REPORT

Final RD/RA Work Plan for Newell Street Area I

General Electric Company
Pittsfield, Massachusetts

August 2003

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BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Corporate Environmental Programs
General Electric Company
100 Woodlawn Avenue, Pittsfield, MA 01201

Transmitted Via Overnight Delivery

August 4, 2003

Bryan Olson
U.S. Environmental Protection Agency
EPA New England
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Re: GE-Pittsfield/Housatonic River Site
Newell Street Area I (GECD440)
Final Removal Design/Removal Action Work Plan

Dear Mr. Olson:

Enclosed is the General Electric Company's (GE's) Final Removal Design/Removal Action Work Plan for Newell Street Area I (Final Work Plan). As indicated in the Final Work Plan, GE is in the process of selecting a Remediation Contractor to perform the remediation activities specified in the enclosed document. As a result, certain implementation-related logistical information (i.e., required contractor submittals) will be provided to EPA in a supplemental information package, which will be submitted once the Remediation Contractor has been selected.

Please contact me with any comments/questions about this Final Work Plan.

Sincerely,

Andrew T. Silfer/cmt

Andrew T. Silfer, P.E.
GE Project Coordinator
V:\GE_Pittsfield_CD_Newell_St_Area_I\Reports and Presentations\Final Work Plan\1133Ltr.doc

ATS/meg
Enclosure

cc: Tim Conway, EPA
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Richard Gates, GE
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James Nuss, BBL
James Bieke, Shea & Gardner
Property Owner – 187 Newell Street
Property Owner – 203 Newell Street
Property Owner – 217 Newell Street
Property Owner – 221, 229, 230 Newell Street
Property Owner – 247/249 Newell Street
Property Owner – 269 Newell Street
Property Owner – 273 Newell Street
Cristóbal Bonifaz, Esq.
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1. Introduction

1.1 General

On October 27, 2000, a Consent Decree (CD) executed in 1999 by the General Electric Company (GE), the United States Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MDEP), and several other government agencies was entered by the United States District Court for the District of Massachusetts. The CD requires (among other things) the performance of Removal Actions to address polychlorinated biphenyls (PCBs) and other hazardous constituents present in soils, sediment, and groundwater in several Removal Action Areas (RAAs) located in or near Pittsfield, Massachusetts. These RAAs are part of the GE-Pittsfield/Housatonic River Site. For each Removal Action, the CD and accompanying *Statement of Work for Removal Actions Outside the River* (SOW) (Appendix E to the CD) establish Performance Standards that must be achieved, as well as specific work plans and other documents that must be prepared to support the response actions for each RAA. For most of the Removal Actions, these work plans/documents include the following: Pre-Design Investigation Work Plan, Pre-Design Investigation Report, Conceptual Removal Design/Removal Action (RD/RA) Work Plan, and Final RD/RA Work Plan.

To date, GE has completed several of the aforementioned documents for the Newell Street Area I RAA. Specifically, GE has prepared a Pre-Design Investigation Work Plan (March 2000, with Addendum dated December 2000); a Pre-Design Investigation Report (May 2001, and supplemental report in July 2001); a Conceptual RD/RA Work Plan (Conceptual Work Plan) (January 2002); and a Conceptual RD/RA Work Plan Addendum (Conceptual Work Plan Addendum) (April 2003). The Conceptual Work Plan presented preliminary evaluations of the need for response actions to address PCBs and the other constituents listed in Appendix IX of 40 CFR Part 264, plus three additional constituents -- benzidine, 2-chloroethyl vinyl ether, and 1,2-diphenylhydrazine (Appendix IX+3). Those preliminary evaluations, which were developed using the investigation results summarized in the Pre-Design Investigation Report, were subsequently revised to incorporate: (1) EPA comments on the assumptions and methodologies utilized by GE in the performance of the PCB and Appendix IX+3 evaluations presented therein; and (2) supplemental investigation data collected by GE between July 2002 and February 2003.

The Conceptual Work Plan Addendum presented: (1) the results of the supplemental investigation activities; (2) revised evaluations of both the PCB and the non-PCB Appendix IX+3 data under existing conditions,

incorporating the data from the supplemental investigations, to assess the need for soil-related remediation activities; (3) where necessary, a conceptual proposal for soil-related remediation activities; and (4) revised evaluations of PCBs and other Appendix IX+3 constituents in soil under post-remediation conditions (where relevant) to demonstrate that the proposed remediation activities will achieve the applicable Performance Standards under the CD and SOW. On May 13, 2003, EPA issued a letter to GE providing approval of the Conceptual Work Plan Addendum and requiring submittal of the Final RD/RA Work Plan by August 1, 2003.

This *Final RD/RA Work Plan for Newell Street Area I* (Final Work Plan) presents a summary of the pre-design investigation activities performed at the Newell Street Area I RAA, a summary of the PCB and Appendix IX+3 evaluation procedures and evaluation results, design information, an implementation plan, a discussion regarding contractor selection, details regarding post-construction civilities, and a section concerning the schedule of construction activities. Additional details regarding the specific components of this Final Work Plan are provided in Section 1.3.

1.2 Description of Newell Street Area I

The Newell Street Area I RAA is generally bounded to the north by the Housatonic River, to the south by Newell Street, to the west by the Ontario Street Extension and Newell Street Area II (an adjacent RAA), and to the east by the Lakewood Playground, as shown on Figures 1 and 2. This approximately 11-acre area originally consisted of land within or adjoining several oxbows or low-lying areas of the Housatonic River. Rechannelization and straightening of the Housatonic River in the early 1940s by the City of Pittsfield and United States Army Corps of Engineers separated these oxbows and low-lying areas from the active course of the river. The oxbows and low-lying areas were subsequently filled with various materials from a variety of sources. The Newell Street Area I RAA is considered one of the Former Oxbow Areas under the CD and the SOW.

