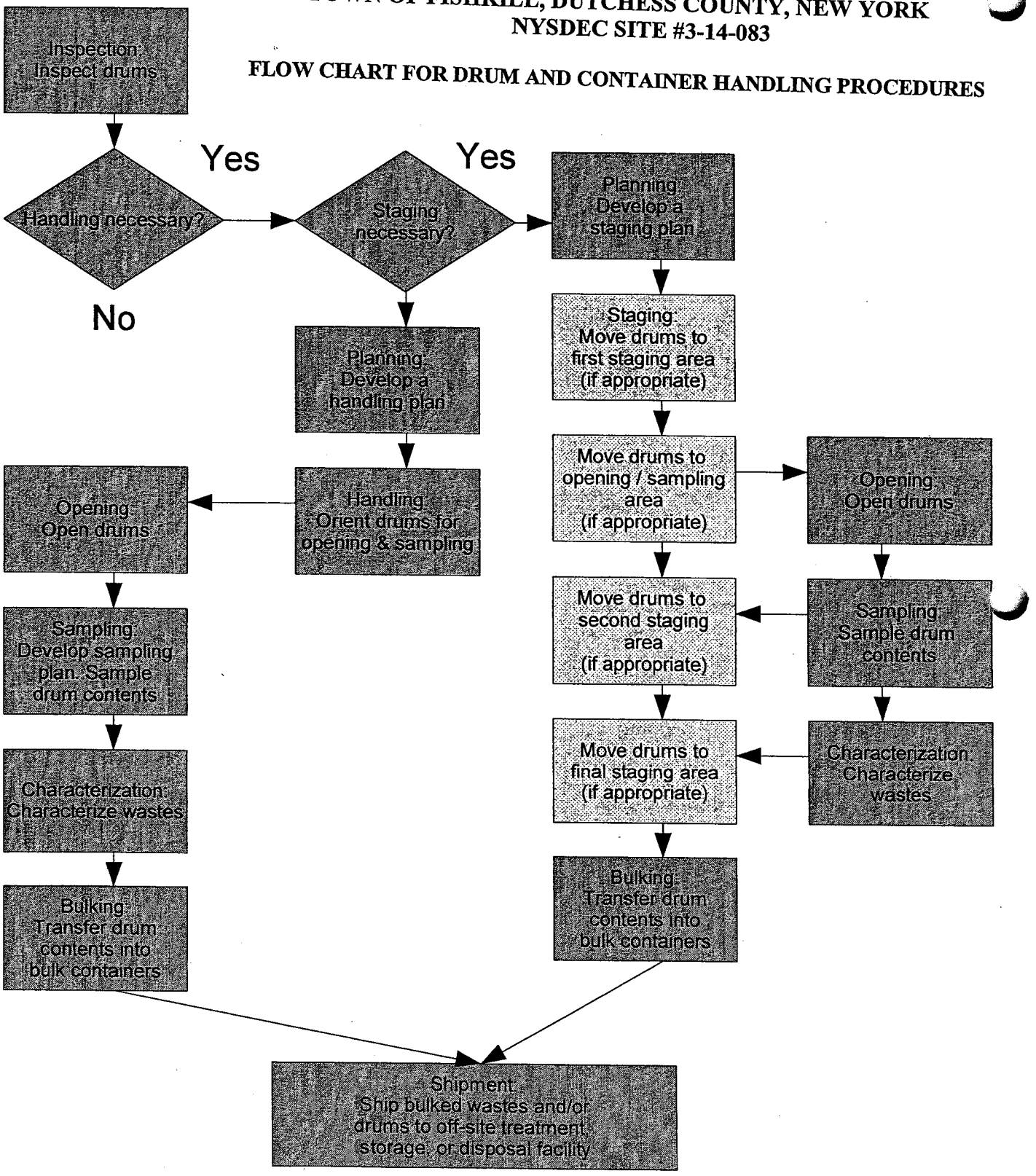
[1] A normal work ensemble consists of cotton overalls or other cotton clothing with long sleeves and pants.

For work levels of 250 kilocalories/hour.

TABLE 5

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

FLOW CHART FOR DRUM AND CONTAINER HANDLING PROCEDURES



Notes: Flow chart for drum handling.
Lighter gray boxes indicate optional steps.
Number of staging areas necessary is site specific.

APPENDIX A

DIRECTIONS TO HOSPITALS

YAHOO! DRIVING DIRECTIONS

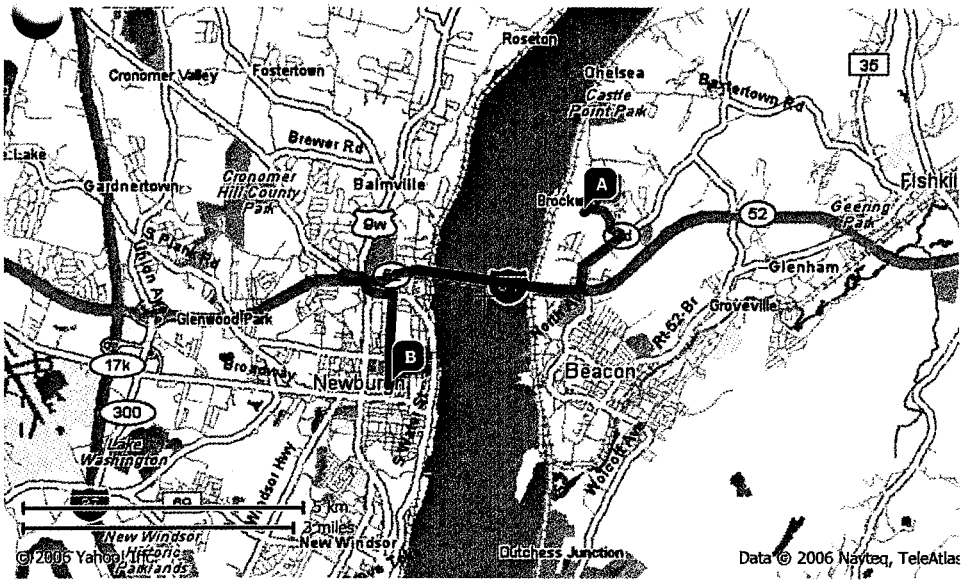
A 190 BROCKWAY RD, Wappingers Falls, NY, 12590

1.	Start at **190 BROCKWAY RD, WAPPINGERS FALLS** going toward **INDUSTRIAL WAY** - **go 0.6** mi
2.	Turn R on **RT-9D** - **go 0.8** mi
3.	Bear R onto **I-84 WEST** toward **NEWBURGH** - **go 2.5** mi
4.	Take exit **#10S/RT-32** onto **N PLANK RD[RT-32]** toward **NEWBURGH** - **go 0.4** mi
5.	Turn R to follow **RT-32** - **go 0.1** mi
6.	Continue on **US-9W** - **go 0.1** mi
7.	Turn L on **PLANK RD** - **go 0.2** mi
8.	Continue on **NORTH ST** - **go 0.1** mi
9.	Turn R on **POWELL AVE** - **go 0.6** mi
10.	Continue on **DUBOIS ST** - **go 0.4** mi
11.	Arrive at **70 DUBOIS ST, NEWBURGH,** on the L

Distance: 5.8 miles, Travel Time: 12 mins

B St Luke's Hospital (845) 561-4400
70 DUBOIS ST, Newburgh, NY

Total Distance: 5.8 miles, Total Travel Time: 12 mins



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

YAHOO! DRIVING DIRECTIONS

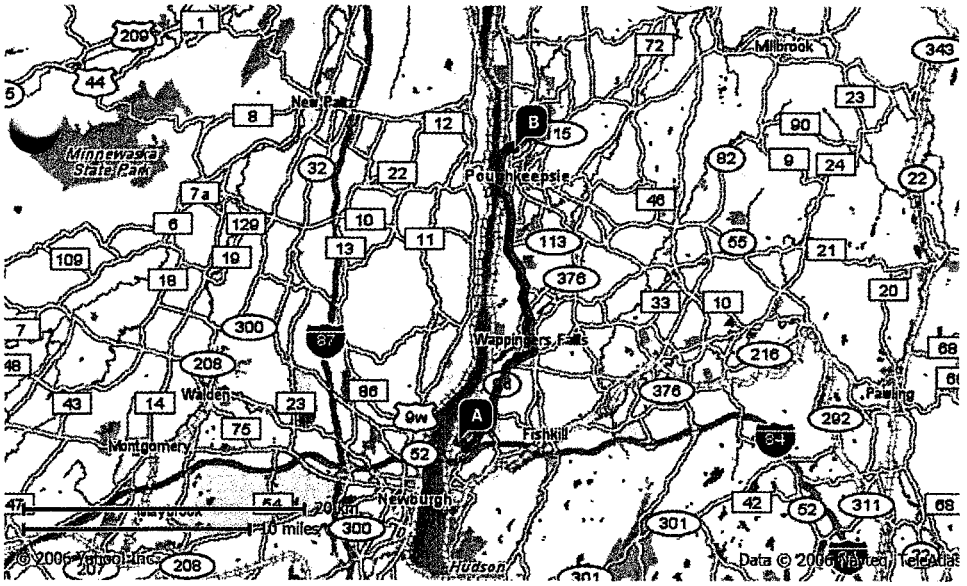
A 190 BROCKWAY RD, Wappingers Falls, NY, 12590

1. Start at **190 BROCKWAY RD, WAPPINGERS FALLS** going toward **INDUSTRIAL WAY** - **go 0.6** mi
2. Turn L on **RT-9D** - **go 5.0** mi
3. Turn R on **MIDDLEBUSH RD** - **go 0.8** mi
4. Turn L on **US-9 NORTH** - **go 9.5** mi
5. Turn R on **MARIST DR[RT-9G]** - **go 0.1** mi
6. Bear L on **NORTH RD** - **go 0.1** mi
7. Turn R on **W CEDAR ST** - **go 0.3** mi
8. Turn R on **GARDEN ST EXT** - **go 0.1** mi
9. Turn R on **WEBSTER AVE** - **go 0.0** mi
10. Arrive at **1 WEBSTER AVE, POUGHKEEPSIE** St. Francis Hospital

Distance: 16.5 miles, Travel Time: 30 mins

B 1 Webster Ave Poughkeepsie NY 12601

Total Distance: 16.5 miles, Total Travel Time: 30 mins



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

APPENDIX B

FIELD FORMS

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

AUTHORIZED SITE PERSONNEL

Name	*Medical Exam Date*	*Initial (40 hr.) Training Date*	*Site Supervisor Training Date*	*Refresher Training Date*	*Respiratory Fit Test And Training Date*

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

ACCIDENT/EXPOSURE FORM

Employee Name_____
Date of Birth_____
Home Address_____
Tel. No._____
Sex: Male_____Female_____Job Ttile_____
Social Security No._____
Where did accident or exposure occur_____
_____
_____
What was employee doing when injured (be specific)_____
_____
_____
_____
How did accident or exposure occur?_____
_____
_____
_____
What steps should be taken to prevent such an occurrence_____
_____
_____
_____
_____
Object or substance that directly injured employee_____
_____
_____
Describe injury_____
_____
Name and address of physcian_____
_____
Name and address hsopital_____
_____
Date of injury_____Time of injury_____

Completed by (print)_____

Signaure/Title_____
Date_____

This form must be completed by the HSO or Project Manager immediately upon learning of the incident. This form must be kept on file at the office trailer, and a copy must be transmitted to the main office.

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

DAILY AIR MONITORING DATA SHEET

Estimated Wind Direction/Speed/Weather Conditions _____

_____

Date _____

Field Activities _____

_____

_____

Sample Location	Start Time	Stop Time	Dust	Comments

Additional Notes: _____

_____

_____

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

DAILY INSTRUMENT CALIBRATION RECORD SHEET

Note: One sheet per instrument per day.

Instrument:_____

Serial Number:_____

DATE	Calibration Gas Type (if applicable)/Concentration	Response	Calibrated (Y/N)

COMMENTS:

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

EXCLUSION ZONE DAILY LOG

Date _____

Name of Person Entering Exclusion Zone	Signature	Time In	Time Out

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

EXPOSURE TO BLOODBORNE PATHOGENS INCIDENT REPORT

Employee Name_____

Date_____ Time_____

Circumstances: Supervisor's assessment of the following control measures used at the time of exposure:

Route of Exposure_____

_____

_____

Engineering_____

_____

_____

Work Practice_____

_____

_____

Personal Protective Equipment_____

_____

_____

Reason for Failure of the Control Measures or Failure to Comply with Recommended Protective Measures_____

_____

_____

_____

Measures Taken to Minimize Reoccurrence of Incident_____

_____

_____

Supervisor's Signature_____

Date_____

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

PROJECT EXPOSURE HISTORY FORM

Form to be completed by HSO, HSS or Project Manager

Date from/to:_____

Former Circle M Wood Personnel on-site

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

SUSPECTED CONTAMINANTS (list) **VERIFIED CONTAMINANTS/MEDIA**

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

SIGNATURE AND ACKNOWLEDGEMENT OF REVIEW OF HASP

NAME	SIGNATURE	COMPANY	DATE

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

SITE SAFETY BRIEFING FORM

ON-SITE SAFETY MEETING

Date/Time: _____

Type of Work: _____

Safety Topic(s) Presented:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name - Print	**Signature**

Meeting Conducted by: _____

Name - Print **Signature**

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL, DUTCHESS COUNTY, NEW YORK
NYSDEC SITE #3-14-083

CONTRACTOR AND SUBCONTRACTOR STATEMENT OF COMPLIANCE

The purpose of this form is to confirm that the employees listed below are qualified by virtue of training and experience to engage in field activities at the Former Circle M Wood Treating Site, Town of Fishkill, Dutchess County, New York NYSDEC Site #3-14-083 to investigate or remediate the subject property. Further, all contractor and subcontractor employees have been determined to be properly trained and medically fit to perform these investigative or remedial activities and to use the respiratory protective equipment necessary to perform the job safely and in accordance with 29 CFR 1910 and 1926 and any other Federal, State or local requirement.

Name	*Medical Exam*	*Initial (40 hr.) Training*	*Site Supervisor Training*	*Refresher Training*	*Respiratory Fit Test And Training*	*Reviewed HASP*

APPENDIX C

HAZARD COMMUNICATION PROGRAM

HAZARD COMMUNICATION PROGRAM

INTRODUCTION

The bottom line for progress in health and safety problems is awareness. That means employers and employees must be aware of potential hazards before they can work safely.

A new standard, the Hazard Communication Standard, has been introduced into the workplace as a means to further communicate information about potential hazards. Specifically, this standard promotes awareness about chemical hazards, so if you work with or around hazardous substances this important standard affects you.

The following guidelines are intended as a training tool to explain the Hazard Communication Standard. What it is and how it is implemented in the workplace. These guidelines can be used as an introduction to the standard and also as an ongoing reference to be used as necessary.

Included areas:

- A self-quiz to test your knowledge of the Hazard Communication Standard.
- A section by section breakdown of Material Safety Data Sheet (MSDS).
- An example of a substance warning label.
- A glossary of common technical terms.
- An explanation of the responsibilities of the chemical manufacturer, the employer, and the employee.

SELF-QUIZ

Test your knowledge of the Hazard Communication Standard and the NYS Right to Know Law by taking the following quiz. And when you've finished reading this booklet, re-test yourself. If you still have any questions, ask your supervisor.

	YES	NO	
1.	_____	_____	Do you know the basic purpose of OSHA's Hazard Communication Standard, The Right to Know?
2.	_____	_____	Do you know what your organizations' responsibilities are concerning the disclosure of hazardous material information?
3.	_____	_____	Do you know who is responsible for determining potential substance hazards?
4.	_____	_____	Do you know what information must be contained on the substance-warning label?
5.	_____	_____	Do you know what MSDS is and what information it contains.
6.	_____	_____	Do you know the difference between a physical hazard and a health hazard?

I. INVENTORY

This section applies to any Hazardous Substance which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

- Material Safety Data Sheets (MSDS) shall be maintained on the site for any materials used or stored by the contractor during the duration of the contract. A MSDS Binder shall be available for storing this documentation and to be used as a quick reference for employees.

What is a Hazardous Chemical

Virtually all-chemical hazards fall into one or more of the four categories. There are no strict boundaries between these four categories and most chemicals will fit into more than just one category. For example, flammable paint thinners can also be toxic.

Flammable:	Includes materials that will burn. Usually, they are liquids that give off vapors that can ignite, but could also be gases, dusts and solid materials.
Corrosive:	These materials can damage or burn our eyes or skin on contact and damage your lungs if inhaled. These are the acids, caustics, and some cleaners you may use.
Toxic:	These include materials, which are poisonous to the body. They can be any forms solid, liquid or gas.
Reactive:	Includes materials that can react sometimes violently, when mixed with certain other materials. The reaction can release toxic vapors and gases. They can also produce heat or oxygen, which can create a serious fire problem or explosion.

II. WARNING LABELS

The project Supervisor will ensure that each container of hazardous chemicals in the workplace has a MSDS and will be labeled with the following information:

- Identity of the hazard.
- Appropriate hazard warning or physical hazard.
- Health hazard.
- Manufacturers name and address
- C.A.S. No. (Chemical Abstract Service)

NOTE: OSHA - 29CFR-1910.1200

Labeling (F) (7)

The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers and are intended for immediate use only.

LABEL EXAMPLES: (SEE PAGE 4a)

III. MATERIAL SAFETY DATE SHEET (MSDS)

The project field supervisor shall maintain or develop a MSDS for all hazardous chemicals used in the workplace. The MSDS is a form that provides more detailed information about a chemical than the label. It is accessible upon request to employees through the employer.

The standard does not require that the MSDS be uniform in format, however, the following information must be included:

- Identity of the chemical.
- Physical and chemical characteristics of the hazardous chemical.
- Known acute and chronic health effects and related health information.
- Exposure limits.
- Whether the chemical is considered to be a carcinogen.
- Precautionary measures.
- Emergency and first aid procedures.
- Identification of the organization responsible for preparing the MSDS.

An example of an MSDS is included in this document in Appendix 4.

Explanation:

Product Name & Identification

Chemical Manufacturer's Name - this may list one or more alternate manufacturers or importers, the address and emergency telephone number.

Name of Product - generally the trade name, which is an adopted name that is given by a manufacturer to distinguish it as produced by him and that it may be protected as a trademark.

Chemical Name - lists the name of the chemical. (In some cases this may be listed as a "Trade Secret" but the remainder of the MSDS should be filled out).
Take a special note that it may come across a SOS at a label that does not list the chemical name. Sometimes that's all.

A manufacturer, importer, or employer may withhold the chemical identity if it is a trade secret. However, it must be stated clearly that the chemical is a trade secret and the hazardous nature of the chemical MUST still be listed, both on the label and the MSDS.

IV. HEALTH HAZARDS & EMERGENCY FIRST AID

a. Health Hazard

This section is a quick summary of the possible health hazards associated with exposure to the chemicals.

b. Emergency First Aid

This section explains which type first aid is to be applied in case of inhalation-absorption-ingestion.

V. FIRE, EXPLOSION & REACTIVITY

a. Extinguishing Agent

This explains what type extinguisher is to be used in case of fire. ABC-WATER-FOAM-etc.

b. Flash Point

Minimum temperature at which a liquid gives off sufficient vapor to form, with air, an ignitable mixture.

c. Reactivity

Reactive are materials which can change violently when combined with certain other materials or conditions. There are very few reactives in use by the construction trades. But knowing the hazard can help you when you do come in contact with water.

Oxides add oxygen to any situation where burning is occurring, and make the fire more intense and more difficult to put out. Some reactives explode or give off gas and heat in air or on contact with water.

Many materials can act like reactives when mixed with incompatible materials. Acids and bases react strongly with each other, giving of heat, often enough to cause boiling and splattering of the mixture. The Material Safety Data Sheet should tell you what materials may be incompatible with the chemical you are working with and what other materials to avoid.

Examples:

The most common reactive mixture in construction is found in gas welding or brazing. Acetylene gas mixtures with oxygen gas to provide an extremely powerful reaction in the form of a very intense flame.

Oxides, though, are the most commonly found reactive class. Most oxides are also corrosive, so keeping them away from the skin and eyes is necessary.

VI. PROTECTION EQUIPMENT

1. Personal Protection Equipment (PPE)

The respiratory protection plan contained in the Accident Prevention Plan (APP) describes the levels of protection and requirements for PPE use when working with chemicals.

Example:

- Air-Purifying Respirator

- Supplied-air with positive pressure
- Positive pressure-demand with a self contained breathing apparatus
- Rubber gloves and boots

- Chemical resistant suit

Degree of exposure is always a consideration in the determination of exactly which of the personal protective equipment items shown is necessary for each particular operation. Consult AGC Safety Director for further guidance and information.

This section also lists requirements for ventilation and names the specific types of ventilation needed.

VII. HANDLING AND STORAGE

This section describes proper handling and storage procedure for chemicals.

Example:

Safe Handling and Use of Flammables

The important points for using flammables safely and reducing the amount of flammable vapor in the air and limiting sources of ignition are:

- Don't Smoke - Eliminate all sources of flames or ignition.
- Keep work containers of flammable materials as small as possible.
- Reduce surface area of all containers.
- Use adequate ventilation.
- Clean up spill promptly.
- Store flammable soaked rags in covered protective containers.
- Bond and ground all containers when dispensing.
- Use explosion proof wiring and equipment.

Safe handling of flammables may require personal protective equipment. Repeated contact with flammables on skin can remove the fatty protective layer and lead to irritation and infection. Some flammables are also toxic and may require the use of a respirator. Also, avoid splashes onto the skin and into the eyes.

Safe Storage of Flammables

Flammables, especially solvents, should be stored in the right container, unbreakable and specially designed for flammable liquids. It should have flame arresters and have a spring-loaded cover. If storage is inside, small amount can be kept in special lammable cabinets. Larger amounts should be stored in specially designed storage room, which have devices and controls to minimize the risk of fire or explosion.

Care should be taken to provide storage of flammables away from oxidizers and corrosives. Oxidizers may ignite an otherwise non-flammable mixture. Corrosives may destroy the contained and allow the release of flammable vapors into the atmosphere. Concentrated vapors of flammables may sink to the floor and travel some distance to a source of ignition with the flashback traveling back to the source containers.

EMERGENCIES:

Spills & Leaks

Small leaks should be cleaned up quickly. If it is possible to limit the leak by closing a valve, shutting down the equipment, or moving the container, it should be done. Turn off

electrical equipment, which may provide a source of ignition.

If the leak is large, or your skin, eyes or clothes are contaminated, leave the area immediately. Wash eyes, skin and clothes with lots of water to remove the material. Get to fresh air. Notify your foreman or contractor as soon as it is safe to do so. Unless you have special training and the proper protective equipment, do not try to clean up a large leak.

Storage & Handling

Reactives should be stored away from other types of materials. Many, such as lithium, require conditions for storage, which necessitates separate rooms or facilities for storage.

Read the MSDS carefully when you see the words oxidizer or reactive. Note what chemicals are incompatible with the materials that you are using and avoid situations where they might become mixed.

Be sure to use any protective clothing or respiratory protection required by the MSDS or the process documentation. Many reactives are toxic, corrosive, or both. Protect yourself against the health hazards as well as the physical hazards of reactives.

In the event of a spill, shut down any electrical equipment. If possible, stop the spill or leak from continuing, but if there is any doubt, leave the area and notify your foreman or contractor.

Do not try to neutralize the material or clean up the spill unless you have appropriate protective equipment and have been properly trained in how to do so safely.

VIII. EXPOSURE LIMITS

TOXIC

Any material can be hazardous under the wrong conditions. The degree of the hazard depends on the dose. Even a substance as necessary to life as salt can cause problems when too much is present: drinking saltwater is eventually fatal. Small amounts of most materials may cause mild symptoms, which disappear once the person is removed from the exposure. Larger doses can cause more severe illness, and extremely large doses can cause irreversible illness and even death.

Each person responds differently to hazardous material. In the United State, OSHA Permissible Exposure Limits are intended to protect the average person from the harmful effects of chemical exposures over a working lifetime. OSHA's definition of Toxic or Highly Toxic materials applies to only a very few potent poisons seldom used by construction trades. We will use the more common definition of toxic: any material, which can cause illness or injury.

Acute and Chronic Effects

Toxic materials can poison the body and cause harmful effects. There is a difference between the acute effect and chronic effect of exposure to toxic chemical hazards. Acute effects are usually due to a sudden overexposure to large quantities or concentrations of a material. The acute effects, for example, a firefighter overcome by smoke will usually disappear after the exposure time. However, supportive medical treatment is needed, but the body usually returns to normal.

Chronic toxic effects aren't easy to recognize. They are often the result of low levels of

exposure over a long period of time. Typically, they effect one or more of the body's organ systems. If the problem is identified, the effect can often be reduced. If the exposure to a toxic material is stopped, healing of the organ or organ system can return the body to normal. Because of the slow and subtle nature of some diseases caused by exposure, irreversible damage can be caused by long-term exposure to a chemical hazard. Asbestosis is a disease common to older insulation workers and is an example of debilitating chronic disease resulting from a long-term exposure to asbestos fibers in the air.

Routes of Entry

Three most common ways that chemicals can enter your body.

Inhalation - Whenever you are doing a job that uses a toxic material, you need to be careful not to breathe too much of that material. This is the most common way that chemicals get into the bloodstream. As we breathe the air, it enters our lungs. It is then easily transferred into our blood and taken throughout the body. To prevent this from happening, good ventilation is very important. Open doors and windows, or set up a fan that directs the air away from you. Respirators may also be necessary to protect you. Be sure you choose the correct one and know how to use it. Air filtration respirators take the toxic material out of the air you breathe, while air supplied respirators provide you with clean air from a tank or other source. If you think you need a respirator, check with your foreman or contractor and read the label or MSDS.

Ingestion - Some chemicals can hurt you if you accidentally eat or swallow them. Good personal habits often stop this route of entry. Washing hands before you eat and keeping your clothes clean are good practices. Check the MSDS or label for emergency and first aid procedures, and see a doctor if necessary.

Skin Absorption - This is a hazard with some materials. They have the ability to pass through unprotected skin into the bloodstream. Wearing proper gloves and other skin or face protection will reduce the chance for this route of entry to cause you harm. The label and MSDS both will tell you if gloves or other equipment is recommended. Remember that not all gloves are alike, nor will they protect you from all materials. Use the right ones.

Examples of Toxic Materials

Solvents - Solvents are among the most common toxic materials in the workplace. Many processes, mixing and cleaning, use or give off solvent vapors. They are also used as thinners in paint and adhesives. Solvents vary in their toxicity from practically non-toxic materials such as freons and acetone, through moderately toxic materials such as the alcohols, ketones, halogenated solvents, to the very toxic such as dimethyl acetamide, methyl acrylate and other materials. Some solvents are also flammable or reactive.

The government and health professionals evaluate the hazards of materials, and decide upon exposure limits. These levels are called Threshold Limit Values (TLV). TLV's are usually stated in parts per million or milligrams per cubic meter, and represent a mixture

of the material which the air we breathe over a period of time. The TLV is expressed as a time weighted average (TWA) and indicates the of exposure that you should have over a period of time (eight hour workday, 40 hour workweek). The TLV should not be exceeded. The TLV can be found for each material on the MSDS.

The following table provides a "Rough Guide" to the toxicity of solvents or other toxic materials you may work with. Check the glues, solvents or other cleaners you use against this table. So you don't get confused, the more hazardous chemicals have the lowest TLV's, while the safer ones usually have high values listed.

Mildly Toxic	500-1000 ppm
Moderately Toxic	50-500 ppm
Toxic	1-50 ppm
Highly Toxic	Less than 1 ppm

Solvents can all cause irritations to eyes and skin in high concentrations. Most will dissolve the protective layer of oils on the skin and leave it looking white in the small cracks. They should never be used to clean the skin; if there is a problem with contamination, some form of glove or barrier cream should be used to protect the skin. The early signs of overexposure often include headaches, dizziness, and nausea, but there are many other causes of these symptoms.

Metals and other particulate solids - can be toxic and are usually given off when welding or grinding. Some, like gypsum dust are only nuisance dusts. Others, like zinc fume, can cause flue-like symptoms. Others, like asbestos have been linked to cancer of other chronic diseases. Dusts can irritate the skin and be ingested along with food, drinks, or smoking materials if they aren't washed off the hands and removed from clothing. They may even be carried home to the family and cause problems there.

Lubricants, coolants and machine oils - are not that common in constructions, but are used when cutting, turning or milling metals. There are three types: petroleum based (straight oils), water based, and synthetic fluids, which contain no oils. Many cutting oils contain additives to inhibit corrosion, prevent bacterial growth and permit high temperature operation. The fumes are mist from cutting operations can be irritating to the eyes and lungs. Skin exposure can result in acne-like conditions and can cause other problems. Avoid breathing mist and fumes and use gloves and aprons to minimize contact with the materials.

Gases - present a range of problems. Some like nitrogen, are simple asphyxiates - they prevent the body from getting enough oxygen by displacing it from the airstream. Some are chemically hazardous, like carbon monoxide, or nitrous oxide, which cause poisoning of the body systems. Some are very toxic, like many of the gases used in the semiconductor industry. These gases, which include silane, chlorosilane, arsine, phosphine, and others, are very toxic - a few concentrated breaths can be fatal. Some are also very reactive, silane burns when exposed to air, and these hazards must be dealt with using carefully designed engineering controls. Other gases, like hydrogen, and natural gas are explosive and must be treated with great care. All compressed gas cylinders should be secured by chains or stands at all times, and only the proper fittings should be used.

Plastics, epoxies and polymers are a growing group of industrial chemicals. Materials such as polystyrene, polypropylene, acrylates, polyacrylates, vinyls, polyurethanes are used for making a wide variety of products. Although most of these materials are not toxic in their final form, where they are being molded, extruded, vacuum formed, or laid up, there can be significant hazards. Isocyanates, used in polyurethane production are strong lung sensitizers. Where the material is cut or molded at high temperatures, the monomer materials, which can be quite toxic, can be released. The products of partial

thermal decomposition, or burning, can be very hazardous.

Sensitizers are a special class of materials that present a unique hazard. These are materials, such as epoxy systems and isocyantates that react with the body's immune system. On the first exposure, which may be rather high, some mild irritation may be experienced. But, in future small exposures, sever immune reactions, hives, asthma-like symptoms and others, can be disabling and even fatal.

Carcinogens, mutagens, and taratogens: A mutagen is a material, which causes a change in the genetic makeup of a cell. Mutagens that cause cancer are called

carcinogens. Those, which change the reproductive calls and can cause changes in the offspring, are called taratogens. Although the body may be able to deactivate or remove some of their materials, a control strategy, which minimized worker exposure, is essential when working with these materials.

Reproductive hazards: Some materials can cause problems in reproduction, either by interfering in the capability for reproduction, such as DBCP, or through being toxic to fetuses in the womb. Dimethyl acetamide is a material which is more toxic to developing fetuses than to the mother. Fortunately, few materials in construction fit this hazard category.

Safe Handling

In general, minimizing contact with toxic materials will minimize the toxic effect. For hundreds of years, scientists noted that "The dose makes the poison." Use controls, such as ventilation, to draw contaminants away from the workplace air. Use respiratory protection to minimize the inhaled dose. Use goggles, gloves, aprons and other protective gear to keep the material off the skin, out of the eyes and away from the body. Although the body can get rid of a certain amount of most toxic chemicals, and the standards are there to maintain the level below that point, you can minimize your exposure by proper understanding of the routes of entry and methods of control.

IX. TRAINING & LEARNING

a. TRAINING

Our employee training shall include, but not be limited to the following:

Inventory

Employees shall be instructed of what hazardous chemicals are used and stored in their workplace.

Employees shall be instructed on how to understand labeling.

Physical & Health Hazards

Employees shall be instructed of the health hazards of each hazardous chemical in their workplace.

Employees shall be instructed on how to protect themselves to a hazardous chemical.

Protection Equipment

Employees shall be instructed on the type and use of personal protective equipment required when using a particular hazardous chemical.

Material Safety Data Sheets (MSDS)

Employees shall be instructed on the location and use of the (MSDS's)

Handling and Storage

Employees shall be instructed on the proper handling and storage of each hazardous chemical used or stored at their workplace.

b. Learning

Knowing that we have an inventory of hazardous materials, MSDS's on file warning labels, on the containers can improve our safety. But learning to recognize the hazards on the job and how to protect ourselves is really what this training section is all about.

We share the responsibility for safety and health with our employees, and we also share the training responsibility.

But, we can have all the training in the world and if we don't learn anything or practice what we've learned, the entire system can be a failure. Take this program as an example. IT contains most of the important points you need to know. But if you don't take the time to learn it, how will you know when you face a material that is hazardous, or what to do to protect yourself when you use it?

Learning, not training, is really what this part of the system is all about. Be concerned and ask questions.

APPENDIX D

CONFINED SPACE ENTRY PERMIT

CONFINED SPACE ENTRY PERMIT

TO BE COMPLETED BY SITE SAFETY OFFICER

LOCATION

DATE OF ENTRY AND PURPOSE

	YES	NO	N/A
ENTRANT AND ATTENDANT TRAINING			
CONTENTS REMOVED/PURGED			
ELECTRICAL/MECHANICAL LOCK-OUT			
PRELIMINARY VENTILATION REQUIRED			
CONTINUOUS VENTILATION REQUIRED			
RESCUE EQUIPMENT AVAILABLE			
LINE BREAK COMPLETE (LOCK-OUT/TAG-OUT)			
HOT WORK PERMIT REQUIRED			
PRE-ENTRY MEETING HELD, INCLUDING BUT NOT LIMITED TO: AREA SUPERVISOR, PROJECT MANAGER CONSTRUCTION SUPERVISOR			

REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

HARD HATS		SAFETY GLASSES		GOGGLES		FACE SHIELD	
RESPIRATOR		LATEX GLOVES		OVER GLOVES		EAR PLUGS	
CHEMICAL PROTECTIVE SUIT (TYVEX)							
OTHER (SPECIFY)							

SAFETY EQUIPMENT REQUIRED

HARNESS		TRIPOD		LIFE LINE		RADIO		PERSONAL MONITORING	
LADDER		PORTABLE LIGHT		NON SPARKING TOOLS					
OTHERS(SPECIFY)									

AIR QUALITY MONITORING

	ACCEPTABLE CONDITIONS	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)	RESULTS (am/pm)
OXYGEN										
FLAMMABILITY										
H2S										
CO2										
OTHERS (SPECIFY										

ENTRANT

Print Name _____ Signature _____ Date _____

ATTENDANT

Print Name _____ Signature _____ Date _____

SITE SAFETY OFFICER

Print Name _____ Signature _____ Date _____

(if more than one of each, print name below and initial:)

		INITIAL
1		
2		
3		
4		
5		

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

Hazard Categories of Confined Spaces

CLASS A:

A space containing an atmosphere that may be Immediately Dangerous to Life or Health (IDLH). Examples of IDLH conditions are:

- Oxygen deficiency ($O_2 < 19.5\%$).
- Oxygen enriched atmosphere ($O_2 > 23.5\%$).
- LEL or LFL > 10%.
- A toxic atmosphere is present.
- A combustible dust atmosphere is present that equals or exceeds its LFL or that obscures vision at a distance of five (5) feet or less.

Entry can be made into a Class A confined space only with special precautions or equipment to reduce these hazards. These determinations will only be made by the Health and Safety Manager or his designee. At no time will an employee enter a space that is oxygen enriched or that has a LEL or LFL atmosphere over 10%.

CLASS B:

A confined space that has an atmosphere where:

- Oxygen is between 19.5% and 23.5%.
- The LEL or LFL is less than 10%.
- A toxic atmosphere is not present.
- A combustible dust atmosphere does not exist.
- Any other recognized serious safety or health hazards are not present.

Entry into a Class B category may be made without any special modifications to the entry work procedure. In general, the basic provisions of confined space entry preparation, equipment, and crew requirements will be adequate for most Class B entries. All confined space entry work will be conducted in accordance with the confined space entry permit, following the entry parameters of the standards, unless specifically changed by the Health and Safety Manager, or designee. Any such modifications to the entry procedure shall not conflict with confined space entry regulations.

Because of the variety of hazardous conditions may be encountered in confined space entry work, it is important that the potential hazards of the space be thoroughly evaluated so that adequate measures can be taken to allow safe completion of the project.

Confined Space Entry Preparation

Confined space entry work often presents a combination of hazards to the entrants and also to those who are supporting the job from outside the space. Effort spent at the beginning of a confined space entry for proper preparation is essential for the following reasons: (1) the entry may be able to be made with less stringent procedural and equipment requirements; (2) the entry may require less staffing; and (3) preparation is important in terms of safety, time, money, and energy.

The following steps are in the usual order that these jobs should be accomplished:

1. Drain, flush, or purge all original contents from the space.

2. Blind flange, double block, and bleed, de-energize, and lock-out all sources of material, energy, or motion into the space. In rare cases, a tag-out may be acceptable instead of a positive mechanical method.

3. Ventilate the space to rid it of flammable and/or toxic materials and provide air circulation. The space should have approximately 5 to 6 complete air changes per hour. Be sure that the positioning of the ventilation equipment does not block access to the entrance of the confined space or create a trip or electrocution hazard. Two ventilators (one to supply air and one to exhaust air) may be required depending on size, configuration, and atmospheric hazards of the space. Conversely, in some instances, mechanical ventilation may not be requires for a particular confined space.

4. Control any sources of ignition such as sparks, open flame, welding/cutting equipment, and space heaters.

5. Survey the confined space entry site to ascertain that no hazards exist that could create problems - for example, machinery that could crimp or sever an airline hose.

6. Assemble and set up all other auxiliary equipment including wench/hoist mechanism or airline system.

7. Perform atmospheric checks of the space from outside. Be sure to take readings from several areas inside the space; check corners, low-lying areas within the confined space, or portions of the space that may not be ventilated as uniformly as the rest of the space. Oxygen must be the first atmospheric parameter measures, followed by flammable vapor and any appropriate toxic contaminants.

8. Enter the results on the permit. Determine the hazard class of the confined space.

9. If conditions are suitable for entry, and all required equipment for entry is available and in working order, assemble all team members and proceed with site safety briefing.

10. If a prohibited condition develops during entry, or if entrants initiate self-rescue, work must stop and the permit is void.

Confined Space Entry Procedures

Workers should not enter a confined space unless the following precautions are followed:

- Under no circumstance should a worker enter a confined space without at least one individual standing by. This individual should be capable of monitoring what occurs in the confined area and be equipped to remove or initiate rescue of the worker in an emergency. The use of lifelines and safe communicating devices is recommended.

- All lines that contain harmful agents, such as supply, discharge, overflow, vent drain, or similar connections entering the space, must be physically separated or blocked by means of blinds or other devices that are capable of ensuring complete closure, except fire suppressants and extinguishing systems.

- All fixed mechanical devices or equipment should be disconnected, because their operation might endanger the employee or cause additional hazards. Electrical service equipment, excluding lighting, should be padlocked or tagged (29 CFR 1910.145(f)).

- When adequate natural air movement or continuous forces ventilation is not provided, the atmosphere should be tested for oxygen deficiency (less than 19.5 percent oxygen). The internal atmosphere must be tested for combustible gas and for air contaminants in excess of published standards when there is reason to suspect their presence.

- Ventilation:

  - When air monitoring indicates an unsafe atmosphere, the space should be ventilated until the concentration of the hazardous substances(s) is reduced to a safe level or eliminated, at which time the employee is permitted to enter the confined space. Ventilation must be continued as long as recurrence of the hazard is probable.

  - As an alternative to ventilation, or if ventilation does not adequately reduce or remove the hazardous substance, a confined space should be entered only if an appropriate respirator is worn. If a self-contained respirator is used, sufficient primary air capacity should be available as well as reserve capacity to perform the task inside the confined space. The wearer of the respirator may not be permitted to remain in the confined space when the primary air system is depleted or is being replaced. The reserve air supplies of rescue personnel and ordinary workers should be used only in an emergency.

  - An adequate, continuous supply of air must be provided while work is performed under any of the following conditions:

    1. When combustible or explosive gas vapors have been initially detected and subsequently reduced to a safe level by ventilation.
    2. When organic solvents are used in the work procedure.
    3. When open-flamed torches are used in the work procedure.
    4. When in a manhole that is located in that portion of a public right-of-way open to vehicle traffic or exposed to a seepage of gases.
    5. When an oxygen deficiency or toxic gas is present.

The following provisions regarding communication must be met:

1. Provision for constant communication with an employee in the immediate vicinity who is not in the confined space (use of the "buddy system").
2. Provision for an adequate rescue procedure, including equipment specifically designed for rescue from the confined space.

3. Provision for training in rescue and cardiopulmonary resuscitation procedures for employees working inside and outside the confined space.

- Lighting:

  - Temporary lights should be equipped with guards to prevent accidental contact with the bulb unless the bulb is deeply recessed within a reflector.

  - Temporary lights should be equipped with heavy-duty electric cords, with connections and insulation maintained in safe condition. Temporary lights may not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices should have insulation equal to that of a cable.

  - Working spaces, walkways, and similar locations should be kept clear of cords.

  - Portable electric lighting used in moist or other hazardous locations (e.g., drums, tanks, and vessels) should be operated at a maximum of 12 volts.

APPENDIX E

BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

Circle M Wood Treating Site
Town of Fishkill, Dutchess County

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SECTION 1: Regulatory Requirements - 29 CFR 1910.1030

Applicability: All persons at the Circle M Wood Treating Site who in the course of their work are potentially exposed to blood or other potentially infectious materials will make all attempts to avoid contact with those materials. If in the event of a medical emergency, first aid and CPR trained personnel will use universal precautions (personal protective equipment (ppe)) as a primary means of protection from blood and other infectious materials. If a project requires consultant and contractor personnel (laborers, equipment operators, supervisors) to be exposed to potentially infectious materials as part of a facility clean up, landfill operations, sewer work or related activity, project personnel will be required to utilize universal precautions (ppe) and work procedures to prevent exposure. All blood and body fluids will be treated as potentially infectious materials. Garbage and sewage will be treated like potentially infectious materials.

SECTION 2: Program Requirements

Training: All personnel who are first aid/CPR trained will be provided with bloodborne pathogen training. All project personnel and supervisory personnel will be provided with bloodborne pathogen training. Training will consist of making employees aware of the exposure control plan, health effects, vaccinations, universal precautions (ppe), hazard types and reporting requirements in the event of exposure.

SECTION 3: Safe Work Practices

Any personnel working with or near potentially infectious materials will exercise extreme caution and use appropriate ppe to avoid contact. Material handling will require the use of gloves, protective coveralls and eye protection. All precautions will be made to avoid punctures from sharps (needles) or other sharp materials that may be contaminated. Proper hygiene procedures will be utilized such as washing with hot water and anti-bacterial soap.

SECTION 4: PPE

Typical PPE will be rubber gloves, safety glasses, face shields, Tyvek coveralls and respiratory protection (based on application).

SECTION 5: Job Hazard Analysis

Projects where the potential exists for exposure to bloodborne pathogens or other potentially infectious materials will require the generation of a project specific hazard analysis. The hazard analysis will be either part of a health and safety plan (hazwoper) or a stand alone analysis for the activity. The analysis will address the nature of the hazard, the tasks associated with the potential exposure, materials handling, preventative measures, ppe, decontamination and emergency procedures.

SECTION 6: Decontamination

The primary method of decontamination of employees will be the proper removal of ppe. Also hand washing with appropriate cleaning supplies. Surfaces requiring decontamination will be cleaned with appropriate anti-bacterial cleaning agents. Equipment and tool decontamination will be conducted by power washing (steam cleaning) or other methods based on specific needs.

SECTION 7: Exposure Incident

In the event of an exposure incident a supervisor will evaluate the following:

a. What work practices were being used at the time of the incident?

b. What PPE was being used or not used at the time of the incident?

c. An evaluation process of the specific circumstances that led to the exposure incident.

SECTION 8: Reporting/Recordkeeping

Employees who receive skin punctures or have potentially infectious materials that come into contact with mucus membranes will report their incident to their supervisor. The employee may be required to be sent to a doctor for medical evaluation and testing. The supervisor will document on a company accident/investigation form the incident and document the event as a bloodborne exposure incident.

SECTION 9: Post-Exposure

Consultant and contractor safety and supervisory staff will advise exposed employees on the process of medical follow-up after an incident. Employees will receive appropriate medical testing as recommended by medical personnel.

SECTION 10: Hepatitis B Vaccine

Employees whose job category is covered by the Exposure Control Program will be provided with a Hepatitis B vaccine at no cost to the employee. The vaccination must be made available within 10 days of initial assignment. If an employee wishes to not receive a vaccine, they will be required to sign a declination form (see Attachment A).

ATTACHMENT A

Hepatitis B Vaccine Declination

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

_____ _____

Employee Signature Date

APPENDIX F

DRUM AND CONTAINER HANDLING PROCEDURES

APPENDIX F

Drum and Container Handling Procedures

Hazards of handling drums and other hazardous waste containers may include detonations, fires, explosions, vapor generation, and physical injury resulting from working around heavy equipment and deteriorated drums or containers. Specific risk factors associated with drum handling, opening, sampling and staging, and which field personnel should be aware of include the following:

- Unknown materials;
- Leaking, ripped, corroded, damaged containers;
- Contents under pressure;
- Inadequate PPE or air monitoring equipment.

These potential hazards and the health and safety procedures necessary to minimize potential risks associated with these hazards are described below. The following work practices should be used at all times during handling of drums and other containers in order to minimize potential risks to on-site workers. Air monitoring operations should be in progress during all phases of drum and container handling, opening and sampling activities.

Equipment List

Specialized equipment is required for safe drum handling, opening, sampling and staging. The equipment and methods are summarized below.

- Monitoring equipment (PID, Combustible Gas Meter, Radioactivity Meter)
- Personal Protective Equipment (Level B or C)
- Container Inventory Logs
- Over-packs and spill containment materials, including:
  - Spill control kit with absorbent
  - Containment berm
  - Fire suppression equipment
  - Spill pans
  - 6-Mil clear polyethylene sheeting
  - Drum and container opening equipment (e.g., screwdriver and bung wrench)
  - Replacement bungs or plugs
  - Glass rods for sampling drums
  - Spark-resistant tools
  - Explosion-proof equipment

With the exception of the monitoring equipment, PPE, spill containment and fire suppression materials, certain equipment may be substituted with alternate materials or eliminated as necessary on a site-specific basis, at the discretion of the Health and Safety Manager. For example, equipment needs would change based on the characteristics of the drum contents (i.e., solid or liquid).

Site Preparation and Survey

During site preparation, the work area is prepared for sampling. The drum container handling procedures presented below should be followed.

Primary and secondary staging areas should be constructed prior to the sampling event as necessary. Proper staging areas reduce the amount of cleanup required as a result of spills or leaking drums. A Work Plan will be developed for excavation and sampling activities at the site, describing in detail the procedures for site preparation and drum staging, which should be followed at all times.

Inspection

The appropriate procedures for handling drums and other containers depend on the drum or container contents. Prior to any handling, drums and containers should be visually inspected to gain as much information as possible about their contents. The following information, if available or legible, should be noted on the field logs compiled by the inspection team:

- Symbols, words, or other markings on the drum or container indicating that its contents are hazardous, e.g., radioactive, explosive, toxic, flammable;
- Signs of deterioration, such as corrosion, rust and leaks;
- Evidence that the drum or container is under pressure, such as swelling and bulging;
- Drum type and associated hazards as noted below:
    - Polyethylene or PVC-Lined Drums:

      Often contain strong acids or bases. If the lining is punctured, the substance usually quickly corrodes the steel, resulting in a significant leak or spill.
    - Exotic Metal Drums (i.e., Aluminum, Nickel, Stainless Steel or Other Unusual Metal):

      Very expensive drums that usually contain an extremely dangerous material.
    - Laboratory Packs:

      Used for the disposal of expired chemicals and process samples from laboratories, hospitals and similar institutions in small containers. Many of these containers may be incompatible materials and not packed in absorbent material. They may contain radioisotopes, shock-sensitive, highly volatile, highly corrosive, or very toxic exotic chemicals.
- Configuration of the drum head:
    - Whole lid removable – designed to contain solid material;
    - Has a bung – designed to contain a liquid;
    - Contains a liner – may contain a highly corrosive or otherwise hazardous material.

Conditions in the immediate vicinity of the drums or containers may provide information about drum or container contents and their associated hazards. Air monitoring should be conducted around the drums and containers using instruments such as a PID, Combustible Gas Meter, and a Radioactivity Meter.

As a precautionary measure, personnel should assume unlabeled drums contain hazardous materials until their contents are characterized. **Drums and containers may also be mislabeled; the label may not accurately describe its contents.**

Planning

Drum and container handling should be carefully planned based on all available information. The results of the inspection can be used to assess (1) if any hazards are present and appropriate response, and (2) which drums and containers need to be staged in order to be opened and sampled. The inspection team supervisor should specify the extent of handling necessary, the personnel for the job, and the most appropriate procedures based on the hazards associated with the probable drum or container contents as determined by visual inspection and air monitoring. These procedures should be revised on a site-specific basis, as necessary, at the time of field activities, or as new information is obtained during drum or container handling.

Handling Drums and Containers

Drums and containers should only be handled if necessary. Drum and container handling may be required to (1) respond to any obvious problems that might impair worker safety, such as leakage, or the presence of explosive substances, (2) unstack and orient containers for sampling, and (3) if necessary, to organize or stage containers into different areas on-site to facilitate characterization and remedial action. Prior to handling, all personnel involved should be warned about the hazards of handling and instructed to minimize handling as much as possible. In all phases of handling, personnel should be alert for new information about potential hazards (e.g., spills, leaks or bulging drums or containers). These hazards should be responded to before continuing with more routine handling operations. Drum handling procedures are summarized in a flow-chart in Table 5.

The following procedures should be used to maximize worker safety during container handling and movement. For example, if heavy equipment is required to enter an area and move drums, sufficient space is necessary for proper operation. Therefore, any drums preventing sufficient working area must first be removed.

- Train personnel in proper lifting and moving techniques to prevent back injuries.
- Have over-packs and spill containment materials ready before any attempt is made to exhume or move drums or containers.
- Before moving any drums, identify the most appropriate sequence to follow for the various containers to be removed.
- Do ***NOT*** move drums or containers unless they are intact and tightly sealed.
- Ensure that personnel moving containers have a clear view of the access way when carrying containers. Where necessary, have workers available to guide the motion of the carrier.

Several types of equipment can be used to move drums:

- A drum grappler attached to a hydraulic excavator;
- A small front-end loader, which can be either loaded manually or equipped with a bucket sling;
- A rough terrain forklift;

- A roller conveyor equipped with solid rollers;
- Drum carts designed specifically for drum handling.

Drums may also be moved manually. The drum grappler is the preferred piece of equipment for drum handling since it keeps the operator removed from the drum.

Explosive, shock-sensitive waste, or bulging drums or containers may be encountered during field activities. If they are discovered, the following precautions apply:

- Drums or Containers that May Contain Explosive or Shock-Sensitive Materials:

  If a drum or container is suspected to contain explosive or shock-sensitive waste as determined by visual inspection, it will not be handled. All personnel will be kept a safe distance from such drums. The Health and Safety Manager and STERLING Project Manager will initially be contacted and apprised of the situation.

- Bulging Drums or Containers:

  Pressurized drums and containers can be extremely hazardous. Do not move containers that may be under internal pressure, as evidenced by bulging or swelling. Exercise extreme caution when working with or adjacent to potentially pressurized drums or containers.

- Leaking, Open and Deteriorated Drums or Containers:

  If a drum or container containing a liquid cannot be moved without rupture, transfer its contents into a clean drum using a pump specifically designed for that application. Containers noted below that can be moved without rupture should be placed in over-pack drums at the site of discovery.

Responding to Spills or Leaks

In the event that spills or leaks occur during container handling, personnel should respond before continuing with handling operations. Over-pack drums or containers and a spill control kit containing an adequate volume of absorbent will be brought to the site with each field crew and placed near areas where minor spills may occur. Where major spills may occur, a containment berm adequate to contain the entire volume of liquid should be constructed before handling drums or containers. If the container contents spill, personnel trained in spill response procedures should isolate and contain the spill. If a container is leaking, the leak can be stopped by rotating the drum or container and immediately placing it into an over-pack, if moving the container is possible.

Opening Drums and Containers

The procedures for opening drums remain the same for sampling in-place or staging, followed by sampling. To enhance the efficiency and safety of drum-opening personnel, the following procedures should be used:

- Protect personnel by keeping them at a safe distance from the drums or containers being opened. Locate equipment for opening, monitoring and fire suppression behind the staging and sampling area.

- Place spill pans (or polyethylene sheeting where a spill pan is not feasible) underneath smaller containers before opening and sampling.

- Conduct air monitoring with a PID, Combustible Gas Meter, and Radioactivity Meter during opening. Monitor as close as possible to the contaminant source, i.e., the drum opening, to identify the "worst case" exposure level. Then continue monitoring at the worker's breathing space to ensure that respiratory protection is adequate. Combustible gases should continue to be monitored at the source. Do not insert the monitoring instrument probe into the opening of the drum.

- When Level C PPE is worn, withdraw from the area immediately if breakthrough occurs.

- All electrically powered equipment must be intrinsically safe.

- If the container shows signs of swelling or bulging, the following precautions must be followed. Relieve excess pressure prior to opening, if possible, from a remote location using such devices as a pneumatic impact, spark-resistant wrench or hydraulic penetration device. If pressure must be relieved manually, place a barrier such as plexiglass sheeting between the worker and bung or container lid to deflect any gas, liquid or solids which may be expelled as the bung or lid is loosened.

- Enter exotic metal drums and polyethylene or polyvinyl chloride-lined (PVC-lined) drums through the bung. Exercise extreme caution when manipulating these containers.

- Replace bungs as soon as possible to avoid vapor generation and/or explosions. If an open drum or container cannot be re-sealed, place the drum or container into an over-pack, and pack with absorbent and cover.

- Decontaminate reusable equipment after each use to avoid mixing of incompatible wastes.

Drum and Container Sampling

Drum and container sampling can be one of the most hazardous activities to worker safety and health because it often involves direct contact with unidentified wastes. Prior to collecting any sample, a detailed sampling plan should be prepared which presents background information about the drums and containers to be sampled and standard operating procedures for opening and sampling the drums or containers, sample packaging, and transportation. In addition to the sampling protocol, the following health and safety precautions should be taken:

- Air monitoring should be conducted in the breathing zone at all times during sampling.

- If the contents of the drums are unknown, sampling personnel must commence activities in Level B PPE.

- If at any time during sampling activities an odor is detected through the respiratory protection equipment, withdraw from the area immediately.

- Place spill pan underneath container (when possible) and cover container tops with at least one layer of 6-mil clear polyethylene sheeting to avoid excessive contact with the container tops.

Where it is not feasible to place a spill pan underneath the container, place polyethylene sheeting under the container. Discard the sheeting after sampling each type of material.

- Keep sampling personnel at a safe distance while drums or containers are being opened. Sample only after opening operations are complete.

- Do ***NOT*** lean over other drums or containers to reach the container being sampled, unless absolutely necessary.

- ***NEVER*** stand on drums or containers. This is extremely dangerous. Us mobile steps or another platform to achieve the height necessary to safely sample from the drums or containers.

- Obtain samples with either glass rods or vacuum pumps.

Drum and Container Staging

If drum and container staging is required, the general procedures outlined below for these activities should be followed. The extent of staging must be determined individually for each site, and should always be kept to a minimum. Additionally, the following health and safety procedures should be implemented:

- Place the opening area (where drums or containers are opened, sampled and re-sealed) a safe distance from the original waste disposal or storage site and from all staging areas to prevent a chain reaction in case of fire or explosion.

- In all staging areas, stage the drums or containers two-wide in two rows per area, and space these rows 7 to 9 feet apart to enable movement of the drum and container-handling equipment.

APPENDIX F

SITE MANAGEMENT PLAN
(SMP)

STERLING
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SITE MANAGEMENT PLAN

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

Prepared For:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

Prepared By:

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Latham, New York 12110

February 20, 2007

SITE MANAGEMENT PLAN

FORMER CIRCLE M WOOD TREATING SITE
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SITE MANAGEMENT PLAN

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
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1.0 INTRODUCTION

The approved Remedial Program for the former Circle M Wood Treating Site involves the excavation, relocation and consolidation of approximately 18,000 cubic yards of impacted soil. The Remedial Design and Engineering Report, with associated drawings and construction specifications, identifies the limits of excavation (horizontal and vertical) and lays out the proceedings for completion of the work.

2.0 SOIL EXCAVATION

The surficial soils will be excavated to depths of up to 24 inches below the ground surface, generally as depicted by Figure 6 of the Record of Decision (ROD) and as shown in more detail on Plate 3. The actual excavation depth at a given location is determined based on the subsurface soil characterizations previously performed. The soil excavation details shown on Plate 3, depicts the horizontal and vertical limits of the excavation and is overlain with a grid to allow for accurate field documentation and recordkeeping as the work is completed.

Soil will be excavated utilizing conventional earth moving equipment. It is expected that the majority of the excavation will be completed by a bulldozer. Excavated soil near the consolidation area will be pushed onto the consolidation footprint by bulldozer. In more remote locations, the stripped soil will be loaded into dump trucks for delivery to the consolidation area.

At the consolidation area soil will be unloaded, spread and compacted as described below.

Prior to commencement of work, all excavation and fill areas will be carefully checked for underground and overhead utilities. Overhead utilities will be abandoned or moved. In the event certain utility poles must remain, the details for holding and protecting the pole will be worked out with the utility prior to construction. Contractors will be advised that work beneath active power lines may require work permits from Central Hudson.

Underground utilities within the proposed footprint of the consolidation area including storm sewers, sanitary sewers, electric and gas will be abandoned in place. In the case of electric and gas service, the contractor will coordinate with Central Hudson to verify the service is shut off and properly abandoned.

3.0 SOIL HANDLING AND CONSOLIDATION

Soil will be handled and transported with typical earth moving equipment. While no special equipment or excavation techniques are required, care will be exercised to minimize generation and migration of dust. As set forth in the Dust Control Plan (DCP) and the Community Air Monitoring Plan (CAMP), weather conditions and field activities will be carefully monitored as the work progresses to determine if dust

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control activity measures are adequate or require modification.

Soil from the excavation areas will be direct pushed onto the consolidation area or will be trucked to the area over established haul ways. Generally, the excavation will commence at the distance furthest from the consolidation area and will progress towards the consolidation area.

In this manner, the hauling and handling of soils will occur over soils slated for removal. Dust generated or spillage from trucks during hauling will be collected as the soil is removed.

Certain activities may be curtailed during periods of excessive wind. When the excavation is complete the area will be finished and graded as shown on Plate 4, seeded and vegetated. During the excavation phase, and until the vegetation is fully established, the entire affected area will be maintained pursuant to the Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan.

Soil unloaded at the consolidation area will be unloaded, spread in approximate 12-inch loose lift and compacted using a track machine. The consolidation area will be constructed from south to north. Fill placement and compaction will continue in accordance with the final grading plan, as depicted on Plate 4. Upon attaining the finished grade the pile will be covered with two (2) feet of the soil and seeded. This activity is also subject to the requirements of the SWPPP and Erosion Control Plan.

4.0 CONSOLIDATION AREA GRADING PLAN

The delineated limits and grading plan for the proposed consolidation area are shown on Plate 4.

The grading plan provides for a crown generally sloped at 1% towards the perimeter. The perimeter side slopes are generally sloped at no greater than 20%. This grading plan provides an approximate 4.1-acre area which can be developed for recreational fields and/or vehicular parking at a later date.

5.0 CONSOLIDATION AREA LONG TERM OPERATION AND MAINTENANCE

The consolidation areas will initially be stabilized by seeding and vegetating. Portions of the consolidation area may be developed into a park with playing fields at a future date. Consideration is also given to using portions of the consolidation area for vehicular parking. In each case the consolidation area will be the subject of long term use restrictions prohibiting excavation and disturbance to the soil. Additionally, the consolidation area will be inspected annually for evidence of burrowing animals, settlement, erosion, etc. Erosion and/or other damage to the cover will be promptly repaired. Areas of sparse vegetation will be reseeded as necessary and periodically mowed to prevent woody vegetation from establishing.

6.0 INSTITUTIONAL CONTROLS

At the conclusion of the construction phase the final limits of the soil consolidation area will be surveyed and a metes and bounds description will be prepared for use in a Conservation Easement. The Conservation Easement will establish the range of acceptable future activities within the delineated area and will also provide for its long term maintenance. Excavation or any disturbance to the ground surface will be prohibited.

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APPENDIX G

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND EROSION CONTROL PLAN

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STORM WATER POLLUTION PREVENTION PLAN

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083

Prepared for:

Chelsea Waterfront Development, LLC
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February 20, 2007

STORM WATER POLLUTION PREVENTION PLAN
FORMER CIRCLE M WOOD TREATING SITE
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1.0 INTRODUCTION

1.1 Site Description & Background

Chelsea Industrial Park consists of a 57.3-acre parcel at the western end of Brockway Road in the Town of Fishkill, Dutchess County, New York (see Figure 1). The industrial park is located east of the railroad tracks along the east bank of the Hudson River at an elevation approximately 55 feet above mean sea level, and 50 feet above the Hudson River mean water level.

The former Circle M Wood Treating facility occupied approximately eight (8) acres of the Chelsea Industrial Park. Circle M operated from the eastern half of an 18,500 square foot building. The former Circle M facility includes the 18,500 square foot building, an adjoining 90 x 150-foot concrete drip pad, adjacent paved driveways and other concrete pads. The Circle M facility has been vacant during most of the period since 1990, and is now occupied by a pavement maintenance company.

The balance of the property contains various additional buildings, concrete/paved areas, and gravel site roads not associated with the Circle M operation. Large sections of the property are presently unpaved and undeveloped.

Previous investigations at the site revealed that arsenic, chromium and copper are present at concentrations exceeding background levels within surficial soils proximate to the Circle M facility. Subsequently, the former Circle M facility was determined to be a Class 2 Inactive Hazardous Waste Disposal Site. On September 30, 2005, the New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) that outlines the remedy to be implemented in order to remediate the site.

1.2 Project Description

Among other requirements, the selected remedy set forth in the September 30, 2005 ROD involves:

- Excavation and consolidation of contaminated soil. Soil will be consolidated within the designated area and will include the treatment building's slab, which will be left in place, beneath a portion of the consolidation area. The consolidation area will then be covered with a geotextile fabric and by two (2) feet of clean fill.

- Development of an erosion control program in the form of grass or other vegetative cover to stabilize soils on the stream bank.

This Storm Water Pollution Prevention Plan (SWPPP) addresses the construction activities necessary to implement the hazardous waste site remediation program outlined in the ROD, specifically those listed above.

2.0 REGULATORY REQUIREMENTS

Pursuant to the Federal Clean Water Act (CWA) and various State and Federal regulations, storm water is defined as water from rain, melting snow, sleet or hail that does not infiltrate into the ground however runs off into waterways. Storm water flows from the ground surface, over paved areas and exposed soil, and through vegetated surfaces. As it flows, storm water runoff typically collects and transports soil, organic matter and a variety of other materials, which may be potential pollutants. The quality of runoff

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is affected by numerous factors and depends on the season, local meteorology, geography and upon activities which lie in the path of runoff.

The United States Environmental Protection Agency (USEPA) published regulations on December 8, 1999, entitled "National Pollutant Discharge Elimination System - Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges." These regulations are referred to as "Phase II", which requires permits for storm water discharges from Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas and for construction activities disturbing one or more acres. To implement the law, the NYSDEC has issued two general permits, one for MS4s in urbanized areas and one for construction activities. The permits are part of the State Pollutant Discharge Elimination System (SPDES).

2.1 NYSDEC Requirements

Certain identified activities trigger the need to obtain SPDES permits issued by the NYSDEC, which authorize the discharge of runoff to surface waters of the State. Specifically, owners of lands which discharge storm water associated with construction activity must apply for a permit if activities involve the disturbance of one (1) acre or more. Construction activity that results in a land disturbance of less than one (1) acre, but which is part of a larger common plan of development or sale, must also be covered by a storm water permit.

This permit is referred to as GP-02-01 "SPDES General Permit for Storm Water Discharges from Construction Activity" (Construction Activity General Permit). The Construction Activity General Permit requires the owner to implement storm water management measures for controlling pollutants in the storm water runoff.

Construction activities associated with remediation of hazardous waste sites that have a NYSDEC-approved work plan do not need to obtain coverage under the Construction Activity General Permit provided that a SWPPP meeting the substantive requirements of the Construction Activity General Permit is prepared for the project, and that a completed Notice of Intent (NOI) form is submitted to the NYSDEC prior to construction.

As described above, this SWPPP is in support of the construction activity necessary for the NYSDEC-approved remediation of the former Circle M facility, and meets the substantive requirements of the Construction Activity General Permit. As such, this SWPPP is written with specific reference to the Construction Activity General Permit, although the NYSDEC's approval of the Remedial Design is used in lieu of coverage under the Construction Activity General Permit.

2.2 Notice of Intent

The Construction Activity General Permit application process administered by the NYSDEC begins with the filing of a Notice of Intent (NOI). Generally, coverage under the General Permit begins five (5) days after the NYSDEC's receipt of a complete NOI providing that the activity is eligible for coverage under this Construction Activity General Permit and provided the NYSDEC has not informed the applicant otherwise.

When a filing is made, a copy of the NOI must be maintained at the site, and there must be a posting of a brief description at a prominent place at the site. A signed copy must be submitted to the local government and any authorized agency with jurisdiction or regulatory control over the construction project.

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A SWPPP must be developed by the operator of a facility for storm water discharges associated with construction activities covered under a Construction Activity General Permit. The SWPPP must be in accordance with good engineering practice and must identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges. In addition, the SWPPP must describe practices that will be used to reduce the pollutants in storm water discharges and those appropriate to ensure compliance with the permit. Operators are responsible for implementing the SWPPP, and for ensuring that all contractors and subcontractors provide certification or agreements as required in the SWPPP.

As this project is a hazardous waste site remediation pursuant to an NYSDEC approved work plan, submittal of the NOI will provide notification of the planned construction activities authorized under the approved Remedial Work Plan. This SWPPP is prepared in substantive compliance with the Construction Activity General Permit requirements.

The completed NOI filing form is presented as Appendix A of this SWPPP.

2.3 Special Conditions and Prohibitions

The Construction Activity General Permit includes the following special conditions and prohibitions.

2.3.1 Non-Storm Water Discharges

Most non-storm water discharges must not be mixed with the storm water, unless a separate SPDES Permit is obtained.

All discharges, other than storm water, must be in compliance with a SPDES Permit and are not authorized under a storm water General Permit, with the exception of discharges associated with:

- Fire fighting activities;
- Fire hydrant flushing;
- Routine external building washdown (that does not contain detergents);
- Pavement washdown where spills or leaks of toxic or hazardous materials have not occurred;
- Air conditioning condensate;
- Springs;
- Foundation/footing drains;
- Vehicle wash water (no detergents) and water applied for dust control purposes (covered under the Construction Activity General Permit); and
- Irrigation drainage and lawn watering discharges (covered under the Industrial Activity General Permit).

2.3.2 Maintaining Water Quality

The discharges authorized pursuant to the General Permit must not cause or contribute to a violation of water quality standards as contained in 6 NYCRR 700-705, including but not limited to:

- There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

- There shall be no suspended, colloidal and settleable solids that will cause deposition or impair the water for its best usages; and

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- There shall be no residue from oil and floating substances, visible oil film, globules or grease.

The following section outlines the general requirements for the SWPPP, and individual requirements for the Construction Activity General Permit.

3.0 STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION ACTIVITIES

This SWPPP meets the substantive requirements of the Construction Activity General Permit, which is provided as Appendix B of this report. The following section addresses the SWPPP requirements contained in the Construction Activity General Permit.

3.1 Signature and Plan Review

A copy of the NOI is included as Appendix A. Generally, construction activities are authorized five (5) business days after the NYSDEC's receipt of the completed NOI, provided that the activities are eligible for coverage under the Construction Activity General Permit and the NYSDEC has not informed the applicant otherwise. Although the NOI will not be formally submitted, the NOI will be completed and signed prior to commencement of remediation construction activities.

When this SWPPP has been signed in accordance with the substantive requirements of the Construction Activity General Permit, a copy of the SWPPP will be retained on-site. Additional copies will be retained at the Town of Fishkill Town Hall and with the Town Engineer.

3.2 Revisions

This SWPPP will be updated whenever there is a change in design, construction, operation and/or maintenance, which may have a significant effect on the potential for the discharge of pollutants. This SWPPP will also be amended if it proves to be ineffective in minimizing the discharge of pollutants in storm water or achieving the general objectives of controlling pollutants in storm water discharge. This SWPPP will also be amended to identify any new contractor and/or subcontractor that will implement the SWPPP.

3.3 General Permit

The substantive requirements of the Construction Activity General Permit are supported by this SWPPP and address the construction activities anticipated throughout the remediation project. This SWPPP has been developed in accordance with good engineering practices and shall identify the potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges. Additionally, this SWPPP was developed using NYSDEC technical standards for erosion and sediment controls as detailed in the NYSDEC's "New York State Standards and Specifications for Erosion and Sediment Control", dated August 2005.

With respect to water quality and quantity controls, this SWPPP is developed in conformance with the NYSDEC's technical standards, which are detailed in the NYSDEC's "New York State Storm Water Management Design Manual", dated August 2003.

This SWPPP applies to all activities by the owner and contractors working at the site. As these practices relate to storm water management, the following observations are made.

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3.3.1 Site Soils

The soil type of the area immediately surrounding the buildings on the property is classified as "Urban Land" by the Dutchess County Soil Survey. "Urban Land" is described as "areas where the soil surface is covered by impervious materials". This area of the site contains numerous buildings, concrete pads, and paved and gravel roads and parking areas. Soil texture is described as varied. The "Urban Land" soils covered by impervious surfaces are not susceptible to erosion, but because the texture of these soils is varied, it is assumed that they are easily erodible, given the reported erosion characteristics of adjacent soil types.

The Soil Survey classifies the majority of the remaining property as "Udorthents, Smoothed, 0 to 8 percent slopes", which is described as very deep, excessively drained to moderately well drained soils that have been altered by cutting and filling, or otherwise disturbed. Soil texture is described as loamy, and these soils are described as being easily erodible.

The Soil Survey classifies the soils along the southeast edge of the property where the small stream is located as "Hudson and Vergennes Soils, 8 to 16 percent slopes" (HvC) and "Hudson and Vergennes Soils, hilly" (HvD).

Hudson series soils are described as being very deep, gently sloping, moderately well drained loamy soils that formed in lake-laid sediments. Surface layers typically contain silt loam, and deeper profiles silty clay. Permeability is moderately slow to slow in the surface and subsurface layers, and slow to very slow in the subsoil and substratum. The seasonal high water table is reported to be 1.5 to 2 feet deep from November to April.

Vergennes series soils are described as very deep, gently sloping, moderately well drained clayey soils that formed in lake-laid sediments. Surface layers are typically clay, and deeper profiles have thin clay layers interbedded with thin layers of silt. Permeability is slow or moderately slow in the surface layer, slow or very slow in the subsoil, and very slow in the substratum. The seasonal high water table is reported to be 1 to 3 feet deep from December to May.

HvC and HvD soils consist of approximately 40% Hudson soils, 40% Vergennes soils, and 20% other soils; however, some areas may consist of mostly one type. Both Hudson and Vergennes series soils are described as easily erodible.

A copy of relevant portions of the Dutchess County Soil Survey is included in Appendix D of this report.

3.3.2 Soil Erosion and Sediment Control

The areas of the site where construction activity will occur comprises the open areas to the north and east of the former Circle M facility where treated wood products were stored, the former Circle M facility itself including the 18,500 square foot building and surrounding areas, and the area between the former Circle M facility and Brockway Road.

A majority of the buildings on the property will be demolished, with the exception of the southernmost, one (1) story brick and masonry building and the easternmost one (1) story steel and concrete/one (1) story metal building. The concrete slabs will remain in-place, except those located in or protruding into the excavation areas.

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The following areas will be excavated to the depths prescribed in the Remedial Design:

- The former storage areas to the north and west of the former Circle M facility;
- the site road and surrounding soils along the southeastern edge of the property; and
- the soils surrounding the one (1) story brick and masonry building.

The excavated soils will be placed in the soil consolidation area, which will have final slopes less than 20% but greater than 1%.

The areas surrounding the one (1) story brick and masonry building and the former site road along the southeastern edge of the property will be filled and graded to match pre-existing topography after the areas have been excavated.

Erosion and sediment control for the remediation project will consist of the following:

Site Preparation

Before remediation construction activities commence (pavement/concrete slab removal, soil excavation and relocation, etc.), erosion and sediment controls will be installed. As shown on Plate 2 of the Remedial Design & Engineering Report, a stabilized construction entrance will be installed at the entrance of the remediation project Support Zone, silt fencing will be installed around the downstream perimeter of the work area, and temporary sediment traps will be installed at the planned low points in the areas to be excavated.

Typical detailed specifications addressing sediment and erosion control measures from the NYSDEC document "New York State Standards and Specifications for Erosion and Sediment Control" are presented in Appendix C of this report, and further detailed specifications addressing sediment and erosion control are presented on Plate 6 of the Remedial Design & Engineering Report.

Each Sediment Trap will have storage volumes equal to or greater than 3,600 cubic feet (cf) per acre (ac) of drainage area. Details for the sediment traps are presented on Plate 6 of the Remedial Design & Engineering Report, and are in conformance with the NYSDEC's "New York State Standards and Specifications for Erosion and Sediment Control". Design details for the temporary sediment traps are summarized in the following table:

Sediment Trap I.D.	Type	Drainage Area	Storage Required (min.)	Outlet Pipe Riser Dia. (min.)	Outlet Pipe Barrel Dia. (min.)
ST-1	Pipe Outlet (Type I)	4.16 ac	14,976 cf	27 in	21 in
ST-2	Pipe Outlet (Type I)	1.04 ac	3,744 cf	18 in	15 in
ST-3	Pipe Outlet (Type I)	3.89 ac	14,004 cf	24 in	21 in
ST-4	Pipe Outlet (Type I)	2.69 ac	9,684 cf	21 in	18 in
ST-5	Pipe Outlet (Type I)	3.26 ac	11,736 cf	24 in	21 in

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Following the installation of the temporary erosion and sediment controls, the designated excavation areas will be cleared and grubbed.

Construction - Excavation

The planned excavation activities to the west and north of the former Circle M facility will create depressions in the topography that will act as perimeter swales, and will direct storm water runoff from the disturbed areas to the sediment traps. Accordingly, installation of silt fencing along the downstream perimeter of these excavation areas is mainly a precautionary measure, and will serve primarily to define the work zone as well as provide protection to the surrounding existing vegetation.

The planned excavation activities along the southeastern edge of the property will result in the bulk removal of soils to a depth of 24 inches below existing grade, along the top of the existing bank in that area. As such, excavation from this area shall begin adjacent to Sediment Trap ST-4, and progress away from it to the northeast and the southwest. Perimeter dike/swales will be installed along the downstream edge of the excavation to direct storm water runoff to the Sediment Trap. Details and specifications regarding installation of perimeter dike/swales are presented on Plate 6 of the Remedial Design & Engineering Report.

The excavation areas will be seeded and mulched as soon as areas are approved to have been excavated to the required depth. The perimeter swale/dikes, perimeter silt fencing, and temporary sediment traps will remain in place and will be maintained until all areas upstream from these control measures are stabilized.

Construction – Soil Consolidation Fill

The soil consolidation area consists mainly of soils covered by impervious surfaces or gravel driving surfaces. Accordingly, the soils in this area do not pose a high erosion risk initially, but as soil is placed over the impervious surfaces, susceptibility to erosion and potential for sediment migration will increase.

Prior to placement of soil in any location within the consolidation fill area, silt fencing will be installed along the downstream perimeter of the fill area to become active. As fill activities progress, the entire perimeter of the soil consolidation fill area will be protected by silt fencing.

Once final grades of the soil consolidation fill are established, geotextile will be placed over the entire surface, and then two (2) feet of clean fill will be placed to provide a soil cover to the consolidation fill. Final grades of the soil consolidation fill area are expected to be established from the southern end, then progressing north. Once final grades are established at the southern end of the fill area, a second stabilized construction entrance from Brockway Road will be installed, as shown on Plate 4 of the Remedial Design & Engineering Report, so that the two (2) foot final cover can be placed directly on the soil consolidation fill. Soil cover installation is then expected to progress northward, until the entire consolidation fill cover is complete.

Once they are no longer required, the stabilized construction entrances will be removed, and the areas will be restored. The stabilized construction entrance installed initially, in a location west of the remediation project area, will be restored to a vegetated state through removal of the materials installed, grading, seeding and mulching.

The second stabilized construction entrance, installed to the south of the remediation project area off of Brockway Road, will become the entrance to the gravel maintenance access road.

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Inspection of the sediment and erosion control measures will be conducted as required during the construction operations, and the control measures described above will be maintained and modified, as necessary. Inspection and maintenance requirements are discussed in Sections 3.3.5, 3.3.8 and 3.4, below.

3.3.3 Dust Control

Site haul roads and construction activities will be maintained through dust control measures in order to reduce and minimize the generation of dust that could settle on the remainder of the site and potentially mobilize during subsequent rain events. During construction activities, a water truck will be present as appropriate to suppress dust generation within the excavation and fill areas, as well as along site access and haul roads.

Two separate documents related to dust control have been prepared for this remediation project, and are presented as appendices to the Remedial Design Engineering Report. These documents are entitled "Dust Control Plan (DCP)" and "Community Air Monitoring Plan (CAMP)", and can be found in Appendices D and H of the Remedial Design & Engineering Report.

3.3.4 Petroleum Storage

Temporary petroleum storage facilities may be installed by the contractor(s) during construction activities. All temporary petroleum storage facilities installed at the site will comply with applicable NYSDEC requirements for petroleum bulk storage as set forth in 6 NYCRR 612-614.

3.3.5 Erosion and Sediment Control Maintenance Schedule

Assurance of the continuous and effective operation of the erosion and sediment control practices will be verified by facility inspection as described below in Section 3.4. If the controls are found to be inadequate, appropriate modifications will follow. Maintenance is discussed further in Section 3.3.8, below.

3.3.6 Post-Development Storm Water Runoff

Due to the existing topography of the property, the existing storm water runoff patterns at the remediation site are such that the site drains radially to the west, north, and east of the existing industrial park.

Runoff to the north and east of the site drains to an un-named tributary of the Hudson River, which flows directly to the Hudson River through a box culvert located at the northwestern corner of the property. The northern portion of the property also drains to the un-named tributary along its length as the tributary flows along the northern edge of the property.

Runoff to the west of the remediation site drains to two culverts located on the western edge of the property, which drain directly to the Hudson River.

The proposed remediation project will not significantly change the pre-development runoff patterns. Post-development peak flow rates and storm water runoff volumes are, however, expected to be less than pre-development rates and volumes, do to the significant reduction in impervious area after the project is completed.

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3.3.7 Post-Development Storm Water Management

Water Quantity Control

In accordance with the NYSDEC's "New York State Storm Water Management Design Manual", post-development water quantity controls are normally required for the following:

- stream channel protection (Cp) through extended detention of the one-year, 24-hour storm event;
- overbank flood control (Qp) through attenuation of the post-development 10-year, 24-hour peak discharge rate to predevelopment rates; and
- extreme flood protection (Qf) through attenuation of the post-development 100-year, 24-hour peak discharge rate to predevelopment rates.

However, if the site discharges directly to tidal waters or fourth order or larger streams, these control requirements do not apply.

As the site discharges directly to the Hudson River, which is both a tidal water and is classified as having a stream order larger than a fourth order stream at the location of the site, water quantity controls are not required. As such, post-development stream channel, overbank flood, and extreme flood controls are not planned.

Water Quality Control

The NYSDEC's "New York State Storm Water Management Design Manual" normally requires capture and treatment of 90% of the average annual storm water runoff volume, termed the Water Quality Volume (WQv).

However, the NYSDEC's "Interim Strategy for Redevelopment Projects", dated April 30, 2004, and the subsequent proposed "Redevelopment Projects" chapter for the "New York State Storm Water Management Design Manual", advertised for public comment in the NYSDEC's June 14, 2006 "Environmental Notice Bulletin", provide options for achieving water quality treatment objectives at redevelopment projects.

Redevelopment is defined as "reconstruction or modification to any existing, previously developed land such as residential, commercial, industrial, institutional or road/highway, which involves soil disturbance". Redevelopment is distinguished from development or new development in that new development refers to construction on land where there had not been previous construction.

One of the options presented in the proposed "Redevelopment Projects" chapter of the NYSDEC's "New York State Storm Water Management Design Manual", is that the redevelopment plan proposes a reduction of impervious cover by a minimum of 25% of the existing total site impervious area, and that final grading should minimize runoff contribution from the new pervious area onto impervious cover.

The proposed remediation/redevelopment project will achieve a reduction of impervious cover of approximately 56% through the planned removal of buildings, concrete pads and pavement in the areas to be excavated and/or filled. The proposed final grading of the site is such that runoff will be directed away from the impervious areas to remain on the property. As such, the proposed remediation/redevelopment project satisfies the water quality treatment option described above, and post-development water quality controls are not planned.

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3.3.8 Maintenance

Erosion and sediment controls will be maintained during and after the planned construction activities. All areas where construction activities occur will be inspected regularly for erosion, siltation, etc., and any problems identified will be promptly repaired. See Section 3.4 below for a description of planned inspection activities.

If inspections reveal that any erosion and sediment controls measures are inadequate, such measures will be replaced with more suitable means as part of their maintenance.

The soil cover of the consolidation area will initially be vegetated. Under current plans portions of the consolidation area may be developed into a park with playing fields. Consideration was also given to using portions of the consolidation area for parking. In each case the consolidation area will be the subject of long term use restrictions prohibiting excavation and disturbance to the soil. Additionally, the consolidation area will be inspected regularly for evidence of burrowing animals, settlement, erosion, etc. Damage to the cover will be promptly repaired.

A majority of the excavated areas will initially be vegetated. Under current plans, the areas that are north and west of the soil consolidation area may be developed as part of a multi-family housing development. Also, under current plans, the one (1) story brick and masonry building that will be preserved and area immediately surrounding it may be used for support of the park and playing fields being considered, which may include a gravel parking area. A gravel maintenance access road will be constructed in the excavation/fill area along the southeast edge of the soil consolidation area, which will be reserved for maintenance access to the adjacent side slopes of the soil cover. All excavated/filled areas will be inspected regularly for evidence of erosion, siltation, etc., which, if identified, will be promptly repaired.

3.4 Inspections

Prior to the commencement of construction, a site assessment will be conducted to ensure that the site has been properly prepared, as required by Part III.D of the Construction Activity General Permit.

In accordance with the Construction Activity General Permit, disturbed areas of the site, structural control measures, and locations where vehicles enter or exit the site, will be inspected weekly, and within 24 hours after a storm which produces 0.5 inch or greater of rain. The inspections will include preparation of a site map that depicts all disturbed site areas and drainage pathways and all areas that have and have not undergone temporary or permanent stabilization. Additionally, the inspector will record the approximate degree of sediment accumulation as a percentage of the storage volume. Findings of the site assessment will be provided in an inspection report.

Inspections will be conducted to identify the potential for migration of pollutants. Erosion and sediment control measures will be observed to ensure that they are operating correctly. Locations where vehicles enter or exit will be inspected for evidence of off-site tracking of soil or sediment. The disturbed areas will be inspected to identify erosion, siltation, and restriction to the flow of water in swales, outlet structures, etc. The inspections will also identify any storm water issues related to runoff impacts to the unnamed stream. A monthly summary of the site inspection activities will be posted at the site, in a publicly accessible location.

Inspection reports will be completed which contain the following information: the date and scope of the inspection; the name and position of the inspector; observations made and actions taken. These reports

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will be maintained in the site log book and made available upon request. All inspection reports must be retained for three (3) years from completion of construction activities.

Upon completion of the remediation project, prior to filing the Notice of Termination (NOT), a qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls not needed for long-term erosion control have been removed.

Monthly visual inspections will be performed to identify any problems with the soil cover system or excavated/filled areas outside of the soil consolidation area. The inspections will identify erosion, siltation, or restriction to the flow of water in ditches, swales, etc.

3.5 Stabilization

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased. Consistent with the requirements of the General Permit stabilization measures will be implemented within fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased.

During the following instances, the fourteen (14) day deadline may not apply:

- If construction activity is temporarily or permanently ceased due to snow cover or frozen ground conditions, stabilization measures shall be implemented as soon as practicable.

- When construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures need not be initiated on that portion of the site.

Final stabilization of all disturbed areas, including the soil consolidation cover, will be accomplished by seeding and mulching to produce permanent vegetation. Portions of the disturbed areas, as described above, will be covered by gravel parking areas and the gravel maintenance access road.

3.6 Work by Contractors

In substantial compliance with the Construction Activity General Permit, all contractors will be required to review this SWPPP prior to commencing any site-related construction activities. As required by the Construction Activity General Permit Part III Section E, the following statement is incorporated into all contract work for construction activities at the facility.

> *"I certify under penalty of law that I understand and agree to comply with the terms and conditions of the pollution prevention plan for the construction site identified in such plan as a condition of authorization to discharge storm water. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."*

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Along with the above statement, the certification will also include:

- Name and title of person providing the signature;
- Name, address and telephone number of the contracting firm;
- Address of the site; and
- Date the certification was signed.

3.7 Record Retention

All records regarding storm water discharges will be maintained at the facility for a period of no less than three (3) years. A written summary of the General Permit compliance status will be completed at a minimum frequency of every three (3) months during which coverage under this permit exists. All records will be made available upon request.

4.0 CERTIFICATION

The person signing this Plan makes the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person(s) who manage the system, or the person(s) directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURES

_____ _____

Mark P. Millspaugh, P.E. Date
Sterling Environmental Engineering, P.C.

21044\SWPPP\Circle M SWPPP_ txt.doc

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FIGURE 1

SITE LOCATION MAP



MAP REFERENCE: NYSDOT WAPPINGERS FALLS QUADRANGLE, 1989.

FIGURE 1

STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road • Latham, New York 12110

SITE LOCATION MAP

CHELSEA WATERFRONT DEVELOPMENT LLC

CIRCLE M WOOD TREATMENT SITE

TOWN OF FISHKILL — DUTCHESS CO., N.Y.

PROJ. No.:	DATE:	SCALE:	DWG. NO.	FIGURE
21044	9-12-06	1" = 2000'	21044005	1

APPENDIX A

STORM WATER NOTICE OF INTENT (NOI)

1752059166

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR [ ][ ][ ][ ][ ][ ]
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-02-01

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required. To properly complete this form, please refer to the Instruction Manual which can be accessed at www.dec.state.ny.us/website/dow/toolbox/instr_man.pdf

-IMPORTANT-

THIS FORM FOR MACHINE PRINT ONLY
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
Chelsea Waterfront Development LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
Perna

Owner/Operator Contact Person First Name
Thomas

Owner/Operator Mailing Address
1 Executive Boulevard

City
Yonkers

State: NY Zip: 10701 -

Phone (Owner/Operator): 914 - 965 - 3990

Fax (Owner/Operator): - -

Email (Owner/Operator)

Location Information

Project Site Information

Project/Site Name
Circle M Wood Treatment Site Remediation

Street Address (NOT P.O. BOX)
Chelsea Waterfront, Brockway Road

City/Town/Village (THAT ISSUES BUILDING PERMIT)
Town of Fishkill

State: NY

Zip: ____ - ____

County

DEC Region (if known)

Name of Nearest Cross Street
NYS Route 9D

Distance to Nearest Cross Street (Feet)
3700

Direction to Nearest Cross Street
○ North ○ South ● East ○ West

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.state.ny.us/website/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site go to the dropdown menu on the left and choose "Get Coordinates". Click on the center of your site and a small window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting): 585500

Y Coordinates (Northing): 4598591

2. What is the nature of this construction project?

○ New Construction

○ Redevelopment with increase in imperviousness

● Redevelopment with no increase in imperviousness

4198059163

Project Site Information

Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use	Post-Development Future Land Use
○ FOREST	○ SINGLE FAMILY HOME
○ PASTURE/OPEN LAND	○ SINGLE FAMILY SUBDIVISION
○ CULTIVATED LAND	○ TOWN HOME RESIDENTIAL
○ SINGLE FAMILY HOME	○ MULTIFAMILY RESIDENTIAL
○ SINGLE FAMILY SUBDIVISION	○ INSTITUTIONAL/SCHOOL
○ TOWN HOME RESIDENTIAL	○ INDUSTRIAL
○ MULTIFAMILY RESIDENTIAL	○ COMMERCIAL
○ INSTITUTIONAL/SCHOOL	○ ROAD/HIGHWAY
● INDUSTRIAL	○ RECREATIONAL/SPORTS FIELD
○ COMMERCIAL	○ BIKE PATH/TRAIL
○ ROAD/HIGHWAY	○ LINEAR UTILITY (water, sewer, gas, etc.)
○ RECREATIONAL/SPORTS FIELD	○ PARKING LOT
○ BIKE PATH/TRAIL	○ OTHER
○ SUBSURFACE UTILITY	OTHER: Remediated site
○ PARKING LOT	
○ OTHER	
OTHER:	

Number of Lots:

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ Yes ● No

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ● Yes ○ No

6. Is this property owned by a state authority, state agency or local government? ○ Yes ● No

7. In accordance with the larger common plan of development or sale; enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	Acreage To Be Disturbed	Existing Impervious Area Within Disturbed	Future Impervious Area Within Disturbed
53.3	15.5	6.8	3.0

8. Will there be more than 5 acres disturbed at any given time? ● Yes ○ No

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
76 %	%	2 %	22 %

10. Is this a phased project? **(if yes, The SWPPP must address all planned phases)** * ● Yes ○ No

11. Enter the planned start and end dates of the disturbance activities

Start Date 04/01/2007 – End Date 12/01/2007

Receiving System(s)

12. Provide the name of the nearest, natural, classified surface waterbody(ies) into which construction site runoff has the potential to discharge.

Hudson River

For Questions 13 and 14 refer to the Instruction Manual for a subset of 303(d) segments and TMDL watersheds subject to Condition A of the permit. These waterbodies and watersheds have been identified for regulation within the stormwater program due to some level of impairment by nutrients, silt or sediment. The Instruction Manual can be accessed at www.dec.state.ny.us/website/dow/toolbox/instr_man.pdf

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment? * ○ Yes ● No

14. Is this project located in a TMDL Watershed? * ○ Yes ● No

***NOTE:** If you answered Yes to either question 13 or 14, Pursuant to Part I.D.3.(b) of the permit, you must have your SWPPP prepared and certified by a licensed/certified professional and the SWPPP is subject to a 60-business day review.*

15. Does the site runoff enter a separate storm sewer system- including roadside drains, swales, ditches, culverts, etc? **(if no, skip question 16)** ● Yes ○ No ○ Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

Consolidated Rail Corporation

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ Yes ● No ○ Unknown

Stormwater Pollution Prevention Plan (SWPPP)

18. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ? (*) ● Yes ○ No

19. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) **If no, Skip question 20** ○ Yes ● No

20. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ? (*) ○ Yes ○ No

NOTE: If you answered no to question 18 or 20, Pursuant to Part I.D.3.(b) of the permit, you must have your SWPPP prepared and certified by a licensed/certified professional and the SWPPP is subject to a 60-business day review. Please provide further details in the details/comment section on the last page of this form.

21. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● Professional Engineer (P.E.)
- ○ Soil and Water Conservation District (SWCD)
- ○ Registered Landscape Architect (R.L.A)
- ○ Certified Professional in Erosion and Sediment Control (CPESC)
- ○ Owner/Operator
- ○ Other

SWPPP Preparer Information (if different from Owner/Operator info)

SWPPP Preparer: Sterling Environmental Engineering, PC

Contact Name (Last, Space, First): Millspaugh Mark

Mailing Address: 24 Wade Road

City: Latham

State: NY Zip: 12110 -

Phone: 518 - 456 - 4900 Fax: 518 - 456 - 3532

Email: Mark@SterlingEnvironmental.com

Stormwater Pollution Prevention Plan (SWPPP)

Erosion and Sediment Control Practices

22. Has a construction sequence schedule for the planned management practices been prepared?

● Yes ○ No

23. Select **all** of the erosion and sediment control practices that will be employed on the project site.

Temporary Structural

- ○ Check Dams
- ● Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ● Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ● Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ● Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ● Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ○ Sodding
- ● Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ● Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ● Rock Outlet Protection
- ○ Streambank Protection

Other

The Rock Outlet Protection for the Pipe Outlet Sediment Traps are temporary.

Stormwater Pollution Prevention Plan (SWPPP)

Water Quality and Quantity Control

Important:Completion of Questions 24-30 is not required if the project:

Disturbs less than 5 acres and is planned for single-family residential homes(including subdivisions) or construction on agricultural property and does not have a discharge to a 303(d) water or is not located within a TMDL watershed.

Additionally, sites where there will be no future impervious area within the disturbed area and that do not have a change(pre to post development)in hydrology do not need to complete questions 24-30.

24. Indicate **all** the permanent Stormwater Management Practice(s) that will be installed on this site

Post Construction Stormwater Management Practices

Ponds

- ○ Micropool Extended Detention (P-1)
- ○ Wet Pond (P-2)
- ○ Wet Extended Detention (P-3)
- ○ Multiple Pond System (P-4)
- ○ Pocket Pond (P-5)

Filtering

- ○ Surface Sand Filter (F-1)
- ○ Underground Sand Filter (F-2)
- ○ Perimeter Sand Filter (F-3)
- ○ Organic Filter (F-4)
- ○ Bioretention (F-5)
- ○ Other

Wetlands

- ○ Shallow Wetland (W-1)
- ○ Extended Detention Wetland (W-2)
- ○ Pond/Wetland System (W-3)
- ○ Pocket Wetland (W-4)

Infiltration

- ○ Infiltration Trench (I-1)
- ○ Infiltration Basin (I-2)
- ○ Dry Well (I-3)

Open Channels

- ○ Dry Swale (O-1)
- ○ Wet Swale (O-2)

Describe other stormwater management practices not listed above or explain any deviations from the technicial standards. If the SWPPP does not conform to the technicial standards, the SWPPP must be prepared and certified by a licensed/certified professional and is subject to a 60-business day review.

Has a long term Operation and Maintenance plan for the post construction management practices been developed? ● Yes ○ No

If Yes, Identify the entity responsible for the long term Operation and Maintenance

Chelsea Waterfront Development LLC

Stormwater Pollution Prevention Plan (SWPPP)
Water Quality and Quantity Control

25. Provide the total water quality volume required and the total provided for the site.

Total Water Quality Volume (WQv)

WQv Required	WQv Provided
0.[ ][ ][ ] acre-feet	0.[ ][ ][ ] acre-feet

26. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required	CPv Provided
0.[ ][ ][ ] acre-feet	0.[ ][ ][ ] acre-feet

The need to provide for channel protection has been waived because

- ● **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development	Post-development
0.[ ][ ][ ] CFS	0.[ ][ ][ ] CFS

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development	Post-development
0.[ ][ ][ ] CFS	0.[ ][ ][ ] CFS

The need to provide for flood control has been waived because

- ● **Site discharges directly to fourth order stream or larger**
- ○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 27 and 28 impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s) (Total Drainage Area = Project Site + Offsite areas)

27. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. [ ][1][3] %

28. Post-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. [ ][ ][6] %

29. Indicate the total number of permanent stormwater management practices to be installed [ ][0]

30. Provide the total number of stormwater discharge points from the site (include discharges to either surface waters or to seperate storm sewer systems) [ ][3]

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Other Permits

Select any other DEC permits that are required for this project or ○ None

DEC Permits

○ Air Pollution Control	○ Stream Protection/Article 15
○ Coastal Erosion	○ Water Quality Certificate
● Hazardous Waste	○ Dam Safety
○ Long Island Wells	○ Water Supply
○ Mined Land Reclamation	○ Freshwater Wetlands
○ Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers

Other

32. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.

NYR

Details/Comments

NYSDEC Hazardous Waste Site #3-14-083

Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I also certify under penalty of law that this document and the corresponding documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction. and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name

MI

Print Last Name

Owner/Operator Signature

Date

/ /

APPENDIX B

CONSTRUCTION ACTIVITY GENERAL PERMIT
GP-02-01

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-02-01

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 8, 2003

Expiration: January 8, 2008

William R. Adriance
Chief Permit Administrator

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

Authorized Signature

William R. Adriance

Date: January 8, 2003

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES
FROM CONSTRUCTION ACTIVITY

Preface

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater discharges from certain construction activities to waters of the United States[1] are unlawful unless they are authorized by a NPDES (National Pollutant Discharge Elimination System) permit or by a state permit program. New York's SPDES (State Pollutant Discharge Elimination System) is a NPDES-approved program with permits issued in accordance with the Environmental Conservation Law ("ECL"). Discharges of pollutants to all other "Waters of New York State" such as groundwaters are also unlawful unless they are authorized by a SPDES permit.

A discharger, owner, or operator may[2] obtain coverage under this general permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this General Permit and the NOI for New York are available by calling (518) 402-8109 or at any Department of Environmental Conservation (the Department) regional office (see Appendix A on Page 23). They are also available on the Department's website at:

www.dec.state.ny.us

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[1] "Waters of the United States" means:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; and
(b) All interstate waters, including interstate "wetlands"; and
(c) All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
    (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    (3) Which are used or could be used for industrial purposes by industries in interstate commerce; and
(d) All impoundments of waters otherwise defined as waters of the United States under this definition; and
(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; and
(f) The territorial sea; and
(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal areas in wetlands) nor resulted from the impoundment of waters of the United States.