As also shown on Figure 2, the Newell Street Area I RAA is composed of 10 commercial/industrial parcels (three of which have the same owner) and three recreational parcels as follows:

Commercial/Industrial

- Parcel J9-23-13 (187 Newell Street);
- Parcel J9-23-16 (191 Newell Street);

Commercial/Industrial (continued)

- Parcel J9-23-18 (217 Newell Street);
- Parcels J9-23-19, -20, and -21 (221, 229, and 230 Newell Street);
- Parcel J9-23-22 (247/249 Newell Street);
- Parcel J9-23-23 (261 Newell Street);
- Parcel J9-23-24 (269 Newell Street); and
- Parcel J9-23-25 (273 Newell Street);

Recreational

- Parcel J9-23-12[1];
- Parcel J9-23-17 (203 Newell Street); and
- Parcel J9-23-26 (northwest portion of Lakewood Playground only).

Three of these parcels are currently owned by GE (Parcels J9-23-12, J9-23-16, and J9-23-23), one is owned by the City of Pittsfield (Parcel J9-23-26), and the remaining properties are owned by private individuals or organizations.

1.3 Contents of Final Work Plan

Section 3.4 of the SOW contains specific requirements regarding the information required in Final Work Plans, including:

- Results of pre-design studies/investigations;

- An evaluation of the areas and depths subject to response actions to meet the PCB-related Performance Standards set forth in the SOW;

- An evaluation of the need for additional response actions to address non-PCB constituents and (if needed) the type of such response actions;

[1] Note: Only the non-riverbank portions of this parcel are included in the Newell Street Area I RAA. The riverbank portions of this parcel were subject to a separate Removal Action under the CD – the Upper ½-Mile Reach Removal Action.

- A further description of the activities necessary to meet the Performance Standards for natural resource restoration/enhancement activities (if any) at the RAA in question (not applicable at Newell Street Area I);

- An evaluation of other issues that may affect the type and extent of response actions (e.g., groundwater, NAPL);

- Design assumptions and parameters;

- Identification of Applicable or Relevant and Appropriate Requirements (ARARs) in accordance with Attachment B of the SOW;

- Detailed design of the response actions;

- Description of other implementation details concerning performance of the response actions;

- Summary of anticipated Post-Removal Site Control activities following completion of the Removal Action;

- Identification of the Removal Action team, including key personnel, roles and responsibilities, and lines of authority;

- Process for selection of Removal Action contractor (if not already selected);

- Schedule for implementation of Removal Action;

- Construction Quality Assurance Plan (CQAP); and

- Project closeout requirements.

1.4 Scope and Format of Work Plan

To satisfy the requirements identified in Section 1.3 above, the remainder of this Final Work Plan is presented in eight sections. The title and a brief overview of each section are presented below:

Section 2 – Summary of Pre-Design Activities, describes the pre-design soil investigation activities conducted by GE at Newell Street Area I, the results of which were used to determine the need for and extent of remediation actions to address PCBs and Appendix IX+3 constituents in soil at the 13 parcels located within this RAA.

Section 3 – Summary of PCB and Appendix IX+3 Evaluation Procedures, provides an overview of the applicable PCB and Appendix IX+3 Performance Standards for recreational and commercial/industrial properties, and describes the procedures used to evaluate PCBs and other Appendix IX+3 constituents in soil at these parcels under existing and, where necessary, post-remediation conditions.

Section 4 – PCB and Appendix IX+3 Evaluation Results, presents an overall summary of the PCB and Appendix IX+3 evaluations for the parcels located within Newell Street Area I, as presented in the Conceptual Work Plan Addendum, as well as the response actions proposed to achieve the Performance Standards (i.e., soil removal/replacement and/or the installation of engineered barriers, as necessary) for each parcel.

Section 5 – Design Information, describes additional design-related information associated with the response actions identified in Section 4. Such information includes technical plans and specifications, technical drawings, information regarding performance of soil removal activities and installation of engineered barriers, an evaluation of the effects of the proposed engineered barriers on flood storage capacity of the 100-year floodplain in this area and the need for compensatory flood storage, a description of building demolition activities for certain GE-owned parcels located within Newell Street Area I, identification of site-specific ARARs, and a description of the procedures to be implemented to ensure attainment of those ARARs.

Section 6 – Contractor Selection, discusses the process for selecting the Remediation Contractor.

Section 7 – Implementation Plan, discusses certain site-specific implementation components, including identification of the project participants, contractor submittal requirements, project-specific site preparation and construction-related components, and the perimeter air monitoring approach. As also discussed in this section, there remains certain implementation-related logistics that are currently unknown and will be provided to EPA in a supplemental information package once a Remediation Contractor has been selected.

Section 8 – Post-Construction Activities, identifies the various activities to be performed following implementation of remediation activities, including project closeout activities (i.e., pre-certification inspection and preparation of a Final Completion Report) and Post-Removal Site Control activities.

Section 9 – Schedule, identifies the schedule for submission of a supplemental information package to support this Work Plan, as well as the anticipated schedule for construction and reporting activities.

The discussions in the above-referenced sections are supported by tables, figures, and other evaluations presented in several appendices, as described in subsequent sections of this Final Work Plan.

Finally, it should also be noted that this Final Work Plan evaluates the need for and scope of response actions to achieve the soil-related Performance Standards set forth in the CD and SOW. Groundwater at Newell Street Area I is being addressed separately as part of GE's groundwater-related activities for the Plant Site 1 Groundwater Management Area (GMA 1), pursuant to the CD and the SOW. At the present time, these activities consist of the performance of a baseline monitoring program in accordance with GE's Baseline Monitoring Program Proposal for GMA 1, as conditionally approved by EPA.

2. Summary of Pre-Design Investigation Activities

2.1 General

The response actions presented in this Final Work Plan are based on the results of extensive pre-design investigation activities performed by GE and EPA at Newell Street Area I. Since Section 2 of both the January 2002 Conceptual Work Plan and April 2003 Conceptual Work Plan Addendum provided detailed descriptions of the pre-design investigation activities, as well as the corresponding data tables presenting the results of those investigations, only a summary of those investigations is provided herein.

2.2 Summary of Pre-Design Soil Investigations

Prior to 2002, the pre-design investigation activities for the Newell Street Area I RAA consisted of the following:

- Historical soil investigations conducted prior to January 2000 and not associated with the pre-design investigation activities proposed in GE's Pre-Design Investigation Work Plan (March 2000, with Addendum dated December 2000);

- Pre-design investigation activities conducted by GE between January 2000 and May 2001, generally including the collection and analysis of soil samples for analysis of PCBs and, in a portion of those samples, other Appendix IX+3 constituents;

- Submittal of a Supplemental Data Validation/Assessment Report, which included: (1) a report on the data validation performed for the pre-design soil investigation sample results in accordance with GE's *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP); and (2) a report on a more general data quality assessment for prior (i.e., historical) soil sampling data;

- Performance of a detailed site survey, including existing buildings, paved and unpaved areas, surface elevations and topography, property boundaries and easements, certain utilities (e.g., manholes, catch basins, etc.), soil sample locations, and other site features; and

- Investigation activities performed by EPA at the Newell Street Area I RAA during GE's pre-design investigations as well as on prior occasions. The validated results of these EPA analyses were provided to GE as part of a data exchange agreement between GE and EPA. These data have also been considered in the response action evaluations for this RAA (excluding the sample results rejected in EPA's data validation process).

The results of the pre-design activities listed above were the basis for the preliminary PCB and Appendix IX+3 evaluations presented in the Conceptual Work Plan. However, as indicated in Section 5 of that Work Plan, GE determined that additional investigation activities were needed to supplement and/or complete the preliminary PCB and Appendix IX+3 evaluations. Further, in its May 24, 2002 comment letter on the Work Plan, EPA indicated the need for additional investigation activities beyond those proposed by GE at Newell Street Area I and required GE to develop a supplemental sampling proposal to perform such additional investigation activities. The supplemental pre-design activities included the following:

- Supplemental pre-design soil sampling, including the collection of the approximately 26 soil samples for analysis of PCBs and approximately 108 samples for analysis of other Appendix IX+3 constituents (or, in some cases, select non-PCB constituents), performed by GE between August 2002 and February 2003;

- Supplemental sampling activities performed by EPA, including the collection of approximately 26 additional soil samples at several locations within Newell Street Area I between July and September 2002 for analysis of PCBs or, in some cases, certain Appendix IX+3 constituents; and

- Preparation of a Data Validation Report for GE's supplemental investigation data (included in Appendix A of the Conceptual Work Plan Addendum). (The supplemental EPA data were not included in that Data Validation Report, since those data have been validated by EPA.)

A summary of the results of the pre-design investigation soil sampling activities (upon which the evaluations presented in the Conceptual Work Plan Addendum were based), was provided in Section 2.3 of the Conceptual Work Plan Addendum. The corresponding data summary tables providing the results of those supplemental soil sampling activities were provided in Appendix B of the Conceptual Work Plan Addendum.

3. Summary of PCB and Appendix IX+3 Evaluation Procedures

3.1 General

This section of the Final Work Plan summarizes the procedures used by GE to determine the need for response actions to achieve the PCB and Appendix IX+3 Performance Standards specified in the SOW for the parcels located within the Newell Street Area I RAA. This section provides an overview of the PCB evaluation procedures (Section 3.2), followed by an overview of the evaluation procedures for other Appendix IX+3 constituents (Section 3.3).

3.2 Summary of PCB Evaluation Procedures

This section provides an overview of the PCB evaluation procedures for Newell Street Area I. It includes: (1) a description of the applicable PCB-related Performance Standards for this RAA; (2) a summary of the current status regarding the obtaining of Grants of Environmental Restrictions and Easements (EREs) for the non-GE-owned parcels located in Newell Street Area I; (3) an overview of parcel-specific PCB evaluation procedures; and (4) an overview of the utility corridor PCB evaluation procedures.

3.2.1 PCB-Related Performance Standards

For the Former Oxbow Areas at the CD Site, which include Newell Street Area I, the Performance Standards related to the presence of PCBs in soil are set forth in Paragraph 26 of the CD and Section 2.3.2 of the SOW. An overview of the pertinent Performance Standards related to the presence of PCBs in soil at the Newell Street Area I RAA is presented below:

- GE must execute and record EREs for properties owned by GE at Newell Street Area I, and must make "best efforts" (as defined in the CD) to obtain EREs at private properties not owned by GE at this RAA. (The City of Pittsfield has also agreed in the CD to execute EREs on its properties if necessary.) If an ERE cannot be obtained at a non-GE-owned private property, GE must implement a Conditional Solution. The

scope of soil-related response actions at a property is dependent upon whether an ERE is obtained or a Conditional Solution will be implemented, as discussed below.