[2] "may" refers to circumstances under which the discharger is ineligible for coverage under this general permit because of other provisions of this permit. Dischargers which are excluded from coverage under this general permit as provided for in Part I, Section C, for example, are not authorized to discharge under this permit. This also applies to possible situations in which an NOI has been submitted and/or a regulatory fee paid pursuant to Article 72 of the ECL. The submittal of an NOI and/or regulatory fee has no bearing or relevance whatsoever on the eligibility of the construction activity discharging stormwater runoff under the authority of this permit.

Local Programs of a Regulated MS4

Under the federal Phase II stormwater program, many cities, villages, towns, and other public entities in New York State which are located within "Urbanized Areas" as defined by the U.S. Census and who operate a Municipal Separate Storm Sewer System ("MS4") will be required to obtain SPDES permit coverage for stormwater discharges under their jurisdiction and control (see 40CFR Part 122 §122.26.32). Additionally, MS4s may be designated by the Department as regulated MS4s. Among other requirements, the Phase 2 NPDES stormwater regulations require regulated MS4s to address stormwater runoff from construction activities. Construction activities covered under this general permit, which are subject to stormwater runoff controls of a regulated MS4, will also need to comply with the MS4's controls.

Five (5) Day Coverage

Prior to the submission of an NOI, the owner or operator must have completed a Storm Water Pollution Prevention Plan (SWPPP) that complies with all requirements of this general permit. Submitting an NOI is an affirmation that a SWPPP has been prepared and will be implemented. If an applicant certifies that the SWPPP has been developed in conformance with the Department's technical standards, the applied-for activity may obtain coverage under this general permit in five (5) business days after the Department's receipt of the NOI provided, that the activity is eligible for coverage under this general permit and that the Department has not informed the applicant otherwise.

Sixty (60) Day Coverage

While the Department's technical standards are appropriate statewide, it is recognized that there may be situations where stormwater management goals can best be met by alternative means that are more suitable given local conditions.

For construction projects in these situations, applicants must identify in their NOI each of the deviations from the Department's technical standards that they are seeking. Applicants must also explain why the deviations are needed or desired and what impacts to water quality, if any, can be expected if the deviation were allowed. Applicants must also explain the actions, if any, that local board(s) have taken with respect to the deviation(s). For applicants which cannot certify conformance with the Department's technical standards, the SWPPP must also be certified by a licensed/certified professional that the SWPPP has been developed in a manner which will insure compliance with water quality standards and with the substantive intent of this permit.

In cases of deviations from the Department's technical standards, applicants must allow sixty (60) business days after the receipt by the Department of a completed NOI and certification before gaining coverage under this general permit and before initiating any construction activity. During this 60 day period, the Department may conduct further review of the NOI and SWPPP. If additional information is needed to complete the review, the NOI will be considered

incomplete and the applicant will be so advised. The intent of this provision is to require conformance the Department's technical standards wherever possible and appropriate. At the same time, alternative means to address stormwater control may be allowed under this general permit where they are more suitable for the site in question and where they will not diminish water quality protection.

There are other scenarios under which coverage under this general permit will not occur until 60 business days from the receipt of a completed NOI. For example, if the construction activity or post construction runoff causes the discharge of a pollutant of concern to a water identified on the 303(d) list or a watershed with an approved TMDL for that pollutant of concern, coverage under the general permit will not occur until sixty (60) business days from the receipt by the Department of a completed NOI. For these projects the operator may be required to submit the SWPPP and/or appropriate certification(s) to the Department for review. The flowchart shown in Figure 1 on page vi will help to describe the process under which certain conditions exist that require possible further analysis and water quality/quantity considerations.

Computer Tool Available For Completion of SWPPPs and NOIs Under Development

The Department is currently developing an interactive computer software tool entitled "How to Prepare SWPPPs and Notices of Intent" to assist applicants in both developing SWPPPs and completing NOIs. This will be available in the near future for use on the Department website as well as being packaged independently on compact discs. This tool will contain guidance as well as many useful links to reference materials and documents concerning erosion and sedimentation control, as well as to the design of stormwater management practices . The Department's website will contain the latest information and guidance on the various tools available.

The Department's Technical Standards

The Department's technical standards for erosion and sediment control are contained in the document, *"New York Standards and Specifications for Erosion and Sediment Control"*[3] published by the Empire State Chapter of the Soil and Water Conservation Society. For the design of water quantity and water quality controls (post-construction stormwater control practices), the Department's technical standards are detailed in the *"New York State Stormwater Management Design Manual."* Both of these documents are available on the Department's website. If an applicant certifies that stormwater management practices will conform to the Department's technical standards, then coverage under the permit may occur sooner than otherwise would be the case if non-conformance with the manuals existed. See Figure 1 on page vi for more information.

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[3] Previously, the *"New York Guidelines for Urban Erosion and Sediment Control"*, also commonly referred to as the "Blue Book".

Permit Valid for Any Size Disturbance

This permit may be used for construction activities involving any amount of disturbed acreage, provided that all other eligibility conditions in subsection B of Part I are satisfactorily met (see page 2 of this permit). Thus, this permit may apply to activities identified under 40 CFR Part 122, subsection 122.26(b)(14)(x) which are also referred to as "NPDES Phase 1 construction activities" involving soil disturbances of five (5) acres or more. This permit may also apply to activities identified under 40 CFR Part 122, subsection 122.26(b)(15) which are also referred to as "NPDES Phase 2 small construction activities" involving soil disturbances of between one (1) and five (5) acres. And, this permit may also apply to construction activities involving soil disturbances of less than one (1) acre if the Department determines that a SPDES permit is required pursuant to the ECL. In any and all cases, all of the eligibility provisions of this general permit must be met in order to gain coverage.

Notice of Termination

After construction is completed as defined in the general permit (see Part II beginning on Page 7), cancellation of coverage is accomplished by the submittal of a Notice of Termination ("NOT"). Failure to submit a NOT may result in the continued obligation to pay a yearly Regulatory Fee established pursuant to Article 72 of the ECL and/or may be cause for suspension of permit coverage.

Previous versions of NOIs, NOTs and Notices of Intent, Transfer and Termination ("NOITT"s) cannot be used in conjunction with this general permit. There is a new NOI required for obtaining coverage under this general permit. Failure to include information identified as "mandatory" entries on the new NOI form may prevent and/or delay discharge authorization being sought under this permit.

The new NOT will also include an identification of any permanent structures that are being left on the site after stabilization occurs and after termination of permit coverage under this general permit. The NOT will also include a certification that the structures were constructed as described in the SWPPP and that an Operation and Maintenance ("O&M") manual has been prepared and has been made available to the owner of such permanent structures who is expected to conduct the necessary O&M over the life of the structure(s).

Ineligible Activities

The submittal of a completed NOI and/or the payment of an annual regulatory fee by an applicant does not necessarily mean that an applicant is covered under this permit if the applicant is ineligible for coverage under this permit under the terms cited in Part I of this permit. In other words, submitting a completed NOI and paying an annual regulatory fee does not automatically gain an applicant permit coverage if the applicant is ineligible for coverage under this permit even if the Department fails to immediately inform the applicant of such ineligibility.

Permit Expiration Date

Coverage under this general permit is available January 8, 2003 and will expire five (5) years after issuance on January 8, 2008.

Activities Previously Covered Under GP-93-06

In a separate proposal, the Department is also concurrently seeking to re-issue GP-93-06 with an expiration of August 1, 2003. The purpose of this action is to provide a transition period for permittees which have had SPDES permit coverage under GP-93-06 immediately prior to January 8, 2003, the effective date of GP-02-01. **Prior to August 1, 2003**, these activities will need to:
(1) stabilize their sites in accordance with GP-93-06 and submit an NOT; or, if necessary,
(2) gain coverage under GP-02-01 by submitting a new NOI.

For **new** construction activities, coverage under GP-93-06 will not be available after the effective date of GP-02-01, January 8, 2003. Such discharges may be eligible for coverage under GP-02-01 (see Part I.B. on page 2 of this permit).

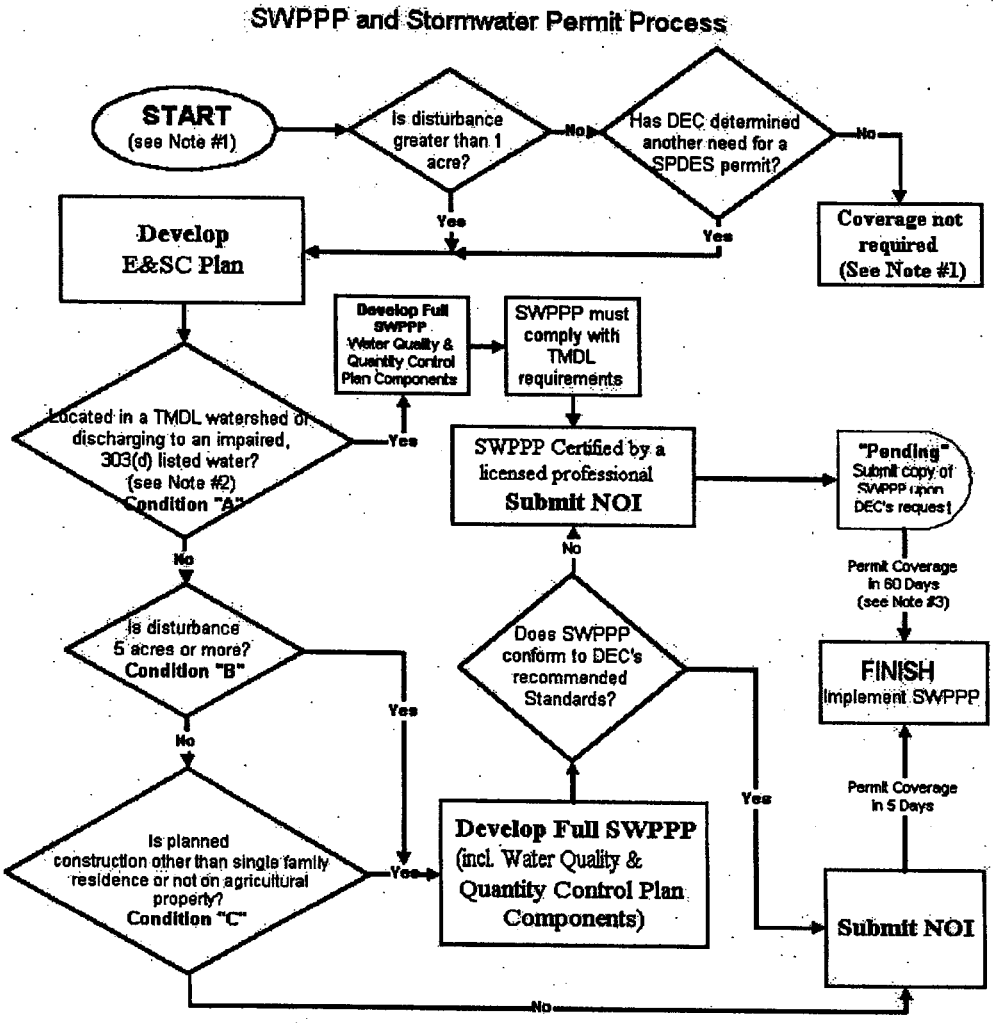
Water Quality Violations Not Permitted

This permit does not authorize any person to cause or contribute to a condition in contravention of any water quality standards that are contained in the Rules and Regulations of the State of New York (see Part I of this permit on page 2) even if the permittee is in compliance with all other provisions of this permit. Any violations of water quality standards may be considered by the Department to be violations of this permit and/or the ECL, including its accompanying regulations.

Other Department Permits

Construction activities may also require other Department permits in addition to the coverage provided by this general permit including, but not limited to, dam safety, wetlands and stream protection. Such other Department permits must be obtained separately from coverage under this general permit. Further information concerning these permits should be sought from the Regional Permit Administrator at the appropriate Department regional office (See Appendix A on page 23).

FIGURE 1



NOTES:

1. Under any of the above conditions other environmental permits may be required. DEC may require permit for construction disturbance < 1 acre on a case by case basis.
2. **and** the following exists: construction and/or stormwater discharges from the construction or post-construction site contain the pollutant of concern identified in the TMDL or 303(d) listing.
3. After receipt by DEC of completed application.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES

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Part I. COVERAGE UNDER THIS PERMIT

A. **Maintaining Water Quality** - It shall be a violation of this general permit and the Environmental Conservation Law ("ECL") for any discharge authorized by this general permit to either cause or contribute to a violation of water quality standards as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York including, but not limited to:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal and settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

B. **Eligibility Under This General Permit**

1. This permit may authorize all discharges of stormwater from construction activity[4] to surface waters and groundwaters except for ineligible discharges identified under subparagraph C of this Part (see below). Discharge authorization under this permit requires the submittal of a completed NOI.

2. Except for non-stormwater discharges explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from construction activities.

3. Notwithstanding paragraphs B.1 and B.2 above, the following non-stormwater discharges may be authorized by this permit: discharges from fire

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[4] This includes discharges of stormwater associated with industrial activity identified under 40 CFR Part 122, subsection 122.26(b)(14)(x), small construction activities identified under 40 CFR Part 122, subsection 122.26(b)(15) or any other stormwater from construction activities that are not otherwise ineligible for coverage under this permit (See Part I, subsection B beginning on page 2).

fighting activities; fire hydrant flushings; waters to which cleansers or other components have **not** been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this general permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP(see Part III beginning on Page 7). Under all circumstances, the permittee must still comply with water quality standards (see Part I, subsection A on Page 2).

C. **Activities Which Are Ineligible for Coverage Under This General Permit** - All of the following stormwater discharges from construction activities are **not** authorized by this permit:

1. Discharges after construction activities have been completed and the site has undergone final stabilization[5];

2. Discharges that are mixed with sources of non-stormwater other than those expressly authorized under subsection B.3. of this Part (see page 3) and identified in the SWPPP required by this permit;

3. Discharges that are subject to an existing SPDES individual or general permit or which are required to obtain an individual or alternative general permit pursuant to Part V, subparagraph K (see page 21) of this permit;

4. Discharges that are likely to adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. Discharges which are subject to an existing effluent (limitation) guideline addressing stormwater and/or process wastewater unless said guidelines are contained herein; or

6. Discharges which either cause or contribute to a violation of water quality standards adopted pursuant to the ECL and its accompanying regulations (See subsection A of Part I on page 2).

---

[5] "Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 80% has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

D. **Authorization Under This General Permit**

1. An operator[6] must submit a completed NOI form in order to be authorized to discharge under this general permit. The NOI form shall be one which is associated with this general permit, signed in accordance with Part V. H.(see Page 19) of this permit and submitted to the address indicated on the NOI form. NOIs and NOITTs used in association with either previous or other general permits are not valid for obtaining coverage under this general permit. The submittal of an NOI is an affirmation to the operators' understanding and belief that the activity is eligible for coverage under this permit and that a SWPPP has been prepared and will be implemented in accordance with Part III of this permit.

2. All contractors and subcontractors of the operator identified under Part III.E.1 (see page 17) must provide the certification cited under Part III.E.2 (see page 17). Such certifications shall become part of the SWPPP for the construction activity covered under this general permit.

3. Unless notified by the Department to the contrary, operators who are eligible for coverage under this permit **and** who submit an NOI in accordance with the requirements of this permit, may be authorized to discharge stormwater from construction activities under the terms and conditions of this permit, and in accordance with the following timetable:

a. For construction activities which:

(1) develop a SWPPP in conformance with the Department's technical standards (See subsection D of Part III on page 10), and do not or will not discharge a pollutant of concern to an impaired water or a TMDL watershed;

or

(2) as of the effective date of this general permit, GP-02-01, have obtained coverage under, and are operating in compliance with, GP-93-06; and do not or will not discharge a pollutant of concern to an impaired water or a TMDL watershed;

authorization to discharge under this permit may occur five (5) business days after the date on which the NOI is received by the Department.

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6 For the purposes of this permit, the term "operator" means the person, persons, or legal entity which owns or leases the property on which the construction activity is occurring. Also, see Part V., subsection H. on page 19 of this permit.

b. For activities which do not comply with the preceding subsection (i.e. Part I.D.3.a.), authorization to discharge under this permit will begin no sooner than sixty (60) business days from the receipt of the completed NOI unless notified differently by the Department pursuant to Part V, subsection K of this permit (see page 21). For activities not satisfying Part I.D.3.a.(1) above, or for construction site runoff subject to a TMDL (see Figure 1 on page vi), the SWPPP must be prepared by a licensed/certified professional[7] and include a certification stating that the SWPPP has been developed in a manner which will assure compliance with water quality standards (see Part I.A.) and with the substantive intent of this permit.

c. For construction activities which are subject to a sixty-day period provision identified in the preceding subparagraph b., the SWPPP shall include each of the components identified in Part III.A.1.b. (see page 8).

4. At its sole discretion, the Department may deny or terminate coverage under this permit and require coverage under another SPDES permit at any time based on a review of the NOI, the SWPPP or other relevant information (see Part V, subsection K of this permit on page 21).

5. A copy of the NOI and a brief description of the project shall be posted at the construction site in a prominent place for public viewing.

6. A signed copy of the NOI, the SWPPP, and any reports required by this permit shall also be submitted concurrently to the local governing body and any other authorized agency[8] having jurisdiction or regulatory control over the construction project.

7. New stormwater discharges from construction activities that require any other Uniform Procedures Act permit (Environmental Conservation Law, 6 NYCRR Part 621) cannot be covered under this general permit until the other required permits are obtained. Upon satisfaction of the State Environmental Quality Review Act ("SEQRA") for the proposed action and issuance of necessary permits, the applicant may submit an NOI to obtain coverage under this general

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7 A "licensed/certified professional" means a person currently licensed to practice engineering in New York State or is a Certified Professional in Erosion and Sediment Control (CPESC).

8 For the purposes of this general permit, "any other authorized agency" shall include any local, regional, or state entity or agency except the Department which has authority to review stormwater discharge from the project, including authority under any approved watershed protection plan or regulations.

permit.[9] In order to facilitate the Department's review of a multi-permitted project, an applicant should submit, at a minimum, a copy of the SWPPP which contains the information specified in Appendix B (see page 24). This information will assist the Department in determining whether or not coverage under this general permit or another SPDES permit is the more appropriate option. The Department may also require the submission of additional information in order to determine the SWPPP's conformance with the Department's technical standards.

8. Upon renewal of this general permit or issuance of a new general permit, the permittee is required to notify the Department of its intent to be covered by the new general permit. Coverage will continue under this permit for its term unless action is taken to terminate permit coverage as provided elsewhere in this permit. See also Part V. subsection B. on page 18 of this permit.

9. In the event of a transfer of ownership or responsibility for stormwater runoff, there can be no "automatic" transfer of permit coverage from one permittee to the next without appropriate notification from the dischargers. The former permittee must submit an NOT and notify the new discharger of the possible need for the new discharger to submit a new NOI (see Section E, subparagraph 2 below).

E. Deadlines for Notification

1. Operators who intend to obtain coverage under this general permit for stormwater runoff from construction activities must submit an NOI in accordance with the requirements of this Part at least five (5), or sixty (60) business days, as appropriately determined from Part I, Section D.3 (see page 4) prior to the commencement of construction[10] activities.

2. For stormwater runoff from construction activities where the operator changes, a new NOI must be submitted by the new operator in accordance with the requirements of this permit. The former operator must submit a NOT in accordance with Part II (see page 7) of this permit and notify the new operator of the requirement to submit a new NOI to obtain coverage under this permit. The new operator must also review and sign the SWPPP in accordance with Part III.B.(see page 9) and continue implementation of the SWPPP as required by this

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9 The purposes of this subsection is to assure that the requirements of SEQRA are fulfilled, if necessary, before any discharge authorization under this general permit is granted.

10 "Commencement of Construction" means the initial disturbance of soils associated with clearing, grading, or excavating activities, or other construction activities.

permit.

Part II. TERMINATION OF COVERAGE[11]

Where a site has been finally stabilized, the operator must submit a NOT form prescribed by the Department for use with this general permit. The NOT shall be signed in accordance with Part V. H.(see page 19) of this permit and submitted to the address indicated on the approved NOT form.

The permittee must identify all permanent stormwater management structures that have been constructed and provide the owner(s) of such structures with a manual describing the operation and maintenance practices that will be necessary in order for the structure to function as designed after the site has been stabilized. The permittee must also certify that the permanent structure(s) have been constructed as described in the SWPPP.

Part III. STORMWATER POLLUTION PREVENTION PLANS ("SWPPP"s)

A. General

1. SWPPP Preparation

a. A SWPPP shall be developed by the operator for construction activities at each site to be covered by this permit, prior to the initiation of activities requiring coverage under this permit. SWPPPs shall be prepared in accordance with sound engineering practices. The SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges. In addition, the SWPPP shall describe and ensure the implementation of practices which will be used to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. Operators are encouraged to have their SWPPP reviewed for adequacy and completeness by the local soil and water conservation district ("SWCD") and/or other professionals qualified in erosion and sediment control practices[12] and stormwater management. Moreover, if the construction activity is identified under Part I, subsection D.3.b. (See page 5), or for construction site runoff subject to a TMDL (see Figure 1 on page vi), the SWPPP must include a certification by a licensed/certified professional.

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11 Submittal of an NOT will terminate coverage under this general permit and will also remove the permittee from subsequent billings of the annual regulatory fee levied under Article 72 of the ECL.

12 For example, CPESC, Inc. administers a certified program of individuals under its CPESC (Certified Professional in Erosion and Sediment Control) program which is sponsored by the International Erosion Control Association (IECA) and the Soil and Water Conservation Society (SWCS) and is endorsed by USDA - Natural Resources Conservation Service. CPESC, Inc. also administers the CPSWQ (Certified Professional in Stormwater Quality) program.

b. All SWPPPs shall include erosion and sediment controls. For construction activities meeting either Condition "A", "B" or "C" described below, the SWPPP shall also include water quantity and water quality controls (post-construction stormwater control practices).(see Part III. D.).

(1) Condition A - Construction site or post construction runoff discharging a pollutant of concern to either an impaired water identified on DEC's 303(d) list or a TMDL watershed for which pollutants in stormwater have been identified as a source of the impairment.

(2) Condition B - Construction site runoff from Phase 1 construction activities (construction activities disturbing five (5) or more acres) identified under 40 CFR Part 122, §122.26(b)(14)(x).

(3) Condition C - Construction site runoff from construction activity disturbing between one (1) and five (5) acres of land during the course of the project, exclusive of the construction of single family residences and construction activities at agricultural properties.

2. **SWPPP Implementation** - Operators are responsible for implementing the provisions of the SWPPP and ensuring that all contractors and subcontractors who perform professional services at the site provide certification of the SWPPP in accordance with Part I.D.2. (see page 4) and Part III.E.2. (see page 17) of this permit. All contractors and subcontractors identified in the SWPPP in accordance with Part III.E.1. (see page 17) of this permit must agree to implement applicable provisions of the SWPPP and satisfy the certification requirement of Part III.E.2. (see page17). However, contractors and subcontractors who are not operators, as defined in this permit (see page 4), are not required to submit a NOI in addition to the NOI submitted by the operator.

3. **Deadlines for SWPPP Preparation and Compliance** - The SWPPP must be developed prior to the submittal of an NOI and provide for compliance with the terms and schedule of the SWPPP beginning with the initiation of construction activities. The operator shall also certify in the SWPPP that all appropriate stormwater control measures will be in place before commencement of construction of any segment of the project that requires such measures.

4. **Local Requirements** - Developing a SWPPP that complies with the requirements listed herein does not relieve an operator from the obligation of complying with stormwater management requirements of the local government having jurisdiction over the project.

5. **Activities Previously Covered Under GP-93-06** - For construction activities which are covered by GP-93-06 as of the effective date of this permit (GP-02-01), the continued implementation of their SWPPP that was developed and implemented in accordance with GP-93-06 is acceptable until such time as:

(a) an NOT is submitted;

(b) the Department notifies them otherwise in accordance with this permit, including Part V, subsection K (see page 21); or

(c) this permit expires.

B. **Signature and SWPPP Review**

1. The SWPPP shall be signed in accordance with Part V. H.(see page 19), and be retained at the site where the construction activity occurs in accordance with Part IV (see retention of records on page 17) of this permit.

2. The permittee shall submit a copy of the SWPPP and any amendments thereto to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction activity. The operator shall make SWPPPs available upon request to the Department and any local agency having jurisdiction; or in the case of a stormwater discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the municipal operator of the system.

3. The Department, or its authorized representative, may notify the permittee at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. Such notification shall identify those provisions of the permit which are not being met by the SWPPP and identify which provisions of the SWPPP require modifications in order to meet the minimum requirements of this permit. Within seven (7) days of such notification, (or as otherwise provided by the Department) the permittee shall make the required changes to the SWPPP and shall submit to the Department a written certification that the requested changes have been made. Notwithstanding the foregoing, the Department reserves all rights to enforce the terms of the ECL.

C. **Keeping SWPPPs Current** - The permittee shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or

2. The SWPPP proves to be ineffective in:

   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP required by this permit, or

   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity.

3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP (see Part III.E, page 17 below). Amendments to the SWPPP may be reviewed by the Department in the same manner as provided by Part III.B (see page 9 above).

D. **General Contents of SWPPPs** -

1. Standards for construction activities covered under this permit - The Department's technical standards for erosion and sediment controls are detailed in the "*New York Standards and Specifications for Erosion and Sediment Control*"[13] published by the Empire State Chapter of the Soil and Water Conservation Society. For the design of water quality and water quantity controls (post-construction stormwater control practices), the Department's technical standards are detailed in the "*New York State Stormwater Management Design Manual.*"

If an operator certifies that the SWPPP has been developed in conformance with the Department's technical standards referenced above, they may obtain coverage under this general permit in five (5) business days from the Department's receipt of the NOI, provided the construction activity does not meet Condition A in Part III.A.1.b. For SWPPPs which will not conform with the Department's technical standards, the SWPPP must be prepared by a licensed/certified professional and include a certification stating that the SWPPP has been developed in a manner which will assure compliance with the State's water quality standards and with the substantive intent of this permit. In addition, coverage under this general permit will not begin until sixty (60) business days from the receipt of a completed NOI.

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13 Previously, the "*New York Guidelines for Urban Erosion and Sediment Control*," also commonly referred to as the "Blue Book."

2. **Minimum SWPPP Components** SWPPPs prepared pursuant to this general permit shall present fully designed and engineered stormwater management practices with all necessary maps, plans and construction drawings. The SWPPP must, at a minimum, include the following:

a. For all construction activities subject to this general permit -

(1). provide background information about the scope of the project, including the location, type and size of project.

(2) provide a site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map should show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of off-site material, waste, borrow or equipment storage areas; and location(s) of the stormwater discharge(s);

(3) provide a description of the soil(s) present at the site;

(4) provide a construction phasing plan describing the intended sequence of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance. Consistent with the New York Guidelines for Urban Erosion and Sediment Control, there shall not be more than five (5) acres of disturbed soil at any one time without prior written approval from the Department;

(5) provide a description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the storm water discharges;

(6) provide a description of construction and waste materials expected to be stored on-site with updates as appropriate, and a description of controls to reduce pollutants from these materials including storage practices to minimize exposure of the materials to storm water, and spill prevention and response;

(7) describe the temporary and permanent structural and vegetative measures to be used for soil stabilization, runoff control and sediment control for each stage of the project from initial land

clearing and grubbing to project close-out;

(8) identify and show on a site map/construction drawing(s) the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

(9) provide the dimensions, material specifications and installation details for all erosion and sediment control practices, including the siting and sizing of any temporary sediment basins;

(10) identify temporary practices that will be converted to permanent control measures;

(11) provide an implementation schedule for staging temporary erosion and sediment control practices, including the timing of initial placement and the duration that each practice should remain in place;

(12) provide a maintenance schedule to ensure continuous and effective operation of the erosion and sediment control practices;

(13) provide the names(s) of the receiving water(s);

(14) provide a delineation of SWPPP implementation responsibilities for each part of the site;

(15) provide a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable; and

(16) provide any existing data that describes the stormwater runoff characteristics at the site.

b. For construction activities meeting Condition A, B or C in Part III.A.1.b.

(1) provide all the information required in Parts III.D.2.a.1 - 16 above;

(2) provide a description of each post-construction stormwater control practice;

(3) identify and show on a site map/construction drawing(s) the specific location(s) and size(s) of each post-construction stormwater control practice;

(4) provide a hydrologic and hydraulic analysis for all structural components of the stormwater control system for the applicable design storms;

(5) provide a comparison of post-development stormwater runoff conditions with pre-development conditions;

(6) provide the dimensions, material specifications and installation details for each post-construction stormwater control practice;

(7) provide a maintenance schedule to ensure continuous and effective operation of each post-construction stormwater control practice.

The following three subsections, Part III.D. 3. through Part III.D. 5., apply only to construction activities covered under this general permit which meet Conditions "A" , "B"[14] or "C" in Part III. A.1.b. Beginning with Part III.E. below (see page 17) the requirements set forth therein apply to all permittees covered under this permit.

3. **Site Assessment and Inspections** -

a. The operator shall have a qualified professional[15] conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP and required by Part III.D. (see page 10) of this permit have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. During each inspection, the qualified professional shall record the following information:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

(4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and

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14 Condition "B" includes construction activities covered under GP-93-06 and, therefore, are subject to Part III.D.3 through Part III.D. 5.

15 "Qualified professional" means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist.

containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water;
and

(6) All deficiencies that are identified with the implementation of the SWPPP.

b. The operator shall maintain a record of all inspection reports in a site log book. The site log book shall be maintained on site and be made available to the permitting authority upon request. Prior to the commencement of construction,[16] the operator shall certify in the site log book that the SWPPP, prepared in accordance with Part III.D. (see page 10) of this permit, meets all Federal, State and local erosion and sediment control requirements.

The operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.

c. Prior to filing of the Notice of Termination or the end of permit term, the operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[17] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

d. The operator shall certify that the requirements of Parts III.D.3., III.D.4. and III.D.5 of this permit have been satisfied within 48 hours of actually meeting such requirements.

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16 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

17 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

4. **Stabilization**[18] - The operator shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply in the following instances:

a. Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;

b. Where construction activity on a portion of the site is temporarily ceased, and earth-disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures need not be initiated on that portion of the site.

5. **Maintenance** - Sediment shall be removed from sediment traps or sediment ponds whenever their capacity has been reduced by fifty (50) percent from the design capacity.

18 "Stabilization" means covering or maintaining an existing cover over soil. Cover can be vegetative (e.g. grass, trees, seed and mulch, shrubs, or turf) or non-vegetative (e.g. geotextiles, riprap, or gabions).

E. **Contractors**

1. The SWPPP must clearly identify for each measure identified in the SWPPP, the contractor(s) and subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the SWPPP must sign a copy of the certification statement in Part III.E.2 (see below) of this permit in accordance with Part V.H.(see page 19) of this permit. All certifications must be included in the SWPPP. Additionally, new contractors and subcontractors (see subsection C.3. above) need to similarly certify.

2. **Certification Statement** - All contractors and subcontractors identified in a SWPPP in accordance with Part III.E.1 (see above) of this permit shall sign a copy of the following certification statement before undertaking any construction activity at the site identified in the SWPPP:

> "I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction site identified in such SWPPP as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

The certification must include the name and title of the person providing the signature in accordance with Part V.H.(see page 19) of this permit; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part IV. MONITORING, REPORTING AND RETENTION OF RECORDS

A. The Department may, at its sole discretion, require monitoring of discharge(s) from the permitted construction activity after notifying the permittee in writing of the basis for such monitoring, the parameters and frequency at which monitoring shall occur and the associated reporting requirements, if any.

B. The operator shall retain copies of SWPPPs and any reports submitted in conjunction with this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

C. The operator shall retain a copy of the SWPPP required by this permit at the construction site from the date of initiation of construction activities to the date of final

stabilization.

D. The operator shall also prepare a written summary of its status with respect to compliance with this general permit at a minimum frequency of every three months during which coverage under this permit exists. The summary should address the status of achieving each component of the SWPPP . This summary shall be handled in the same manner as prescribed for SWPPPs under Part III, subsection B (see Page 9).

E. **Addresses** - Except for the submittal of NOIs and NOTs, all written correspondence under this permit directed to the Department, including the submittal of individual permit applications, shall be sent to the address of the appropriate Department Office as listed in Appendix A (see page 23).

Part V. STANDARD PERMIT CONDITIONS

A. **Duty to Comply** - The operator must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against either the operator or the contractor/subcontractor; permit revocation or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all construction activity at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the operator or the operator's on-site representative.

B. **Continuation of the Expired General Permit** - This permit expires five (5) years after issuance on January 8, 2008. However, coverage may be obtained under the expired general permit which will continue in force and effect until a new general permit is issued. After issuance of a new general permit, those with coverage under GP-02-01 will have six (6) months from the effective date of the new general permit to complete their project or obtain coverage under the new permit. Unless otherwise notified by the Department in writing, operators seeking authorization under a new general permit must submit a new NOI in accordance with the terms of such new general permit. See also Part I, subsection D.8. on page 6.

C. **Penalties for Violations of Permit Conditions** - There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $25,000 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. **Need to halt or reduce activity not a defense** - It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the construction activity in order to maintain compliance with the conditions of this permit.

E. **Duty to Mitigate** - The permittee and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. **Duty to Provide Information** - The permittee shall furnish any information requested by any agency with regulatory or review authority over this project for the purpose of determining compliance with this permit or compliance with any other regulatory requirements placed on the project in conjunction with this permit. Failure to provide requested information shall be a violation of this permit. Such regulating agencies include but are not limited to the Department, SWCDs,[19] local planning, zoning, health, and building departments that review and approve erosion and sediment control plans, grading plans, and Stormwater Management Plans, as well as MS4s into whose system runoff from the permitted project or activity discharges. The SWPPP and inspection reports required by this general permit are public documents that the operator must make available for inspection, review and copying by any person within five (5) business days of the operator receiving a written request by any such person to review the SWPPP and/or the inspection reports. Copying of documents will be done at the requester's expense.

G. **Other Information** - When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI or in any other report to the Department, he or she shall promptly submit such facts or information.

H. **Signatory Requirements** - All NOIs, NOTs, SWPPPs, reports, certifications or information required by this permit or submitted pursuant to this permit, shall be signed as follows:

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation: by (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person authorized to and who performs similar policy or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

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19 "SWCD" means Soil and Water Conservation District

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and all reports required by the permit and other information requested by the Department or local agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Department.

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. **Certification** - Except for NOIs and NOTs, any person signing documents in accordance with this Part shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

I. **Property Rights** - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

J. **Severability** - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. **Denial of Coverage Under This Permit**

1. At its sole discretion, the Department may require any person authorized by this permit to apply for and/or obtain either an individual SPDES permit or an alternative SPDES general permit. Where the Department requires a discharger authorized to discharge under this permit to apply for an individual SPDES permit, the Department shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual SPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate Department Office indicated in Appendix A of this permit. The Department may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual SPDES permit application as required by the Department under this paragraph, then the applicability of this permit to the individual SPDES permittee is automatically terminated at the end of the day specified by the Department for application submittal.

2. Any discharger authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix A on page 23 of this permit). The request may be granted by issuance of an individual permit or an alternative general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger covered by this permit, or the discharger is authorized to discharge under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual SPDES permit is denied to an operator otherwise subject to this permit, or the operator is denied for coverage under an alternative SPDES general permit, the applicability of this permit to the individual SPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Department.

L. **Proper Operation and Maintenance** - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of SWPPPs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

M. **Inspection and Entry** - The permittee shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an MS4, an authorized representative of the MS4 receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. **Permit Actions** - At the Department's sole discretion, this permit may, at any time, be modified, revoked, or renewed. The filing of a request by the permittee for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not stay compliance with any terms of this permit.

APPENDIX A

List of NYS DEC Regional Offices

Region	Covering the following counties:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) Permit Administrators	DIVISION OF WATER (DOW) Water (SPDES) Program
1	Nassau and Suffolk	Bldg 40 - SUNY @ Stony Brook Stony Brook, NY 11790-2356 Tel. (631) 444-0365	Bldg 40 - SUNY @ Stony Brook Stony Brook, NY 11790-2356 Tel. (631) 444-0405
2	Bronx, Kings, New York, Queens and Richmond	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4997	1 Hunters Point Plaza, 47-40 21st St. Long Island City, NY 11101-5407 Tel. (718) 482-4933
3	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester	21 South Putt Corners Road New Paltz, NY 12561-1696 Tel. (845) 256-3059	200 White Plains Road, 5th Floor Tarrytown, NY 10591-5805 Tel. (845) 332-1835
4	Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2069	1150 North Westcott Road Schenectady, NY 12306-2014 Tel. (518) 357-2045
5	Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington	Route 86, PO Box 296 Ray Brook, NY 12977-0296 Tel. (518) 897-1234	232 Hudson Street Warrensburg, NY 12885-0220 Tel. (518) 623-1200
6	Herkimer, Jefferson, Lewis, Oneida and St. Lawrence	State Office Building 317 Washington Street Watertown, NY 13601-3787 Tel. (315) 785-2245	State Office Building 207 Genesee Street Utica, NY 13501-2885 Tel. (315) 793-2554
7	Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins	615 Erie Blvd. West Syracuse, NY 13204-2400 Tel. (315) 426-7438	615 Erie Blvd. West Syracuse, NY 13204-2400 Tel. (315) 426-7500
8	Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne and Yates	6274 East Avon-Lima Road Avon, NY 14414-9519 Tel. (585) 226-2466	6274 East Avon-Lima Rd. Avon, NY 14414-9519 Tel. (585) 226-2466
9	Allegany, Cattaraugus, Chautauqua, Erie, Niagara and Wyoming	270 Michigan Avenue Buffalo, NY 14203-2999 Tel. (716) 851-7165	270 Michigan Ave. Buffalo, NY 14203-2999 Tel. (716) 851-7070

APPENDIX B

Information Required of Construction Activities Which Are Identified Under Part I, subsection D.7. (see page 5)

A. The location (including a map) and the nature of the construction activity;

B. The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit;

C. Proposed measures, including best management practices, to control pollutants in storm water discharges during construction, including a brief description of applicable State and local erosion and sediment control requirements;

D. Proposed measures to control pollutants in storm water discharges that will occur after construction operations have been completed, including a brief description of applicable State or local erosion and sediment control requirements;

E. An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of the fill material and existing data describing the soil or the quality of the discharge; and

F. The name of the receiving water(s).

APPENDIX C

SEDIMENT AND EROSION CONTROL SPECIFICATIONS AND GUIDELINES

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

New York State Standards and Specifications for Erosion and Sediment Control

August 2005



New York State
Department of Environmental Conservation

George E. Pataki, Governor

NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL

Prepared By:
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Contributing Agencies:

Center for Integrated Waste Management, Cornell University

New York State Conservation District Employees Association

New York State Department of Environmental Conservation

New York City Department of Environmental Protection

New York State Department of State

New York State Department of Transportation

New York State Soil & Water Conservation Committee

United States Department of Agriculture Natural Resources Conservation Service—formerly the Soil Conservation Service

General Disclaimer

The mention of trade names, products, proprietary processes, or companies does not constitute an endorsement by the New York State Department of Environmental Conservation. References are used for the purposes of information sources and alternative concepts. This manual is intended for periodic update and thus, sections may be changed or added as criteria for erosion and sediment control evolve.

Printed By:

SOIL AND WATER CONSERVATION SOCIETY

Empire State Chapter
Soil and Water Conservation Society

For:

New York State
Department Of Environmental
Conservation

SECTION 3
VEGETATIVE MEASURES
FOR EROSION AND SEDIMENT CONTROL

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STANDARD AND SPECIFICATIONS FOR MULCHING



Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7"	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2"	9 cu. yds.	405 cu. yds.	3"	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/ yd. 60-90 lbs./roll	48" x 50 yds. or 48" x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8" x 100" 2-sided plastic, 48" x 180" 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3" pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3"	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 3.8
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS FOR PROTECTING VEGETATION DURING CONSTRUCTION



Definition

The protection of trees, shrubs, ground cover and other vegetation from damage by construction equipment.

Purpose

To preserve existing vegetation determined to be important for soil erosion control, water quality protection, shade, screening, buffers, wildlife habitat, wetland protection, and other values.

Condition Where Practice Applies

On planned construction sites where valued vegetation exists and needs to be preserved.

Design Criteria

1. Planning Considerations

   A. Inventory:

      1) Property boundaries, topography, vegetation and soils information should be gathered. Identify potentially high erosion areas, areas with tree windthrow potential, etc. A vegetative cover type map should be made on a copy of a topographic map which shows other natural and manmade features. Vegetation that is desirable to preserve because of its value for screening, shade, critical erosion control, endangered species, aesthetics, etc., should be identified and marked on the map.

      2) Based upon this data, general statements should be prepared about the present condition, potential problem areas, and unique features of the property.

   B. Planning:

      1) After engineering plans (plot maps) are prepared, another field review should take place and recommendations made for the vegetation to be saved. Minor adjustments in location of roads, dwellings, and utilities may be needed. Construction on steep slopes, erodible soils, wetlands, and streams should be avoided. Clearing limits should be delineated (See Section 2).

      2) Areas to be seeded and planted should be identified. Remaining vegetation should blend with their surroundings and/or provide special function such as a filter strip, buffer zone, or screen.

      3) Trees and shrubs of special seasonal interest, such as flowering dogwood, red maple, striped maple, serviceberry, or shadbush, and valuable potential shade trees should be identified and marked for special protective treatment as appropriate.

      4) Trees to be cut should be marked on the plans. If timber can be removed for salable products, a forester should be consulted for marketing advice.

      5) Trees that may become a hazard to people, personal property, or utilities should be removed. These include trees that are weak-wooded, disease-prone, subject to windthrow, or those that have severely damaged root systems.

      6) The vigor of remaining trees may be improved by a selective thinning. A forester should be consulted for implementing this practice.

2. Measures to Protect Vegetation

   A. Limit soil placement over existing tree and shrub roots to a maximum of 3 inches. Soils with loamy texture and good structure should be used.

   B. Use retaining walls and terraces to protect roots of trees and shrubs when grades are lowered. Lowered grades should start no closer than the dripline of the tree. For narrow-canopied trees and shrubs, the stem diameter in inches is converted to feet and doubled, such that a 10 inch tree should be protected to 20 feet.

C. Trenching across tree root systems should be the same minimum distance from the trunk, as in "B". Tunnels under root systems for underground utilities should start 18 inches or deeper below the normal grounds surface. Tree roots which must be severed should be cut clean. Backfill material that will be in contact with the roots should be topsoil or a prepared planting soil mixture.

D. Construct sturdy fences, or barriers, of wood, steel, or other protective material around valuable vegetation for protection from construction equipment. Place barriers far enough away from trees, but not less than the specifications in "B", so that tall equipment such as backhoes and dump trucks do not contact tree branches.

E. Construction limits should be identified and clearly marked to exclude equipment.

F. Avoid spills of oil/gas and other contaminants.

G. Obstructive and broken branches should be pruned properly. The branch collar on all branches whether living or dead should not be damaged. The 3 or 4 cut method should be used on all branches larger than two inches at the cut. First cut about one-third the way through the underside of the limb (about 6-12 inches from the tree trunk). Then (approximately an inch further out) make a second cut through the limb from the upper side. When the branch is removed, there is no splintering of the main tree trunk. Remove the stub. If the branch is larger than 5-6 inches in diameter, use the four cut system. Cuts 1 and 2 remain the same and cut 3 should be from the underside of the limb, on the outside of the branch collar. Cut 4 should be from the top and in alignment with the 3rd cut. Cut 3 should be 1/4 to 1/3 the way through the limb. This will prevent the bark from peeling down the trunk. Do not paint the cut surface.

H. Penalties for damage to valuable trees, shrubs, and herbaceous plants should be clearly spelled out in the contract.

STANDARD AND SPECIFICATIONS FOR PERMANENT CRITICAL AREA PLANTINGS



Definition

Establishing grasses with other forbs and/or shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

Purpose

To reduce erosion and sediment transport.

Conditions Where Practice Applies

This practice applies to all disturbed areas void of, or having insufficient, cover to prevent erosion and sediment transport. See additional standards for special situations such as sand dunes and sand and gravel pits.

Criteria

All water control measures will be installed as needed prior to final grading and seedbed preparation. Any severely compacted sections will require chiseling or disking to provide an adequate rooting zone, to a minimum depth of 12". The seedbed must be prepared to allow good soil to seed contact, with the soil not too soft and not too compact. Adequate soil moisture must be present to accomplish this. If surface is powder dry or sticky wet, postpone operations until moisture changes to a favorable condition. If seeding is accomplished within 24 hours of final grading, additional scarification is generally not needed, especially on ditch or stream banks. Remove all stones and other debris from the surface that are greater than 4 inches, or that will interfere with future mowing or maintenance.

Soil amendments should be incorporated into the upper 2 inches of soil when feasible. **The soil should be tested to determine the amounts of amendments needed.** Apply ground agricultural limestone to attain a pH of 6.0 in the upper 2 inches of soil. If soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 600 lbs. per acre of 5-10-10 or equivalent. If manure is used, apply a quantity to meet the nutrients of the above fertilizer. This requires an appropriate manure analysis prior to applying to the site. Do not use manure on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

Seed mixtures may vary depending on location within the state and time of seeding. Generally, warm season grasses should only be seeded during early spring, April to May. These grasses are primarily used for vegetating excessively drained sands and gravels. See Standard and Specification for Sand and Gravel Mine Reclamation. Other grasses may be seeded any time of the year when the soil is not frozen and is workable. When legumes such as birdsfoot trefoil are included, spring seedings are preferred. See Table 3.1 "Permanent Critical Area Planting Mixture Recommendations" for additional seed mixtures.

General Seed Mix:
[1] add inoculant immediately prior to seeding

	Variety	lbs./acre	lbs/1000 sq. ft.
Birdsfoot trefoil[1] OR	Empire/Pardee	8[2]	0.20
Common white clover[1]	Common	8	0.20
PLUS			
Tall fescue	KY-31/Rebel	20	0.45
PLUS			
Redtop OR	Common	2	0.05
Ryegrass (perennial)	Pennfine/Linn	5	0.10

[2] Mix 4 lbs each of Empire and Pardee OR 4 lbs of Birdsfoot and 4 lbs white clover per acre.

Time of Seeding: The optimum timing for the general seed mixture is early spring. Permanent seedings may be made any time of year if properly mulched and adequate moisture is provided. Late June through early August is not a good time to seed, but may facilitate covering the land without additional disturbance if construction is completed. Portions of the seeding may fail due to drought and heat. These areas may need reseeding in late summer/fall or the following spring.

Method of seeding: Broadcasting, drilling, cultipack type

seeding, or hydroseeding are acceptable methods. Proper soil to seed contact is key to successful seedings.

M[illegible]hing: Mulching is essential to obtain a uniform stand o[illegible]ded plants. Optimum benefits of mulching new seedings are obtained with the use of small grain straw applied at a rate of 2 tons per acre, and anchored with a netting or tackifier. See the mulch standard and specification for choices and requirements.

Irrigation: Watering may be essential to establish a new seeding when a drought condition occurs shortly after a new seeding emerges. Irrigation is a specialized practice and care must be taken not to exceed the application rate for the soil or subsoil. When disconnecting irrigation pipe, be sure pipes are drained in a safe manor, not creating an erosion concern.

Table 3.1
Permanent Critical Area Planting Mixture Recommendations

Seed mixture	Variety	Rate in lbs. per acre	Rate in lbs. Per 1000 sq. ft.
Mix #1			
Creeping red fescue	Ensylva, Pennlawn, Boreal	10	.25
Perennial ryegrass	Pennfine, Linn	10	.25
*This mix is used extensively for shaded areas.			
Mix #2			
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	20	.5
*This rate is in pure live seed, this would be an excellent choice along the upland edge of a wetland to filter runoff and provide wildlife benefits. In areas where erosion may be a problem, a companion seeding of sand lovegrass should be added to provide quick cover at a rate of 2 lbs. per acre (0.05 lbs. per 1000 sq. ft.).			
Mix #3			
Switchgrass	Shelter, Pathfinder, Trailblazer, or Blackwell	4	.1
Big bluestem	Niagara	4	.1
Little bluestem	Aldous or Camper	2	.05
Indiangrass	Rumsey	4	.1
Coastal panicgrass	Atlantic	2	.05
Sideoats grama	El Reno or Trailway	2	.05
Wildflower mix		.5	.01
*This mix has been successful on sand and gravel plantings. It is very difficult to seed without a warm season grass seeder such as a Truax seed drill. Broadcasting this seed is very difficult due to the fluffy nature of some of the seed, such as bluestems and indiangrass.			
Mix #4			
Switchgrass	Shelter, Pathfinder Trailblazer, or Blackwell	10	.25
Coastal panicgrass	Atlantic	10	.25
*This mix is salt tolerant, a good choice along the upland edge of tidal areas and roadsides.			
Mix #5			
Saltmeadow cordgrass (Spartina patens)—This grass is used for tidal shoreline protection and tidal marsh restoration. It is planted by vegetative stem divisions.			
'Cape' American beachgrass can be planted for sand dune stabilization above the saltmeadow cordgrass zone.			
Mix #6			
Creeping red fescue	Ensylva, Pennlawn, Boreal	20	.45
Tall fescue	KY 31, Rebel	20	.45
Perennial ryegrass	Pennfine, Linn	5	.10
Birdsfoot trefoil	Empire, Pardee	10	.45
*General purpose erosion control mix. Not to be used for a turf planting or play grounds.			