- For the 10 commercial/industrial parcels (Parcels J9-23-13, J9-23-16, J9-23-18, J9-23-19, J9-23-20, J9-23-21, J9-23-22, J9-23-23, J9-23-24, and J9-23-25), GE must achieve the following standards:

  - For properties where an ERE is obtained, if the spatial average PCB concentration in the top foot of soil in the unpaved portion of the property exceeds 25 ppm, GE must remove and replace soils as necessary to achieve that average concentration in such portion. For the paved portion of the property, if the spatial average PCB concentration exceeds 25 ppm in the top foot of soil, GE must either remove and replace soils as necessary to achieve that spatial average concentration or else enhance the pavement in such portion in accordance with the specifications for pavement enhancement in the SOW. In addition, considering both paved and unpaved portions together, GE must remove/replace soils as necessary to achieve a spatial average PCB concentration of 200 ppm in the 1- to 6-foot depth increment and must install an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

  - For properties where an ERE cannot be obtained, GE must implement a Conditional Solution, which includes soil removal/replacement as necessary to achieve spatial average PCB concentrations of 25 ppm in both the top foot of soil (considering paved and unpaved portions together) and the top 3 feet of soil and 200 ppm in the 1- to 6-foot depth increment, and installation of an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

- For two recreational properties (Parcels J9-23-17 and J9-23-26), GE must achieve the following standards:

  - For properties where an ERE is obtained, GE must remove/replace soils as necessary to achieve spatial average PCB concentrations of 10 ppm in the top foot and 15 ppm in the 1- to 3-foot depth increment, and must install an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm.

  - For properties where an ERE cannot be obtained, GE must implement a Conditional Solution, which includes soil removal/replacement to achieve a spatial average PCB concentration of 10 ppm in both the

top foot and the top 3 feet of soil, and installation of an engineered barrier if the remaining spatial average PCB concentration in the 0- to 15-foot depth interval exceeds 100 ppm.

- For the GE-owned riparian strip (Parcel J9-23-12) (excluding the riverbank portion), GE has the option of either: (a) removing and replacing soils as necessary to achieve spatial average PCB concentrations at or below 10 ppm in the top foot and 15 ppm in the 1- to 3-foot depth increment; or (b) removing the top foot of soil and installing a vegetative engineered barrier over portions of the strip until the spatial average PCB concentrations in the remainder of the strip do not exceed the above concentrations. In either case, if the remaining spatial average PCB concentration in the 0- to 15-foot depth increment exceeds 100 ppm, GE must install a vegetative engineered barrier.

- Further, at each of the above properties that exceeds 0.5 acre in size, if GE elects to consider the entire property as an averaging area, GE must ensure the removal of all soils in the top foot in unpaved portions of the property that contain PCB concentrations greater than 125 ppm at commercial/industrial properties and 50 ppm at recreational properties -- the "not-to-exceed" (NTE) levels. Alternatively, GE may establish averaging areas that do not exceed 0.5 acre in size or may propose other specific averaging areas to EPA for approval, in which case the above NTE PCB levels will not apply.

- In addition, at all properties where utilities potentially subject to emergency repair requirements are present, if the spatial average PCB concentration in the utility corridor exceeds 200 ppm, GE must evaluate whether any additional response actions are necessary. Further, if utilities are installed, repaired, or replaced, GE must ensure that the spatial average PCB concentration in the backfill material is less than 25 ppm at commercial/industrial properties, and less than 10 ppm in the top 3 feet and 25 ppm at greater depths for recreational properties.

3.2.2 Status of EREs

Section 3.2.2 of the Conceptual Work Plan Addendum provided a summary of the ERE status for each of the properties within Newell Street Area I. Since that time, the following developments have occurred: First, the owner of Parcel J9-23-24 has executed the ERE for his property, as he had previously agreed. That executed ERE and related documentation (i.e., subordination agreement and title certificate) will be submitted to EPA and MDEP shortly. Second, the owner of Parcel J9-23-17 has advised GE by letter dated July 21, 2003, that it has

now decided that it does not wish to execute an ERE on its property and instead elects the Conditional Solution approach. Accordingly, GE will implement a Conditional Solution for that property. As shown in the Conceptual Work Plan Addendum, the proposed remediation for Parcel J9-23-17 will meet both the Performance Standards applicable to properties with EREs and the Performance Standards applicable to properties that will be subject to a Conditional Solution. As a result, no change in the proposed remediation for that property is necessary in light of the property's owner's revised decision regarding an ERE.

The following table reflects the current ERE status for each of the properties located within Newell Street Area I:

Parcel ID	Property Type	Ownership	ERE
J9-23-12	Recreational	GE	Yes
J9-23-13	Commercial/Industrial	Non-GE	No
J9-23-16	Commercial/Industrial	GE	Yes
J9-23-17	Recreational	Non-GE	No
J9-23-18	Commercial/Industrial	Non-GE	No
J9-23-19, -20, and -21	Commercial/Industrial	Non-GE	No
J9-23-22	Commercial/Industrial	Non-GE	No
J9-23-23	Commercial/Industrial	GE	Yes
J9-23-24	Commercial/Industrial	Non-GE	Yes
J9-23-25	Commercial/Industrial	Non-GE	No
J9-23-26	Recreational	City	Yes

Based on the above information, Conditional Solutions will be implemented at the properties at which the owners have not agreed to EREs.

3.2.3 Parcel-Specific PCB Evaluation Procedures

Section 3.2.3 of the Conceptual Work Plan Addendum detailed the general procedures used to evaluate PCB concentrations in soil on a parcel-specific basis for the properties located within Newell Street Area I. These procedures were established in Attachment E to the SOW (Protocols for PCB Spatial Averaging). These procedures basically involved the following steps: (1) for parcels to which the NTE levels apply, comparing the discrete PCB concentrations in the top foot of soil in unpaved areas to the applicable NTE levels; (2) comparing the existing spatial average PCB concentrations for the relevant depth increments at each parcel to the applicable PCB Performance Standards; (3) at parcels where there were exceedances of the applicable NTE levels or other

Performance Standards, developing a remediation proposal to address those exceedances; and (4) repeating the evaluations for those parcels in their post-remediation condition to ensure that the proposed remediation would achieve the Performance Standards. The evaluation results were presented in Section 4 of the Conceptual Work Plan Addendum on a parcel-by-parcel basis, with supporting documentation (i.e., Theissen polygon maps and averaging tables) provided in Appendix C of that document.

3.2.4 Utility Corridor Evaluations

As discussed in Section 3.2.4 of the Conceptual Work Plan Addendum, subsurface utilities potentially subject to emergency repairs were also subject to additional evaluation activities. Specifically, the corridor associated with each such utility was evaluated by calculating the spatial average PCB concentration for each such corridor, using the procedures described in Section 3.2.4 of the Conceptual Work Plan Addendum, and then comparing that average concentration to the PCB Performance Standard of 200 ppm for utility corridors. The results of these evaluations were presented in Section 4.15 of the Conceptual Work Plan Addendum.

3.3 Summary of Appendix IX+3 Constituent Evaluation Procedures

This section provides an overview of the applicable Performance Standards for non-PCB Appendix IX+3 constituents in soil and of the procedures used to assess achievement of those standards. As with PCBs, the other Appendix IX+3 constituents were evaluated first for each property in its existing condition; and then, for each property where the applicable Performance Standards are not met, remediation was proposed and post-remediation conditions were evaluated to ensure achievement of the Performance Standards.

3.3.1 Applicable Performance Standards

The applicable Performance Standards for non-PCB constituents in soil at Newell Street Area I are included in Section 2.3.2 of the SOW. These standards include the following:

- For dioxins and furans, total toxicity equivalency quotient (TEQ) concentrations must be calculated using the Toxicity Equivalency Factors (TEFs) developed by the World Health Organization (WHO) (Van den Berg et al., *Environ. Health Perspectives*, Vol. 106, No. 12, Dec. 1998). Either the maximum TEQ

concentration or the 95% percent upper confidence limit on the mean (95% UCL) of the TEQ data must be below certain Preliminary Remediation Goals (PRGs) developed or approved by EPA for dioxin/furan TEQs. These PRGs are: for commercial/industrial properties, 5 ppb in the top foot of soil and 20 ppb in subsurface soil; and for recreational properties, 1 ppb in the top foot and 1.5 ppb in the 1- to 3-foot depth interval. In addition, EPA requested, in its May 24, 2002 comment letter, that GE also compare the maximum or 95% UCL TEQ concentrations to the following TEQ criteria, although these are not Performance Standards specified in the CD or SOW: 5 parts per billion (ppb) for the 0- to 3-foot depth increment at commercial/ industrial properties that will not have EREs; 1 ppb for the 0- to 3-foot depth increment at recreational properties that will not have EREs; and 20 ppb for soils below 3 feet at all recreational properties.

- For other non-PCB constituents, any combination of the following must be achieved: (1) maximum concentrations of individual constituents that do not exceed the Screening PRGs established or approved by EPA (as discussed below); or (2) for the remaining constituents, average concentrations that either: (a) do not exceed the Method 1 soil standards specified in the Massachusetts Contingency Plan (MCP) (or Method 2 standards, if developed); or (b) are shown through a parcel-specific risk evaluation to have cumulative risk levels that do not exceed an excess lifetime cancer risk of 1×10^{-5} and a non-cancer Hazard Index of 1.0.

3.3.2 Overview of Evaluation Process

The initial task performed in the evaluation of the non-PCB constituents in soil at Newell Street Area I was to assess such constituents in soil at each parcel under existing conditions, based on all available Appendix IX+3 data collected from that parcel, without considering PCB-related remediation. This assessment consisted of several steps:

- First, a screening step was conducted, which generally involved comparison of the maximum concentrations of all detected constituents (other than dioxin/furan TEQs) to the applicable PRGs developed by EPA Region 9 (as set forth in Exhibit F-1 to Attachment F of the SOW) or certain surrogate PRGs approved by EPA (together, the "Screening PRGs"). Additional details regarding this screening step were provided in Section 3.3.3 of the Conceptual Work Plan Addendum.

- Second, for dioxin/furan TEQs, the maximum concentration or 95% UCL at each parcel and relevant depth increment was compared to the applicable dioxin/furan PRG described above (as well as those additional criteria requested by EPA). Additional details regarding this evaluation step were provided in Section 3.3.4 of the Conceptual Work Plan Addendum.

- Third, for those constituents (other than dioxin/furan TEQs) that were not screened out in Step 1, the existing average concentrations of each such constituent were calculated for the same depth increments used for the required PCB evaluations, as specified in Section 3.2.1. These average concentrations were then compared to the MCP Method 1 soil standards for such constituents. Additional details regarding this evaluation step were provided in Section 3.3.5 of the Conceptual Work Plan Addendum.

- Fourth, for properties where there were exceedances of the Method 1 soil standards in any depth increment but such exceedances were not significantly above the Method 1 soil standards, a parcel-specific risk evaluation was conducted for the same constituents evaluated in Step 3 and in accordance with the procedures specified for such evaluations in the SOW. Additional details regarding this evaluation step were provided in Section 3.3.6 and Appendix F of the Conceptual Work Plan Addendum.

At properties where these evaluations indicated the need for additional remediation to address non-PCB constituents in soil, a remediation proposal was developed. As with the PCB-related remediation, the additional remediation at these properties involved soil removal/replacement and/or installation of an engineered barrier, as appropriate. For such properties, an evaluation was then conducted of post-remediation conditions. This evaluation consisted of repeating Steps 2 through 4 of the above-described process, as necessary to demonstrate that the proposed remediation would achieve the applicable Performance Standards for non-PCB constituents. The specific procedures used to take account of the proposed soil removal/replacement and/or engineered barrier in the post-remediation evaluations were discussed further in Section 3.3.7 of the Conceptual Work Plan Addendum. The evaluation results were summarized on a property-by-property basis in Section 4 of the Work Plan Addendum, with supporting documentation provided in Appendices E (evaluation tables) and F (risk evaluations) of that document.