SECTION 5A
TEMPORARY STRUCTURAL MEASURES
FOR
EROSION AND SEDIMENT CONTROL

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STANDARD AND SPECIFICATIONS FOR CONSTRUCTION ROAD STABILIZATION



Definition

The stabilization of temporary construction access routes, on-site vehicle transportation routes, and construction parking areas.

Purpose

To control erosion on temporary construction routes and parking areas.

Condition Where Practice Applies

All traffic routes and parking areas for temporary use by construction traffic.

Design Criteria

Construction roads should be located to reduce erosion potential, minimize impact on existing site resources, and maintain operations in a safe manner. Highly erosive soils, wet or rocky areas, and steep slopes should be avoided. Roads should be routed where seasonal water tables are deeper than 18 inches. Surface runoff and control should be in accordance with other standards.

Road Grade – A maximum grade of 12% is recommended, although grades up to 15% are possible for short distances.

Road Width – 14 foot minimum for one-way traffic or 24 foot minimum for two-way traffic.

Side Slope of Road Embankment – 2:1 or flatter.

Ditch Capacity – On-site roadside ditch and culvert capacities shall be the 10 yr. peak runoff.

Composition – Use a 6-inch layer of NYS DOT sub-base Types 1,2,3, 4 or equivalent as specified in NYS – Standards and Specifications for Highways.

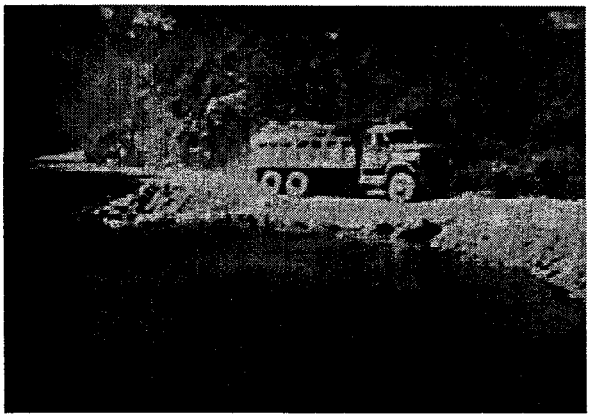
Construction Specifications

1. Clear and strip roadbed and parking areas of all vegetation, roots, and other objectionable material.
2. Locate parking areas on naturally flat areas as available. Keep grades sufficient for drainage, but not more than 2 to 3 percent.
3. Provide surface drainage and divert excess runoff to stabilized areas.
4. Maintain cut and fill slopes to 2:1 or flatter and stabilized with vegetation as soon as grading is accomplished.
5. Spread 6-inch layer of sub-base material evenly over the full width of the road and smooth to avoid depressions.
6. Provide appropriate sediment control measures to prevent offsite sedimentation.

Maintenance

Inspect construction roads and parking areas periodically for condition of surface. Topdress with new gravel as needed. Check ditches for erosion and sedimentation after rainfall events. Maintain vegetation in a health, vigorous condition. Areas producing sediment should be treated immediately.

STANDARD AND SPECIFICATIONS FOR DUST CONTROL



Definition

The control of dust resulting from land-disturbing activities.

Purpose

To prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the local permitting authority.

Construction Specifications

A. **Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. **Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

Barriers – Woven geotextiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

Windbreak – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

All Stormwater Pollution Prevention Plans must contain the NYS DEC issued "Conditions for Use" and "Application Instructions" for any polymers used on the site. This information can be obtained from the NYS DEC website.

Maintenance

Maintain dust control measures through dry weather periods until all disturbed areas are stabilized.

STANDARD AND SPECIFICATIONS FOR PERIMETER DIKE/SWALE



Definition

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Purpose

The purpose of a perimeter dike/swale is to prevent off site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Conditions Where Practice Applies

Perimeter dike/swale is constructed to divert flows from entering a disturbed area, or along tops of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.

The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.3 on page 5A.8 for details.

The perimeter dike/swale shall not be constructed outside the property lines without obtaining legal easements from affected adjacent property owners. A design is not required for perimeter dike/swale. The following criteria shall be used:

Drainage area – Less than 2 acres (for drainage areas larger than 2 acres but less than 10 acres, see earth dike or temporary swale; for drainage areas larger than 10 acres, see standard and specifications for diversion).

Height – 18 inches minimum from bottom of swale to top of dike evenly divided between dike height and swale depth.

Bottom width of dike – 2 feet minimum.

Width of swale – 2 feet minimum.

Grade – Dependent upon topography, but shall have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 8 percent.

Stabilization – The disturbed area of the dike and swale shall be stabilized within 7 days of installation, in accordance with the standard and specifications for temporary swales.

Outlet

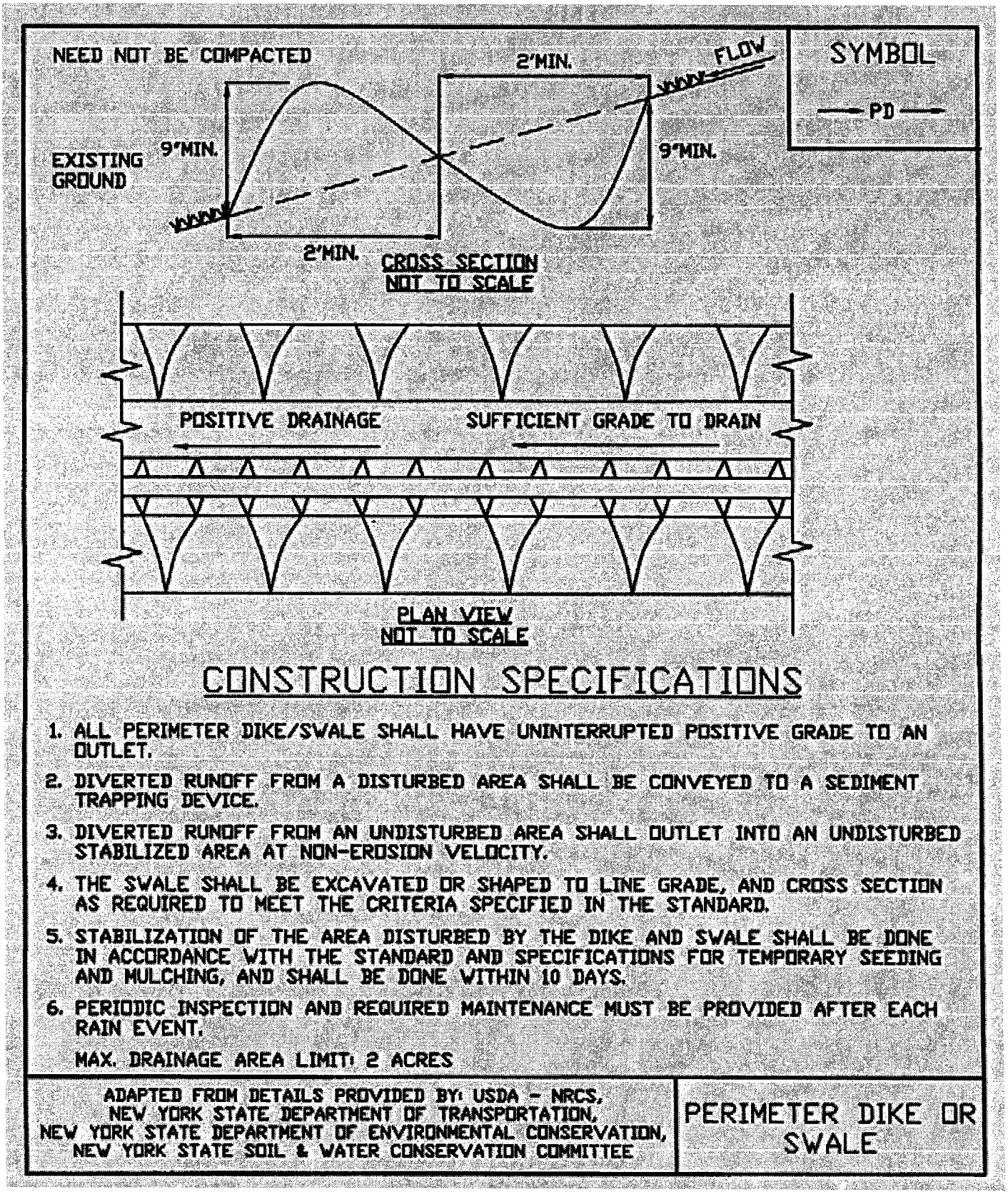
1. Perimeter dike/swale shall have a stabilized outlet.

2. Diverted runoff from a protected or stabilized upland area shall outlet directly onto an undisturbed stabilized area.

3. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device such as a sediment trap, sediment basin, or to an area protected by any of these practices.

4. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 5A.3
Perimeter Dike/Swale



CONSTRUCTION SPECIFICATIONS

1. ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATIONS FOR TEMPORARY SEEDING AND MULCHING, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

MAX. DRAINAGE AREA LIMIT: 2 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PERIMETER DIKE OR SWALE

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP



Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

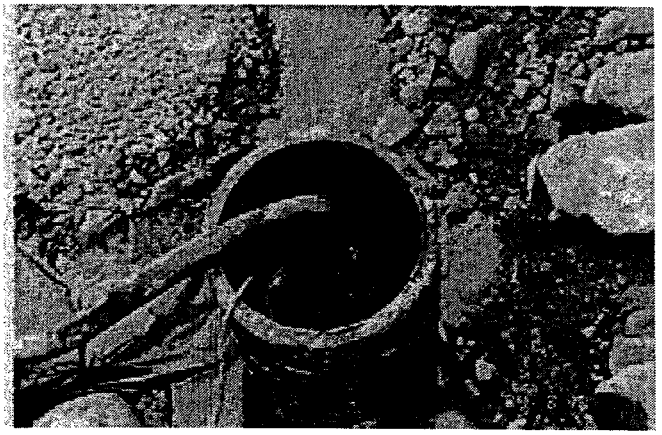
Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

STANDARD AND SPECIFICATIONS FOR SUMP PIT



Definition

A temporary pit which is constructed to trap and filter water for pumping to a suitable discharge area.

Purpose

To remove excessive water from excavations.

Conditions Where Practice Applies

Sump pits are constructed when water collects during the excavation phase of construction. This practice is particularly useful in urban areas during excavation for building foundations.

Design Criteria

The number of sump pits and their locations shall be determined by the contractor/engineer. A design is not required, but construction should conform to the general criteria outlined on Figure 7A.39 on page 7A.90.

A perforated vertical standpipe is placed in the center of the pit to collect filtered water. Water is then pumped from the center of the pipe to a suitable discharge area.

Discharge of water pumped from the standpipe should be to a sediment trap, sediment basin, or stabilized area, such as a filter strip. If water from the sump pit will be pumped directly to a storm drain system, filter cloth (Mirafi 100X, Poly Filter GB, or a filter cloth with an equivalent sieve size between 40-80) should be wrapped around the standpipe to ensure clean water discharge. It is recommended that ¼ to ½ inch hardware cloth be wrapped around and secured to the standpipe prior to attaching the filter cloth. This will increase the rate of water seepage into the standpipe.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length practicable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Grass Outlet Sediment Trap ST-II in Figure 5A.17 on page 5A.40.

III. Catch Basin Sediment Trap

A Catch Basin Sediment Trap consists of a basin formed by excavation on natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet.

A yard drain inlet or an inlet in the median strip of a dual highway could use the inlet opening for the type outlet. The trap should be out of the roadway so as not to interfere with future compaction or construction. Placing the trap on the opposite side of the opening and diverting water from the roadway to the trap is one means of doing this. Catch basin sediment traps shall be limited to a three (3) acre maximum drainage area. The volume of this trap is measured at the elevation of the crest of the outlet (invert of the inlet opening).

See details for Catch Basin Sediment Trap ST-III in Figure 5A.18 on page 5A.41.

IV. Stone Outlet Sediment Trap

A Stone Outlet Sediment Trap consists of a trap formed by an embankment or excavation. The outlet of this trap is over a stone section placed on level ground. The minimum length (feet) of the outlet shall be equal to four (4) times the drainage area (acres).

Required storage shall be 3,600 cubic feet per acre of drainage area.

The outlet crest (top of stone in weir section) shall be level, at least one (1) foot below top of embankment and no more than one (1) foot above ground beneath the outlet. Stone used in the outlet shall be small riprap (4 in. x 8 in.). To provide more efficient trapping effect, a layer of filter cloth should be embedded one (1) foot back into the upstream face of the outlet stone or a one (1) foot thick layer of two (2) inch or finer aggregate shall be placed on the upstream face of the outlet.

Stone Outlet Sediment Traps may be interchangeable in the field with pipe or riprap outlet sediment traps provided they are constructed in accordance with the detail and specifications for those traps. Stone outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Stone Outlet Sediment Trap ST-IV in Figure 5A.19 on page 5A.42.

V. Riprap Outlet Sediment Trap

A Riprap Outlet Sediment Trap consists of a trap formed by an excavation and embankment. The outlet for this trap shall be through a partially excavated channel lined with riprap. This outlet channel shall discharge onto a stabilized area or to a stable watercourse. The riprap outlet sediment trap may be used for drainage areas of up to a maximum of 15 acres.

Design Criteria for Riprap Outlet Sediment Trap

1. The total contributing drainage area (disturbed or undisturbed either on or off the developing property) shall not exceed 15 acres.
2. The storage needs for this trap shall be computed using 3600 cubic feet of required storage for each acre of drainage area. The storage volume provided can be figured by computing the volume of storage area available behind the outlet structure up to an elevation of one (1) foot below the level weir crest.
3. The maximum height of embankment shall not exceed five (5) feet.
4. The elevation of the top of any dike directing water to a riprap outlet sediment trap will equal or exceed the minimum elevation of the embankment along the entire length of this trap.

Riprap Outlet Sediment Trap ST-V
(for Stone Lined Channel)

Contributing Drainage Area (ac.)	Depth of Channel (a) (ft.)	Length of Weir (b) (ft.)
1	1.5	4.0
2	1.5	5.0
3	1.5	6.0
4	1.5	10.0
5	1.5	12.0
6	1.5	14.0
7	1.5	16.0
8	2.0	10.0
9	2.0	10.0
10	2.0	12.0
11	2.0	14.0
12	2.0	14.0
13	2.0	16.0
14	2.0	16.0
15	2.0	18.0

See details for Riprap Outlet Sediment Trap ST-V on Figures 5A.20(1) and 5A.20(2) on pages 5A.43 and 5A.44.

Optional Dewatering Methods

Optional dewatering devices may be designed for use with sediment traps. Included are two methods, which may be used. See Figure 5A.21 on page 5A.45 for details.

Figure 5A.16(1)
Pipe Outlet Sediment Trap: ST-I

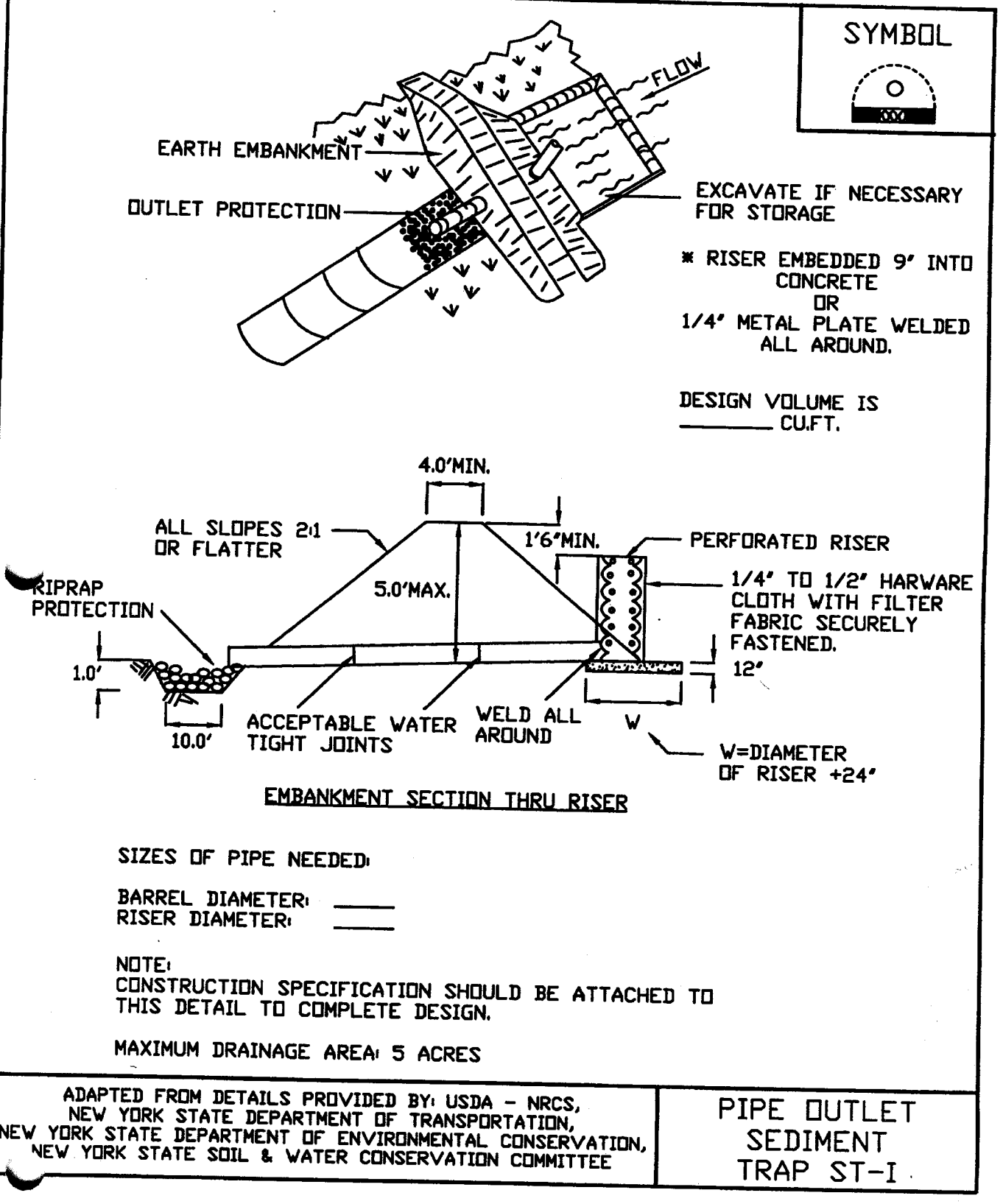


Figure 5A.16(2)
Pipe Outlet Sediment Trap: ST-I—Construction Specifications

SYMBOL



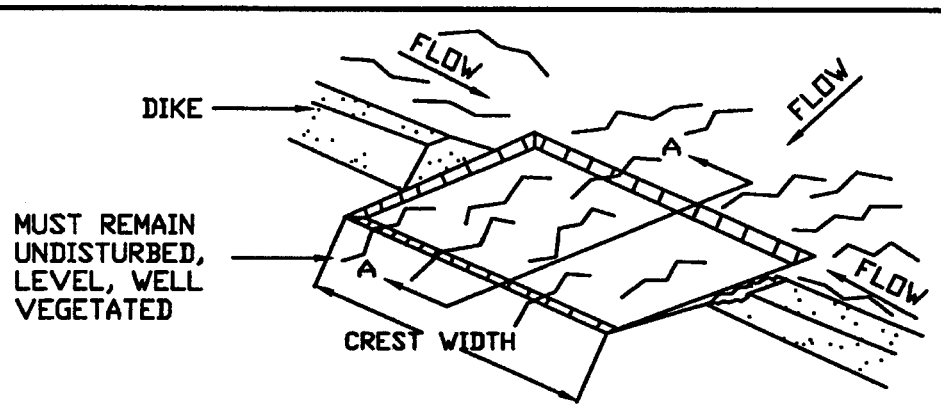
CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
4. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
5. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
7. THE STRUCTURE SHALL BE REMOVED AND AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER; CUT SLOPES 1:1 OR FLATTER.
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. THE TOP 2/3 OF THE RISER SHALL BE PERFORATED WITH ONE (1) INCH DIAMETER HOLES OR SLITS SPACED SIX (6) INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF PIPE. NO HOLES WILL BE ALLOWED WITHIN SIX (6) INCHES OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/4 TO 1/2 INCH HARDWARE CLOTH WIRE THEN WRAPPED WITH FILTER CLOTH (HAVING AN EQUIVALENT SIEVE SIZE OF 40-80). THE FILTER CLOTH SHALL EXTEND SIX (6) INCHES ABOVE THE HIGHEST HOLE AND SIX (6) INCHES BELOW THE LOWEST HOLE. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVER-LAPPED, FOLDED AND STAPLED TO PREVENT BYPASS.
12. STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRIC IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN FOUR (4) INCH LAYERS. A MINIMUM OF TWO (2) FEET OF HAND COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. FOR CONCRETE BASED THE DEPTH SHALL BE TWELVE (12) INCHES WITH THE RISER EMBEDDED NINE (9) INCHES. A 1/4 INCH MINIMUM THICKNESS STEEL PLATE SHALL BE ATTACHED TO THE RISER BY A CONTINUOUS WELD AROUND THE BOTTOM TO FORM A WATERTIGHT CONNECTION AND THEN PLACE TWO (2) FEET OF STONE, GRAVEL, OR TAMPED EARTH ON THE PLATE.

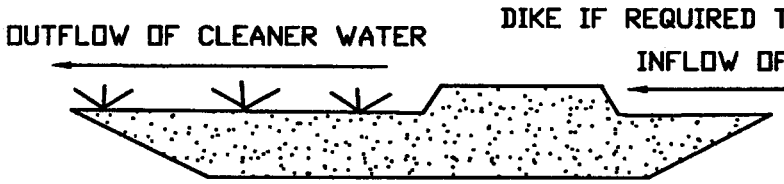
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PIPE OUTLET
SEDIMENT TRAP
ST-I

Figure 5A.17
Grass Outlet Sediment Trap: ST-II



SYMBOL



CREST WIDTH (FT)=4xDRAINAGE AREA (ACRES)

SECTION A - A
EXCAVATED GRASS OUTLET SEDIMENT TRAP

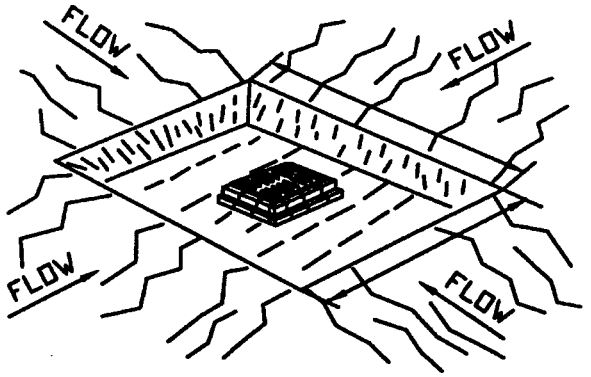
CONSTRUCTION SPECIFICATIONS

1. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE AREA.
2. MINIMUM CREST WIDTH SHALL BE 4 x DRAINAGE AREA
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
6. THE SEDIMENT TRAP SHALL BE REMOVED AND AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 5 ACRES

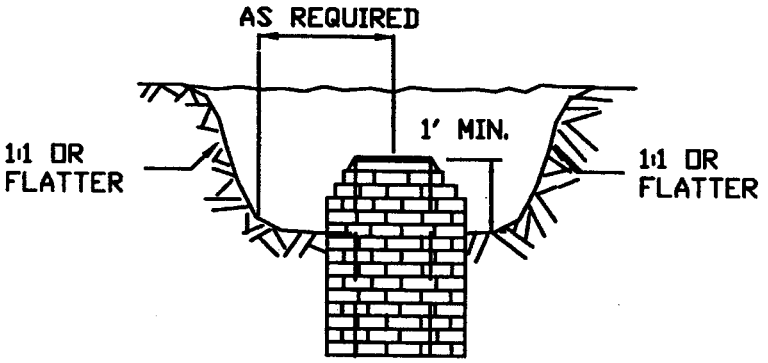
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	GRASS OUTLET SEDIMENT TRAP ST-II

Figure 5A.18
Catch Basin Sediment Trap: ST-III



YARD DRAIN

SYMBOL



CROSS SECTION

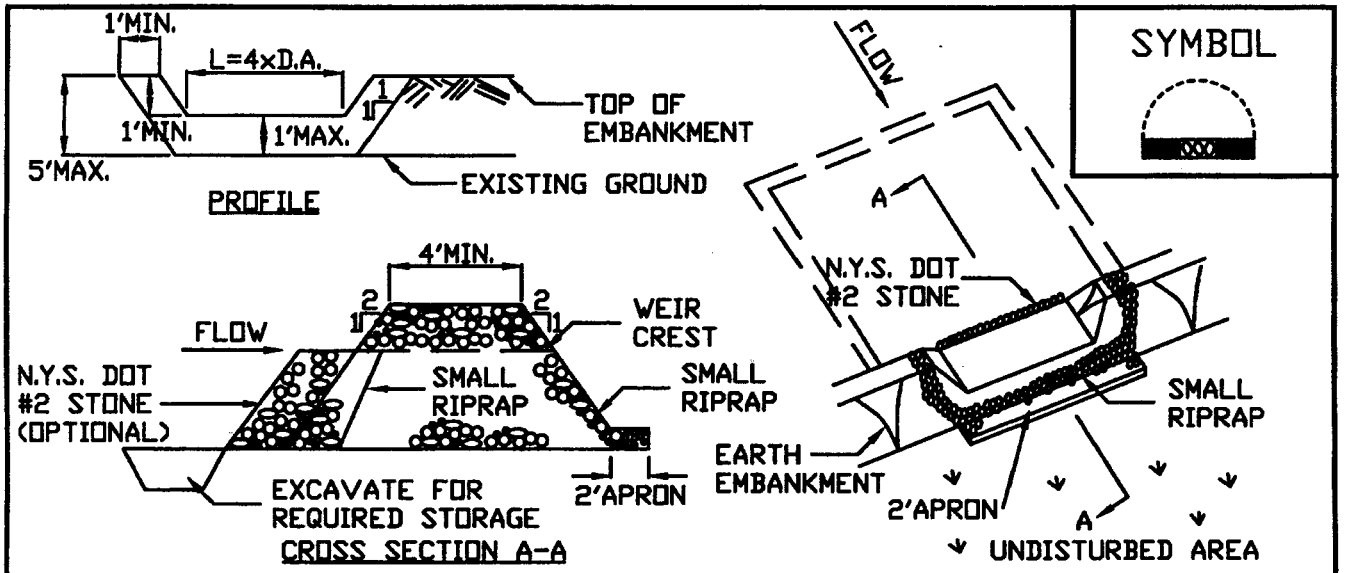
CONSTRUCTION SPECIFICATIONS

1. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
2. THE VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
3. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE CONSTRUCTED DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
6. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 3 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA – NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	CATCH BASIN SEDIMENT TRAP ST-III

Figure 5A.19
Stone Outlet Sediment Trap: ST-IV



OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

MAXIMUM DRAINAGE AREA 5 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STONE OUTLET SEDIMENT TRAP ST-IV

Figure 5A.20(1)
Riprap Outlet Sediment Trap: ST-V

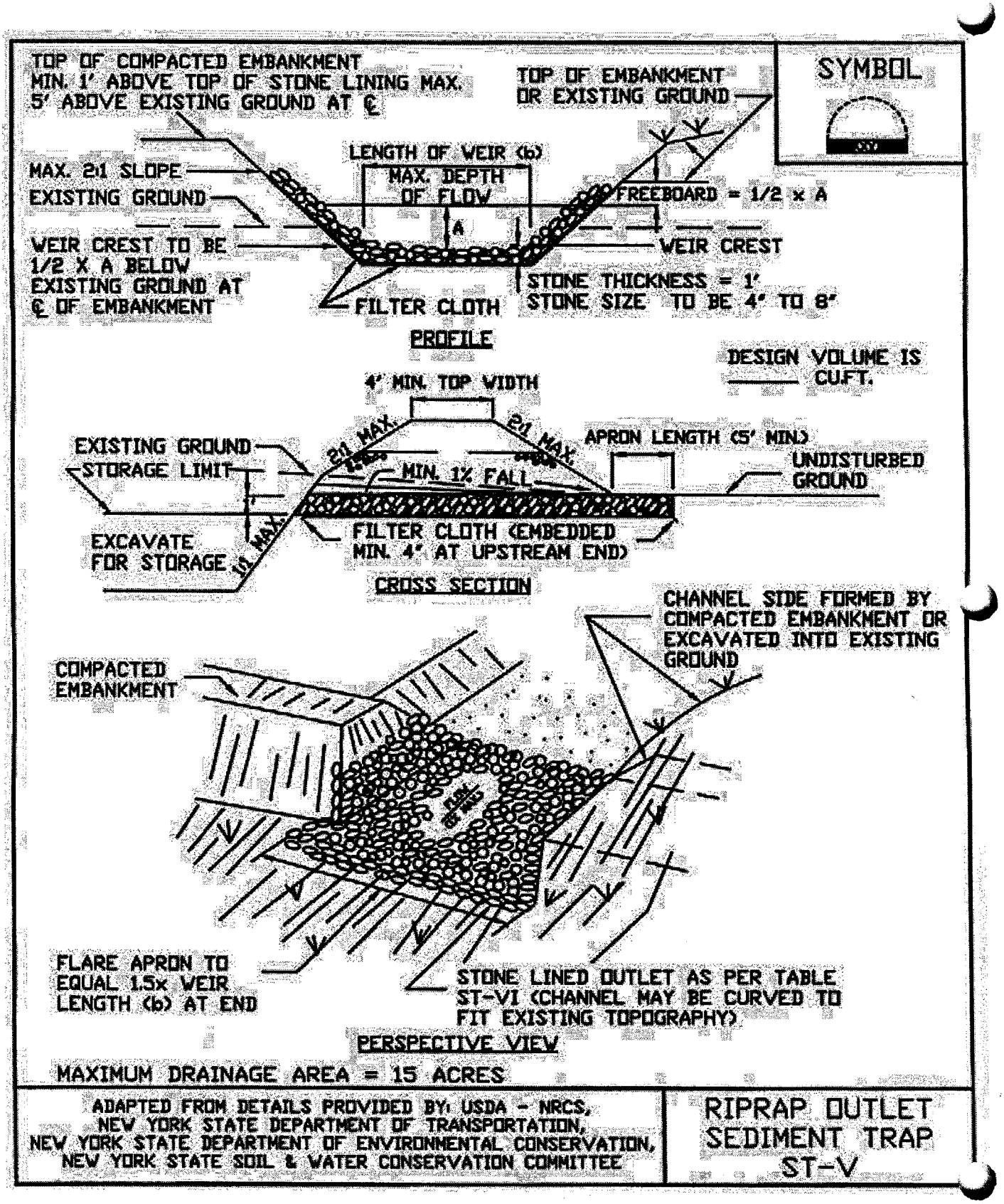


Figure 5A.202)
Riprap Outlet Sediment Trap: ST-V—Construction Specifications

SYMBOL



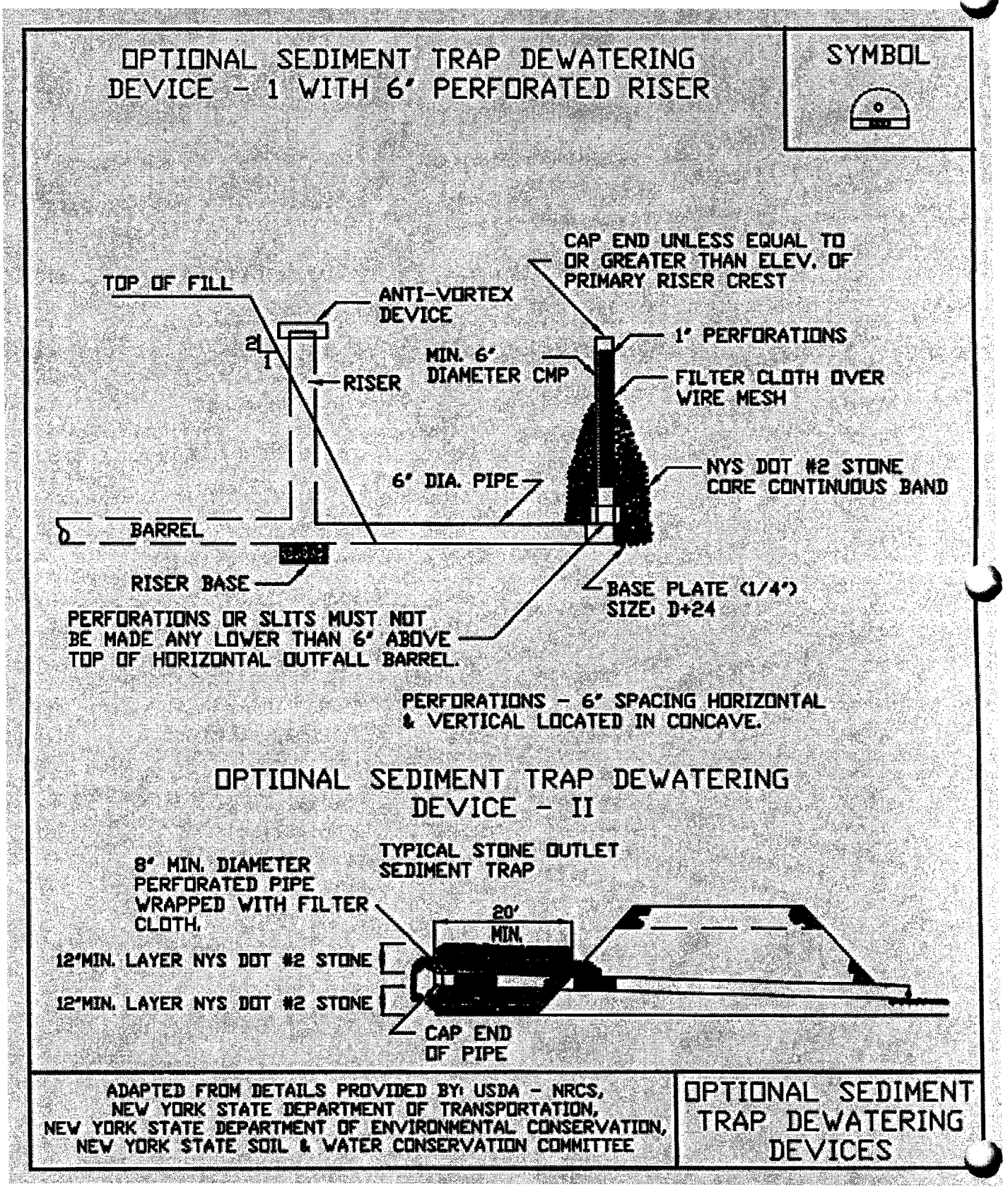
CONSTRUCTION SPECIFICATIONS

1. THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF OF EMBANKMENT SHALL BE FIVE (5) FEET, MEASURED AT CENTERLINE OF EMBANKMENT.
3. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER, CUT SLOPES 1:1 OR FLATTER.
4. ELEVATION OF THE TOP OF ANY DIKE DIRECTING WATER INTO TRAP MUST EQUAL OR EXCEED THE HEIGHT OF EMBANKMENT.
5. STORAGE AREA PROVIDED SHALL BE FIGURED BY COMPUTING THE VOLUME AVAILABLE BEHIND THE OUTLET CHANNEL UP TO AN ELEVATION OF ONE (1) FOOT BELOW THE LEVEL WEIR CREST.
6. FILTER CLOTH SHALL BE PLACED OVER THE BOTTOM AND SIDES OF THE OUTLET CHANNEL PRIOR TO PLACEMENT OF STONE. SECTIONS OF FABRIC MUST OVERLAP AT LEAST ONE (1) FOOT WITH SECTION NEAREST THE ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OUTLET CHANNEL.
7. STONE USED IN THE OUTLET CHANNEL SHALL BE FOUR (4) TO EIGHT (8) INCH RIPRAP. TO PROVIDE A FILTERING EFFECT, A LAYER OF FILTER CLOTH SHALL BE EMBEDDED ONE (1) FOOT WITH SECTION NEAREST ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
8. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
9. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRED AS NEEDED.
10. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
11. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
12. DRAINAGE AREA FOR THIS PRACTICE IS LIMITED TO 15 ACRES OR LESS.

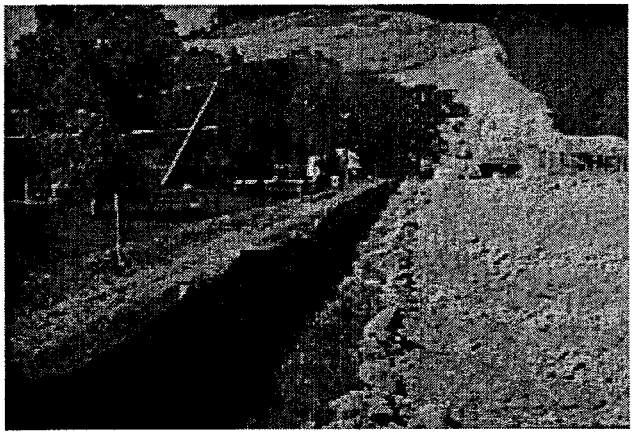
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RIPRAP OUTLET
SEDIMENT TRAP
ST-V

Figure 5A.21
Optional Sediment Trap Dewatering Devices



STANDARD AND SPECIFICATIONS FOR SILT FENCE



Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

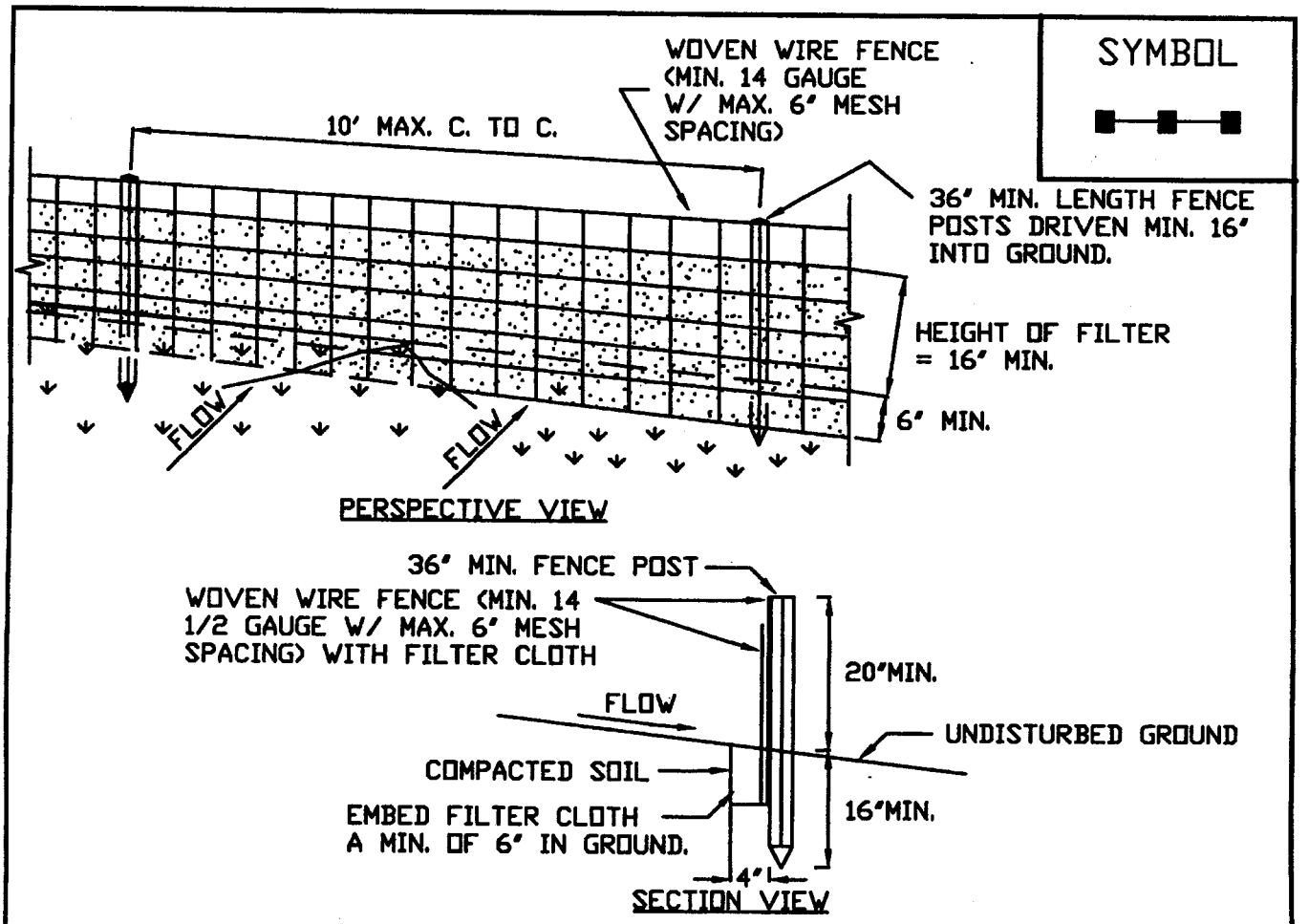
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ENTRANCE



Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

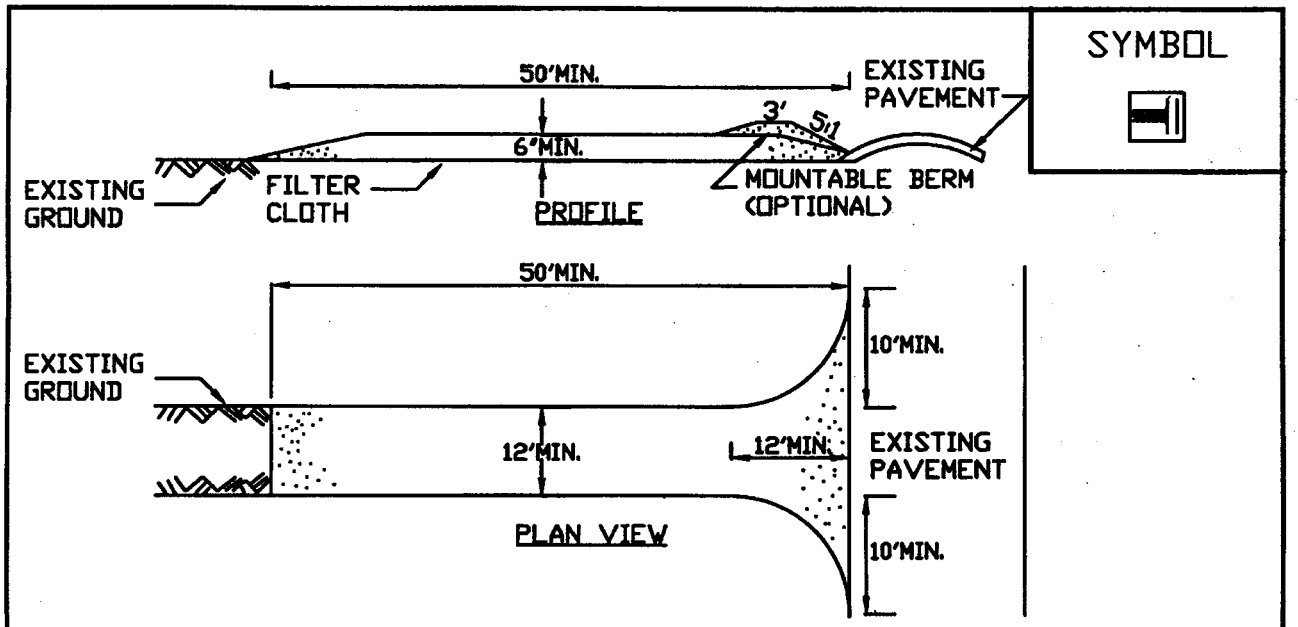
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE



Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

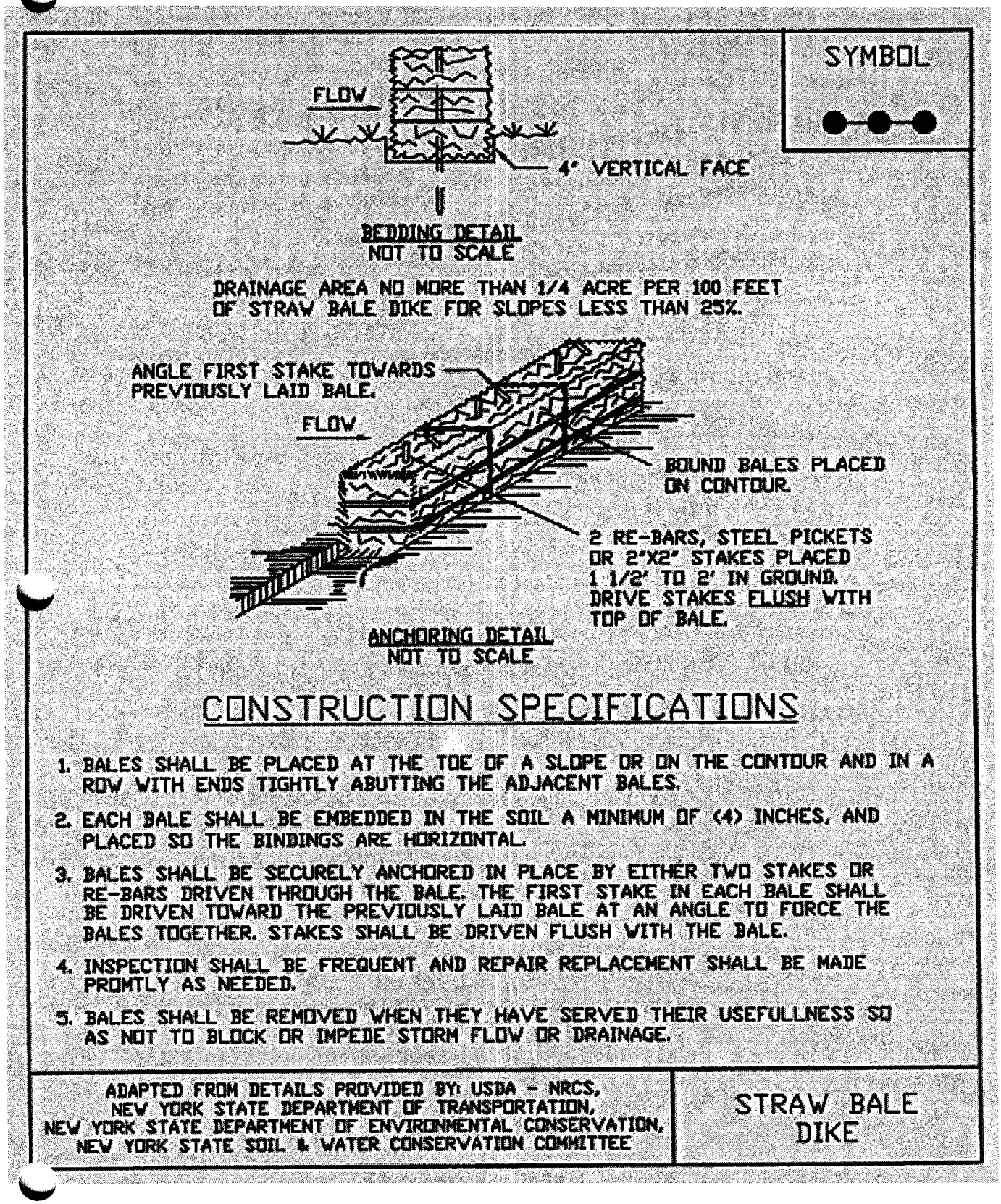
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

Figure 5A.7
Straw Bale Dike



CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

STRAW BALE DIKE

SECTION 5B
PERMANENT STRUCTURAL MEASURES
FOR
EROSION AND SEDIMENT CONTROL

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STANDARD AND SPECIFICATIONS FOR LANDGRADING



Definition

Reshaping of the existing land surface in accordance with a plan as determined by engineering survey and layout.

Purpose

The purpose of a landgrading specification is to provide for erosion control and vegetative establishment on those areas where the existing land surface is to be reshaped by grading according to plan.

Design Criteria

The grading plan should be based upon the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surrounding to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, effect on adjacent properties and drainage patterns, measures for drainage and water removal, and vegetative treatment, etc.