4. Summary of PCB and Appendix IX+3 Evaluation Results

4.1 General

Section 4 of the Conceptual Work Plan Addendum presented the results of the parcel-specific PCB and Appendix IX+3 evaluations, which were performed in accordance with the evaluation procedures summarized in Section 3 of that document. The Conceptual Work Plan Addendum presented the following information for each parcel located within Newell Street Area I:

- Description of property and identification of applicable Performance Standards;
- Evaluation of existing conditions with respect to PCBs and discussion of the need for remediation to address PCBs;
- Evaluation of existing conditions with respect to other Appendix IX+3 constituents and discussion of the need for remediation to address these constituents;
- Description of proposed remedial actions (as shown on Figure 4-1 of the Conceptual Work Plan Addendum);
- Evaluation of post-remediation conditions with respect to PCBs, if required; and
- Evaluation of post-remediation conditions with respect to other Appendix IX+3 constituents, if required.

Following the discussion of above-referenced parcel-specific evaluations, the Work Plan Addendum presented the required utility corridor evaluation for PCBs.

In support of these evaluations, the Conceptual Work Plan Addendum included backup documentation for the evaluations. Specifically, the spatial averaging tables and Theissen polygon maps developed in support of the parcel-specific PCB evaluations were presented in Appendix C of the Conceptual Work Plan Addendum, while the spatial averaging tables and Theissen polygon maps developed in support of the utility corridor PCB evaluations were presented in Appendix D of that document. Appendix E of the Conceptual Work Plan Addendum contained the evaluation tables developed in support of the Appendix IX+3 evaluations, and Appendix F of that report presented the parcel-specific risk evaluations.

4.2 Overall Summary

Based on the evaluations presented in Section 4 of the Conceptual Work Plan Addendum, that document proposed soil remediation, consisting of soil removal/replacement and/or installation of engineered barriers, at 11 of the 13 parcels at Newell Street Area I. The table below lists the post-remediation average PCB concentration for each depth increment subject to evaluation at each parcel, as presented in the Conceptual Work Plan Addendum, as well as the applicable PCB Performance Standard for that depth increment. Information regarding the post-remediation concentrations of non-PCB Appendix IX+3 constituents and corresponding parcel-specific risk evaluations (where necessary) is provided in Appendix E and Appendix F, respectively, of the Conceptual Work Plan Addendum.

The following table also lists the currently estimated volume of soil removal and estimated area requiring installation of engineered barriers at each parcel. The soil removal volumes presented in this table are greater than those specified in the Conceptual Work Plan. These revised soil removal volumes incorporate miscellaneous additional soil removal associated with the design and constructability of the soil removal actions (e.g., additional soil removal to take account of site topography or to accommodate construction of the engineered barriers at several of the parcels, etc.), as well as removal of existing soil piles at Parcels J9-23-19 and J9-23-20 (discussed in Section 5.6 below).

Parcel	Final Average PCB Concentration (ppm)	PCB Performance Standard (ppm)	Estimated Soil Removal Volume (cubic yards)	Estimated Engineered Barrier Area (square feet)
J9-23-12			1,455	0
0 – 1'	1.60	10		
1 – 3'	11.57	15		
0 – 15'	72.54	100		
J9-23-13			1,250	6,000
0 – 1'	1.33	25		
0 – 3'	3.43	25		
1 – 6'	21.85	200		
0 – 15'	31.50	100		
J9-23-16			2,200	12,120
0 – 1' Unpaved	1.33	25		
0 – 1' Paved	3.43	25		
1 – 6'	21.85	200		
0 – 15'	31.50	100		

Parcel	Final Average PCB Concentration (ppm)	PCB Performance Standard (ppm)	Estimated Soil Removal Volume (cubic yards)	Estimated Engineered Barrier Area (square feet)
J9-23-17			2,120	14,600
0 – 1'	7.55	10		
0 – 3'	9.90	10		
0 – 15'	41.55	100		
J9-23-18			325	5,500
0 – 1'	5.18	25		
0 – 3'	22.75	25		
1 – 6'	86.25	200		
0 – 15'	77.11	100		
J9-23-19			1,585	11,865
0 – 1'	1.51	25		
0 – 3'	13.11	25		
1 – 6'	89.89	200		
0 – 15'	33.77	100		
J9-23-20			400	1,000
0 – 1'	1.92	25		
0 – 3'	11.04	25		
1 – 6'	55.40	200		
0 – 15'	69.79	100		
J9-23-21			405	0
0 – 1'	3.12	25		
0 – 3'	20.70	25		
1 – 6'	71.62	200		
0 – 15'	34.69	100		
J9-23-22			2,505	7,035
0 – 1'	2.88	25		
0 – 3'	16.66	25		
1 – 6'	136.05	200		
0 – 15'	61.49	100		
J9-23-23			1,130	8,720
0 – 1' Unpaved	14.37	25		
0 – 1' Paved	2.08	25		
1 – 6'	146.73	200		
0 – 15'	91.48	100		
J9-23-24			1,435	0
0 – 1' Unpaved	6.98	25		
0 – 1' Paved	0.25	25		
1 – 6'	25.05	200		
0 – 15'	61.94	100		

Parcel	Final Average PCB Concentration (ppm)	PCB Performance Standard (ppm)	Estimated Soil Removal Volume (cubic yards)	Estimated Engineered Barrier Area (square feet)
J9-23-25			0	0
0 – 1'	2.07	25		
0 – 3'	3.77	25		
1 – 6'	9.91	200		
0 – 15'	21.13	100		
J9-23-26			0	0
0 – 1'	1.04	10		
1 – 3'	4.06	15		
0 – 15'	6.99	100		
Total:			**14,810**	**66,840**

As indicated in the above table, the remediation for Newell Street Area I will involve the excavation of a total of approximately 14,810 cubic yards of soil (including approximately 620 cubic yards attributable to the soil pile removal at Parcels J9-23-19 and J9-23-20) and the installation of a total of approximately 1.5 acres of engineered barrier.

Since each of the above-listed parcels is located entirely within the 100-year floodplain for the Housatonic River (which is situated at approximately elevation 990.5 feet in the vicinity of Newell Street Area I), compensatory flood storage will be required to offset the loss of flood storage capacity associated with the installation of engineered barriers or other ancillary items in locations where soil removal is not proposed. Since most of the engineered barriers will be installed at locations where soil removal is proposed, only those barriers and other restoration items proposed for areas not subject to soil removal need to be considered in determining the required compensatory flood storage volume. Calculations regarding the volume of lost flood storage capacity associated with the proposed response actions, together with a proposal for obtaining the required volume of compensatory flood storage capacity within the floodplain, are discussed in Section 5.8 below.

5. Design Information

5.1 General

The primary objectives for the Newell Street Area I Removal Action involve the reduction of PCB and Appendix IX+3 constituent concentrations to levels that are protective of human health and the environment. This section discusses the Removal Action activities necessary to achieve those objectives. These activities generally consist of the excavation of impacted material, disposal of this material at On-Plant Consolidation Areas (OPCAs) located at the GE Pittsfield facility, backfilling of excavations with clean material, placement of a 1-foot-thick (minimum) engineered barrier (engineered barrier) over the surface of specific areas (in accordance with Technical Drawings 7 through 14), and general site restoration. These and other pertinent components of the construction activities are discussed in the remainder of this section. As discussed in Section 6, GE is currently in the process of selecting a Remediation Contractor to perform the response actions specified herein. Section 6 provides further details regarding that selection process, while Section 7 provides additional site-specific implementation details associated with construction of the various design components.

5.2 Technical Specifications

Preliminary technical design information regarding soil removal and the installation of engineered barriers within Newell Street Area I was provided in the Conceptual Work Plan Addendum. In addition, certain of the plans comprising GE's Project Operations Plan (POP) provide additional design, construction, and implementation-related information relevant to the construction activities. With the exception of the FSP/QAPP and the Health and Safety Plan (HASP) (which was provided to EPA for informational purposes only), the latest revisions to the POP plans were conditionally approved by EPA in a letter dated April 24, 2003, and were submitted to EPA on July 14, 2003.

The POP contains a series of plans that address several common aspects of the Removal Actions Outside the River and apply to various activities to be conducted as part of those Removal Actions, ranging from initial pre-design activities to the performance and completion of remediation activities. Collectively, these plans describe the minimum requirements, general activities, protocols, and methodologies that are applicable to these Removal Actions. These plans include a Waste Characterization Plan, a Soil Cover/Backfill Characterization Plan, a Site Management Plan, an Ambient Air Monitoring Plan, and a Contingency and Emergency Procedures

Plan. The POP also includes a CQAP, which provides technical requirements related to items such as backfill, topsoil, seeding, mulch, engineered barrier components, etc. In addition, the CQAP specifies activities that are relevant to certain of the construction activities, such as soil placement and grading/compaction, survey control, liner/barrier component placement, etc. The general provisions of the POP are applicable to the Newell Street Area I construction activities and are incorporated herein by reference.

Since the time the Conceptual RD/RA Work Plan Addendum was submitted to the EPA in April 2003, GE has further developed the technical design of the remediation actions for Newell Street Area I. The various design details are summarized in this Final Work Plan, but are more specifically described in the Technical Drawings and Specifications that have been developed by GE for use in selecting a Remediation Contractor. Copies of the Technical Drawings and Specifications are provided in Attachments A and B, respectively, and include those related to soil removal and engineered barrier installation, as well as other construction elements. The Technical Specifications in Attachment B include project-specific construction quality assurance requirements for engineered barriers.

Given the various owners of the properties at Newell Street Area I and the need to obtain owner access agreements to perform the remediation, it is currently anticipated that the remediation activities described in this Final Work Plan will be performed in phases. These phases (designated Phases I through IV) are identified on the Technical Drawings provided in Attachment A. Also, these phases will not be performed in any particular order, and multiple phases may be performed concurrently.

5.3 Soil Removal Activities

As described in Section 4.2, GE will remove approximately 14,810 cubic yards of soil from Newell Street Area I. The soils subject to removal will be transported to, and properly disposed of at, either the Building 71 OPCA or the Hill 78 OPCA, as described in Section 7.5.5. Prior to initiating removal activities for the areas subject to soil removal, the horizontal limits of removal will be surveyed and staked in the field. During removal activities, field measurements will be made to verify that the target removal depths have been achieved for each area. Following removal, common fill will be obtained from an off-site source (Sections 5.6 and 7.5.6) and will be placed and compacted to re-establish the original grade and/or sub-grade elevation for an engineered barrier. The provisions specified in the Technical Drawings (Attachment A) and Specifications (Attachment B), and the

POP (including the Soil Cover/Backfill Characterization Plan and the CQAP) will be utilized during the removal and backfill activities.