Many counties have regulations and design procedures already established for land grading and cut and fill slopes. Where these requirements exist, they shall be followed.

The plan must show existing and proposed contours of the area(s) to be graded. The plan shall also include practices for erosion control, slope stabilization, safe disposal of runoff water and drainage, such as waterways, lined ditches, reverse slope benches (include grade and cross section), grade stabilization structures, retaining walls, and surface and subsurface drains. The plan shall also include phasing of these practices. The following shall be incorporated into the plan:

1. Provisions shall be made to safely conduct surface runoff to storm drains, protected outlets, or to stable water courses to ensure that surface runoff will not damage slopes or other graded areas; see standards and specifications for Grassed Waterway, Diversion, Grade Stabilization Structure.

2. Cut and fill slopes that are to be stabilized with grasses shall not be steeper than 2:1. When slopes exceed 2:1, special design and stabilization consideration are required and shall be adequately shown on the plans. (Note: Where the slope is to be mowed, the slope should be no steeper than 3:1, although 4:1 is preferred because of safety factors related to mowing steep slopes.)

3. Reverse slope benches or diversion shall be provided whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slope it shall be increased to 30 feet and for 4:1 to 40 feet. Benches shall be located to divide the slope face as equally as possible and shall convey the water to a stable outlet. Soils, seeps, rock outcrops, etc., shall also be taken into consideration when designing benches.

   A. Benches shall be a minimum of six feet wide to provide for ease of maintenance.

   B. Benches shall be designed with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Bench gradient to the outlet shall be between 2 percent and 3 percent, unless accompanied by appropriate design and computations.

   C. The flow length within a bench shall not exceed 800 feet unless accompanied by appropriate design and computations; see Standard and Specifications for Diversion on page 5B.1

4. Surface water shall be diverted from the face of all cut and/or fill slopes by the use of diversions, ditches and swales or conveyed downslope by the use of a designed structure, except where:

   A. The face of the slope is or shall be stabilized and the face of all graded slopes shall be protected from surface runoff until they are stabilized.

B. The face of the slope shall not be subject to any concentrated flows of surface water such as from natural drainage ways, graded swales, downspouts, etc.

C. The face of the slope will be protected by special erosion control materials, sod, gravel, riprap, or other stabilization method.

5. Cut slopes occurring in ripable rock shall be serrated as shown in Figure 5B.23 on page 5B.51. The serrations shall be made with conventional equipment as the excavation is made. Each step or serration shall be constructed on the contour and will have steps cut at nominal two-foot intervals with nominal three-foot horizontal shelves. These steps will vary depending on the slope ratio or the cut slope. The nominal slope line is 1 ½: 1. These steps will weather and act to hold moisture, lime, fertilizer, and seed thus producing a much quicker and longer-lived vegetative cover and better slope stabilization. Overland flow shall be diverted from the top of all serrated cut slopes and carried to a suitable outlet.

6. Subsurface drainage shall be provided where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

7. Slopes shall not be created so close to property lines as to endanger adjoining properties without adequately protecting such properties against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.

8. Fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris, and other objectionable material. It should be free of stones over two (2) inches in diameter where compacted by hand or mechanical tampers or over eight (8) inches in diameter where compacted by rollers or other equipment. Frozen material shall not be placed in the fill nor shall the fill material be placed on a frozen foundation.

9. Stockpiles, borrow areas, and spoil shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

10. All disturbed areas shall be stabilized structurally or vegetatively in compliance with the Standard and Specifications for Critical Area Treatment in Section 3.

Construction Specifications

See Figures 5B.23 and 5B.24 for details.

1. All graded or disturbed areas, including slopes, shall be protected during clearing and construction in accordance with the erosion and sediment control plan until they are adequately stabilized.

2. All erosion and sediment control practices and measures shall be constructed, applied and maintained in accordance with the sediment control plan and the "New York Standards and Specifications for Erosion and Sediment Control."

3. Topsoil required for the establishment of vegetation shall be stockpiled in amount necessary to complete finished grading of all exposed areas.

4. Areas to be filled shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable material.

5. Areas that are to be topsoiled shall be scarified to a minimum depth of four inches prior to placement of topsoil.

6. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence, or other related problems. Fill intended to support buildings, structures, and conduits, etc., shall be compacted in accordance with local requirements or codes.

7. All fill shall be placed and compacted in layers not to exceed 9 inches in thickness.

8. Except for approved landfills or nonstructural fills, fill material shall be free of frozen particles, brush, roots, sod, or other foreign objectionable materials that would interfere with, or prevent, construction of satisfactory fills.

9. Frozen material or soft, mucky or highly compressible materials shall not be incorporated into fill slopes or structural fills.

10. Fill shall not be placed on saturated or frozen surfaces.

11. All benches shall be kept free of sediment during all phases of development.

12. Seeps or springs encountered during construction shall be handled in accordance with the Standard and Specification for Subsurface Drain on page 5B.44 or other approved methods.

13. All graded areas shall be permanently stabilized immediately following finished grading.

14. Stockpiles, borrow areas, and spoil areas shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.

Figure 5B.23
Typical Section of Serrated Cut Slope

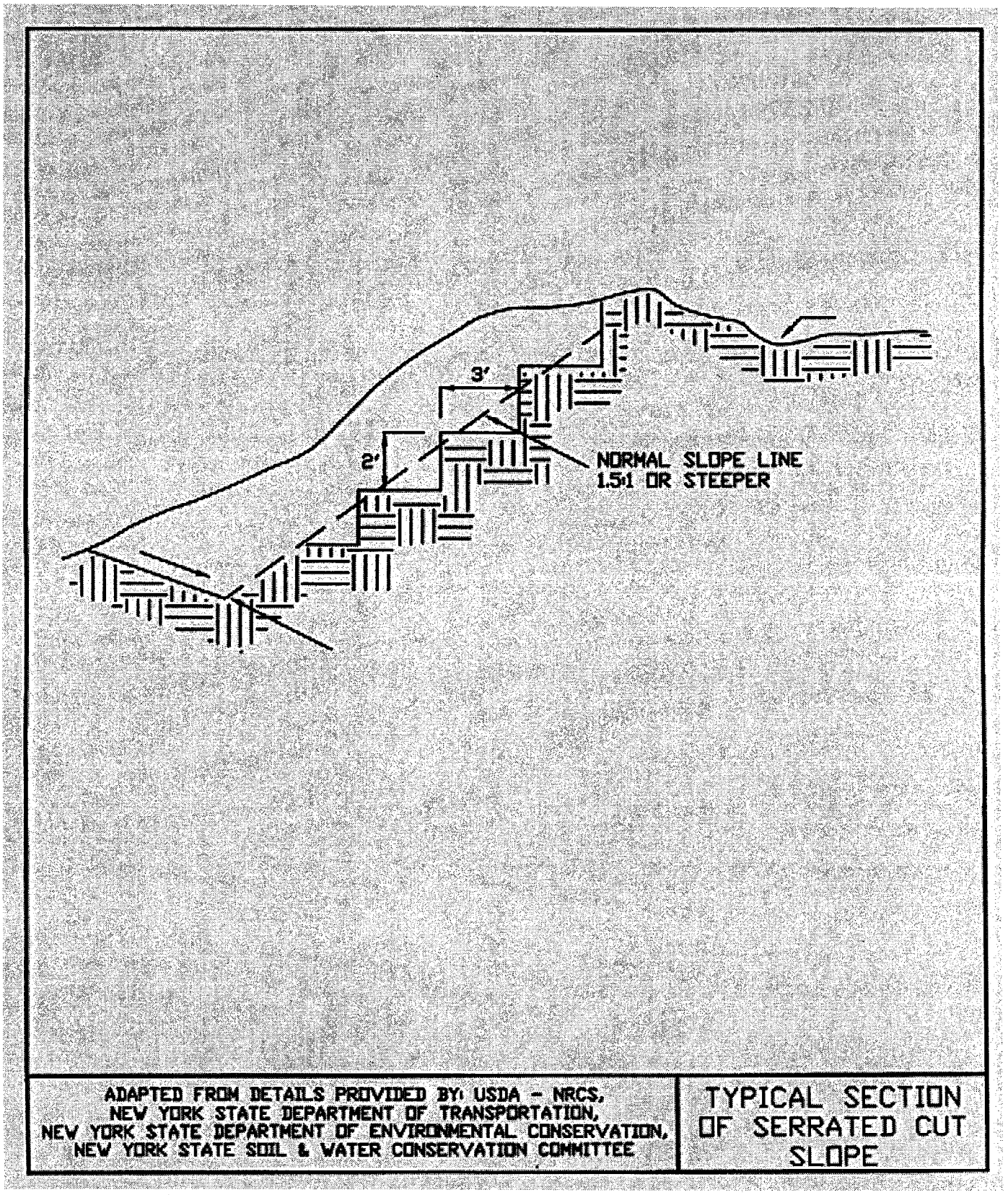


Figure 5B.24 (1)
Landgrading

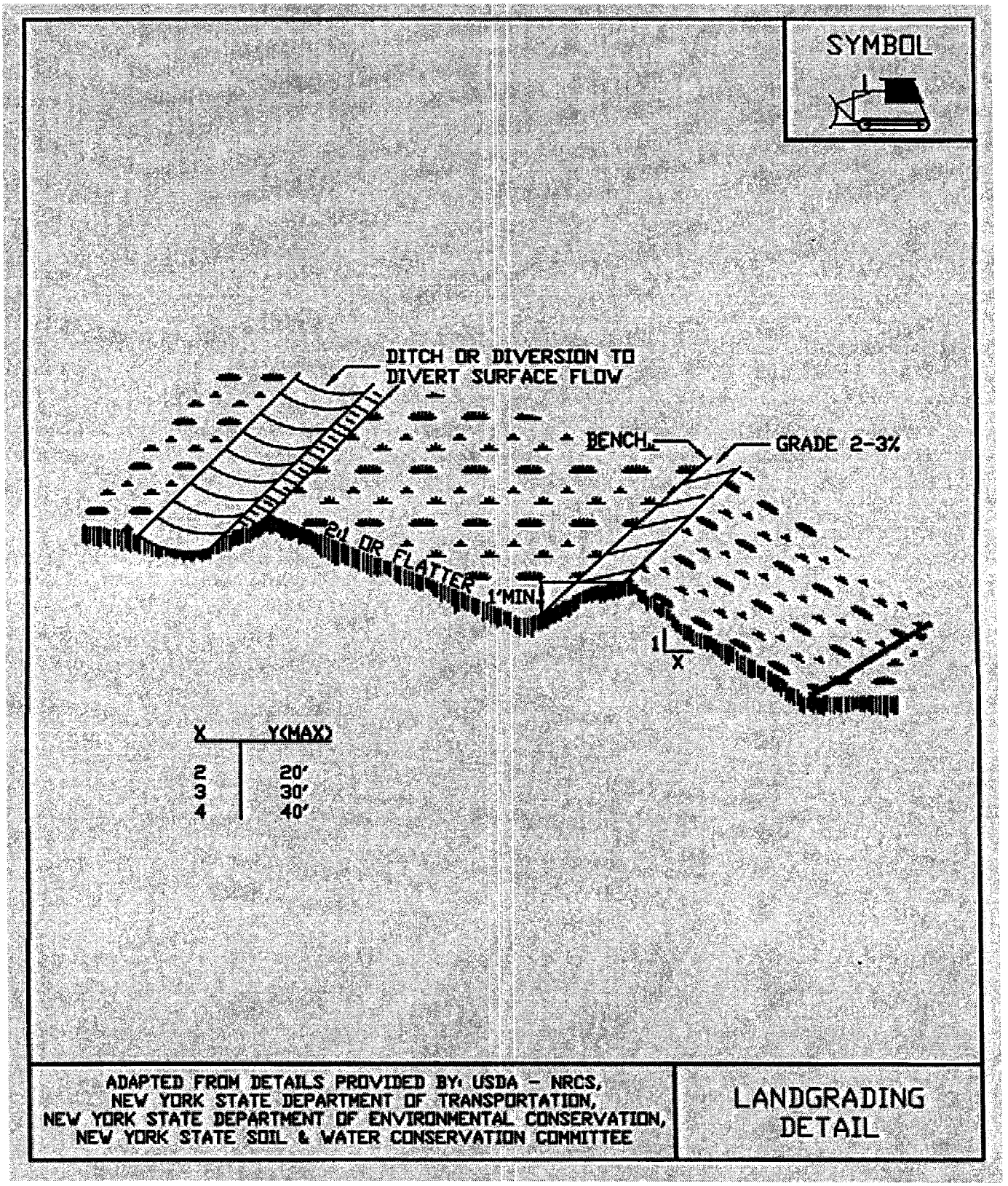
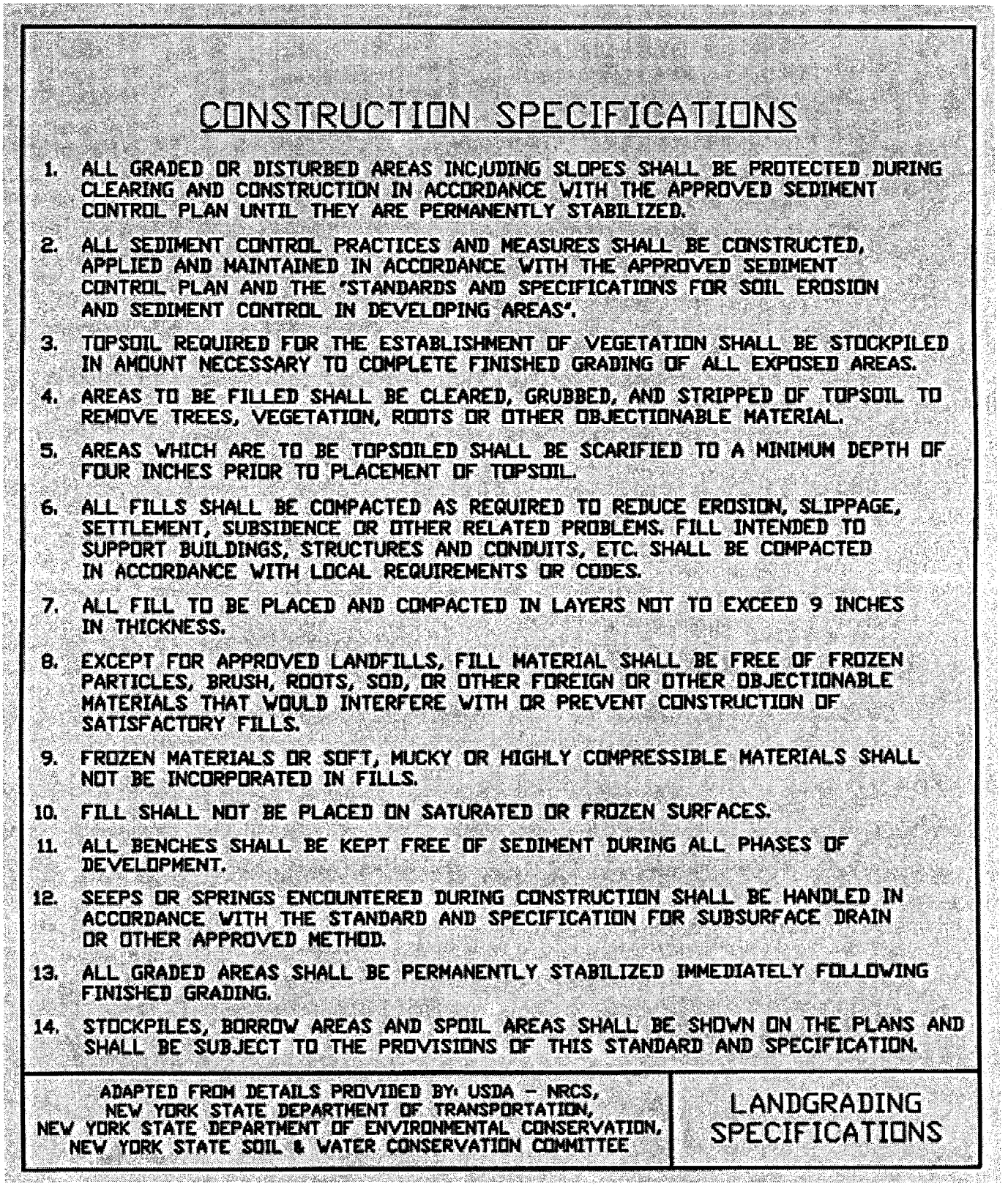


Figure 5B.24 (2)
Landgrading —Construction Specifications



CONSTRUCTION SPECIFICATIONS

1. ALL GRADED OR DISTURBED AREAS INCLUDING SLOPES SHALL BE PROTECTED DURING CLEARING AND CONSTRUCTION IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN UNTIL THEY ARE PERMANENTLY STABILIZED.
2. ALL SEDIMENT CONTROL PRACTICES AND MEASURES SHALL BE CONSTRUCTED, APPLIED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED SEDIMENT CONTROL PLAN AND THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS".
3. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNT NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS.
4. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL.
5. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF FOUR INCHES PRIOR TO PLACEMENT OF TOPSOIL.
6. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
7. ALL FILL TO BE PLACED AND COMPACTED IN LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
8. EXCEPT FOR APPROVED LANDFILLS, FILL MATERIAL SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
9. FROZEN MATERIALS OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED IN FILLS.
10. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
11. ALL BENCHES SHALL BE KEPT FREE OF SEDIMENT DURING ALL PHASES OF DEVELOPMENT.
12. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
13. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY FOLLOWING FINISHED GRADING.
14. STOCKPILES, BORROW AREAS AND SPOIL AREAS SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATION.

ADAPTED FROM DETAILS PROVIDED BY: USDA – NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

LANDGRADING SPECIFICATIONS

STANDARD AND SPECIFICATIONS FOR ROCK OUTLET PROTECTION



Definition

A section of rock protection placed at the outlet end of the culverts, conduits, or channels.

Purpose

The purpose of the rock outlet protection is to reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving downstream reach.

Scope

This standard applies to the planning, design, and construction of rock riprap and gabions for protection of downstream areas. It does not apply to rock lining of channels or streams.

Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This applies to:

1. Culvert outlets of all types.

2. Pipe conduits from all sediment basins, dry storm water ponds, and permanent type ponds.

3. New channels constructed as outlets for culverts and conduits.

Design Criteria

The design of rock outlet protection depends entirely on the location. Pipe outlet at the top of cuts or on slopes steeper than 10 percent, cannot be protected by rock aprons or riprap sections due to re-concentration of flows and high velocities encountered after the flow leaves the apron.

Many counties and state agencies have regulations and design procedures already established for dimensions, type and size of materials, and locations where outlet protection is required. Where these requirements exist, they shall be followed.

Tailwater Depth

The depth of tailwater immediately below the pipe outlet must be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the outlet pipe, and the receiving stream is wide enough to accept divergence of the flow, it shall be classified as a Minimum Tailwater Condition; see Figure 5B.12 on page 5B.25 as an example. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it shall be classified as a Maximum Tailwater Condition; see Figure 5B.13 on page 5B.26 as an example. Pipes which outlet onto flat areas with no defined channel may be assumed to have a Minimum Tailwater Condition; see Figure 5B.12 on page 5B.25 as an example.

Apron Size

The apron length and width shall be determined from the curves according to the tailwater conditions:

Minimum Tailwater – Use Figure 5B.12 on page 5B.25
Maximum Tailwater – Use Figure 5B.13 on page 5B.26

If the pipe discharges directly into a well defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank, whichever is less.

The upstream end of the apron, adjacent to the pipe, shall have a width two (2) times the diameter of the outlet pipe, or conform to pipe end section if used.

Bottom Grade

The outlet protection apron shall be constructed with no sl[illegible] along its length. There shall be no overfall at the end o[illegible] apron. The elevation of the downstream end of the apron shall be equal to the elevation of the receiving channel or adjacent ground.

Alignment

The outlet protection apron shall be located so that there are no bends in the horizontal alignment.

Materials

The outlet protection may be done using rock riprap, grouted riprap, or gabions.

Riprap shall be composed of a well-graded mixture of stone size so that 50 percent of the pieces, by weight, shall be larger than the d_{50} size determined by using the charts. A well-graded mixture, as used herein, is defined as a mixture composed primarily of larger stone sizes, but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone size in such a mixture shall be 1.5 times the d_{50} size.

Thickness

The minimum thickness of the riprap layer shall be 1.5 t[illegible] the maximum stone diameter for d_{50} of 15 inches or l[illegible], and 1.2 times the maximum stone size for d_{50} greater than 15 inches. The following chart lists some examples:

D_{50} (inches)	d_{max} (inches)	Minimum Blanket Thickness (inches)
4	6	9
6	9	14
9	14	20
12	18	27
15	22	32
18	27	32
21	32	38
24	36	43

Stone Quality

Stone for riprap shall consist of field stone or rough unhewn quarry stone. The stone shall be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5.

I[illegible]cled concrete equivalent may be used provided it has a density of at least 150 pounds per cubic foot, and does not have any exposed steel or reinforcing bars.

Filter

A filter is a layer of material placed between the riprap and the underlying soil surface to prevent soil movement into and through the riprap. Riprap shall have a filter placed under it in all cases.

A filter can be of two general forms: a gravel layer or a plastic filter cloth. The plastic filter cloth can be woven or non-woven monofilament yarns, and shall meet these base requirements: thickness 20-60 mils, grab strength 90-120 lbs; and shall conform to ASTM D-1777 and ASTM D-1682.

Gravel filter blanket, when used, shall be designed by comparing particle sizes of the overlying material and the base material. Design criteria are available in Standard and Specification for Riprap Slope Protection on page 5B.57.

Gabions

Gabions shall be made of hexagonal triple twist mesh with heavily galvanized steel wire. The maximum linear dimension of the mesh opening shall not exceed 4 ½ inches and the area of the mesh opening shall not exceed 10 square inches.

Gabions shall be fabricated in such a manner that the sides, ends, and lid can be assembled at the construction site into a rectangular basket of the specified sizes. Gabions shall be of single unit construction and shall be installed according to manufacturers recommendations.

The area on which the gabion is to be installed shall be graded as shown on the drawings. Foundation conditions shall be the same as for placing rock riprap, and filter cloth shall be placed under all gabions. Where necessary, key, or tie, the structure into the bank to prevent undermining of the main gabion structure.

Maintenance

Once a riprap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows for evidence of scour beneath the riprap or for dislodged stones. Repairs should be made immediately.

Design Procedure

1. Investigate the downstream channel to assure that nonerosive velocities can be maintained.
2. Determine the tailwater condition at the outlet to establish which curve to use.
3. Enter the appropriate chart with the design discharge to

determine the riprap size and apron length required. It is noted that references to pipe diameters in the charts are based on full flow. For other than full pipe flow, the parameters of depth of flow and velocity must be used to adjust the design discharges.

4. Calculate apron width at the downstream end if a flare section is to be employed.

Examples

Example 1: Pipe Flow (full) with discharge to unconfined section.

Given: A circular conduit flowing full.

Q = 280 cfs, diam. = 66 in., tailwater (surface) is 2 ft. above pipe invert (minimum tailwater condition).

Find: Read d_{50} = 1.2 and apron length (L_a) = 38 ft.

Apron width = diam. + L_a = 5.5 + 38 = 43.5 ft.

Use: d_{50} = 15", d_{max} = 22", blanket thickness = 32"

Example 2: Box Flow (partial) with high tailwater

Given: A box conduit discharging under partial flow conditions. A concrete box 5.5 ft. x 10 ft. flowing 5.0 ft. deep,

Q = 600 cfs and tailwater surface is 5 ft. above invert (max. tailwater condition).

Since this is not full pipe and does not directly fit the nomograph assumptions of Figure 7B.13 substitute depth as the diameter, to find a discharge equal to full pipe flow for that diameter, in this case 60 inches.

Since, $Q = AV$ and $A = \frac{\pi D^2}{4}$

First, compute velocity:

V = (Q/A) = (600/(5) (10)) = 12 fps

Then substituting:

$$Q = \frac{\pi D^2}{4} \times V = \frac{3.14\ (5\ ft)^2}{4} \times 12\ fps = 236\ cfs$$

At the intersection of the curve d = 60 in. and Q = 236 cfs, read d_{50} = 0.4 ft.

Then reading the d = 60 in. curve, read apron length (L_a) = 40 ft.

Apron width, W = conduit width + (6.4)(L_a) = 10 + (0.4) (40) = 26 ft.

Example 3: Open Channel Flow with Discharge to Unconfined Section

Given: A trapezoidal concrete channel 5 ft. wide with 2:1 side slopes is flowing 2 ft. deep, Q = 180 cfs (velocity = 10 fps) and the tailwater surface downstream is 0.8 ft. (minimum tailwater condition).

Find: Using similar principles as Example 2, compute equivalent discharge for a 2 foot, using depth as a diameter, circular pipe flowing full at 10 feet per second.

Velocity:

$$Q = \frac{\pi\ (2ft)^2}{4} \times 10\ fps = 31.4\ cfs$$

At intersection of the curve, d = 24 in. and Q = 32 cfs, read d_{50} = 0.6 ft.

Then reading the d = 24 in. curve, read apron length (L_a) = 20 ft.

Apron width, W = bottom width of channel + L_a = 5 + 20 = 25 ft.

Example 4: Pipe flow (partial) with discharge to a confined section

Given: A 48 in. pipe is discharging with a depth of 3 ft. Q = 100 cfs, and discharge velocity of 10 fps (established from partial flow analysis) to a confined trapezoidal channel with a 2 ft. bottom, 2:1 side slopes, n = .04, and grade of 0.6%.

Calculation of the downstream channel (by Manning's Equation) indicates a normal depth of 3.1 ft. and normal velocity of 3.9 fps.

Since the receiving channel is confined, the maximum tailwater condition controls.

Find: discharge using previous principles:

$$Q = \frac{\pi\ (3ft)^2}{4} \times 10\ fps = 71\ cfs$$

At the intersection of d = 36 in. and Q = 71 cfs, read d_{50} = 0.3 ft.

Reading the d = 36" curve, read apron length (L_a) = 30 ft.

Since the maximum flow depth in this reach is 3.1 ft., that is the minimum depth of riprap to be maintained for the entire length.

Construction Specifications

1. The subgrade for the filter, riprap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

2. The rock or gravel shall conform to the specified grading limits when installed respectively in the riprap or filter.

3. Filter cloth shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of cloth over the damaged part or by completely replacing the cloth. All overlaps, whether for repairs or for joining two pieces of cloth shall be a minimum of one foot.

4. Stone for the riprap or gabion outlets may be placed by equipment. Both shall each be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for riprap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Riprap shall be placed in a manner to prevent damage to the filter blanket or filter cloth. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

Figure 5B.12
Outlet Protection Design—Minimum Tailwater Condition
(Design of Outlet Protection from a Round Pipe Flowing Full, Minimum Tailwater Condition: $T_w < 0.5D_o$) (USDA - NRCS)

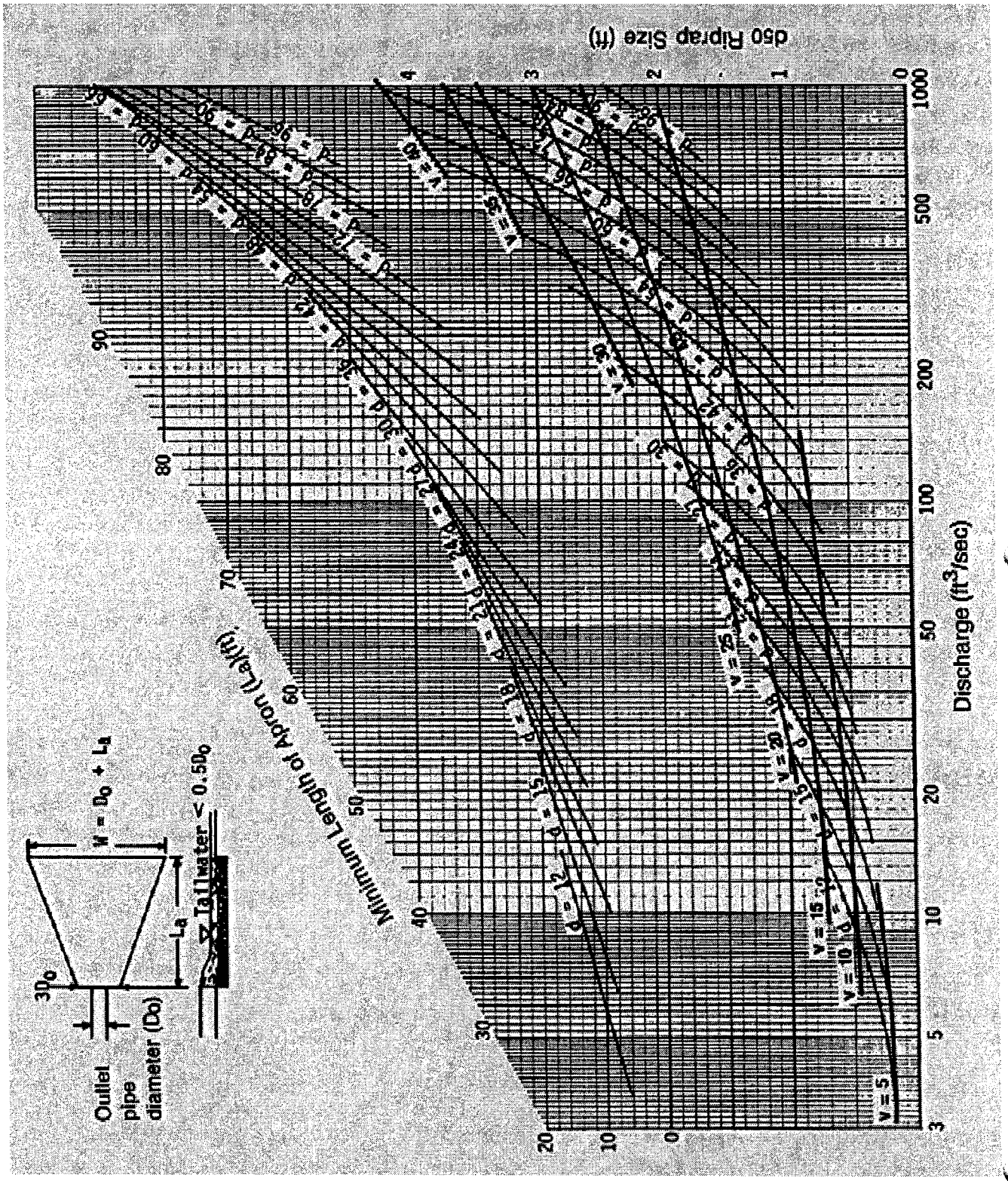


Figure 5B.13
Outlet Protection Design—Maximum Tailwater Condition
(Design of Outlet Protection from a Round Pipe Flowing Full, Maximum Tailwater Condition: $T_w \geq 0.5D_o$) (USDA - NRCS)

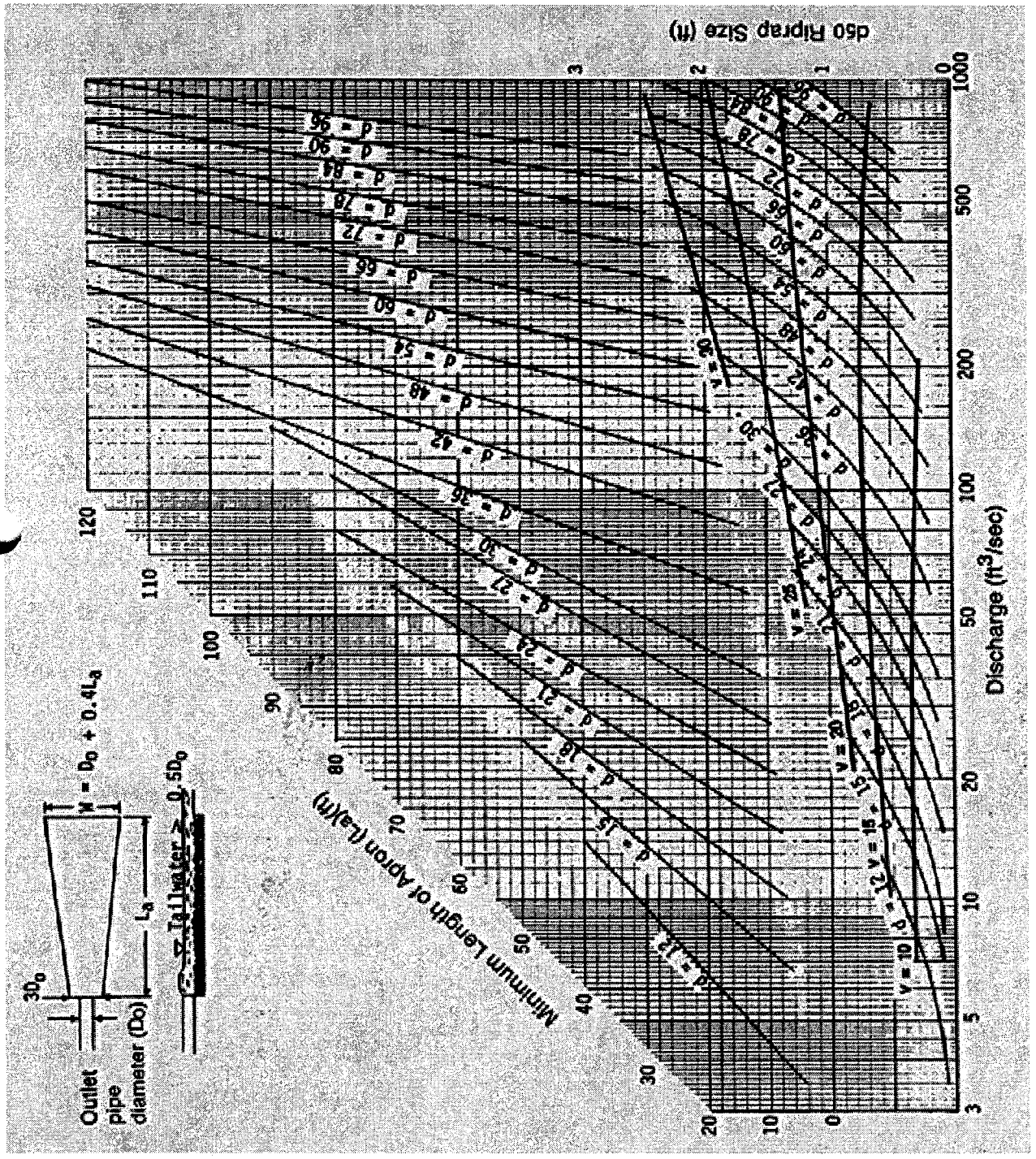


Figure 5B.14
Riprap Outlet Protection Detail (1)

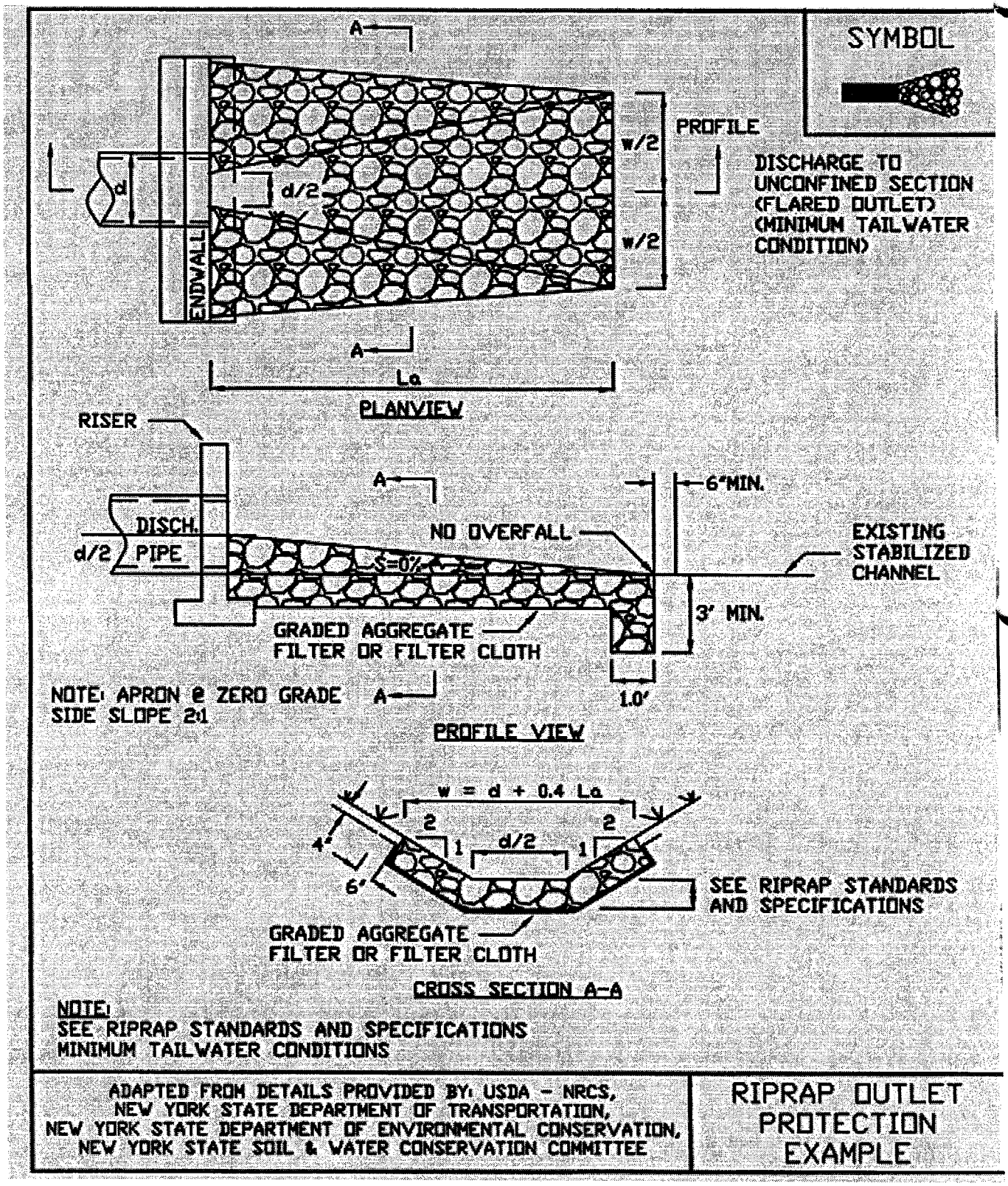


Figure 5B.15
Riprap Outlet Protection Detail (2)

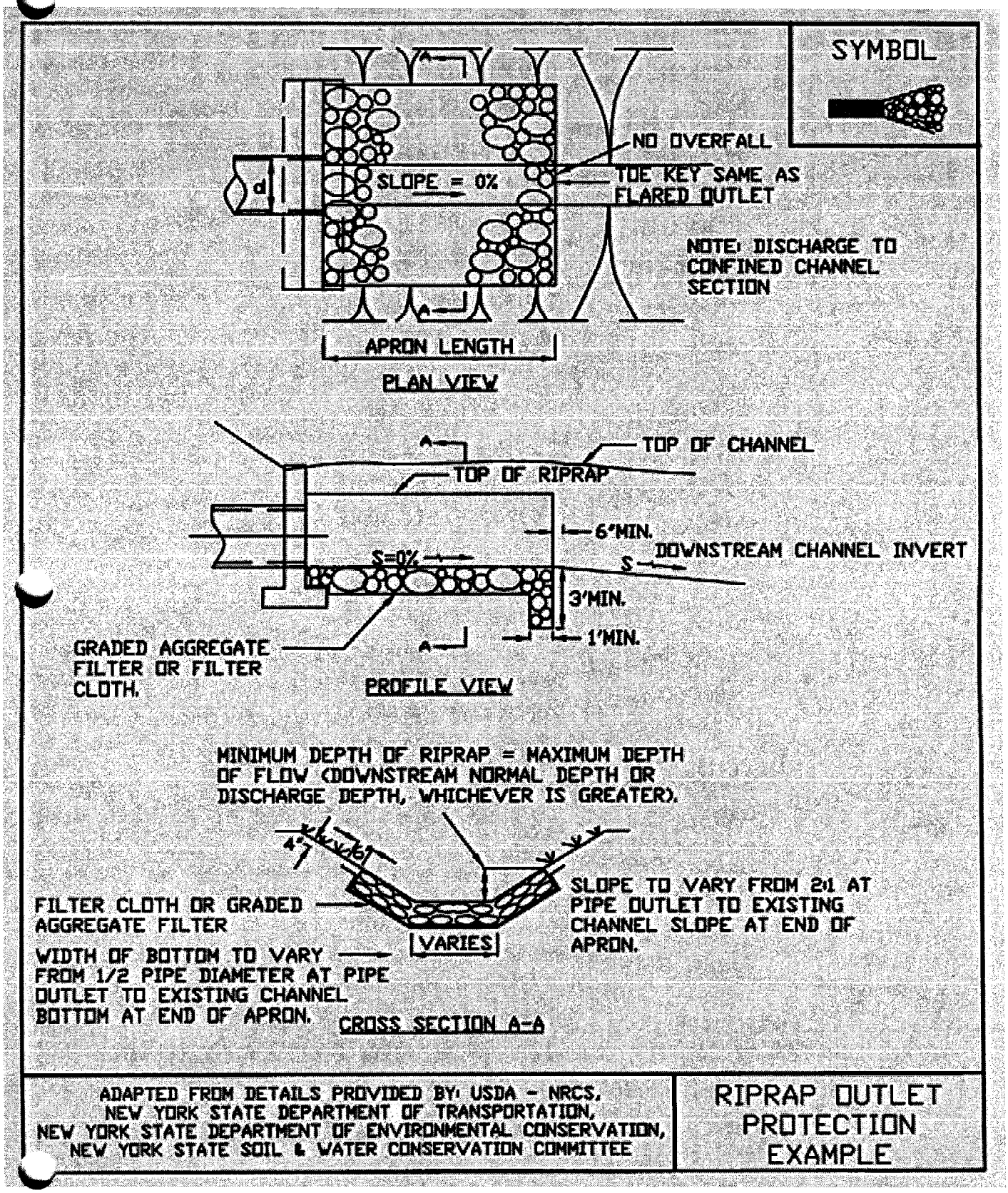
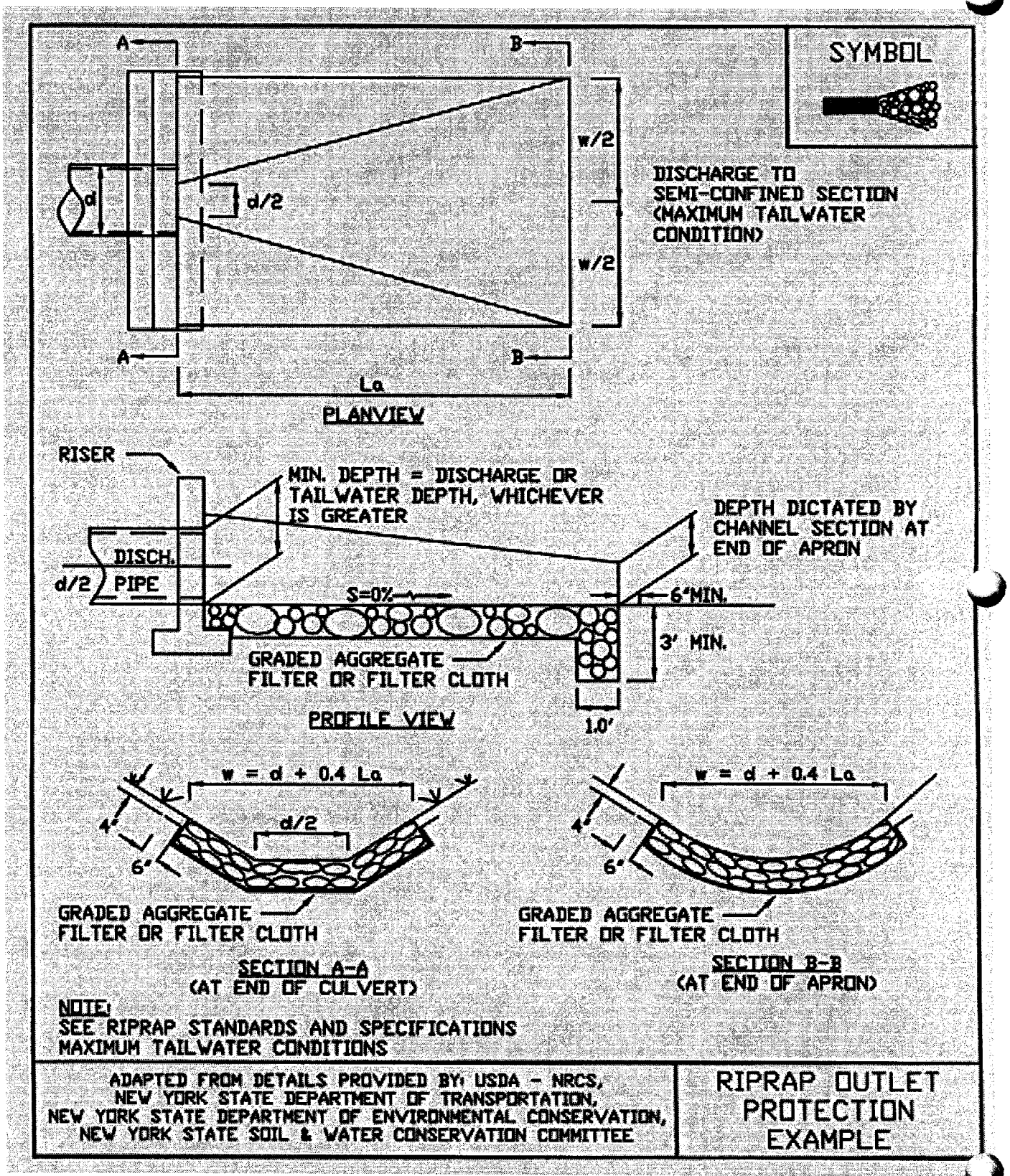


Figure 5B.16
Riprap Outlet Protection Detail (3)

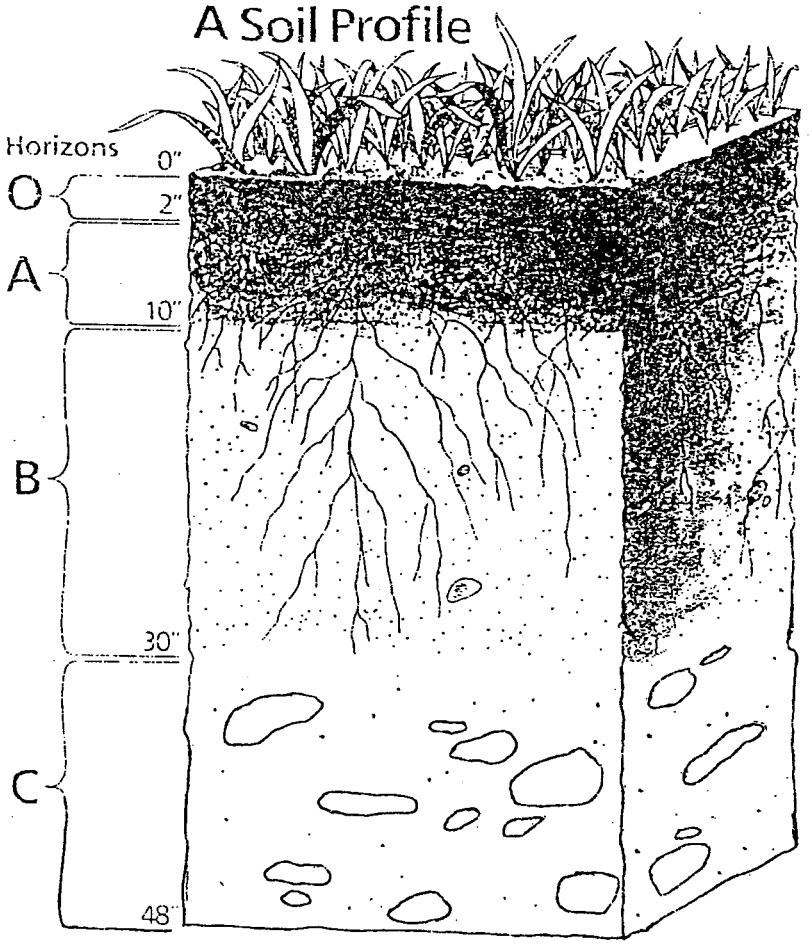


APPENDIX D

DUTCHESS COUNTY
SOIL SURVEY INFORMATION

DUTCHESS COUNTY SOIL SURVEY

USERS GUIDE



Dutchess County, New York

Dutchess County Soil and Water Conservation District

SOIL SURVEY
USERS GUIDE

Dutchess County, New York

Dutchess County Soil and Water Conservation District

September 1991

All programs and services are offered on a nondiscriminatory basis without regard to race, marital status, color, sex, age, handicap, religion, or national origin.

DUTCHESS COUNTY SOIL SURVEY INFORMATION CHART							
SOIL SYMBOL	SOIL NAME	PERCENT SLOPE	PRIME 2)	STATE-WIDE 2)	HYDRIC 3)	SCS CLASS I-VIII 4)	NYS SOIL GROUPS 1-10 5)
HoD	Hollis-Chatfield-Rock outcrop complex, hilly	15-30				VIs	8
HoE	Hollis-Chatfield-Rock outcrop complex, steep	25-45				VIIs	8
HoF	Hollis-Chatfield-Rock outcrop complex, very steep	45-70				VIIs	8
HsA	Hoosic GR-L, nearly level	0-2		S		IIIs	3
HsB	Hoosic GR-L, undulating	2-6		S		IIIs	4
HsC	Hoosic GR-L, rolling	5-16		S		IIIe	6
HsD	Hoosic GR-L, hilly	15-30				VIe	7
HsE	Hoosic GR-L	25-45				VIIe	8
HtA	Hoosic CN-L, fan	0-3		S		IIIs	3
HtB	Hoosic CN-L, fan	3-8		S		IIIs	4
HuA	Hoosic-Urban land complex, nearly level	0-2				-	9
HuB	Hoosic-Urban land complex, undulating	2-6				-	9
HvB	Hudson and Vergennes soils	3-8		S		IIe	4
HvC	Hudson and Vergennes soils	8-15		S		IIIe	6

DUTCHESS COUNTY SOIL SURVEY INFORMATION CHART							
SOIL SYMBOL	SOIL NAME	PERCENT SLOPE	PRIME 2)	STATE -WIDE 2)	HYDRIC 3)	SCS CLASS I-VIII 4)	NYS SOIL GROUPS 1-10 5)
Ud	Udorthents, smoothed	-				-	9
Ue	Udorthents, wet substratum	-			I	-	9
UnB	Unadilla SIL	3-8	P			IIe	2
Ur	Urban land	-				-	9
W	Water	-				-	10
We	Wappinger L	0-3	P			I	1
Wy	Wayland SIL	0-3			H	Vw	8

Footnote:

1) Refer to U.S.D.A. texture chart on page 16 for abbreviations.
2) Refer to pages 17 and 18 for definitions. Both Prime and New York Statewide Important Farmland soils are in their undrained state.
3) Refer to page 17 for definitions. These references to the soil are for their undrained state. If you have a drained soil, please contact the District Office.
4) Refer to page 18 for definitions. SCS soil classes are in their undrained state. If you have a drained soil, please contact the District Office.
5) The NYS Soil Groups are subject to change from year to year. Refer to page 19 for definitions and use.

SOIL TEXTURES:

LS	Loamy sand
LFS	Loamy fine sand
LVFS	Loamy very fine sand
VFSL	Very fine sandy loam
FSL	Fine sandy loam
SL	Sandy loam
L	Loam
SIL	Silt loam
SICL	Sitly clay loam
SIC	Silty clay
C	Clay

SOIL TEXTURE MODIFIERS:

GR-	Gravelly
GRV-	Very gravelly
CN-	Channery
CNV-	Very channery

FOR EXAMPLE: GR-LS is gravelly loamy sand

DEFINITIONS

DRAINAGE CLASS (Natural): Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage.

Somewhat excessively drained - Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained - Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained - Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained - Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained - Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained - Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded.

HYDRIC SOILS: (Listed with an H on the Dutchess County Soil Survey Information Chart beginning on page 8.)

A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (generally the upper 20 inches).

Hydric soils are developed under conditions sufficiently wet to support the growth and regeneration of hydrophytic vegetation. The list includes phases (subdivisions) of soil series that may or may not have been drained. Some series have phases that are not hydric depending on water table, flooding, and ponding characteristics.

Where soil map units are made up of two or more soils, only that portion of the unit designated as hydric is considered in the soil designation. A field investigation may be necessary to determine which soil occurs at that site.

HYDRIC INCLUSIONS: (Listed with an I on the Dutchess County Soil Survey Information Chart beginning on page 8).

Soils with potential hydric inclusions are soils that are not hydric but have a high likelihood of small areas of hydric soils that could not be shown on the soil maps. There is a possibility that some well and moderately well drained soils, that are not listed as "soils with potential hydric inclusions" may contain hydric inclusions. These areas are likely to be indicated on soils maps with a wet spot, spring, or marsh symbol.

PRIME FARMLAND: (Identified with a P on the Dutchess County Soil Survey Information Chart beginning on page 8.)

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited for producing food, feed, forage, fiber, and oilseed crops. Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may

be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0-6 percent.

FARMLAND OF STATEWIDE IMPORTANCE: (Listed with an S on the Dutchess County Soil Survey Information Chart beginning on page 8.)

This is land, in addition to prime and unique farmland, that is of statewide importance for the production of crops. Unique farmland is land other than prime farmland that is used for the production of specific high-value food crops. Farmland of Statewide Importance is important to agriculture in New York, yet exhibits some soil properties that do not meet prime farmland criteria. Examples of such properties are seasonal wetness, erodibilty, limited rooting zones, flooding, or droughtiness. These soils can be farmed satisfactorily by greater inputs of fertilizer and soil amendments, drainage improvement, erosion control practices or flood protection. These soils are nearly level to sloping and range in slope gradient from 0-15 percent. They can be cultivated with modern farm machinery. Normal tillage practices are not hindered by excess stones. These soils produce fair to good crop yields when managed properly.

LAND CAPABILITY CLASSIFICATION OR SCS CLASS I-VIII:

Land capability classification describes, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped in two levels: capability class and subclass. The levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability Subclasses are soil groups within a capability class. They are designated by adding a small letter, e, w, or s, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and s shows that the soil is limited mainly because it is shallow, droughty, or stony.

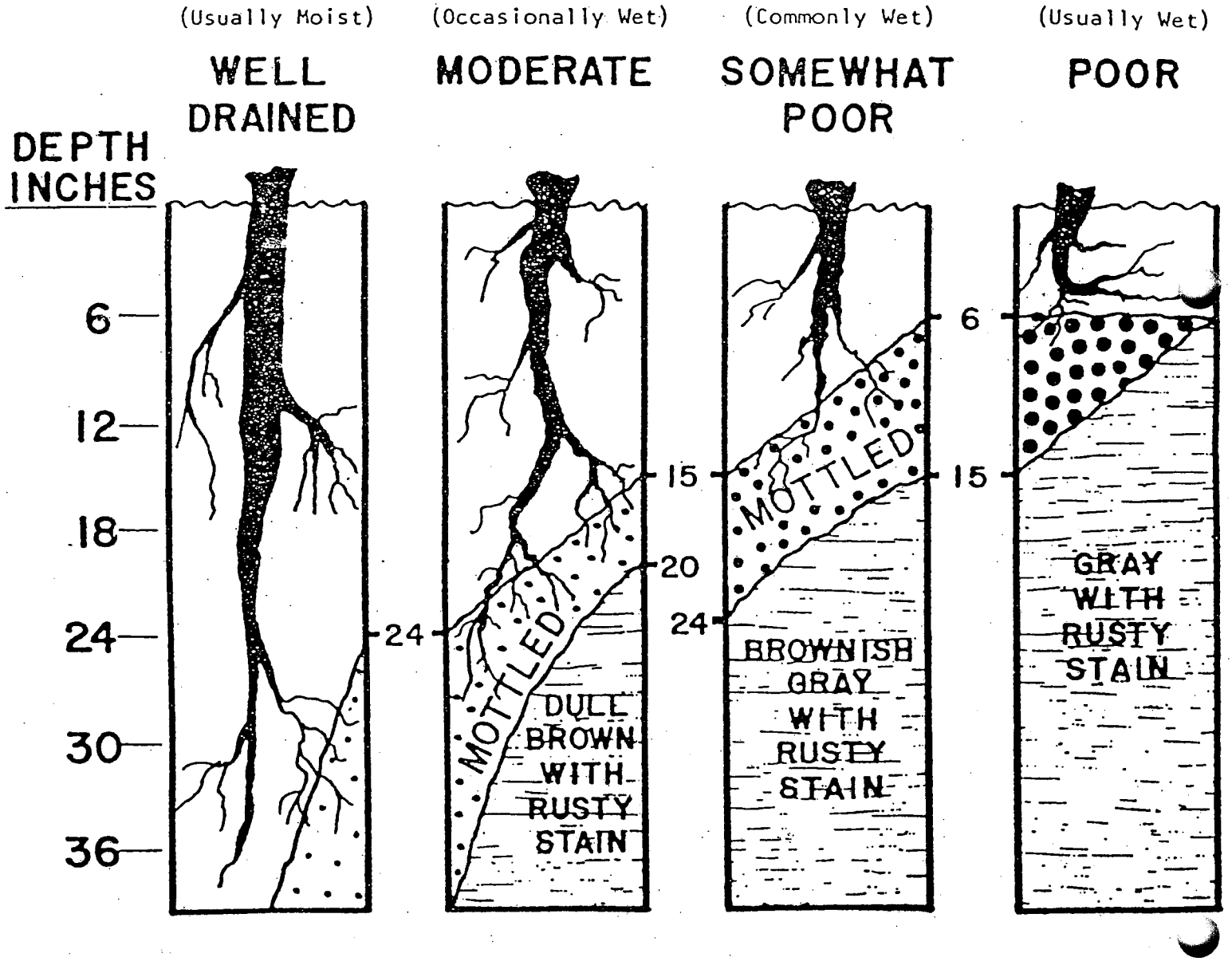
In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by w or s because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

NEW YORK STATE SOIL GROUPS 1-10:

NYS Soil Groups 1-10 were developed as a result of the agricultural value assessment program the state uses to tax qualified farmland at a reduced tax rate. Number one is considered the most productive soil, while ten is soil that is usually unable to produce commercial crops.

SOIL

DRAINAGE CLASS



Urban land - Areas covered by buildings, streets, parking lots, and other impervious surfaces which obscure soil identification.

HvB Hudson and Vergennes soils, 3 to 8 percent slopes - This unit is about 40 percent Hudson soils, 40 percent Vergennes soils, and 20 percent other soils. Some areas consist mostly of Hudson soils, some of mostly Vergennes soils, and some of both.

Hudson soils - Very deep, gently sloping, moderately well drained loamy soils formed in lake-laid sediments. Permeability is moderately slow to slow in the surface and subsurface layers, and slow to very slow in the subsoil and substratum. Seasonal high water table at 1.5 to 2.0 feet from November to April.

Vergennes soils - Very deep, gently sloping, moderately well drained clayey soils formed in lake-laid sediments. Permeability is slow or moderately slow in the surface layer, slow or very slow in the subsoil, and very slow in the substratum. Seasonal high water table at 1.0 to 3.0 feet from December to May.

HvC Hudson and Vergennes soils, 8 to 15 percent slopes - This unit is about 40 percent Hudson soils, 40 percent Vergennes soils, and 20 percent other soils. Some areas consist mostly of Hudson soils, some of mostly Vergennes soils, and some of both.

Hudson soils - Very deep, gently sloping, moderately well drained loamy soils formed in lake-laid sediments. Permeability is moderately slow to slow in the surface and subsurface layers, and slow to very slow in the subsoil and substratum. Seasonal high water table at 1.5 to 2.0 feet from November to April.

Vergennes soils - Very deep, gently sloping, moderately well drained clayey soils formed in lake-laid sediments. Permeability is slow or moderately slow in the surface layer, slow or very slow in the subsoil, and very slow in the substratum. Seasonal high water table at 1.0 to 3.0 feet from December to May.

HvD Hudson and Vergennes soils, hilly - This unit is about 40 percent Hudson soils, 40 percent Vergennes soils, and 20 percent other soils. Some areas consist mostly of Hudson soils, some of mostly Vergennes soils, and some of both.

Hudson soils - Very deep, gently sloping, moderately well drained loamy soils formed in lake-laid sediments. Permeability is moderately slow to slow in the surface and subsurface layers, and slow to very slow in the

subsoil and substratum. Seasonal high water table at 1.5 to 2.0 feet from November to April.

Vergennes soils - Very deep, gently sloping, moderately well drained clayey soils formed in lake-laid sediments. Permeability is slow or moderately slow in the surface layer, slow or very slow in the subsoil, and very slow in the subsoil, and very slow in the substratum. Seasonal high water table at 1.0 to 3.0 feet from December to May.

HvE Hudson and Vergennes soils, steep (25 to 45 percent slopes) - This unit consists of 45 percent Hudson soils, 45 percent Vergennes soils, and 10 percent of other soils. Some areas consist of mostly Hudson soils, some of mostly Vergennes soils, and some of both.

Hudson soils - Very deep, moderately well drained loamy soils formed in lake-laid sediments. Permeability is moderately slow to slow in the surface and subsurface layers, and slow to very slow in the subsoil and substratum. Seasonal high water table at 1.5 to 2.0 feet from November to April.

Vergennes soils - Very deep, moderately well drained clayey soils formed in lake-laid sediments. Permeability is slow or moderately slow in the surface layer, slow or very slow in the subsoil, and very slow in the substratum. Seasonal high water table at 1.0 to 3.0 feet from December to May.

Hy Hydraquents and Medisaprists, ponded (0 to 1 percent slopes) - This unit consists of 45 percent Hydraquents, 45 percent Medisaprists, and 10 percent other soils. Some areas consist of mostly Hydraquents, some of mostly Medisaprists, and some of both. This unit is tidal influenced and floods daily.

Hydraquents - Very deep, nearly level, very poorly drained loamy soils. Permeability is variable. High water table at +3.0 to 1.0 feet.

Medisaprists - Very deep, nearly level, very poorly drained organic soils. Permeability is moderately slow to moderately rapid. High water table at +5.0 to 0.5 feet.

Kn Kingsbury and Rhinebeck soils (0 to 3 percent slopes) - This unit consists of 40 percent Kingsbury soils, 40 percent Rhinebeck soils, and 20 percent other soils. Some areas consist of mostly Kingsbury soils, some of mostly Rhinebeck soils, and some of both.

Taconic soils - Shallow (10 to 20 inches), somewhat excessively drained loamy soils formed in till underlain by folded phyllite, schist, slate, or quartzite bedrock. Permeability is moderate or moderately rapid.

Malcomber soils - Moderately deep (20 to 40 inches), well drained loamy soils formed in till underlain by folded phyllite, schist, slate, or quartzite bedrock. Permeability is moderate.

Rock Outcrop - Common exposures of folded phyllite, schist, slate, or quartzite bedrock or soils too thin to support plant growth.

TrE Taconic-Rock Outcrop complex, steep (25 to 45 percent slopes) - This complex is about 50 percent Taconic soils, 40 percent folded phyllite, schist, slate, or quartzite rock outcrop, and 10 percent other soils.

Taconic soils - Shallow (10 to 20 inches), somewhat excessively drained loamy soils formed in till underlain by folded phyllite, schist, slate, or quartzite bedrock. Permeability is moderate or moderately rapid.

Rock Outcrop - Common exposures of folded phyllite, schist, slate, or quartzite bedrock or soils too thin to support plant growth.

TrF Taconic-Rock Outcrop complex, very steep (45 to 70 percent slopes) - This complex is about 50 percent Taconic soils, 40 percent folded phyllite, schist, slate, or quartzite rock outcrop, and 10 percent other soils.

Taconic soils - Shallow (10 to 20 inches), somewhat excessively drained loamy soils formed in till underlain by folded phyllite, schist, slate, or quartzite bedrock. Permeability is moderate or moderately rapid.

Rock Outcrop - Common exposures of folded phyllite, schist, slate, or quartzite bedrock or soils too thin to support plant growth.

Ud Udorthents, smoothed (0 to 8 percent slopes) - Very deep, somewhat excessively drained to moderately well drained soils that have been altered by cutting and filling.

Ue Udorthents, wet substratum (0 to 8 percent slopes) - Very deep, moderately well drained soils that have been altered by filling.

UnB Unadilla silt loam, 3 to 8 percent slopes - Very deep, gently sloping, well drained silty soils formed in lake-laid sediments. Permeability is moderate.

Ur Urban land (0 to 8 percent slopes) - Areas where the soil surface is covered by impervious materials.

We Wappinger loam (0 to 3 percent slopes) - Very deep, nearly level, well drained loamy soils formed in recent alluvium. Permeability is moderate in the surface layer and the subsoil, and moderately rapid to rapid in the substratum. Subject to occasional brief flooding from November to May. THIS SOIL IS PRIME FARMLAND.

Wy Wayland silt loam (0 to 3 percent slopes) - Very deep, nearly level, poorly drained and very poorly drained soils formed in recent alluvium. Permeability is moderately slow to moderate in the surface layer, and slow in the subsoil and the substratum. Subject to frequent brief to long flooding from November to June. Seasonal high water table at +0.5 to 1.0 foot from November to June. THIS SOIL IS HYDRIC.

MLRA(S): 101, 140, 142, 144A, 100
REV. MEW,KAW, 2-86
GLOSSAQUIC HAPLUDALFS, FINE, ILLITIC, MESIC

THE HUDSON SERIES CONSISTS OF DEEP, MODERATELY WELL-DRAINED SOILS ON LAKE PLAINS. THEY FORMED IN LAKE LAID SEDIMENTS. TYPICALLY, THESE SOILS HAVE A DARK BROWN SILT LOAM SURFACE LAYER 5 INCHES THICK, A SUBSURFACE LAYER FROM 5 TO 8 INCHES IS BROWN SILT LOAM. THE UPPER PART OF THE SUBSOIL FROM 8 TO 16 INCHES IS YELLOWISH-BROWN SILTY CLAY. THE LOWER PART OF THE SUBSOIL FROM 16 TO 28 INCHES IS MOTTLED BROWN SILTY CLAY. THE CALCAREOUS SUBSTRATUM FROM 28 TO 60 INCHES IS MIXED GRAYISH-BROWN AND LIGHT OLIVE BROWN SILTY CLAY. SLOPES RANGE FROM 0 TO 60 PERCENT.

LANDSCAPE AND CLIMATE PROPERTIES

ANNUAL AIR TEMPERATURE	FROST FREE DAYS	ANNUAL PRECIPITATION	ELEVATION (FT)	DRAINAGE CLASS	SLOPE (PCT)
				MW	0-60

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. >10 IN (PCT)	FRACT. > 3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	CLAY (PCT)
0-8	SIL, SICL, L	ML, CL-ML, OL, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	65-95	20-40
0-8	GR-SIL, GR-L, CN-SICL	ML, CL-ML, GM, GC	A-4, A-6, A-7		5-10	65-90	60-85	55-85	40-80	20-40
8-16	SIC, SICL	CL, CH	A-7, A-6	0	0	95-100	90-100	80-100	80-100	35-60
16-28	SIC, SICL	CL, CH	A-7, A-6	0	0	95-100	90-100	80-100	80-100	25-60
28-60	SIC, SIL, C	CL, CH	A-7, A-6	0	0	95-100	90-100	80-100	60-100	35-60

DEPTH (IN.)	LIQUID LIMIT	PLASTICITY INDEX	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SAR	CEC (ME/100G)	CACO3 (PCT)	GYPSUM (PCT)
0-8	25-48	5-19	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	-				
0-8	25-48	5-19	1.20-1.40	0.2-2.0	0.10-0.14	5.1-7.3	-				
8-16	35-65	15-35	1.15-1.40	<0.2	0.13-0.17	5.1-7.3	-				
16-28	35-65	15-35	1.15-1.40	<0.2	0.13-0.17	5.6-7.8	-				
28-60	35-65	15-35	1.15-1.40	<0.2	0.12-0.20	6.6-8.4	-				

DEPTH (IN.)	ORGANIC MATTER (PCT)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	WIND EROD. INDEX	CORROSIVITY STEEL	CONCRETE
0-8	3-6	MODERATE	.49	3	-	-	HIGH	LOW
0-8	3-6	MODERATE	.37	3	-	-		
8-16		MODERATE	.28					
16-28		MODERATE	.28					
28-60		MODERATE	.28					

FLOODING FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE DEPTH (FT)	KIND	MONTHS	CEMENTED PAN DEPTH (IN)	HARDNESS	BEDROCK DEPTH (IN)	HARDNESS	SUBSIDENCE INIT. (IN)	TOTAL (IN)	HYD GRP	POTENT'L FROST ACTION
NONE			1.5-2.0	PERCHED	NOV-APR	-		>60		-		C	HIGH

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	0-15%:SEVERE-PERCS SLOWLY,WETNESS 15+%:SEVERE-SLOPE,PERCS SLOWLY,WETNESS
SEWAGE LAGOON AREAS	0-2%:SLIGHT 2-7%:MODERATE-SLOPE 7+%:SEVERE-SLOPE
SANITARY LANDFILL (TRENCH)	0-15%:SEVERE-WETNESS,TOO CLAYEY 15+%:SEVERE-SLOPE,TOO CLAYEY,WETNESS
SANITARY LANDFILL (AREA)	0-8%:MODERATE-WETNESS 8-15%:MODERATE-WETNESS,SLOPE 15+%:SEVERE-SLOPE
DAILY COVER FOR LANDFILL	0-15%:POOR-TOO CLAYEY,HARD TO PACK 15+%:POOR-SLOPE,TOO CLAYEY,HARD TO PACK

CONSTRUCTION MATERIAL (B)

ROADFILL	0-25%:POOR-LOW STRENGTH 25+%:POOR-SLOPE,LOW STRENGTH
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	0-15%:POOR-THIN LAYER,TOO CLAYEY 15+%:POOR-SLOPE,THIN LAYER,TOO CLAYEY

WATER MANAGEMENT (B)

POND RESERVOIR AREA	0-3%:SLIGHT 3-8%:MODERATE-SLOPE 8+%:SEVERE-SLOPE
EMBANKMENTS DIKES AND LEVEES	MODERATE-HARD TO PACK,WETNESS
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	0-3%:PERCS SLOWLY,FROST ACTION 3+%.PERCS SLOWLY,FROST ACTION,SLOPE
IRRIGATION	0-3%:WETNESS,PERCS SLOWLY,ERODES EASILY 3+%:WETNESS,PERCS SLOWLY,SLOPE
TERRACES AND DIVERSIONS	0-8%:ERODES EASILY,WETNESS 8+%:SLOPE,ERODES EASILY,WETNESS
GRASSED WATERWAYS	0-8%:PERCS SLOWLY,ERODES EASILY 8+%:SLOPE,PERCS SLOWLY,ERODES EASILY

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	0-15%:SEVERE-WETNESS 15+%:SEVERE-SLOPE,WETNESS
DWELLINGS WITHOUT BASEMENTS	0-8%:MODERATE-WETNESS,SHRINK-SWELL 8-15%:MODERATE-WETNESS,SHRINK-SWELL,SLOPE 15+%:SEVERE-SLOPE
DWELLINGS WITH BASEMENTS	0-15%:SEVERE-WETNESS 15+%:SEVERE-WETNESS,SLOPE
SMALL COMMERCIAL BUILDINGS	0-4%:MODERATE-WETNESS,SHRINK-SWELL 4-8%:MODERATE-WETNESS,SHRINK-SWELL,SLOPE 8+%:SEVERE-SLOPE
LOCAL ROADS AND STREETS	0-15%:SEVERE-FROST ACTION,LOW STRENGTH 15+%:SEVERE-SLOPE,FROST ACTION,LOW STRENGTH
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-8%SIL,SICL,L:MODERATE-WETNESS 8-15%SIL,SICL,L:MODERATE-WETNESS,SLOPE 0-8%GR,CN:MODERATE-SMALL STONES,WETNESS 8-15%GR,CN:MODERATE-SLOPE,SMALL STONES 15+%:SEVERE-SLOPE

MLRA(S): 100, 101, 140, 144A, 144B
WEH, 8-87

UDORTHENTS, LOAMY, CONSIST OF VERY DEEP, SOMEWHAT EXCESSIVELY DRAINED TO MODERATELY WELL DRAINED SOILS. THESE SOILS ARE IN AREAS THAT ARE EXCAVATED OR FILLED, OR OTHERWISE DISTURBED BY MAN. THE SOIL IS DERIVED FROM GLACIAL TILL GLACIAL OUTWASH, GLACIO-LACUSTRINE OR ALLUVIAL DEPOSITS OR RESIDUUM. SOIL PROFILE DEVELOPMENT IS WEAK OR ABSENT, AND SOIL TEXTURE IS DOMINANTLY LOAMY. ALTHOUGH VARIABLE, TYPICALLY THE SURFACE LAYER IS GRAYISH BROWN LOAM ABOUT 4 INCHES THICK. THE SUBSTRATUM, FROM 4 TO 60 INCHES, IS BROWN GRAVELLY LOAM. SLOPE RANGES FROM 0 TO 15 PERCENT.

LANDSCAPE AND CLIMATE PROPERTIES

ANNUAL AIR TEMPERATURE	FROST FREE DAYS	ANNUAL PRECIPITATION	ELEVATION (FT)	DRAINAGE CLASS	SLOPE (PCT)
				SE	0-15

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. >10 IN (PCT)	FRACT. >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	CLAY (PCT)
0-4	SL, L, SICL	SM, ML, CL, SC	A-2, A-4, A-6		0-5	80-100	75-100	55-100	30-95	5-35
0-4	GR-SL, CN-L, GR-SICL	SM, ML, GM, CL	A-2, A-4, A-6		0-10	60-80	55-75	35-75	20-70	5-35
0-4	GRV-SL, CNV-SICL	GM, GW-GM, SM, SC	A-1, A-2, A-4, A-6		0-10	35-60	30-55	20-55	10-50	5-35
4-70	GRV-SL, CN-L, SICL	GM, SC, ML, CL	A-1, A-2, A-4, A-6		0-10	35-100	30-100	20-100	10-95	5-35

DEPTH (IN.)	LIQUID LIMIT	PLASTICITY INDEX	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SAR	CEC (ME/100G)	CACO3 (PCT)	GYPSUM (PCT)
0-4	<45	NP-15	1.20-1.60	0.06-20	0.06-0.15	4.5-7.3	-				
0-4	<45	NP-15	1.20-1.60	0.06-20	0.05-0.13	4.5-7.3	-				
0-4	<45	NP-15	1.20-1.60	0.06-20	0.04-0.10	4.5-7.3	-				
4-70	<45	NP-15	1.30-1.90	0.06-6.0	0.04-0.13	4.5-8.4	-				

DEPTH (IN.)	ORGANIC MATTER (PCT)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	WIND EROD. INDEX	CORROSIVITY STEEL	CONCRETE
0-4	0-5	LOW	.37	3	-	-	MODERATE	MODERATE
0-4	0-5	LOW	.32	3	-	-		
0-4	0-5	LOW	.32	3	-	-		
4-70		LOW	.32					

FLOODING FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE DEPTH (FT)	KIND	MONTHS	CEMENTED PAN DEPTH (IN)	HARDNESS	BEDROCK DEPTH (IN)	HARDNESS	SUBSIDENCE INIT. (IN)	TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			>3.0		NOV-JUN	-		>60				A/D	MODERATE

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	SEVERE-WETNESS, PERCS SLOWLY
SEWAGE LAGOON AREAS	0-7%: SEVERE-SEEPAGE, WETNESS 7+%: SEVERE-SEEPAGE, SLOPE, WETNESS
SANITARY LANDFILL (TRENCH)	SEVERE-SEEPAGE, WETNESS
SANITARY LANDFILL (AREA)	SEVERE-SEEPAGE, WETNESS
DAILY COVER FOR LANDFILL	POOR-SMALL STONES

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	0-8%: MODERATE-DENSE LAYER, WETNESS 8-15%: MODERATE-DENSE LAYER, WETNESS, SLOPE
DWELLINGS WITHOUT BASEMENTS	0-8%: SLIGHT 8-15%: MODERATE-SLOPE
DWELLINGS WITH BASEMENTS	0-8%: MODERATE-WETNESS 8-15%: MODERATE-WETNESS, SLOPE
SMALL COMMERCIAL BUILDINGS	0-4%: SLIGHT 4-8%: MODERATE-SLOPE 8+% SEVERE-SLOPE
LOCAL ROADS AND STREETS	0-8%: MODERATE-FROST ACTION 8-15%: MODERATE-SLOPE, FROST ACTION
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	SL, L, SICL, GR, CN: SEVERE-DROUGHTY GRV, CNV: SEVERE-SMALL STONES, DROUGHTY

CONSTRUCTION MATERIAL (B)

ROADFILL	GOOD
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	POOR-AREA RECLAIM, SMALL STONES

WATER MANAGEMENT (B)

POND RESERVOIR AREA	0-8%: SEVERE-SEEPAGE 8+%: SEVERE-SEEPAGE, SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-SEEPAGE, PIPING
EXCAVATED PONDS AQUIFER FED	SEVERE-SLOW REFILL
DRAINAGE	DEEP TO WATER
IRRIGATION	0-3%: DROUGHTY, PERCS SLOWLY 3+%: SLOPE, DROUGHTY, PERCS SLOWLY
TERRACES AND DIVERSIONS	0-8%GR-SL, CN-L, GR-SICL, GRV-SL, CNV-SICL: PERCS SLOWL 8+%GR-SL, CN-L, GR-SICL, GRV-SL, CNV-SICL: SLOPE 0-8%SL, L, SICL: ERODES EASILY, PERCS SLOWLY 8+%SL, L, SICL: SLOPE, ERODES EASILY
GRASSED WATERWAYS	0-8%GR-SL, CN-L, GR-SICL, GRV-SL, CNV-SICL: DROUGHTY 8+%GR-SL, CN-L, GR-SICL, GRV-SL, CNV-SICL: SLOPE 0-8%SL, L, SICL: ERODES EASILY, DROUGHTY 8+%SL, L, SICL: SLOPE, ERODES EASILY, DROUGHTY

DC0035 SOIL INTERPRETATIONS RECORD URBAN LAND

MLRA(S): ALL
REV. LNL, 7-86

URBAN LAND IS LAND MOSTLY COVERED BY STREETS, PARKING LOTS, BUILDINGS, AND OTHER STRUCTURES OF URBAN AREAS. SLOPES RANGE FROM 0 TO 45 PERCENT.

LANDSCAPE AND CLIMATE PROPERTIES

ANNUAL AIR TEMPERATURE	FROST FREE DAYS	ANNUAL PRECIPITATION	ELEVATION (FT)	DRAINAGE CLASS	SLOPE (PCT)
					0-45

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. >10 IN (PCT)	FRACT. 3-10IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	CLAY (PCT)
0-6	VAR	-	-	-	-	-	-	-	-	-

DEPTH (IN.)	LIQUID LIMIT	PLASTICITY INDEX	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SAR	CEC (ME/100G)	CACO3 (PCT)	GYPSUM (PCT)
0-6	-	-	-	-	-	-	-				

DEPTH (IN.)	ORGANIC MATTER (PCT)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	WIND EROD. INDEX	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-6	-		-	-	-	-		

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE-OCCASIONAL			>2.0			-		>10		-		-	-

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	VARIABLE
SEWAGE LAGOON AREAS	VARIABLE
SANITARY LANDFILL (TRENCH)	VARIABLE
SANITARY LANDFILL (AREA)	VARIABLE
DAILY COVER FOR LANDFILL	VARIABLE

CONSTRUCTION MATERIAL

ROADFILL	VARIABLE
SAND	VARIABLE
GRAVEL	VARIABLE
TOPSOIL	VARIABLE

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	VARIABLE
DWELLINGS WITHOUT BASEMENTS	VARIABLE
DWELLINGS WITH BASEMENTS	VARIABLE
SMALL COMMERCIAL BUILDINGS	VARIABLE
LOCAL ROADS AND STREETS	VARIABLE
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	VARIABLE

WATER MANAGEMENT

POND RESERVOIR AREA	VARIABLE
EMBANKMENTS DIKES AND LEVEES	VARIABLE
EXCAVATED PONDS AQUIFER FED	VARIABLE
DRAINAGE	VARIABLE
IRRIGATION	VARIABLE
TERRACES AND DIVERSIONS	VARIABLE
GRASSED WATERWAYS	VARIABLE

MLRA(S): 142, 144A
REV. GWH,RLM, 12-88
GLOSSAQUIC HAPLUDALFS, VERY-FINE, ILLITIC, MESIC

THE VERGENNES SERIES CONSISTS OF VERY DEEP, MODERATELY WELL DRAINED SOILS ON LAKE PLAINS. THEY FORMED IN CALCAREOUS ESTUARINE AND GLACIOLACUSTRINE CLAYS. TYPICALLY THESE SOILS HAVE A DARK GRAYISH BROWN CLAY SURFACE LAYER 6 INCHES THICK. THE CLAY SUBSOIL FROM 6 TO 29 INCHES IS DARK OR VERY DARK GRAYISH BROWN. THE SUBSTRATUM FROM 29 TO 47 INCHES CONSISTS OF THIN LAYERS OF DARK GRAY CLAY INTERBEDDED WITH THIN LAYERS OF OLIVE BROWN SILT. SLOPES RANGE FROM 0 TO 60 PERCENT.

LANDSCAPE AND CLIMATE PROPERTIES

ANNUAL AIR TEMPERATURE	FROST FREE DAYS	ANNUAL PRECIPITATION	ELEVATION (FT)	DRAINAGE CLASS	SLOPE (PCT)
				MW	0-60

ESTIMATED SOIL PROPERTIES (A)

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. >10 IN (PCT)	FRACT. 3-10 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	CLAY (PCT)
0-6	C, SIC, SICL	MH, CH	A-7	0	0	100	100	90-100	85-100	27-90
0-6	SIL	CL	A-6	0	0	100	100	90-100	80-90	20-27
6-16	C	MH, CH	A-7	0	0	100	100	95-100	75-100	60-90
16-29	C	MH, CH	A-7	0	0	100	100	95-100	95-100	60-90
29-65	C	MH, CH	A-7	0	0	100	100	95-100	95-100	60-90

DEPTH (IN.)	LIQUID LIMIT	PLASTICITY INDEX	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SAR	CEC (ME/100G)	CACO3 (PCT)	GYPSUM (PCT)
0-6	40-80	20-40	1.25-1.55	0.06-0.6	0.11-0.21	4.5-7.3	-				
0-6	30-40	10-20	1.25-1.55	0.06-0.6	0.22-0.24	4.5-7.3	-				
6-16	50-80	20-45	1.10-1.40	<0.2	0.09-0.11	4.5-7.3	-				
16-29	50-80	20-45	1.10-1.40	<0.2	0.09-0.11	5.6-8.4	-				
29-65	50-80	20-45	1.20-1.50	<0.06	0.08-0.10	7.9-8.4	-				

DEPTH (IN.)	ORGANIC MATTER (PCT)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	WIND EROD. INDEX	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-6	2-6	MODERATE	.49	3	-	-	HIGH	MODERATE
0-6	2-6	MODERATE	.49	3	-	-		
6-16		MODERATE	.49					
16-29		MODERATE	.49					
29-65		MODERATE	.49					

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			1.0-3.0	APPARENT	DEC-MAY	-		>60		-		C	MODERATE

SANITARY FACILITIES (B)

SEPTIC TANK ABSORPTION FIELDS	0-15%:SEVERE-WETNESS,PERCS SLOWLY 15+%:SEVERE-WETNESS,PERCS SLOWLY,SLOPE
SEWAGE LAGOON AREAS	0-7%:SEVERE-WETNESS 7+%:SEVERE-SLOPE,WETNESS
SANITARY LANDFILL (TRENCH)	0-15%:SEVERE-WETNESS,TOO CLAYEY 15+%:SEVERE-WETNESS,SLOPE,TOO CLAYEY
SANITARY LANDFILL (AREA)	0-15%:SEVERE-WETNESS 15+%:SEVERE-WETNESS,SLOPE
DAILY COVER FOR LANDFILL	0-15%:POOR-TOO CLAYEY,HARD TO PACK 15+%:POOR-TOO CLAYEY,HARD TO PACK,SLOPE

BUILDING SITE DEVELOPMENT (B)

SHALLOW EXCAVATIONS	0-15%:SEVERE-WETNESS 15+%:SEVERE-WETNESS,SLOPE
DWELLINGS WITHOUT BASEMENTS	0-15%:SEVERE-WETNESS 15+%:SEVERE-WETNESS,SLOPE
DWELLINGS WITH BASEMENTS	0-15%:SEVERE-WETNESS 15+%:SEVERE-WETNESS,SLOPE
SMALL COMMERCIAL BUILDINGS	0-8%:SEVERE-WETNESS 8+%:SEVERE-WETNESS,SLOPE
LOCAL ROADS AND STREETS	0-15%:SEVERE-LOW STRENGTH 15+%:SEVERE-LOW STRENGTH,SLOPE
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-8%SICL:MODERATE-WETNESS 8-15%SICL:MODERATE-WETNESS,SLOPE 15+%SICL:SEVERE-SLOPE 0-15%C,SIC:SEVERE-TOO CLAYEY 15+%C,SIC:SEVERE-SLOPE,TOO CLAYEY

CONSTRUCTION MATERIAL (B)

ROADFILL	0-25%:POOR-LOW STRENGTH 25+%:POOR-LOW STRENGTH,SLOPE
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	0-8%SICL:FAIR-TOO CLAYEY 8-15%SICL:FAIR-TOO CLAYEY,SLOPE 15+%SICL:POOR-SLOPE 0-15%C,SIC:POOR-TOO CLAYEY 15+%C,SIC:POOR-TOO CLAYEY,SLOPE

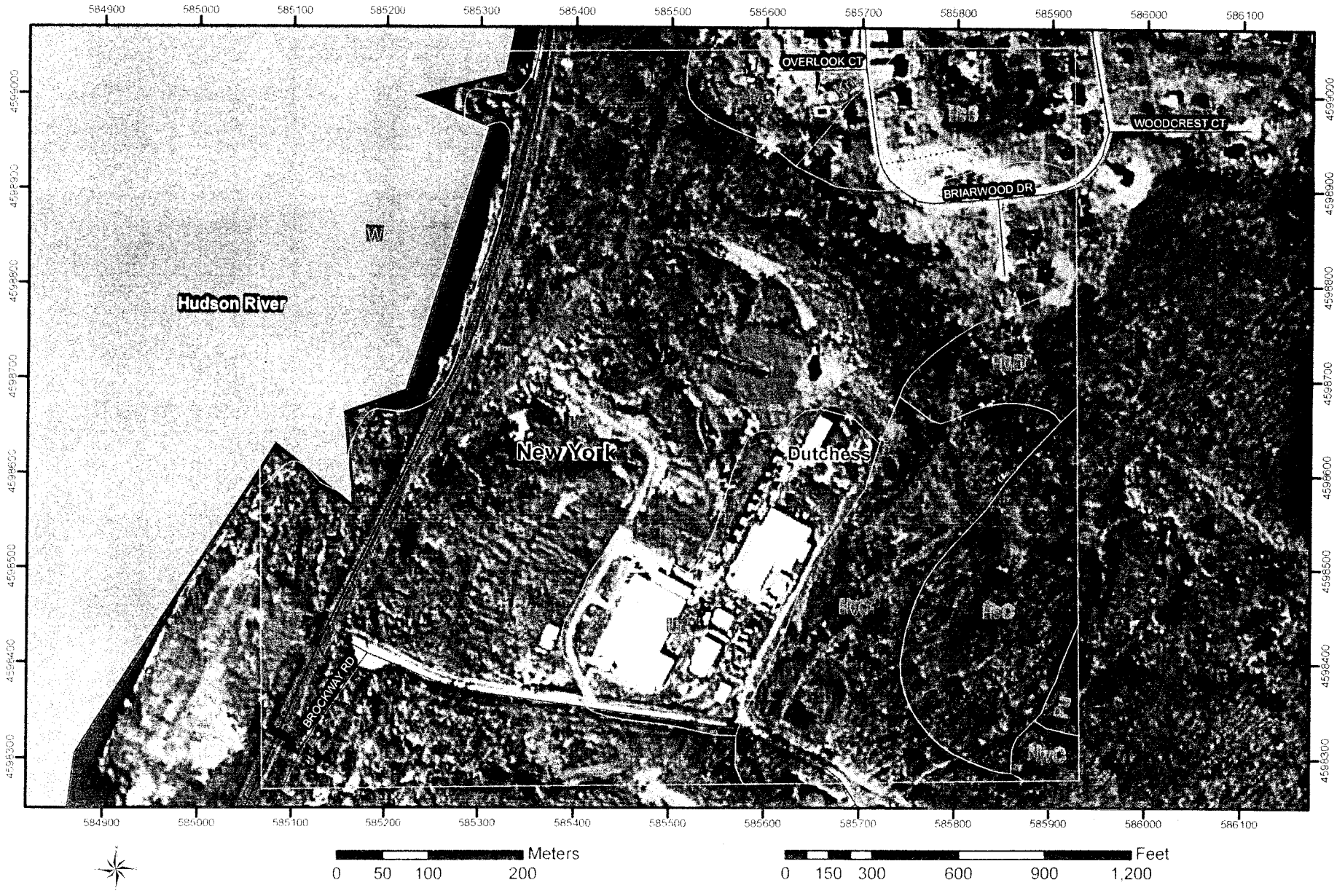
WATER MANAGEMENT (B)

POND RESERVOIR AREA	0-3%:SLIGHT 3-8%:MODERATE-SLOPE 8+%:SEVERE-SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-HARD TO PACK,WETNESS
EXCAVATED PONDS AQUIFER FED	SEVERE-SLOW REFILL
DRAINAGE	0-3%:PERCS SLOWLY 3+%:PERCS SLOWLY,SLOPE
IRRIGATION	SICL:WETNESS,PERCS SLOWLY C,SIC:WETNESS,SLOW INTAKE,PERCS SLOWLY
TERRACES AND DIVERSIONS	0-8%:ERODES EASILY,WETNESS 8+%:SLOPE,ERODES EASILY,WETNESS
GRASSED WATERWAYS	0-8%:WETNESS,ERODES EASILY 8+%:WETNESS,SLOPE,ERODES EASILY

APPENDIX D

DUTCHESS COUNTY
SOIL SURVEY INFORMATION

Circle M Wood Treatment Facility



APPENDIX H

DUST CONTROL PLAN
(DCP)

STERLING
Sterling Environmental Engineering, P.C.

DUST CONTROL PLAN
(DCP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

Prepared For:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

Prepared By:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

February 20, 2007

DUST CONTROL PLAN
(DCP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

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List of Appendices

Appendix 1 Example Form

21044/Dust Control Plan_toc.doc

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DUST CONTROL PLAN
(DCP)

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

1.0 INTRODUCTION

This Dust Control Plan (DCP) sets forth dust control methods that will be implemented for various remedial activities including the excavation, handling and consolidation of impacted soils at the former Circle M Wood Treating Site (Site). The DCP follows guidelines provided in the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum #4031 (TAGM 4031) and the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP).

1.1 Site Description & Background

Chelsea Industrial Park consists of an approximate 58-acre parcel at the end of Brockway Road in the Town of Fishkill, Dutchess County, New York. The industrial park is located east of the railroad tracks along the east bank of the Hudson River at an elevation approximately 55 feet above mean sea level (amsl), and 50 feet above the Hudson River mean water level. The former Circle M Wood Treating facility is located within Chelsea Industrial Park, and occupies approximately eight (8) acres of the industrial park. For the purposes of the Brownfield Cleanup Program, an area of approximately 19.885 acres has been designated as "the Site", which includes the former Circle M building and surrounding area.

This DCP applies to work to be conducted at the Former Circle M Wood Treating Site by Chelsea Waterfront Development, LLC and its contractors. The subject site contains soils impacted by chromated copper arsenate (CCA) from past lumber treatment process and waste management practices. CCA has constituent elements of chromium, arsenic, and copper that are deemed hazardous in the Site soils because of their concentration levels and leaching characteristics.

Findings from the Focused Remedial Investigation (FRI) and Focused Feasibility Study (FFS) served as the foundation for the Record of Decision (ROD) issued by the NYSDEC, setting forth the selected remedies for the Site.

2.0 SCOPE OF WORK TO COMPLETE SELECTED REMEDIES FOR THE SITE

The scope of work to complete the selected remedies for the Site will include the following tasks:

- Disconnect and properly abandon utilities.
- Ensure utilities under the consolidation area are properly abandoned.
- Identify and protect underground utilities in excavation areas.
- Install erosion control measures around areas to be excavated and in consolidation area.

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- Strip uncontaminated organic material, such as trees and brush, from the consolidation area and properly dispose.
- Remove any uncontaminated debris and organic material, such as trees and brush, from the excavation area and properly dispose.
- Excavate the contaminated soil and relocate in the consolidation area.
- Stabilize the disturbed soils at all excavation areas.
- Cover the consolidation area with geotextile fabric and two (2) feet of clean fill.
- Implement erosion control measures on the stream bank.

3.0 POTENTIAL FUGITIVE DUST EMISSION SOURCES AND CONTROL METHODS PLAN

This DCP will be implemented during excavation, grading and covering of materials, and monitoring well installations.

TABLE 1

Potential Dust Source	Control Method [1]	Frequency of Application [2]
Excavation Areas	Pre-moisten area (if dry) before excavating. Cover filled excavation with matting or suitable erosion control material.	As necessary. If moistening alone is not effective.
Stockpile Clean Fill	Moisten stockpile by misting.	As needed.
Stockpile Contaminated Soil	Moisten stockpile by misting.	As needed.
Unpaved Roads	Apply water to the road, control run-off from water application. Apply crushed stone to egress and exit area to/from the exclusion zone [3].	As needed and where directed by Engineer. Once before excavation starts, maintain as needed.
Paved Roads (on-site and public roads)	Water flush and vacuum sweep road. Control run-off from water flush.	Once daily or more as needed.
Vehicles	On-Site Speed Limit 10 mph, Post Signs. Properly Tarp Hauling vehicles.	On-going.

[1] An Inspection Checklist for each Potential Dust Source will be kept to record the type of control method used, the frequency of application and comments with regards to the method's effectiveness (see Appendix 1).

[2] The Frequency of Application for those methods that specify a daily application may be

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increased based on the particulate concentrations that are monitored as required in the Community Air Monitoring Plan (CAMP).

[3] The exclusion zone is identified as the area where contamination is either known or expected to occur and where the greatest potential for exposure exists.

21044/Dust Control Plan_txt.doc

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Appendix 1

Example Form:

Self-Inspection Checklist
Fugitive Dust Control Method Log

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF ASHKILL
DUTCHESS COUNTY, NEW YORK

Self-Inspection Checklist: Fugitive Dust Control Method Log

Date	Time	Name of Inspector	Weather	Location	Control Methods Employed	Comments (Note Effectiveness, Observed Problems, Complaints and Response Actions)

Source: Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110
(518)456-4900
21044/Dust Control Plan/Appendix 1.doc

APPENDIX I

DETAILED CONSTRUCTION SPECIFICATIONS AND CONTRACT DOCUMENTS

STERLING
Sterling Environmental Engineering, P.C.

BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

CONTRACT NO. 1

Prepared for:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

Prepared by:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

February 20, 2007

BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
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Article 2	The Project
Article 3	Engineer
Article 4	Contract Times
Article 5	Contract Price
Article 6	Payment Procedures
Article 7	Vacant
Article 8	Contractor's Representations

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Article 9	Contract Documents
Article 10	Miscellaneous
Article 11	Vacant

CHANGE ORDER

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Article 2	Preliminary Matters
Article 3	Contract Documents: Intent, Amending, Reuse
Article 4	Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points
Article 5	Bonds and Insurance
Article 6	Contractor's Responsibilities
Article 7	Other Work at the Site
Article 8	Owner's Responsibilities
Article 9	Engineer's Status During Construction
Article 10	Changes in the Work; Claims
Article 11	Cost of the Work; Allowances; Unit Price Work
Article 12	Change of Contract Price; Change of Contract Times
Article 13	Tests and Inspections; Correction, Removal or Acceptance of Defective Work
Article 14	Payments to Contractor and Completion
Article 15	Suspension of Work and Termination
Article 16	Dispute Resolution
Article 17	Miscellaneous

SUPPLEMENTARY CONDITIONS

Article 1	Definitions and Terminology
Article 4	Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points
Article 5	Bonds and Insurance
Article 6	Contractor's Responsibilities
Article 9	Engineer's Status During Construction
Article 17	Miscellaneous - Statutory Requirements

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SPECIFICATIONS

Contract No. 1 – Division 1 - General Requirements

01010	Summary of Work
01030	Progress Meetings
01041	Coordination
01050	Field Engineering
01150	Measurement and Payment
01210	Preconstruction Conference
01310	Construction Schedules
01340	Shop Drawings, Product Data and Samples
01370	Schedule of Values
01410	Testing Laboratory Services
01501	Contractor's Field Office
01540	Security
01560	Temporary Controls
01570	Maintenance and Protection of Traffic
01600	Transportation and Handling of Materials and Equipment
01620	Storage and Protection
01720	Project Record Documents

Contract No. 1 – Division 2 – Site Work

02110	Site Preparation/Clearing and Grubbing
02222	Rough Grading, Excavation and Backfill
02290	Storm Water Drainage
02923	Topsoil Placement
02936	Seed and Mulch
02949	Erosion Control
02950	Access Road
03000	Mobilization/Demobilization
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APPENDICES

Appendix A	Storm Water Pollution Prevention Plan (SWPPP) and Notice of Intent

DRAWINGS (separately bound)

Plate 1	Existing Conditions
Plate 2	Subbase Grading Plan
Plate 3	Excavation Plan
Plate 4	Final Grading Plan
Plate 5	Cross Sections
Plate 6	Details

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Plate 7 Details

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BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
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CONTRACT NO. 1

NOTICE TO BIDDERS

Sealed bids for the construction activities associated with the Brownfield Cleanup of the former Circle M Wood Treating Site will be received from invited bidders until _____, 2007 at ____ PM local time at the _____. At that time, the bids will be opened.

The Brownfield Cleanup consists primarily of soil excavation, relocation and consolidation as described in these Contract Documents.

All construction work must be substantially complete by _____, 200_ and must be fully complete by _____, 2008.

The information for Bidders, Bid Forms, Form of Agreement, Specifications, Drawings and other Contract Documents may be examined at the following location:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

A Pre-Bid Conference and Site Inspection are scheduled for _____, 2007 at ____ AM at the project site located in the Town of Fishkill, Dutchess County, New York. Attendance is mandatory.

The owner reserves the right to waive any informalities or to reject any or all bids and to award any proposal which the owner determines to be in the owner's best interest.

Project Engineers:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

Mark P. Millspaugh, P.E.
518/456-4900

BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
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CONTRACT NO. 1

INSTRUCTIONS TO BIDDERS

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2. Delivery of Proposals
3. Preparation and Submission
4. Interpretation of Bidding Documents
5. Inspection of Site
6. Addenda
7. Resultant Contract
8. Proposed Subcontractors and Suppliers
9. Alternates
10. Project Schedule
11. Mandatory Pre-Bid Conference
12. Bidding Documents
13. Health and Safety

1. Invitation

Qualified contractors are invited to provide bid proposals concerning Contract No. 1 – Brownfield Cleanup Program, Former Circle M Wood Treating Site, Town of Fishkill, Dutchess County, New York.

The work specified under Contract No. 1 is generally described as follows:

Contract No. 1

- Site Preparation, Clearing and Grubbing
- Storm Water Drainage
- Rough Grading, Excavation and Backfill
- Soil Consolidation
- Furnish and Install Topsoil, Seed and Mulch
- Erosion Control
- Access Road

2. Delivery of Proposals

Proposals must be hand delivered (or Receipted for delivery by UPS, Federal Express or equivalent) to:

Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

Bids Due:

A. Bid must be received no later than ____ PM, _____, 2007.

B. It is imperative that proposals be received by Addressee no later than date stated above. Bids received after the stated date and time will be returned to bidder unopened.

3. Preparation and Submission

A. One (1) legible copy of the Proposal shall be submitted and shall be enclosed in a sealed opaque envelope.

B. This envelope shall in turn be enclosed in the sealed envelope, bearing the name and return address of the bidder and marked:

PROPOSAL FOR CONTRACT NO. 1 – CHELSEA WATERFRONT DEVELOPMENT - BROWNFIELD CLEANUP

C. The Base Bid Sum and Requested Alternates, if any, are not subject to negotiation and, after the time designated for receipt of bids, they may not be altered for any reason. It is important that the Bid Form be used without alteration. If the Bidder wishes to propose voluntary alternates, they may only be submitted as additional, separately priced alternates in a letter attached to the Bid Form. Such additional unsolicited Bidder's Alternates must not be included in the Base Bid Sum.

D. Proposals shall state the Base Bid Sum in both writing and figures; in case of conflict, the written amount shall govern.

E. No bids will be accepted by telephone, telegraphic bids, or facsimile.

F. Proposals shall be based only on the materials, construction equipment and methods named or described in the Specifications or shown on the Drawings.

G. Contractor's proposal shall list materials and labor cost separately where delineated in the Bid Form.

1. Where requested, a schedule of hourly Billing Rates applying to all classifications of labor and equipment and a schedule of Material Unit Costs shall be attached to the bid to be used for Time and Material contracts and/or extra work. Such Billing Rates shall include all overheads and profit and there shall be no additional charges of any kind. Proposals shall include the required markup to the cost of any material the Contractor may supply to complete the work. Overhead and profit markups are non-accumulative and shall be calculated on the same base rate.

H. Bids are to be submitted on the Contractor's letterhead. They shall be valid and subject to disposition by the Owner for a period of forty-five (45) calendar days after the bid due date, unless the Owner shall notify the Contractor that said period has been extended for an additional forty-five (45) calendar days. Except with the express written consent of the Contractor, the Owner may only extend this period once.

I. Each page of the Contractor's bid proposal submitted shall contain the following information:

1. Contract No. 1
2. Contractor's Proposal Number
3. Page Number (i.e., Page _ of _)
4. Date

J. The Owner reserves the right to reject, with or without cause, any or all Proposals submitted, to waive any informalities therein, or to accept any Proposal where it may appear to be in the Owner's best interest to do so.

4. Interpretation of Bidding Documents

A. If a conflict occurs in or between Bidding Documents regarding methods of performing the work or the material required, and the Bidder does not obtain a written decision with respect thereto prior to submitting his/her Proposal, he/she shall be deemed to have bid upon the more expensive method of doing the work and the better quality or greater quantity of material. If the Owner later elects to use the less expensive method, less expensive quality or lesser quantity of material, the Owner shall receive suitable credit.

B. When doubt exists in the mind of the Bidder as to the true meaning of any part of the Bidding Documents, the Bidder shall request interpretation thereof. Such requests shall be in writing to the Project Manager no later than ten (10) days prior to the bid submission date of _____, 2007.

C. For Technical or Administrative Questions Contact:

Primary Contact	**Secondary Contact**
Project Manager	Owner
Mark P. Millspaugh, P.E.	Dan Simone, P.E.
Sterling Environmental Engineering, P.C.	Chelsea Waterfront Development, LLC
24 Wade Road	1 Executive Boulevard
Latham, New York 12110	Yonkers, New York 10701
518/456-4900	914/965-3990
email: mark@sterlingenvironmental.com	email: dans@avrrealty.com

D. Interpretations in response to inquiries from Bidders, or other clarifications or corrections issued, will be sent to each Bidder by email or facsimile. Bidders are advised to provide their email address and facsimile number to the Owner when obtaining the bid documents.

E. Bidder is advised that quantities presented on the Bid Form are measured in place and are approximate.

5. Inspection of Site

A. Before preparing the Proposal, each Bidder shall personally inspect the site of the proposed work to arrive at a clear understanding of the conditions under which the work is to be performed. The Bidder shall be held to have compared the premises and site with all Bidding Documents and to be satisfied as to the actual conditions of the premises, existing construction, the actual elevations and any other conditions affecting the performance of the work. Bidders must schedule a site inspection

by contacting the individuals listed in Paragraph B below. Bidders must show satisfactory proof of insurance prior to conducting any site investigations.

Bidders must also participate in the pre-bid conference and site inspection described under Item 12 of the Instructions to Bidders.

No consideration will be allowed subsequently by reason of error or oversight on the part of the Bidder or on account of interference by either the Owner or other Contractors' activities. Neglect of the above requirement will not be accepted as reason for delay in the work or for adjustment of the Contract Sum.

B. An inspection of the site may be arranged by communicating with:

Primary Contact

Project Manager
Mark P. Millspaugh, P.E.
Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110
518/456-4900
email: mark@sterlingenvironmental.com

Secondary Contact

Owner
Dan Simone, P.E.
Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701
914/965-3990
email: dans@avrrealty.com

6. Addenda

Addenda issued during the time of bidding shall be sent by email and facsimile and shall be acknowledged on the Bid Form in the space provided, and will be incorporated into any Contract resulting from the Proposal.

7. Resultant Contract

A copy of Agreement, which the successful Bidder will be required to enter into, is included in the Bid Documents, and the Bidder by submission of his/her Proposal acknowledges and agrees to the provisions thereof.

The Bidder is advised that the Contract will be based on a lump sum bid. The quantities presented in the Bid Form are approximate. The unit prices used to prepare Contractor's lump sum bid shall be used to calculate change order amounts in the event the footprint of the excavation or consolidation area increases or decreases over the dimensions presented on the Drawings.

8. Proposed Subcontractors and Suppliers

Proposed subcontractors, except as noted in the Bid Form, are not required to be identified in the Proposal. However, before award of a Contract, the apparent successful Bidder will be required to submit in writing, within five (5) business days after receiving notice that he/she is the successful bidder, a listing of all prospective subcontractors and major material suppliers for acceptance by the Owner. The listing shall include name, address (home office and local address, if different), the segment(s) of work to be performed, and the name of the firm (if other than the Contractor) that will be under contract. Upon acceptance by the Owner, this list shall be identified as part of the Contract Documents. The Owner reserves the right to reject, with or without cause, any prospective

subcontractor and major material supplier, and the Bidder understands that, in the event that the Owner does not approve a subcontractor or major supplier proposed to be used in the work, the Bidder shall submit the name(s) of alternate firms until approved by the Owner without adjustment to the Contract Sum or Contract Schedule.

9. Alternates

A. Bidders shall carefully read requests for Alternates, if any, and thoroughly examine the Drawings and Specifications to determine the full extent of the various changes and conditions and their effect upon price and/or schedule.

B. Bidders shall state in the space provided the net amount to be added to or deducted from the Base Bid Sum for all change work, including all incidental omissions, additions, and adjustments as may be necessary or required by each Alternate. If there is no difference in price or schedule, the Bidder shall state "No Change (N/C)".

C. Please quote best prices for Alternates. Bidders are reminded that alternate prices are not negotiable, and are considered by the Owner in determining the apparent low bidder.

D. See Paragraph 3.C. above, relative to submission of unsolicited Bidders' Alternates.

10. Project Schedule

A. Each Bidder shall submit with his/her proposal a simplified "Critical Path Diagram" covering all important activities showing how the Bidder intends to perform the work and that the work can be accomplished within the calendar days shown in the proposal, with the early start and late finish dates clearly shown.

B. After proposals have been evaluated, and prior to award of the Contract, the Owner may require preparation of a more complete Critical Path Diagram, sufficient to demonstrate that the duration of the entire project along the Critical Path does not exceed the schedule days for substantial and final completion of the project, or portions thereof as quoted in the proposal.

11. Mandatory Pre-Bid Conference

A. Bidders shall familiarize themselves with all elements of the work and the conditions of the site prior to submission of a Bid. A pre-bid conference and site inspection will be conducted at the project site on _____, 2007 at ____AM. Attendance is mandatory.

B. Additional site visits and on-site investigations can be arranged for by Bidders, at the Bidders expense, as described under Item 5 of these Instruction to Bidders.

12. Bidding Documents

A. Bidders shall submit bids on the Forms provided for Contract No. 1 in the "Bid Forms", Pages 1 of 7 to 7 of 7 inclusive.

B. All Bidding Documents remain the property of the Owner. Unsuccessful bidders may return such to the Owner in good condition for a refund of the deposit, upon notification from the Owner that award has been made to another bidder.

13. Health and Safety

Bidders are advised that the Project site is subject to Occupational Safety and Health Administration (OSHA) and New York State Department of Labor (NYSDOL) requirements regarding construction activities and confined spaces.

BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
BROWNFIELD CLEANUP AGREEMENT W3-1077-05-09

CONTRACT NO. 1

BID FORM

CONTRACT IDENTIFICATION: Contract No. 1 – Brownfield Cleanup – Chelsea Waterfront Development

THIS BID IS SUBMITTED TO: Chelsea Waterfront Development, LLC
1 Executive Boulevard
Yonkers, New York 10701

BID FROM: _____

_____

_____

_____

(Name and Address of Bidder)

1. The undersigned Bidder offers and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

   As used herein, the term Bidder shall mean the undersigned **CONTRACTOR**, the term **ENGINEER** shall mean Sterling Environmental Engineering, P.C., and the term **OWNER** shall mean Chelsea Waterfront Development, LLC.

   In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that he/she has examined the Instructions to Bidders, all of the other Bidding Documents and all of the Contract Documents; that the Bidder has examined the actual site and locality where the Work is to be performed; that the Bidder has become familiar with the legal requirements (Federal, State and local laws, ordinances, rules and regulations); that the Bidder has made such visual inspections as deemed necessary; and that the Bidder has become satisfied as to all conditions affecting cost, progress or performance of the Work; and that by signing this bid waives all rights to pleas any misunderstanding regarding the same.

The undersigned further understands and agrees that the estimated quantities for unit price bid items are to be considered as approximate only. The **OWNER** does not expressly or by implication agree that the actual quantities will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as he/she may deem necessary.

Except for an increase or decrease in the excavation area, **CONTRACTOR** understands there will be no entitlement to any adjustment in a lump sum bid price as a result of changes in an estimated quantity and agrees to accept the aforesaid bid prices as complete and total compensation for any additions or deductions caused by any changes or alterations in the Work ordered by the **OWNER**.

Bidder further agrees as follows: 1) that the Bid shall remain open and may not be withdrawn for the time period set forth in the Instructions to Bidders; 2) that the Bidder accepts all of the terms and conditions of the Instructions to Bidders; 3) and that, upon acceptance of this Bid, will execute the Agreement and will furnish the required insurance certificate within the time period(s) set forth in the Instruction to Bidders.

The **OWNER** reserves the right to award all or any part of the work.

The bid price for each item shall be treated as a not-to-exceed lump sum. The sum total of the item bids shall comprise the total project lump sum bid.

BROWNFIELD CLEANUP PROGRAM

FORMER CIRCLE M WOOD TREATING SITE
TOWN OF FISHKILL
DUTCHESS COUNTY, NEW YORK

NYSDEC SITE #3-14-083
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CONTRACT NO. 1

BID FORM

Item	Description	Unit Quantity	Unit Price	Total Cost
1	Site Preparation/Clearing and Grubbing	15.3 Acres	$_____/Acre	$_____*
2	Storm Water Drainage			
	2a. Basin and Outlet Structure	L.S.	$_____L.S.	$_____*
	2b. Ditches and Swales	L.S.	$_____L.S.	$_____*
	2c. Perimeter Controls	L.S.	$_____L.S.	$_____*
3	Rough Grading, Excavation and Backfill	18,000 CY	$_____/CY	$_____*
4	Topsoil Placement			
	7a. Furnish	3,800 CY	$_____/CY	$_____*
	7b. Spread and Place	3,800 CY	$_____/CY	$_____*
5	Seed and Mulch	15.3 Acres	$_____/Acre	$_____*
6	Erosion Control	L.S.	$_____L.S.	$_____*
7	Dust Control	L.S.	$_____L.S.	$_____*
8	Access Road	920 LF	$_____/LF	$_____*
9	Mobilization/Demobilization	L.S.	$_____L.S.	$_____*
10	Health and Safety	L.S.	$_____L.S.	$_____*

TOTAL LUMP SUM BID: $_____*

TOTAL LUMP SUM BID (written in words): _____ **Dollars**

Notes:

* All quantities are approximate and are measured in-place plan view unless otherwise noted. Contractor to verify all quantities.

2. The Bidder has received:

A. Addenda numbers _____ to _____, inclusive, and has included the effect thereof in his/her bid.

B. No addendum _____. (Check, if appropriate).

3. Attached hereto is a completed Statement of Contractor's Qualifications Form.

4. Signatures:

Date:_____, 20_____

Official Address:

_____

_____

_____

Bidder: _____

By: _____

Title: _____

Subscribed and sworn to before me this ____
day of _____, 20 _____

_____

Commission Expires _____, 20__

STATEMENT OF CONTRACTOR'S QUALIFICATIONS

This statement must be submitted by the Contractor with his/her proposal. All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. Use separate sheets for items marked "*".

1. Name of Bidder _____

   Telephone No. _____ Facsimile No. _____

2. Permanent main office address _____

3. When organized or began business _____

4. If a corporation, where incorporated _____

5. How many years have you been engaged in the contracting business under your present firm name? _____

6. *Contracts on hand: (Schedule these showing location, client, gross amount of each contract and the approximate anticipated dates of completion.)

7. *List of contracts of a similar nature performed within the past five years with location, client, gross amount of each contract and the approximate anticipated dates of completion.

8. Have you ever failed to complete any work awarded to you? _____

9. *Have you ever defaulted on a contract? _____

   If yes, where and why? _____

   _____

10. *List your major equipment owned and available within ten (10) days of award of this contract.

11. *Background, experience and resumes of the principal members of your personnel, including the officers.

12. *Credit available - furnish written evidence.

13. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Owner? _____

14. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in certification of the recitals comprising this Statement of Contractor's Qualifications.

15. Provide additional bidding information and qualifications in the Contract Specifications.

Note: For Item No's. 6, 7, 8 and 9 list the engineer or architect who designed and provided resident services for each project along with the address of same.

Dated at_____this_____day of_____20_____

_____
Name of Contractor

By_____

Title_____

State of_____) ss:

County of_____)

_____Being duly sworn deposes and says that he/she is _____

of the _____

Name of Organization

_____
Notary

CERTIFICATE OF INSURANCE

Contractor shall provide Certificate of Insurance in the form and amounts specified in Article 5 of the General Conditions and Article 5 of the Supplementary Conditions.

STANDARD FORM OF AGREEMENT

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification.

SUGGESTED FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

ACEC
American Council of Engineering Companies

National Society of Professional Engineers
Professional Engineers in Private Practice

ASCE American Society of Civil Engineers

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
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AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General Contractors of America

Construction Specifications Institute

Knowledge for Creating and Sustaining the Built Environment

EJCDC C-520 Suggested Form of Agreement Between Owner and Contractor for Construction Contract (Stipulated Price)
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This Suggested Form of Agreement has been prepared for use with the Standard General Conditions of the Construction Contract (C-700, 2002 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the other. The language contained in the Suggested Instructions to Bidders (C-200, 2002 Edition) is also carefully interrelated with the language of this Agreement. Their usage is discussed in the Commentary on EJCDC Construction Documents. See also Guide to the Preparation of Supplementary (C-800, 2002 Edition).

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2715

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

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Introduction

This Suggested Form of Agreement between Owner and Contractor for Construction Contract (Stipulated Price) ("Agreement") has been prepared for use with the Guide to the Preparation of Instructions to Bidders ("Instructions")(C-200, 2002 Edition) and with the Standard General Conditions of the Construction Contract ("General Conditions")(C-700, 2002 Edition). Their provisions are interrelated, and a change in one may necessitate a change in the others. For guidance in the preparation of Supplementary Conditions and coordination with Instructions to Bidders, see Guide to the Preparation of Supplementary Conditions ("Supplementary Conditions")(C-800, 2002 Edition). See also Suggested Bid Form ("Bid Form") (C-410, 2002 Edition). The EJCDC has not prepared a suggested form of Advertisement or Invitation to Bid because such documents will vary widely to conform to statutory requirements.

This form and the other Bidding Documents prepared and issued by the EJCDC assume acceptance of the Project Manual concept of the Construction Specifications Institute which provides for an organizational format for location of all bound documentary information for a construction project, namely: Bidding Requirements (which term refers to the Advertisement or Invitation to Bid, the Instructions, and any Bid Form that may be suggested or prescribed, all of which provide information and guidance for all Bidders) and the Contract Documents (defined in Article 1 of the General Conditions), which include the Agreement, bonds and certificates, the General Conditions, the Supplementary Conditions, the Drawings, and the Specifications. The Bidding Requirements are not considered part of the Contract Documents because much of their substance pertains to the relationships prior to the award of the Contract and has little effect or impact thereafter and because many contracts are awarded without going through the bidding process. In some cases, however, the actual Bid may be attached as an exhibit to the Agreement to avoid extensive retyping. (The terms "Bidding Documents" and "Bidding Requirements" are defined in Article 1 of the General Conditions.) The Project Manual concept is explained in the Manual of Practice issued by the Construction Specifications Institute.

Suggested language is presented herein with "Notes to User" to assist in preparing the Agreement. Much of the language should be usable on most projects, but modifications and additional provisions will often be necessary. The suggested language has been coordinated with the other standard forms produced by the EJCDC. When modifying the suggested language or writing additional provisions, the user must check the other documents thoroughly for conflicts and coordination of language usage and make appropriate revisions in all affected documents.

Refer to the discussions in EJCDC's Recommended Competitive Bidding Procedures for Construction Projects ("Bidding Procedures") (No. 1910-9-D, 1987 Edition) (to be reissued in 2002) on the particular paragraphs of which frequent reference is made below.

For brevity, paragraphs of the Instructions to Bidders are referenced with the prefix "I," those of the Bid Form are referenced with the prefix "BF," and those of this Agreement are referenced with the prefix "A."

NOTES:

1. EJCDC publications may be ordered from:

NSPE headquarters
1420 King Street
Alexandria VA 22314-2715
703-684-2800
www.nspe.org

ASCE headquarters
1801 Alexander Bell Drive
Reston, VA 20191-4400
800-548-2723
www.asce.org.

ACEC headquarters
1015 15th Street NW
Washington DC 20005
202-347-7474
www.acec.org

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EJCDC
SUGGESTED FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR FOR
CONSTRUCTION CONTRACT(STIPULATED PRICE)

THIS AGREEMENT is by and between **Chelsea Waterfront Development, LLC**

(Owner) and _____

(Contractor).

Owner and Contractor, in consideration of the mutual covenants set forth herein, agree as follows:

ARTICLE 1 - WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Soil excavation and consolidation inclusive of storm water management, dust control, health and safety, etc. in accordance with the Drawings and Specifications contained in Contract No. 1.

ARTICLE 2 - THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Brownfield Development – Chelsea Waterfront Development

ARTICLE 3 - ENGINEER

3.01 The Project has been designed by Sterling Environmental Engineering, P.C. (Engineer), who is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

4.01 Time of the Essence

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Dates for Substantial Completion and Final Payment

A. The Work will be substantially completed on or before _____, 2008 and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before _____, 2008.

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4.03 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner $1,000 for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner $1,000 for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

A. For all Work other than Unit Price Work, a Lump Sum of:

_____ ($_____)
(words) (numerals)

All specific cash allowances are included in the above price and have been computed in accordance with paragraph 11.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in this paragraph 5.01.B:

As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions. Unit prices have been computed as provided in Paragraph 11.03 of the General Conditions.

UNIT PRICE WORK

Item No.	Description	Unit	Estimated Quantity	Unit Price	Estimated

TOTAL OF ALL ESTIMATED PRICES _____ $_____
(words) (numerals)

C. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

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6.02 Progress Payments; Retainage

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the _____ day of each month during performance of the Work as provided in Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:

a. _____ percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, Owner, on recommendation of Engineer, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

b. _____ percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 90 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 Final Payment

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 - VACANT

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Agreement Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

E. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and

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Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.

F. Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

I. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 6, inclusive).
2. Other bonds (pages _____ to _____, inclusive).
    a. _____ (pages _____ to _____, inclusive).
    b. _____ (pages _____ to _____, inclusive).
    c. _____ (pages _____ to _____, inclusive).
3. Standard General Conditions (pages 1 to 41, inclusive).
4. Supplementary Conditions (pages 1 to 7, inclusive).
5. Specifications as listed in the table of contents of the Project Manual.
6. Drawings consisting of Plates 1 through 6 with each sheet bearing the following general title: _____ [or] the Drawings listed on attached sheet index.
7. Addenda (numbers _____ to _____, inclusive).
8. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages 1 to 7, inclusive).
    b. Documentation submitted by Contractor prior to Notice of Award (pages _____ to _____, inclusive).
    c. _____.

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9. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

   a. Notice to Proceed (pages _____ to _____, inclusive).

   b. Work Change Directives.

   c. Change Order(s).

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Other Provisions

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in duplicate. One counterpart each has been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

ARTICLE 11 – VACANT

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OWNER:

_____

By: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices:

_____

_____

_____

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Owner-Contractor Agreement.)

CONTRACTOR:

_____

By: _____

Title: _____

[CORPORATE SEAL]

Attest: _____

Title: _____

Address for giving notices:

_____

_____

_____

License No.: _____
(Where applicable)

Agent for service or process: _____

_____

(If Contractor is a corporation or a partnership, attach evidence of authority to sign.)

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CHANGE ORDER

Change Order

No. _____

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments: (List documents supporting change):

CHANGE IN CONTRACT PRICE:

Original Contract Price:

$_____

[Increase] [Decrease] from previously approved Change Orders No._____ to No._____:

$_____

Contract Price prior to this Change Order:

$_____

[Increase] [Decrease] of this Change Order:

$_____

Contract Price incorporating this Change Order:

$_____

CHANGE IN CONTRACT TIMES:

Original Contract Times: ☐ Working days ☐ Calendar days

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] from previously approved Change Orders No._____ to No._____:

Substantial completion (days): _____

Ready for final payment (days): _____

Contract Times prior to this Change Order:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

[Increase] [Decrease] of this Change Order:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

Contract Times with all approved Change Orders:

Substantial completion (days or date): _____

Ready for final payment (days or date): _____

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____	By: _____	By: _____
Engineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable): _____ Date: _____

A. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. COMPLETING THE CHANGE ORDER FORM

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

APPLICATION FOR PAYMENT

Contractor's Application For Payment No. _____

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer)
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

APPLICATION FOR PAYMENT

Change Order Summary

Approved Change Orders

Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1.	**ORIGINAL CONTRACT PRICE**	$ _____
2.	**Net change by Change Orders**	$ _____
3.	**CURRENT CONTRACT PRICE (Line 1 ± 2)**	$ _____
4.	**TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate)**	$ _____
5.	**RETAINAGE:**	
	a. _____ % x $_____ **Work Completed**	$ _____
	b. _____ % x $_____ **Stored Material**	$ _____
	c. **Total Retainage (Line 5a + Line 5b)**	$ _____
6.	**AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)**	$ _____
7.	**LESS PREVIOUS PAYMENTS (Line 6 from prior Application)**	$ _____
8.	**AMOUNT DUE THIS APPLICATION**	$ _____
9.	**BALANCE TO FINISH, PLUS RETAINAGE (Column G on Progress Estimate + Line 5 above)**	$ _____

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:	Date:

Payment of: $_____
(Line 8 or other - attach explanation of other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $_____
(Line 8 or other - attach explanation of other amount)

is approved by: _____ _____
(Owner) (Date)

Approved by: _____ _____
Funding Agency (if applicable) (Date)

EJCDC No. C-620 (2002 Edition)
Prepared by the Engineers' Joint Contract Documents Committee and endorsed by the Associated General Contractors of America and the Construction Specifications Institute.

Progress Estimate — Contractor's Application

For (contract):	Application Number:
Application Period:	Application Date:

A		B	Work Completed		E	F		G
Item			C	D				
Specification Section No.	Description	Scheduled Value	From Previous Application (C + D)	This Period	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (F) B	Balance to Finish (B - F)
	Totals							

Progress Estimate

Contractor's Application

For (contract):	Application Number:
Application Period:	Application Date:

A				B	C	D	E	F		G
Item		Bid Quantity	Unit Price	Bid Value	Estimated Quantity Installed	Value	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F) B	Balance to Finish (B - F)
Bid Item No.	Description									
	Totals									

EJCDC No. C-620 (2002 Edition)
Prepared by the Engineers' Joint Contract Documents Committee and endorsed by the Associated General Contractors of America and the Construction Specifications Institute.

Stored Material Summary

Contractor's Application

For (contract):							Application Number:		
Application Period:							Application Date:		
A	B	C	D		E		F		G
Invoice No.	Shop Drawing Transmittal No.	Materials Description	Stored Previously		Stored this Month		Incorporated in Work		Materials Remaining in Storage ($) (D + E - F)
			Date (Month/Year)	Amount ($)	Amount ($)	Subtotal	Date (Month/Year)	Amount ($)	
		Totals							

STANDARD GENERAL CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

ACEC
American Council of Engineering Companies

National Society of Professional Engineers
Professional Engineers in Private Practice

ASCE American Society of Civil Engineers

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
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This document has been approved and endorsed by

The Associated General Contractors of America

Knowledge for Creating and Sustaining the Built Environment

Construction Specifications Institute

EJCDC C-700 Standard General Conditions of the Construction Contract.
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1015 15th Street, N.W., Washington, DC 20005

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1801 Alexander Bell Drive, Reston, VA 20191-4400

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

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20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

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administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. *Intent of Certain Terms or Adjectives*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents, or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

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E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

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1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work

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(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

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4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

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c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

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1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

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in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

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3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

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deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

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Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

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1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

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c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified , and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued . No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

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or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer,, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

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6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

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ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:* Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

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with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

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arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

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properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

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8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment , a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

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9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

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promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A.Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

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F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

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resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation , overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

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B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

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by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times , or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

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be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

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B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

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payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

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inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

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Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

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under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

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3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

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governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

Table of Articles

Article 1	Definitions and Terminology
Article 4	Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points
Article 5	Bonds and Insurance
Article 6	Contractor's Responsibilities
Article 9	Engineer's Status During Construction
Article 17	Miscellaneous

ARTICLE 1: DEFINITIONS AND TERMINOLOGY

A. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions have the same meanings assigned to them in the Standard General Conditions.

1. Defined terms and applicable publications:

   The publications listed below form a part of these Specifications. The publications are referred to in the text by the basic designation only.

   American Society For Testing And Materials (ASTM) Publications.

   D2487 - 85 Classification Of Soils For Engineering Purposes.

   D2922 - 81 Density of Soil and Soil - Aggregate In Place By Nuclear Methods (Shallow Depth).

ARTICLE 4: AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

A. The following items are available at Chelsea Waterfront Development, LLC for **CONTRACTOR's** review in preparing the Bid:

- Focused Feasibility Study, Circle M Wood Treating Site, Town of Fishkill, Dutchess County, New York, NYSDEC Site #3-14-083, prepared by Sterling Environmental Engineering, P.C. and Conrad Geoscience Corp., dated September 6, 2001, Revised December 20, 2001, Revised December 16, 2002, Revised December 24, 2003 Revised February 10, 2005

ARTICLE 5: BONDS AND INSURANCE

A. Vacant.

B. **CONTRACTOR's** Liability Insurance:

1. This contract shall be void and of no effect if the **CONTRACTOR** fails to secure and maintain for a period of one (1) year after final payment under the contract, insurance coverage as required by the provisions of the Worker's Compensation Law.

2. The limits of liability for the insurance required by Paragraph 5.04 of the Standard General Conditions shall provide coverage for not less than the following amounts, or greater where required by law:

    a. For Workers Compensation, etc. under Paragraph 5.04 of the Standard General Conditions.

        1. Applicable Federal or State: Statutory

        2. Employer's Liability: Statutory

    b. For Comprehensive General Liability under Paragraph 5.04 of the Standard General Conditions (including Premises - Operations, Independent Contractor's Protection, Products and Completed Operations, Broad Form Property Damage, Contractual Liability).

        1. Bodily Injury:

            $2,000,000 Each Occurrence
            $2,000,000 Annual Aggregate

            Property Damage:

            $2,000,000 Each Occurrence
            $2,000,000 Annual Aggregate

            Or combined Single Limit of $2,000,000

        2. Property Damage Liability insurance shall provide Explosion, Collapse, and underground hazards.

    c. For Comprehensive Automobile Liability under Paragraph 5.04 of the General Conditions.

        1. Bodily Injury:

            $2,000,000 Each Person
            $2,000,000 Each Accident

Property Damage:

$2,000,000 Each Occurrence

d. Owner's Protective Liability.

The Contractor shall provide this insurance in the name of the Owner including:

1. Bodily Injury (including death):

$2,000,000 Each Occurrence
$2,000,000 Each Annual Aggregate

3. The **CONTRACTOR** shall identify Chelsea Waterfront Development, LLC and Sterling Environmental Engineering, P.C. as additional named insured on all insurance required by these Contract Documents.

ARTICLE 6: CONTRACTOR'S RESPONSIBILITIES

A. Laws and Regulations:

1. Add the following to Article 6.09 of the Standard General Conditions:

The Industrial code of the State of New York, Rule 53, Part 53 of Title 12 of the Compilation of Codes, Rules and Regulations (12 NYCRR 53) - Construction, Excavation and Demolition Operations at or near underground facilities - Effective April 1, 1975.

This Rule, Part 53 of Title 12 of the Compilation of Codes related to Construction, Excavation and Demolition Operations at or near underground facilities in order to assure safety and prevent damage to public or private property.

B. Permits:

1. Add the following to Article 6.08 of the Standard General Conditions.

CONTRACTOR is advised that certain permits may be required:

a) Dewatering and/or certain storm water management activities undertaken by **CONTRACTOR** may require permits and/or approvals by the NYSDEC.

b) Wetlands: Certain perimeter areas of the project site are potentially jurisdictional wetlands. As such, no filling or excavation activities can occur within the boundary of a jurisdictional wetland and/or regulated buffer area without a permit and/or approval of the Army Corp of Engineers (ACOE) and/or NYSDEC. Prior to commencement of the work, **CONTRACTOR** shall verify the boundary of any jurisdictional wetlands.

ARTICLE 9: ENGINEER'S STATUS DURING CONSTRUCTION

A. PROJECT REPRESENTATION:

Add two new Paragraphs immediately after Paragraph 9.03 of the Standard General Conditions, which are to read as follows:

B. The terms Resident Project Representative and Resident Engineer shall be used interchangeably.

C. The Resident Engineer shall maintain a force for inspection of construction, which shall consist of a field staff and supporting personnel required in connection therewith. Nothing in the **OWNER/ENGINEER** agreement or in the Contract Documents shall be construed to make the Resident Engineer a guarantor of the performance of the **CONTRACTOR** or others, nor shall any provision in this agreement be construed as giving the Resident Engineer, on its own behalf or on behalf of the **OWNER,** the responsibility for or the authority to direct or supervise construction methods, techniques, procedures or safety measures. The Resident Engineer will not be responsible for the enforcement of the obligations of the **CONTRACTOR** or others, nor their failure to execute the Work in accordance with the Contract Documents and within the time period specified. The services furnished hereunder can be generally described as follows:

1. Conferences: The Resident Engineer shall arrange, schedule and attend preconstruction conferences, progress meetings and other job conferences as may be required, and notify in advance those who are expected to attend.

2. Liaison: The Resident Engineer shall serve as the **ENGINEER's,** on-site liaison with the **CONTRACTOR** concerning the **CONTRACTOR's** performance under the terms of its Contract with the **OWNER.**

3. Shop Drawings and Samples: The Resident Engineer shall receive and record the date of receipt, and monitor transmission of Shop Drawings, Samples, and test data submitted by the **CONTRACTOR,** and shall receive and record the date of receipt thereof, and monitor the transmission of the above-referenced submissions which have been reviewed.

4. Change Orders and Supplemental Agreements: The Resident Engineer shall prepare all Change Orders and supplemental agreements in the form and manner approved by the **OWNER,** for authorized alterations to the Work as provided for under the Contract Documents.

5. Records: The Resident Engineer shall maintain at the job site orderly files for correspondence, reports or job conferences, Shop Drawing and Sample submissions, reproductions of original Contract Documents including Addenda, authorized alterations to the Contract Documents, Change execution of the Contract, clarification letters, and other alterations to the Contract Documents, interpretations of the Contract Documents, progress reports and other Project related documents.

6. **CONTRACTOR's** Claims: The Resident Engineer shall investigate and furnish to the **ENGINEER** information relating to the **CONTRACTOR's** claims and make recommendations with regard to payment of such claims.

7. Reports: The Resident Engineer shall furnish the **ENGINEER** with monthly reports as required of the progress of the Work and of the **CONTRACTOR's** compliance with the approved progress schedule, schedule of shop drawings, submissions, and other schedules.

    a. The Resident Engineer shall notify the **ENGINEER** of permanent Work which will not conform to the results required in the Contract Documents, prepare written reports describing any apparent, non conforming Work and make recommendations to the **ENGINEER** for its correction and, at the request of the Engineer, notify the **CONTRACTOR** of **ENGINEER's** directions for correction of nonconforming Work.

    b. The Resident Engineer shall prepare completion lists when substantial Completion of the Project is claimed by the **CONTRACTOR**. The Resident Engineer shall measure items of Work for payment purposes.

8. **CONTRACTOR's** Requests for Payment: The Resident Engineer shall review the **CONTRACTOR's** Application for Payment and shall certify that the Work has progressed to the point indicated by the **CONTRACTOR**, that to the best of the Resident Engineer's knowledge, information and belief, based on its inspection and review, the Work is in accordance with the Contract Documents, and that the **CONTRACTOR** is entitled to the payment of the amount certified.

    a. The Resident Engineer's certification shall be subject to an evaluation of the Work as a functioning project upon Substantial Completion, and to the result of any subsequent tests required by or performed under the Contract Documents, and to minor deviations from the Contract Documents, correctable prior to completion, and to any additional specific qualifications stated in the certificate.

    b. By approving an Application for Payment, the Resident Engineer will not be deemed to have represented that he/she has made any determination as to how or for what purpose any **CONTRACTOR** has used the monies paid on account of the Contract Price, or that title to any of the **CONTRACTOR's** Work, materials, or equipment has passed to the **OWNER** free and clear of any liens, claims, security, interest or encumbrances.

9. Drawings: The Resident Engineer shall, based on documentation provided by the **CONTRACTOR**, and collected and reviewed by said Resident Engineer, submit same to the **ENGINEER** for preparation of record drawings.

10. Guarantees, Certificates, and Inspections Prior to Guarantee Period: During the course of the Work, the Resident Engineer shall verify that guarantees, certificates, maintenance and operation manuals, and other data required to be assembled and furnished by the **CONTRACTOR**, are applicable to the items actually installed, and

shall deliver these items and information to the **ENGINEER** prior to the final acceptance of the Project.

a. The Resident Engineer, as directed by the **ENGINEER**, shall make an inspection approximately ninety (90) days prior to the expiration of the guarantee period of the Contracts, and submit a written report to the **ENGINEER** listing discrepancies between guarantees and performance.

b. The Resident Engineer shall assist in efforts to effect and expedite the correction or adjustment of **CONTRACTOR's** defective Work, if any. The Resident Engineer shall conduct a final inspection to verify that the defective Work has been corrected or adjusted and shall make recommendations to the **ENGINEER** concerning its acceptance.

c. The Resident Engineer shall arrange for instruction by the **CONTRACTOR** and the manufacturer's representatives to the **OWNER** or its designated representatives concerning the proper operation and maintenance of the equipment furnished and installed for the Project.

ARTICLE 17: MISCELLANEOUS

17.7 STATUTORY REQUIREMENTS

A. This Article contains portions of certain Laws and Regulations which, by provision of Law, Ordinance, Rule or Regulation are required to be included in the Contract Documents. The material included in this Article may not be complete or current. **CONTRACTOR's** obligation to comply with all Laws, Ordinances, Rules and Regulations applicable to the Work is set forth in Paragraph 6.09 of the Standard General Conditions.

B. Compliance With Laws:

1. The **CONTRACTOR** shall abide by all local and State Laws or ordinances to the extent that such requirements do not conflict with Federal Laws or Regulations.

2. It is further understood and agreed between the parties that each and every other provision of Law and clause required by Law to be inserted in this Contract shall be deemed to be inserted herein and that this Contract shall be read and enforced as though the same were included herein.

C. Safety and Health Regulations:

1. The **CONTRACTOR** shall comply with all training requirements and general procedures required by applicable Rules, Regulations and the project Health and Safety Plan (HASP).

2. The **CONTRACTOR** shall at all times, comply with the latest applicable State Laws pertaining to the Safety of Workers relating to construction activities.

D. NYSDEC and USEPA Stormwater Permitting:

1. Certain construction activities are subject to State and Federal stormwater permitting requirements. Specifically, the work is to be performed pursuant to the General Permit for Construction Activity (GP-02-01). **CONTRACTOR** is required to develop and submit to the appropriate authorities any and all applications for permit modification, notification letters, Notice of Intent forms, Storm Water Pollution Prevention Plan (SWPPP) revisions, erosion and sediment control plans and other documents necessary to comply with the applicable State and Federal requirements. The current Notice of Intent and SWPPP are provided as Appendix A.

E. NYSDEC and USACOE Wetland Permitting:

1. Portions of the work may be in close proximity to regulated wetland boundaries. **CONTRACTOR** is required to fully comply with applicable wetland rules and regulations. No excavation or filling of regulated wetlands is allowed by these Contract Documents.

END OF SECTION

Contract No. 1 – Division 1 - General Requirements

01010	Summary of Work
01030	Progress Meetings
01041	Coordination
01050	Field Engineering
01150	Measurement and Payment
01210	Preconstruction Conference
01310	Construction Schedules
01340	Shop Drawings, Product Data and Samples
01370	Schedule of Values
01410	Testing Laboratory Services
01501	Contractor's Field Office
01540	Security
01560	Temporary Controls
01570	Maintenance and Protection of Traffic
01600	Transportation and Handling of Materials and Equipment
01620	Storage and Protection
01720	Project Record Documents

SUMMARY OF WORK

PART 1 - GENERAL

A. CONTRACT DOCUMENTS

The Standard General Conditions, Supplementary Conditions, if any, and all other terms provisions of the Contract are included as a part of this Specification. As used throughout these Contract Documents, the term **"OWNER"** is Chelsea Waterfront Development, LLC. The term **"CONTRACTOR"** is the remedial demolition contractors retained by Chelsea Waterfront Development, LLC. The term **"ENGINEER"** is the professional engineering firm retained by Chelsea Waterfront Development, LLC to oversee and certify the completed work.

B. SPECIFICATION ARRANGEMENT

Titles to and arrangement of sections and paragraphs in these specifications are used merely for convenience and shall not be taken as a correct or complete segregation of the several categories of materials, equipment, and labor, nor as an attempt to outline or define jurisdictional procedures.

C. INTENT

The entire work provided for in these Specifications and on the Drawings shall be constructed and finished in every respect in a workmanlike and substantial manner. All parts necessary for the proper and complete execution of the work, whether the same may have been specifically mentioned or not, or indicated in a manner corresponding with the rest of the work shall be provided as if the same were particularly described and specifically provided for herein. It is not intended that the Drawings shall show every detailed piece of material or equipment, but such parts and pieces as may be in accordance with appropriate practices and regulatory requirements even though not shown, shall be furnished and installed. All materials and equipment shall be new unless specifically stated otherwise in these Contract Documents.

D. SCOPE

The work required by these Specifications shall include furnishing all labor, skill, supervision, tools, construction plans, equipment, materials, and performing all operations necessary for the properly complete contract work as shown on the Drawings, as mentioned in these Specifications, and as evidently required, to the complete satisfaction of the **OWNER** and their authorized representatives.

E. GENERAL DESCRIPTION OF WORK

The work consists of demolition of the buildings, excavation and consolidation of identified impacted soils and restoration of impacted area. Within the previously identified impacted areas, soils impacted in excess of the specified action levels will be excavated to the depth specified on the drawings (6", 12" or 24"). The excavated soil will be relocated to the consolidation area and will be placed, compacted and covered with clean soil.

All work is subject to the following plans:

- Health and Safety Plan (HASP);
- Community Air Monitoring Plan (CAMP);
- Dust Control Plan (DCP);
- Site Management Plan (SMP);
- Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan.

The work is divided into the following Construction Bid items:

Item	Description
1	Site Preparation/Clearing and Grubbing
2	Storm Water Drainage
3	Rough Grading, Excavation and Backfill
4	Topsoil Placement
5	Seed and Mulch
6	Erosion Control
7	Dust Control
8	Access Road
9	Mobilization/Demobilization
10	Health and Safety

Payment for all construction work will be for the above items only. All costs incurred by **CONTRACTOR** shall be paid under these items in accordance with Specification 01150 - Measurement and Payment.

F. CONTRACTOR'S USE OF PREMISES

1. **CONTRACTOR's** use of the premises shall be limited to the areas where work must be accomplished as shown on the Drawings.

2. **CONTRACTOR** shall assume full responsibility for protection and safekeeping of products stored on and off premises and shall pay for all additional storage required for his/her operations.

3. **CONTRACTOR** shall not conduct construction activities within adjacent jurisdictional wetland areas.

G. PROJECT WORKING HOURS

CONTRACTOR work hours shall be limited to 7:00 A.M. to 7:00 P.M., Monday through Friday, and 7:00 A.M. to 2:00 P.M. on Saturday. **CONTRACTOR** activities outside these standard hours will require the approval of the **ENGINEER** and the **OWNER**.

END OF SECTION

PROGRESS MEETINGS

PART 1- GENERAL

A. SUMMARY

1. Date and Time:

    a. Regular Weekly Meetings: As mutually agreed upon by **ENGINEER** and **CONTRACTOR.**
    b. Other Meetings: On call.

2. Place: **CONTRACTOR's** office at Project site or other mutually agreed upon location.

3. **ENGINEER** shall prepare agenda, preside at meetings, and prepare and distribute a transcript of proceedings to all parties.

4. **CONTRACTOR** shall provide data required and be prepared to discuss all items on agenda.

B. MINIMUM ATTENDANCE

1. **CONTRACTOR,** Subcontractors and suppliers. Representatives present for each party shall be authorized to act on their behalf.

2. **ENGINEER.**

3. **OWNER's** representative.

4. Others as appropriate.

C. AGENDA

1. Agenda will include, but will not necessarily be limited to, the following:

    a. Transcript of previous meeting.
    b. Progress since last meeting.
    c. Planned progress for next period.
    d. Problems, conflicts and observations.
    e. Change Orders.
    f. Applications for Payment.
    g. Quality standards and controls.
    h. Schedules, including off-site fabrication and delivery schedules.
    i. Corrective measures required.
    j. Coordination between parties.
    k. Other business.

END OF SECTION

COORDINATION

PART 1 - GENERAL

A. SUMMARY

1. As more fully set forth in the General Specifications, **CONTRACTOR** shall be solely responsible for coordination of all of the Work. He/she shall supervise, direct and cooperate fully with all Subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies and all others whose services, materials or equipment are required to ensure completion of the Work within the Contract Time.

2. **CONTRACTOR** shall cooperate with and coordinate his/her Work with the work of any other contractor, utility service company or **OWNER's** employees performing additional work related to the Project at the site.

3. **CONTRACTOR** shall not be responsible for damage done by contractors not under his jurisdiction. He/she will not be liable for any such loss or damage unless it is through the negligence of the **CONTRACTOR**.

4. **CONTRACTOR** shall also coordinate his/her Work with the work of others to assure compliance with schedules.

5. **CONTRACTOR** shall attend and participate in all project coordination or progress meetings and report on the progress of all Work and compliance with schedules.

END OF SECTION

FIELD ENGINEERING

PART 1- GENERAL

A. SUMMARY

1. **ENGINEER** will establish a base line for the Project and one bench mark for use by the **CONTRACTOR. OWNER** will furnish boundary surveys, if required.

2. **CONTRACTOR** shall:

   a. Develop and make all detail surveys and measurements needed for construction, including slope stakes, batter boards, and all other working lines, elevations and cut sheets. This includes detailed stakeout and survey of each excavation area with a sufficient density of survey points to provide for verification that the required excavation depth is achieved during soil removal.

   b. Keep a transit and leveling instrument on the site at all times and a skilled instrument person employed or obtained whenever necessary for layout of the Work.

   c. Provide all material required for benchmarks, control points, batter boards, grade stakes, and other items.

   d. Be solely responsible for all locations, dimensions and levels. No data other than written orders of the **ENGINEER** shall justify departure from the dimensions and levels required by the Drawings.

   e. Safeguard all points, stakes, grade marks, monuments and benchmarks made or established on the Work, re-establish same if disturbed and rectify all Work improperly installed because of not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.

   f. When requested by **ENGINEER**, provide such facilities as may be necessary for the **ENGINEER** to check line and grade points placed by **CONTRACTOR. CONTRACTOR** shall do no excavation or embankment work until all cross-sectioning necessary for determining payment quantities has been completed and checked by **ENGINEER.**

B. CONTRACTOR'S FIELD ENGINEER

1. **CONTRACTOR** shall employ and retain at the site of the Work a field engineer capable of performing all engineering tasks required of the **CONTRACTOR.**

   Tasks included are:

   a. Daily reports of Project activity to be submitted to the **ENGINEER** with all pertinent information pertaining to the Project as follows:

1. Number of employees.
2. Subcontractor employees.
3. Breakdown of employees by trade.
4. Major equipment and materials installed.
5. Major construction equipment utilized.
6. Location of all areas in which construction is performed.
7. Materials and equipment received.

b. Provide all surveying equipment required including transit, level, stakes and required surveying accessories.

c. Furnish all required lines and grades for construction of operations. Check all form work, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials and equipment.

d. Maintain field office files and drawings, record drawings, and coordinate engineering services with Subcontractors. Prepare layout and coordination drawings for construction.

e. Check and coordinate Work for conflicts and interferences and immediately advise **ENGINEER** of all discrepancies noted.

f. Cooperate with **ENGINEER** in field inspections as required.

C. QUALIFICATIONS OF SURVEYOR OR ENGINEER

1. Qualified engineer or land surveyor, acceptable to **CONTRACTOR** and **OWNER.**

D. RECORDS

1. Maintain a complete, accurate log of all control and survey work as it progresses.

E. SUBMITTALS

1. Submit name and address of surveyor or engineer to **ENGINEER.**

2. On request of **ENGINEER**, submit documentation to verify accuracy of field engineering work.

3. When requested by **ENGINEER**, submit certificate signed by engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain all deviations.

END OF SECTION

MEASUREMENT AND PAYMENT

PART 1- GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all labor, materials, tools, equipment, appurtenances, health and safety requirements, and all services necessary to perform all Work required at the lump sum or extra work unit prices bid for the items listed herein.

2. The items listed below refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory work, plans, services, **CONTRACTOR's** or **ENGINEER's** field offices, layout surveys, job signs, sanitary requirements, health and safety services, testing, safety devices, approval and record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, and all other requirements of the Standard General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, items and materials shall be included in the prices stipulated for the lump sum and extra work unit price pay items listed herein.

3. Each lump sum and extra work unit bid price will be deemed to include an amount considered by **CONTRACTOR** to be adequate to cover **CONTRACTOR's** overhead and profit for each separately identified item.

4. Overhead and profit shall not be applied to payroll taxes such as unemployment insurance, Federal Insurance Contribution Act, Workmen's Compensation, personal liability and property damage insurance.

5. For all overruns and/or underruns exceeding 15 percent of the estimated quantity, the **CONTRACTOR** and **ENGINEER** shall review unit price items and negotiate a new unit price, if appropriate. New unit prices are subject to the approval of the **OWNER**.

B. ENGINEER's ESTIMATE OF QUANTITIES

1. The **ENGINEER's** estimated quantities as listed in the Bid Form are approximate only and are included solely for the purpose of comparison of Bids. The **OWNER** does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity, as **OWNER** may deem necessary. Except in the case of a change in the dimensions, **CONTRACTOR** will not be entitled to any adjustment in the bid price for affected items as a result of any change in an estimated quantity and agrees to accept the aforesaid bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by the **OWNER**, and for use in the computation of the value of the Work performed for progress payments.

As more completely described in Section D below, the unit prices and quantities presented in the Bid Form shall be used to calculate the item lump sum price.

In the event the limits of the work are changed at the direction of the **ENGINEER**, the unit prices bid shall be used to calculate the appropriate change order amount of the lump sum item.

C. RELATED PROVISIONS SPECIFIED ELSEWHERE

1. Payments to **CONTRACTOR**: Refer to Standard General Conditions and Contract Agreement.

2. Changes in Contract Price: Standard General Conditions.

3. Schedule of Values: Specification 01370.

D. BID ITEMS

The work is divided into the following Construction Bid items:

Item	Description
1	Site Preparation/Clearing and Grubbing
2	Storm Water Drainage
3	Rough Grading, Excavation and Backfill
4	Topsoil Placement
5	Seed and Mulch
6	Erosion Control
7	Dust Control
8	Access Road
9	Mobilization/Demobilization
10	Health and Safety

END OF SECTION

PRECONSTRUCTION CONFERENCE

PART 1 - GENERAL

A. SUMMARY

1. To clarify construction contract administration procedures, the **ENGINEER** will conduct a Preconstruction Conference prior to start of the Work, as described in this Section.

2. Related Work

   The Standard General Conditions, Supplementary Conditions, if any, and all other terms and provisions of the Contract as to items to be added to the agenda.

B. SUBMITTALS

1. To the maximum extent practicable, advise the **ENGINEER** at least one (1) calendar day in advance of the Conference as to items to be added to the agenda.

2. The **ENGINEER** will compile minutes of the Conference, and will furnish three (3) copies of the minutes to the **CONTRACTOR** and required copies to the **OWNER.** The **CONTRACTOR** may make and distribute such other copies as he/she wishes.

C. QUALITY ASSURANCE

1. For those persons designated by the **CONTRACTOR**, his/her Subcontractors, and suppliers to attend the Preconstruction Conference, provide required authority to commit the entities they represent to solutions agreed upon in the Conference.

D. PRECONSTRUCTION CONFERENCE

1. The Conference will be scheduled and held within ten (10) calendar days after the **OWNER** has issued the Notice of Award, but prior to actual start of the Work.

2. Attendance

   Provide attendance by authorized representatives of the **CONTRACTOR** and major Subcontractors. The **ENGINEER** will advise other interested parties including the **OWNER**, and request their attendance.

3. Minimum Agenda: Data will be distributed and discussed on:

   a. Organizational arrangement of **CONTRACTOR's** forces and personnel, and those of Subcontractors, materials suppliers, and the **ENGINEER**.

   b. Channels and procedures for communication.

   c. Construction schedule, including sequence of critical work.

d. Contract Documents, including distribution of required copies of Specifications and Drawings and revisions.

e. Processing of field decisions and Change Orders.

f. Rules and regulations governing performance of the Work.

g. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

h. All preconstruction documentation required under the Contract shall be submitted to the **OWNER** prior to this meeting and will be reviewed and approved or disapproved by the **ENGINEER** at this meeting. This will include, but not limited to:

- Performance Bond;
- Labor and Materials Payment Bond;
- Construction Schedule; and
- Resume of **CONTRACTOR's** on-site Superintendent.

END OF SECTION

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

A. SUMMARY

1. Provide construction schedule and construction contingency plan which conforms to the requirements below, unless otherwise approved by **ENGINEER**.

2. Update schedules every two (2) months unless otherwise specified or directed by **ENGINEER**.

B. CONTENT

1. Shop Drawing submittal dates and required approval dates.

2. Product delivery dates.

3. Field testing dates.

4. Dates for beginning and completing each phase of the Work by activity and by trades.

5. Contingency plan for meeting the schedule and performance specified herein.

C. FORMAT

1. Type: Horizontal bar chart.

2. Sheet Size: 24-inches by 36-inches.

3. Time Scale: Indicate first date in each work week.

4. Organization:

    a. Group Shop Drawing submittals and reviews into a separate subschedule.
    b. Group product deliveries into a separate subschedule.
    c. Group construction work into a separate subschedule by activity.
    d. Group critical activities, which dictate the rate of progress into a separate subschedule.
    e. Organize each subschedule by Specification Section number.

5. Activity Designations: Show title and related Specification number.

D. SUBMITTALS

1. Submit initial schedule and written construction contingency plan at least ten (10) days prior to commencing work but no later than 20 days after date of execution of Agreement.

2. The **CONTRACTOR's** construction contingency plan shall address an organized, planned and coordinated, technically and financially feasible course of action to be taken in responding to contingencies during construction. The plan must address, at a minimum, actions to be taken with respect to personnel and user safety; on-site personal injury; fires; dust; noise; equipment breakdown; and unusual traffic conditions.

3. Submit updated schedules at progress meeting. If a schedule remains unchanged from one period to the next, submit a written notice to that effect.

4. Make submittals to **ENGINEER.**

5. Unless otherwise specified, submit two (2) copies of each schedule. One copy will be reviewed by the **ENGINEER** and returned. The other copy will be retained by the **ENGINEER.**

6. Attach a letter of transmittal to each submittal and include the following information in the letter:

    a. A listing of items, which have changed since the last submittal.
    b. Discussion of problems causing delays, anticipated length of delays, and proposed countermeasures.

END OF SECTION

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

A. SUMMARY

1. Contract Documents

   Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this Section.

2. Related Documents

   The Standard General Conditions, Supplementary Conditions, if any, and all other terms and provisions of the Contract are included as a part of this Section.

B. SUBMITTALS

1. Make submittals of Shop Drawings, product data and samples, substitution requests, and other items in accordance with the provisions of this Section. All submittals will be in two (2) copies. One (1) copy will be marked with a date and time stamped by the **ENGINEER** and returned to the **CONTRACTOR** as a record of receipt.

C. QUALITY ASSURANCE

1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.

2. Verify each item and the submittal for it conform in all respects with the specified requirements.

3. By affixing the **CONTRACTOR's** signature to each submittal, certifies that this coordination has been performed.

PART 2 - PRODUCTS

A. SHOP DRAWINGS

1. Scale and Measurements

   Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

2. Types of Prints Required

   a. Submit Shop Drawings in the form on one (1) sepia transparency of each sheet plus three (3) blueline or blackline prints of each sheet.

b. Blueprints will not be acceptable.

3. Review comments of the **ENGINEER** will be shown on the sepia transparency when it is returned to the **CONTRACTOR.** The **CONTRACTOR** may make and distribute such copies as are required for his/her purposes.

B. MANUFACTURER'S LITERATURE

1. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly cross out those portions of the contents not being submitted for review.

2. Submit the number of copies which are required to be returned to the **CONTRACTOR,** a receipt copy plus three (3) copies, which will be retained by the **ENGINEER.**

PART 3 - EXECUTION

A. IDENTIFICATION OF SUBMITTALS

1. Consecutively number all submittals.

   a. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
   b. On resubmittals, cite the original submittal number for reference.

2. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

3. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

4. Submittal Log

   a. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times.
   b. Make the submittal log available to the **ENGINEER** for the **ENGINEER's** review upon request.

B. GROUPING OF SUBMITTALS

Unless otherwise specified, make submittals in groups containing all associated items to ensure that information is available for checking each item when it is received.

1. Partial submittals may be rejected as not complying with the provisions of the Contract.

2. The **CONTRACTOR** may be held liable for delays so occasioned.

C. TIMING OF SUBMITTALS

1. Make submittals a minimum of five (5) working days in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

2. In scheduling, allow at least ten (10) working days for review by the **ENGINEER** following the **ENGINEER's** receipt of the submittal.

D. REQUIRED SUBMITTALS

Submittals required by the Contract Documents include those submissions required under each Section of the Construction Specifications and include, but are not limited to, the following:

1. Geotextile Product

   a. Representative samples of the geomembrane (2 ft. by 3 ft. minimum).
   b. Manufacturer's specifications and tolerances for the product.
   c. Manufacturer's written product and installation warrantee.
   d. Manufacturer's quality control program.
   e. Manufacturer's recommended placement and seaming procedure, installation quality control program, repaired procedure for defective seams and limitations.
   f. Manufacturer's subgrade preparation requirements and acceptance criteria.
   g. Manufacturer's protective soil cover and backfill requirements.

2. Health and Safety Plan

   CONTRACTOR shall submit within ten (10) days of Award of Contract a site specific Health and Safety Plan in accordance with applicable OSHA and NYS Department of Labor requirements for the type of construction work anticipated under this Contract and meeting the minimum requirements of the site Health and Safety Plan (HASP) provided herewith.

3. Contingency Plan

   CONTRACTOR shall submit within ten (10) days of Award of Contract a Construction Contingency Plan in satisfaction of 6 NYCRR Part 360-2.10. The Contingency Plan shall include:

   a. Names and telephone numbers of local and State officials to be contacted in the event of an emergency at the site.
   b. Notification procedures for local residences in case of fire.
   c. Fire prevention and fire fighting measures that shall include, at a minimum, procedures and equipment to be employed for responses to fires on the site that may occur in equipment, in the refuse, or elsewhere on the site.
   d. Services available from the local fire department and proposed coordination with such services.
   e. Training of personnel in emergency situations.
   f. Organization for a site fire brigade and specify the personnel assigned to this brigade.

f. Organization for a site fire brigade and specify the personnel assigned to this brigade.
g. Identification of any temporary on-site storage of petroleum products.
h. Identification of methods and procedures for dust minimization.
i. Identification of methods and procedures for dewatering, if required to complete the work.

4. Storm Water Pollution Prevention Plan

Within ten (10) days of the Award of Contract, Contractor shall submit a Storm Water Pollution Prevention Plan (SWPPP) and other related submittals prepared in satisfaction of the requirements of the site SWPPP provided herewith.

END OF SECTION

SCHEDULE OF VALUES

PART 1 - GENERAL

A. SUMMARY

1. Schedule of Values

   Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.

2. Related Work

   The Standard General Conditions, Supplementary Conditions, if any, and all other terms and provisions of the Contract are included as part of this Section.

B. SUBMITTALS

1. Prior to first application for payment, submit a proposed schedule of values to the **ENGINEER.**

   a. Meet with the **ENGINEER** and determine additional data, if any, required to be submitted.

   b. Secure the **ENGINEER's** approval of the schedule of values prior to submitting first application for payment.

C. QUALITY ASSURANCE

1. Use required means to assure arithmetical accuracy of the sums described.

2. When so required by the **ENGINEER**, provide copies of the subcontracts, receipts, purchase orders or other data acceptable to the **ENGINEER**, substantiating the sums described.

END OF SECTION

TESTING LABORATORY SERVICES

PART 1 - GENERAL

A. SUMMARY

1. Unless otherwise specified, all soil and material testing will be the responsibility of the **CONTRACTOR**. Where applicable, **CONTRACTOR** shall perform the specified services for material testing of materials to be incorporated into the Work. Where directed, **CONTRACTOR** shall employ and pay for an independent testing laboratory to perform the specified services for material testing which is the responsibility of the **CONTRACTOR** and/or called for under the Construction Quality Assurance/Construction Quality Control (CQA/CQC) Program. The independent laboratory selected shall be subject to approval by the **ENGINEER**.

2. Inspection, sampling and testing shall be as specified in the individual Construction Specifications.

3. All test results and reports shall be furnished directly to **ENGINEER** by the independent laboratory.

B. QUALIFICATIONS OF LABORATORY

1. Where applicable, meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories.

2. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.

3. Testing Equipment:

    a. Field and laboratory equipment shall be calibrated at maximum 12 month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
    b. Submit copy of Certificate of Calibration, made by accredited calibration agency.

C. INDEPENDENT LABORATORY DUTIES

1. Cooperate with **ENGINEER** and provide qualified personnel promptly on notice.

2. Perform specified inspections, sampling and testing of materials and methods of construction; comply with applicable standards; ascertain compliance with requirements of Contract Documents.

3. Promptly notify **ENGINEER** and **CONTRACTOR** of irregularities or deficiencies of Work, which are observed during performance of services.

4. Promptly submit five (5) copies of reports of inspections and tests to **ENGINEER**, including:

    a. Date issued.
    b. Project title and number.
    c. Testing laboratory name and address.
    d. Name and signature of inspector.
    e. Date of inspection or sampling.
    f. Record of temperature and weather.
    g. Date of test.
    h. Identification of product and Construction Specification Section.
    i. Location in Project.
    j. Type of inspection or test.
    k. Results of tests and observations regarding compliance with Contract Documents.

5. Perform additional tests and services as required to ensure compliance with the Contract Documents.

PART 2 – CONTRACTOR'S COORDINATION WITH LABORATORY

A. SUMMARY

1. Provide to laboratory, representative samples of materials to be tested, in required quantities.

2. Furnish labor and facilities to:

    a. Provide access to Work to be tested.
    b. Obtain and handle samples at the site.
    c. Facilitate inspections and tests.

3. Notify laboratory and **ENGINEER** sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

4. Arrange with laboratory, and pay for, additional samples and tests required for **CONTRACTOR's** convenience.

B. PRODUCT TEST REPORTS

1. Furnish copies of product test reports directly to **ENGINEER** where required by the Construction Specifications or when requested by **ENGINEER**.

END OF SECTION

CONTRACTOR'S FIELD OFFICE

PART 1 - GENERAL

A. SUMMARY

1. Provide a **CONTRACTOR's** field office with the minimum facilities specified. The **CONTRACTOR's** office shall be located as directed by the **ENGINEER.**

2. Field Office and Furnishing:

    a. As required by **CONTRACTOR** but with sufficient room for project meetings.
    b. Include conference table and chairs sufficient for twelve (12) people.
    c. Include one (1) four drawer desk and chair for use by **ENGINEER.**
    d. Telephone service, fax machine, electric service, and water cooler.
    e. Six (6) protective helmets for visitors use.
    f. Exterior identifying sign.
    g. Other furnishings at **CONTRACTOR's** option.
    h. Portable sanitary facilities.

3. Provide one (1) set of all Contract Documents in the office for ready reference at all times by interested parties.

4. Remove office upon final acceptance unless otherwise approved by **ENGINEER.**

END OF SECTION

SECURITY

PART 1 - GENERAL

A. SUMMARY

1. **CONTRACTOR** shall safely guard all Work, materials, equipment and property from loss, theft, damage and vandalism. **CONTRACTOR's** duty to safely guard property shall include the **OWNER's** property and other private property from injury or loss in connection with the performance of the Contract.

2. **CONTRACTOR** shall employ watchmen as may be appropriate to provide the required security and prevent unauthorized entry.

3. **CONTRACTOR** may make no claim against the **OWNER** for damage resulting from trespass.

4. Party responsible for security shall make good all damage to property of **OWNER** and others arising from failure to provide adequate security.

5. If existing fencing or barriers are breached or removed for purposes of construction, **CONTRACTOR** shall provide and maintain temporary security fencing equal to the existing in a manner satisfactory to the **ENGINEER** and **OWNER**.

6. Security measures taken by the **CONTRACTOR** shall be at least equal to those usually provided by **OWNER** to protect his/her existing facilities during normal operation.

7. Keep the gate to the site closed at all times except when actually entering or leaving the site.

8. Maintain security program throughout construction until **OWNER's** acceptance and occupancy precludes need for **CONTRACTOR's** security program.

END OF SECTION

TEMPORARY CONTROLS

PART 1 - GENERAL

A. SUMMARY

1. Provide and maintain methods, equipment, and temporary construction, as necessary, to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

2. See related requirements of the Health & Safety Plan (HASP), Storm Water Pollution Prevention Plan (SWPPP), Erosion Control Plan, Soil Management Plan (SMP), and Community Air Monitoring Plan (CAMP).

B. NOISE CONTROL

1. **CONTRACTOR's** vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the **OWNER** or others.

C. WATER CONTROL

1. Provide methods to prevent surface water from outside the facility from entering the work site and to prevent damage to the Work, the site, or adjoining properties.

    a. Control fill, grading and ditching to direct water away from excavations, pits, and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.
    b. Provide, operate and maintain equipment and facilities of adequate size to control surface water.
    c. Provide appropriate protection to adjacent wetland areas.

D. POLLUTION CONTROL

1. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of dust, soil, storm water sediment and/or noxious substances from construction operations.

2. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.

    a. Prevent any equipment, which has been in contact with facility waste material or other contamination, from leaving the site prior to decontamination.

3. Take special measures to prevent harmful substances from entering public waters.

    a. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.

4. Provide systems for control of atmospheric pollutants.

a. Prevent toxic concentrations of chemicals.
b. Prevent harmful dispersal of pollutants into the atmosphere.

5. All **CONTRACTOR's** equipment used during construction shall conform to all current Federal, State and local laws and regulations.

E. EROSION CONTROL

1. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.

    a. Hold the areas of geomembrane and bare soil exposed at one time to a minimum.
    b. Provide temporary control measures such as berms, dikes and drains.

2. Construct fills and waste areas by selective placement to minimize erosion.

3. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

4. Additional Erosion Control Specifications (Specification 02949) are presented as part of these Specifications.

END OF SECTION

MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 - GENERAL

A. SUMMARY

1. All public streets and trafficways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved by the **ENGINEER** or authority having jurisdiction over same. Industrial road and access to paraflex must be maintained.

2. When required to cross, obstruct or temporarily close a street or trafficway, **CONTRACTOR** shall provide and maintain suitable bridges, detours or other approved temporary expedient for the accommodation of traffic. Closing shall be for the shortest time practical, and passage shall be restored immediately after completion of backfill and temporary paving or bridging.

3. **CONTRACTOR** shall give reasonable notice to the fire and police departments of proposed operations.

4. **CONTRACTOR** shall give reasonable notice to owners or tenants of private property who may be affected by operations.

5. **CONTRACTOR** shall provide signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to requirements of the **OWNER** or authority having jurisdiction. Remove temporary equipment and facilities when no longer required; restore grounds to original, or to specified conditions.

6. **CONTRACTOR** must maintain access to the existing compost area. Access must be assured at all times of the standard work day and for emergency response during non-working hours.

PART 2 - PRODUCT

A. TRAFFIC SIGNALS AND SIGNS

1. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under **CONTRACTOR's** control, or affected by **CONTRACTOR's** operations.

2. Provide traffic control and directional signs, mounted on barricades or standard posts:

    a. At each change of direction of a roadway and at each crossroad.
    b. At detours and hazardous areas.
    c. At parking areas.

B. FLAGMEN

1. Provide qualified and suitable equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic and in accordance with the requirements of the authority having jurisdiction.

C. FLARES AND LIGHTS

1. Provide flares and lights during periods of low visibility:

    a. To clearly delineate traffic lanes, to guide traffic and to warn of hazardous areas.
    b. For use by flagmen in directing traffic.

2. Provide illumination of critical traffic and parking areas.

PART 3 - EXECUTION

A. PARKING CONTROL

1. Control all **CONTRACTOR** related vehicular parking within the limits of the Work to preclude interference with public traffic or parking, access by emergency vehicles, **OWNER's** operations, or construction operations. Provide access to paraflex throughout the project. Provide temporary parking facilities for the public as may be required because of construction or operations.

2. Monitor parking of all construction and private vehicles:

    a. Maintain free vehicular access to and through parking areas.
    b. Prohibit parking on or adjacent to access roads, or in non-designated areas.

B. HAUL ROUTES

1. Consult with governing authorities and Town Engineer regarding streets and establish thoroughfares, which will be used as haul routes and site access. **CONTRACTOR** is advised that various highway and bridge repair projects are underway in the Town, which could limit haul options.

2. Confine construction traffic to designated haul routes.

3. Provide traffic control at critical areas of haul routes to expedite traffic flow and minimize interference with normal public traffic.

END OF SECTION

TRANSPORTATION AND HANDLING OF MATERIALS AND EQUIPMENT

PART 1 - GENERAL

A. SUMMARY

1. **CONTRACTOR** shall make all arrangements for transportation, delivery and handling of equipment and materials required for completion of the Work.

2. Shipments of materials to **CONTRACTOR** or Subcontractors shall be delivered to the site only during regular working hours. Shipments shall be addressed to the proper party, giving name of Project, street number and city. Shipments shall not be delivered to **OWNER** except where otherwise directed.

3. If necessary to move stored materials and equipment during construction, **CONTRACTOR** shall move, or cause to be moved, materials and equipment without any additional compensation.

B. DELIVERY

1. Arrange deliveries of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.

2. Coordinate deliveries to avoid conflict with Work and conditions at site and to accommodate the following:

    a. Work of other contractors, or owners.
    b. Limitations of storage space.
    c. Availability of equipment and personnel for handling products.
    d. **OWNER's** use of premises.

3. Do not have products delivered to project site until related Shop Drawings have been approved by the **ENGINEER**.

4. Do not have products delivered to site until required storage facilities have been provided.

5. Have products delivered to the site in manufacturer's original, unopened, labeled containers. Keep **ENGINEER** informed of delivery of all equipment to be incorporated in the Work.

6. Immediately on delivery, inspect shipment to assure:

    a. Product complies with requirements of Contract Documents and reviewed submittals.
    b. Quantities are correct.
    c. Containers and packages are intact, labels are legible.
    d. Products are properly protected and undamaged.

C. PRODUCT HANDLING

1. Provide equipment and personnel necessary to handle products, including those provided by **OWNER**, by methods to prevent soiling or damage to products or packaging.

2. Provide additional protection during handling, as necessary, to prevent scraping, marring or otherwise damaging products or surrounding surfaces.

3. Handle products by methods to prevent bending or over stressing.

4. Lift heavy components, pallets and rolls only at designated lifting points.

5. Materials and equipment shall at all times be handled in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them. Do not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

END OF SECTION

STORAGE AND PROTECTION

PART 1 - GENERAL

A. RELATED DOCUMENTS

1. The Standard General Conditions, Supplementary Conditions, if any, and all other terms and provisions of the Contract are included as a part of this Section.

B. SUMMARY

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

C. QUALITY ASSURANCE

1. Include within the **CONTRACTOR's** quality assurance program such procedures as are required to assure full protection of Work and materials.

D. MANUFACTURES' RECOMMENDATIONS

1. Except as otherwise approved by the **ENGINEER**, determine and comply with manufacturer's recommendations on product handling, storage, and protection.

E. PACKAGING

1. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

    a. Maintain packaged materials with seals unbroken and labels intact until time of use.
    b. Promptly remove damaged material and unsuitable items as determined by the **ENGINEER** from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the **OWNER**.

2. The **ENGINEER** may reject as non-complying such material and products that do not bear identification satisfactory to the **ENGINEER** as to manufacturer, grade, quality, and other pertinent information.

F. PROTECTION

1. The degree of protection provided will be inspected and determined acceptable or not by the **ENGINEER**.

    a. Protect finished compacted surfaces, installed geomembrane product, and areas seeded and mulched.
    b. Geomembrane product delivered to the site shall be properly stored prior to installation in accordance with manufacturer's recommendation.
    c. Maintain finished surfaces, clean, unmarred, and suitably protected until accepted by the **OWNER**.

G. REPAIRS AND REPLACEMENTS

1. In the event of damage, as determined by the **ENGINEER**, promptly make replacements and repairs to the approval of the **ENGINEER** and at no additional cost to the **OWNER**.

2. Additional time required to secure replacements and to make repairs will not be considered by the **ENGINEER** to justify an extension in the Contract Time of Completion.

END OF SECTION

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

A. SUMMARY

1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described below and, upon completion of the Work, transfer the recorded changes to a set of Project Record Documents, as described below.

2. Related Work

    a. The Standard General Conditions, Supplementary Conditions, if any, and all other terms and provisions of the Contract are included as a part of this Section.
    b. Other requirements affecting Project Record Documents may appear in other pertinent Sections of the Construction Specifications.

B. SUBMITTALS

1. Comply with pertinent provisions of Specification 01340, Shop Drawings, Product Data and Samples.

2. The **ENGINEER's** approval of the current status of Project Record Documents may be a prerequisite to the **ENGINEER's** approval of requests for payment and request for final payment under the Contract.

3. Prior to submitting each request for payment, secure the **ENGINEER's** approval of the current status of the Project Record Documents.

4. Prior to submitting request for final payment, submit the final Project Record Documents to the **ENGINEER** and secure his/her approval.

C. QUALITY ASSURANCE

1. Delegate the responsibility for maintenance of Project Record Documents to one person on the **CONTRACTOR's** staff.

2. Accuracy of Records

    a. Thoroughly coordinate changes within the Project Record Documents, making adequate and proper entries on each page of the Construction Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
    b. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.

3. Make entries within 24 hours after receipt of information that the change has occurred.

D. DELIVERY, STORAGE, AND HANDLING

1. Maintain the job set of Project Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.

2. In the event of loss or damaged recorded data, use means necessary to again secure the data to the **ENGINEER's** approval.

    a. Such means shall include, if necessary in the opinion of the **ENGINEER**, removal and replacement of concealing materials.
    b. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

A. RECORD DOCUMENTS

1. Job set: Promptly following receipt of the **OWNER's** Notice to Proceed, secure from the **ENGINEER,** at no charge to the **CONTRACTOR,** one complete set of all Documents comprising the Contract.

2. Final Record Documents: At a time nearing the completion of the Work, secure from the **ENGINEER,** at no charge to the **CONTRACTOR,** one complete set of sepia transparencies of all Drawings in the Contract.

PART 3 - EXECUTION

A. MAINTENANCE OF JOB SET

1. Immediately upon receipt of the job set described above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET."

2. Preservation

    a. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the **ENGINEER.**
    b. Do not use the job set for any purpose except entry of new data and for review by the **ENGINEER,** until start of transfer of data to final Project Record Documents.
    c. Maintain the job set at the site of Work as that site is designated by the **ENGINEER.**

3. Making Entries on Drawings

    a. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
    b. Date all entries.
    c. Call attention to the entry by a "cloud" drawn around the area or areas affected.
    d. In the event of overlapping changes, use different colors for the overlapping changes.

4. Make entries in the pertinent other Documents as approved by the **ENGINEER.**

5. Conversion of Schematic Layouts

    a. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.

        (1) Final physical arrangement is determined by the **CONTRACTOR**, subject to the **ENGINEER's** approval.

        (2) However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.

    b. Show on the job set of Record Drawings, installed limits and dimension of the completed work.
    c. The **ENGINEER** may waive the requirements for conversion of schematic layouts where, in the **ENGINEER's** judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the **ENGINEER**.

B. FINAL PROJECT RECORD DOCUMENTS

1. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

2. Approval of Recorded Data Prior to Transfer

    a. Following receipt of the transparencies described above, and prior to start of transfer of recorded data thereto, secure the **ENGINEER's** approval of all recorded data.
    b. Make required revisions.

3. Transfer of Data to Drawings

    a. Carefully transfer changed data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.
    b. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described above.

c. Call attention to each entry by drawing a "cloud" around the area or areas affected.
d. Make changes neatly, consistently, and with the proper media to ensure longevity and clear reproduction.
e. Record Drawings must include as-built detailed topographic survey information for each completed element of the work including the rough grading, completed subbase layer installation, select barrier protection layer installation and completed topsoil layer.

4. Transfer of Data to Other Documents

a. If the Documents other than Drawings have been kept clean during progress of the Work, and if entries therein have been orderly to the approval of the **ENGINEER**, the job set of those Documents other than Drawings will be accepted as final Project Record Documents.

b. If any such Document is not so approved by the **ENGINEER**, secure a new copy of that Document from the **ENGINEER** at the **ENGINEER's** usual charge for reproduction and handling, and carefully transfer the changes to the new copy to the approval of the **ENGINEER**.

5. Review and Submittal

a. Submit the completed set of Project Record Documents to the **ENGINEER** as described above.
b. Participate in review meetings as required.
c. Make required changes and promptly deliver the final Project Record Documents to the **ENGINEER**.

C. CHANGES SUBSEQUENT TO ACCEPTANCE

1. The **CONTRACTOR** has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

Contract No. 1 – Division 2 – Site Work

02110	Site Preparation/Clearing and Grubbing
02222	Rough Grading, Excavation and Backfill
02290	Storm Water Drainage
02923	Topsoil Placement
02936	Seed and Mulch
02949	Erosion Control
02950	Access Road
03000	Mobilization/Demobilization
04000	Dust Control
05000	Health and Safety

SITE PREPARATION, CLEARING AND GRUBBING

PART I - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish, operate and maintain all facilities necessary for proper execution and satisfactory completion of this Contract. Prior to any excavation, **CONTRACTOR** shall notify underground utility location services, such as DigSafely NewYork.

2. The types of work required include the following:

    a. Utilities: electricity, telephone service, fax service, potable water supply, and sanitary facilities.
    b. Site security.
    c. Fencing and signs.
    d. Construction or maintenance of site road.
    e. Clearing and grubbing of work zone, portions of the adjacent work zone, and identified borrow area.

3. Related Work specified elsewhere:

    a. Specification 02936, Seed and Mulch.
    c. Specification 02949, Erosion Control.

B. QUALITY ASSURANCE

1. Electrical supply and lighting shall be in accordance with Federal, State and local regulations, as well as local utility company requirements. All work shall be in accordance with the National Electric Code.

2. Lighting shall be in accordance with 29 CFR 1910.120 (m) (1) Table H,-102-1 Minimum Illumination Intensities.

3. All wiring and connections shall comply with 29 CFR 1910.307, which covers requirements for electric equipment and wiring in hazardous (classified) locations as determined by the **ENGINEER**.

4. Sanitary facilities and disposal of sanitary wastes shall be in accordance with New York State Department of Health (NYSDOH) and local requirements.

5. Emergency medical facilities shall be in accordance with OSHA.

6. All materials shall be suitable for their intended use and shall conform to applicable codes and standards. Manufacturer's requirements shall be strictly adhered to.

7. All debris wastes and other materials removed from the site shall be in accordance with all applicable rules, regulations and requirements.

C. SUBMITTALS

1. Shop Drawings showing the following information shall be submitted and approved by the **ENGINEER** prior to delivery to, or installation at, the site:

    a. General layouts of temporary site facilities including trailers, emergency medical facilities, parking areas and equipment lay down areas.
    b. Temporary structures and trailers - floor plans, fixtures, materials of construction.

2. Shop Drawing presenting **CONTRACTOR's** Contingency Plan.

3. Shop Drawing providing **CONTRACTOR's** Health and Safety Plan.

4. The **CONTRACTOR** shall provide to the **ENGINEER** for approval, Shop Drawings showing water supply, sanitary facilities including source points, layout locations, fixtures, materials and methods of disposal, as may be needed for the work.

PART 2 - MATERIALS

A. MATERIALS

1. **CONTRACTOR** shall furnish all materials necessary for proper execution and satisfactory completion of Contract.

PART 3 - EXECUTION

A. UTILITIES

1. Prior to any excavation, **CONTRACTOR** shall arrange to have all existing utilities located and properly marked out.

2. **CONTRACTOR** shall maintain existing electrical utilities at or in the vicinity of the project site and provide new for the proper completion of all work.

3. Lighting shall be provided for all work areas where natural light is inadequate to perform the work safely.

4. The **CONTRACTOR** shall make all arrangements and pay all costs for providing telephone services necessary for the project.

5. The **CONTRACTOR** shall pay the charges for telephone usage.

6. The **CONTRACTOR** shall determine the requirements for temporary water supply and provide adequate potable water at the site, including any necessary arrangements with the **OWNER**.

7. Adequate sanitary facilities for both male and female on-site personnel shall be provided.

8. Waste from sanitary facilities shall be collected in holding tanks and disposed of at the expense of the **CONTRACTOR**.

B. TEMPORARY FACILITIES

1. This section includes furnishing, operating and maintaining the following temporary facilities and their removal upon completion of the project:

   a. Security and communications.
   b. Emergency medical facilities in accordance with OSHA.
   c. Equipment storage.

2. All facilities specified shall be located on-site within the project site boundary except as shown on the Drawings or approved by the **ENGINEER** with the exception of emergency medical facilities.

3. All buildings and trailers other than storage sheds shall be provided with the following minimum requirements:

   a. Lighting; electric, non-glare type producing a minimum illumination level of 50-foot candles measured at desk height.
   b. Heating and cooling; capable of maintaining ambient temperatures within the structure of 70°F (± 3°).
   c. Potable bottled water.
   d. Fire extinguisher; non-toxic, dry chemical type, UL-approved for Class A, B & C Fires (minimum rating of 2A, 10B, 10C).
   e. Separate male and female sanitary facilities.

4. Facilities shall be structurally sound and weather tight, with floors raised aboveground and open to allow free circulation of air.

C. FENCING AND SIGNS

1. **CONTRACTOR** shall maintain existing fencing on project site and provide necessary repairs to prevent unauthorized access to the site.

2. **CONTRACTOR** shall provide appropriate signage to properly control the flow of traffic to and from the work zone and to maintain traffic on adjacent Town road.

3. Signs shall be posted on adjacent Town roads to warn of truck entrance over the duration of the project.

4. Any adjacent wetland areas shall be protected by use of temporary fencing.

D. SITE SECURITY

1. The **CONTRACTOR** shall provide for site security to be maintained to prevent unauthorized entry to the site and support areas. During construction, site access shall be controlled, and a log of personnel entering and leaving the site shall be maintained. The **CONTRACTOR** shall be responsible for the expeditious correction of all problems observed. The **CONTRACTOR** shall report all problems and corrective actions taken to the **ENGINEER**.

E. SITE ROADS

1. **CONTRACTOR** shall construct a road at the location shown on the Drawings. The road shall be adequate for the delivery and placement of the earth materials needed in the final cover system and upon completion of the work shall be left in place as a permanent maintenance road.

F. REMOVAL OF DEBRIS

1. The **CONTRACTOR** shall remove any debris from the work zone in preparation of the site.

G. PROTECTION OF EXISTING TREES, OTHER VEGETATION AND STRUCTURES

1. Streets, roads, adjacent property and other works and structures shall be protected through the duration of the project. **CONTRACTOR** shall return to original condition, satisfactory to the **ENGINEER**, damaged facilities caused by the **CONTRACTOR's** operations.

2. Trees, shrubs and glassed areas, which are to remain, shall be protected by fences, barricades, wrapping or other methods as shown or specified, or as approved by the **ENGINEER**.

H. EROSION CONTROL

1. The **CONTRACTOR** shall schedule and conduct operations to minimize erosion of soils and to prevent silting and muddying of adjacent wetlands, streams, impoundments, and lands adjacent to or affected by the work. Erosion control measures include: water diversion structures or ditches, sedimentation basins or traps, berms, check dams, and seeding, mulching, covering with netting or sodding disturbed areas. The area of soil exposed by construction at any one time should be kept to a minimum and final restoration should be carried out as soon as possible following completion of construction. Specific erosion control requirements are included in the Specification 02949, entitled "Erosion Control" and in the SWPPP provided as Appendix B.

I. WASTE MATERIAL DISPOSAL

1. All waste vegetation, material, soil and rock resulting from clearing and grubbing of the work zone shall be disposed on the site in an area designated by the **ENGINEER.** Trees and brush removed from the work zone will need to be chipped prior to placement on-site at locations approved by **ENGINEER**.

2. Stumps removed during excavation of materials will be filled on-site, as directed by the **ENGINEER**.

J. TREE AND BRUSH REMOVAL

1. **CONTRACTOR** shall clear the minimum extent of trees and vegetation from the work area as necessary to complete the work.

2. No burning will be permitted on or off the site of the Work.

END OF SECTION

ROUGH GRADING, EXCAVATION AND BACKFILL

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all labor, gas vent installation materials and equipment and incidentals required to perform all excavating, backfilling and rough grading of earth materials and installation of gas vents as shown on the Drawings and specified herein.

2. All necessary excavation, backfilling and rough grading necessary to prepare the site for installation of the gas vents and the subbase layer are included.

3. Related Work Specified Elsewhere:

    a. Specification 02290, Storm Water Drainage.
    b. Specification 02949, Erosion Control.

B. QUALITY ASSURANCE

1. Permits and Regulations: **CONTRACTOR** shall perform excavation, backfill and rough grading work in accordance with applicable requirements of governing authorities having jurisdiction. Strict compliance with NYS Industrial Code 53 and OSHA 40 CFR Part 1910 and 1926 shall be required at all times.

PART 2 - PRODUCTS

A. MATERIALS FROM OFF-SITE SOURCES

1. Refer to material specifications for soil materials obtained from on-site and off-site borrow sources.

2. Stone products associated with stabilized pond outlets, as shown on the Drawings.

PART 3 - EXECUTION

A. EXCAVATION

1. Excavate and/or place fill and shape to elevations and dimensions indicated, or required to accomplish work as presented on the Drawings.

2. Carefully prepare work zone and install erosion control as depicted on the Drawings. **CONTRACTOR** must use extreme care to avoid disturbing large areas without sufficient resources to complete work in disturbed area as required by the SWPPP and General Permit for Construction Activity (GP-02-01) within 14 days as specified herein.

    CONTRACTOR shall furnish topsoil to the project to satisfy the requirements of Specifications 02923, Topsoil Placement.

3. At all times during the work, the **CONTRACTOR** shall keep the excavations dry and free from water as determined by the **ENGINEER** until the structures are completed or accepted and backfilled. The **CONTRACTOR** shall provide sufficient pumps and other equipment to handle and dispose of the water to the satisfaction of the **ENGINEER**. Any water pumped from an excavation must be managed at a permitted facility as approved by **ENGINEER**.

4. Storm water runoff from disturbed areas must be managed as storm water subject to the State Pollutant Discharge Elimination System (SPDES) Construction General Permit for Construction Activity and as approved by the **ENGINEER**.

5. The **CONTRACTOR** shall adhere to all environmental constraints and shall discharge storm water only as authorized by the General Permit for Construction Activity (GP-02-01) and as far from wetlands and watercourses as practical to allow for the settling of silt before water reaches wetland and/or surface watercourses.

6. Where continual siltation occurs beyond the initial point of discharge, the **CONTRACTOR** shall provide settling basins or bales of hay to filter the storm water in a manner satisfactory to the **ENGINEER.**

7. Protect bottoms of excavations from the entry of frost into the ground surfaces to the satisfaction of the **ENGINEER**.

8. The **CONTRACTOR** shall supply all necessary forms, shoring, bracing, sheathing, or other equipment necessary to make the necessary excavation, in a safe workmanlike manner.

9. In general, sheathing and bracing shall be removed carefully and the voids filled and compacted to the satisfaction of the **ENGINEER**.

10. All excavation outside the lines and grades shown and which is not approved by the **ENGINEER**, together with the removal and disposal of the associated material shall be at the **CONTRACTOR's** expense. The unauthorized excavation shall be filled and compacted with approved backfill by the **CONTRACTOR**, at his/her expense.

11. All off-site sources shall have valid mining permits and shall meet the approval of the **ENGINEER**. Laboratory testing of off-site borrow sources shall be as specified under Specifications 02290, 02923, 02936, 02949, and as shown on the Drawings.

B. BACKFILL

1. All backfill materials shall be as shown on the Drawings and specified herein.

2. Excessively soft or unstable soils must be removed before backfilling can proceed.

3. All backfill must be properly compacted, as specified in these Construction Specifications and/or on the Drawings.

C. ROUGH GRADING

1. The **CONTRACTOR** shall prepare and compact soil as specified herein.

2. Perimeter drainage improvements are required in conjunction with regrading of the facility. Such facilities are specified in Specification 02290 entitled "Storm Water Drainage" and as shown on the Drawings.

END OF SECTION

EROSION CONTROL

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all labor, materials, equipment and incidentals required to control and prevent erosion within the work/zone boundaries for the project duration. **CONTRACTOR** shall also protect the adjacent land, perimeter natural drainage, riverbank and wetlands.

2. Related Work Specified Elsewhere:

    a. Specification 02110, Site Preparation/Clearing and Grubbing.
    b. Specification 02936, Seed and Mulch.

B. QUALITY ASSURANCE

1. Codes and Standards: "New York Guidelines for Urban Erosion and Sediment Control" shall govern erosion and sediment control measures.

C. SUBMITTALS

1. **CONTRACTOR** shall furnish product data sheet on silt fence material to the **ENGINEER** for approval.

PART 2 - PRODUCTS

A. MATERIALS

1. **CONTRACTOR** shall furnish silt fence fabric as approved by the **ENGINEER.**

PART 3 - EXECUTION

A. EROSION CONTROL

1. Silt fencing shall be installed in all perimeter areas of the work zone adjacent to any jurisdictional wetlands. Silt fencing shall be maintained for the duration of the project.

2. Stone check dams shall be placed at least every 100 feet in all drainage ditches perpendicular to ditch center line. More frequent placements shall be used in any location where erosion is observed.

3. **ENGINEER** may direct **CONTRACTOR** to install additional check dams if conditions warrant.

4. **ENGINEER** may direct **CONTRACTOR** to install additional silt fencing on sloped areas to prevent channel erosion.

5. **CONTRACTOR** shall be responsible to repair any damages caused by erosion or sediment.

6. **CONTRACTOR** shall be responsible to maintain erosion control measures for the duration of the project or until final vegetation is accepted.

7. **CONTRACTOR** shall be responsible for disposal of erosion control materials at completion of project.

8. Should **CONTRACTOR** fail to properly control erosion and maintain protection of wetlands or surface waters, **CONTRACTOR** will be fully responsible for any fines and penalties imposed by regulatory agencies.

END OF SECTION

ACCESS ROAD

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all manpower, material and equipment necessary to construct the access road as shown on the Drawings.

2. An access road shall be constructed at the location as described in the Drawings and herein.

3. Related Work Specified Elsewhere:

    a. Specification 02222, Rough Grading, Excavation and Backfill.
    b. Specification 02923, Topsoil Placement.
    c. Specification 02936, Seed and Mulch.
    d. Specification 02949, Erosion Control and SWPPP Compliance.
    e. Appendix B – Storm Water Pollution Prevention Plan (SWPPP) and GP-02-01.

B. SUBMITTALS

1. **CONTRACTOR** shall identify all stone and geotextile products to be employed in restoration of the road in all areas of the work where the existing road is disturbed.

PART 2 - PRODUCTS

A. MATERIALS

1. Prior to site excavation work, **CONTRACTOR** shall install a stabilized construction entrance as required by the SWPPP and GP-02-01.

2. **CONTRACTOR** shall strip and stockpile existing roadbase gravel for reuse.

3. **CONTRACTOR** shall furnish additional gravel and crushed stone required to reconstruct the road.

    Road materials shall satisfy the following Specifications:

    a. Geotextile: **CONTRACTOR** shall provide woven geotextile filter fabric by Dupont Typar 3401 or approved equal.

b. Crushed Stone: **CONTRACTOR** shall install 12" minimum crusher run gravel, meeting the NYSDOT Item No. 304.03 subbase course, Type 2. The gravel utilized shall satisfy the following gradation:

- 100% passing the 2" screen
- 25% - 60% passing the ¼" screen
- 5% - 40% passing the #40 sieve
- Less than 10% passing the #200 sieve.

c. Run-of-Bank Gravel: **CONTRACTOR** shall provide suitable run-of-bank gravel to serve as road subbase on all disturbed areas. Material shall satisfy the following gradation:

- 100% passing the 4" screen
- Less than 10% passing the #200 sieve

PART 3 - EXECUTION

A. Road removal and reconstruction shall consist of:

a. Install a stabilized construction entrance in accordance with GP-02-01 and the SWPPP.
b. Stripping any existing road base in areas, as needed, to landfill final cover and, as directed by **ENGINEER**.
c. Temporarily stockpiling roadbase at locations approved by **ENGINEER**.
d. Furnishing additional approved roadbase, as required to complete the Work.
e. Reconstruct the road in all perimeter areas where temporary removal of road material is required to install the landfill cover.

END OF SECTION

MOBILIZATION/DEMOBILIZATION

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all manpower, equipment permits and approvals necessary to mobilize to the project site and to complete the work required under these Specifications and Contract Documents.

2. Related Work Specified Elsewhere:

    a. Bid Items 1-7, inclusive of these Specifications.

B. SUBMITTAL

1. **CONTRACTOR** shall identify the equipment to be used for this project and shall provide as a shop drawing submittal the equipment list for each bid item of these Specifications.

PART 2 - PRODUCTS

1. All **CONTRACTOR** material, supplies and products required for mobilization/demobilization will be provided as specified herein.

PART 3 - EXECUTION

1. Mobilization/demobilization activity shall be scheduled in accordance with Specification 01310 entitled, "Construction Schedules" and shall provide adequate coordination to assume that required manpower and equipment is available when needed.

END OF SECTION

DUST CONTROL

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall furnish all materials and labor as needed to provide proper dust control in accordance with these Specifications and the project Dust Control Plan.

2. **CONTRACTOR** shall conduct excavation, grading, hauling and placement activities in a manner that minimizes dust generation.

3. Related Work Specified Elsewhere:

    a. Specification 02222, Rough Grading, Excavation and Backfill.
    b. Specification 02923, Topsoil Placement.
    c. Specification 02936, Seed and Mulch.
    d. Specification 02949, Erosion Control and SWPPP Compliance.
    e. Appendix B – Storm Water Pollution Prevention Plan (SWPPP) and GP-02-01.

B. SUBMITTALS

1. **CONTRACTOR** shall identify all materials and equipment to be utilized for dust control purposes.

PART 2 - PRODUCTS

A. MATERIALS

1. **CONTRACTOR** shall furnish a water truck and/or dust control agents to minimize dust generation.

PART 3 - EXECUTION

A. Dust control shall consist of:

1. Use of water spray.

2. Use of dust control agents such as calcium chloride.

3. Temporary suspension of work during windy conditions.

4. Other methods and procedures as may be necessary to comply with the requirements of the Dust Control Plan.

END OF SECTION

HEALTH AND SAFETY

PART 1 - GENERAL

A. DESCRIPTION

1. **CONTRACTOR** shall conduct all work in full compliance with the Health and Safety Plan (HASP).

2. **CONTRACTOR** shall provide only trained, qualified employees with appropriate credentials.

3. **CONTRACTOR** shall fully comply with OSHA 1910 and 1926 and New York State Department of Labor laws, rules and regulations regarding work at hazardous waste disposal sites.

4. Related Work Specified Elsewhere:

    a. Specification 02222, Rough Grading, Excavation and Backfill.
    b. Specification 02923, Topsoil Placement.
    c. Specification 02936, Seed and Mulch.
    d. Specification 02949, Erosion Control and SWPPP Compliance.
    e. Appendix E – Storm Water Pollution Prevention Plan (SWPPP) and GP-02-01.

B. SUBMITTALS

1. **CONTRACTOR** shall provide a copy of the Corporate Health and Safety Plan, and proof of training for all employees assigned to the site.

2. **CONTRACTOR** shall furnish a Health and Safety Plan based upon the project Health and Safety Plan.

PART 2 - PRODUCTS

A. MATERIALS

1. The project Health and Safety Plan is provided as Appendix E of the Remedial Design and Engineering Report.

PART 3 - EXECUTION

A. **CONTRACTOR** shall fully comply with the Health and Safety Plan and shall furnish documentation required therein. For the duration of the work, **CONTRACTOR** shall develop and maintain all required recordkeeping.

END OF SECTION