5.4 Soil Wedge Design

As demonstrated on Technical Drawings 5 and 6 (provided in Attachment A), certain excavations adjacent to buildings on Parcels J9-23-22 and J9-23-24 may extend below the foundations/frost walls of those structures. (The buildings on Parcel J9-23-23 will be subject to demolition and removal prior to performance of the soil removal activities, as further discussed in Section 5.9.) Based on this assumption, GE is proposing, for Parcels J9-23-22 and J9-23-24, to leave in place a "wedge" of soil extending from the bottom of the building foundation/footer in question to the bottom of the adjacent excavation on a 1:1 slope (1 foot horizontal to 1 foot vertical). Such wedges are meant to augment any excavation controls that the Remediation Contractor determines are necessary to protect the structural integrity of the buildings on these properties during performance of the soil removal activities.

To evaluate the impact of not excavating these soil wedges on the achievement of the PCB Performance Standards for the impacted evaluation intervals (1- to 6-foot and 0- to 15-foot depth increments), GE has developed the supplemental calculations included in Attachment C. The supplemental materials provided in Attachment C include Tables C-1 through C-6 and Figures C-1 through C-7. As indicated in Table C-1, this approach will result in changing the post-remediation average PCB concentrations for the 1- to 6-foot and 0- to 15-foot depth increments at Parcel J9-23-22 from approximately 136 ppm and 61 ppm, respectively, to approximately 138 ppm and 62 ppm, respectively. For Parcel J9-23-24, as shown in Table C-4, leaving the wedges in place will result in changing the post-remediation average PCB concentrations for the 1- to 6-foot and 0- to 15-foot depth increments from approximately 25 ppm and 62 ppm, respectively, to approximately 48 ppm and 69 ppm, respectively. Thus, these revised calculations demonstrate that if these soil wedges are not excavated at either property, the post-remediation average PCB concentrations for the 1- to 6-foot and 0- to 15-foot depth increments will still be far below the Performance Standards of 200 ppm and 100 ppm, respectively.

5.5 Excavation Stabilization

For removal areas where excavations will exceed 4 feet in depth and where Contractor personnel will enter the excavations to perform work, the Remediation Contractor will be required to provide some form of excavation

side wall stability in accordance with Occupational Health and Safety Administration (OSHA) requirements. These methods may include, but not be limited to, benching the excavation or installation of a temporary earth retaining structure (e.g., steel sheet piles, soldier beam and lagging, trench boxes, etc). In addition to these excavation stability measures , the Contractor may elect to use a temporary earth retaining structure and/or other standard practices for maintaining the structural stability of existing buildings (including foundations) located adjacent to excavations that will be extended below the bottom of the existing foundation.

For any temporary earth retaining structure that is planned to be used by the Contractor, a Professional Engineer licensed in the Commonwealth of Massachusetts will design the system, as well as sign and seal the design. For other standard practices for maintaining the integrity of the existing buildings and their foundations, a Professional Engineer licensed in the Commonwealth of Massachusetts will also review and approve the method that the Contractor plans to implement.

5.6 Backfilling Excavations

Soil fill, topsoil, gravel, and engineered barrier components will be used to backfill the excavations at Newell Street Area I. Information regarding the measurement, composition, installation, and (for engineered barrier components) construction quality assurance requirements of acceptable backfill materials/barrier components is provided in the Technical Specifications provided in Attachment B.

The specific fill sources to be used for this project will be identified by the selected Remediation Contractor. The backfill materials that will be used at these parcels will originate either from existing sources or from new, currently unidentified sources of backfill material. Existing sources of backfill material consist of those sources that have been previously used for other GE remediation projects in Pittsfield and have been previously qualified for such use in submittals to EPA and/or the MDEP. The sample data presented in those documents include analyses for PCBs and Appendix IX+3 volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. If such existing, approved sources are used, these prior analytical data will not be re-submitted to EPA. For any backfill materials from a source that has not already been identified and characterized, representative samples of proposed fill materials will be collected and analyzed for PCBs and Appendix IX+3 VOCs, SVOCs, and metals, as required by GE's approved Soil Cover/Backfill Characterization Plan provided in the POP. The name of the proposed backfill source location and the results of the analyses for

PCBs and Appendix IX+3 VOCs, SVOCs, and metals (if necessary) will be submitted to EPA in a supplemental information package prior to the use of such material.

In addition, the response actions for Newell Street Area I will include the removal of three soil piles located on Parcels J9-23-19 and J9-23-20. GE intends to use these soil piles as fill material to backfill the excavations on other properties located within Newell Street Area I, provided that the conditions for doing so, as set forth in Section 3.3 of GE's Soil Cover/Backfill Characterization Plan (provided in the POP), are met. Therefore, these soil piles will be characterized in accordance with the provisions of the Soil Cover/Backfill Characterization Plan. The analytical data for this fill material will be provided to EPA in the supplemental information package, along with an evaluation or proposal regarding the use of this material as backfill at other properties located within Newell Street Area I.

5.7 Engineered Barrier

As established in Technical Attachment G to the SOW, the minimum thickness of the engineered barrier to be placed in certain areas of Newell Street Area I is 1 foot. This minimum thickness will be provided within all areas in which engineered barriers are to be constructed; however, in several areas, the thickness of the engineered barrier will be greater than 1 foot in order to accommodate the variability in the current topography of the area and to provide a final surface that is fairly level but promotes drainage of rainfall runoff (i.e., a downward slope of approximately 1.5% to 2%), as shown by the targeted final grade contours on Technical Drawings 9 through 12.

The total extent of the engineered barrier to be placed within Newell Street Area I encompasses approximately 67,000 square feet (sf) across the entire site. A minimum of 1,000 sf of engineered barrier will be constructed on each of Parcels J9-23-13 through J9-23-19, as well as on J9-23-22 and J9-23-23 (see Technical Drawings 9 through 12). In addition, a small engineered barrier is proposed for a portion of Parcel J9-23-20.

Each engineered barrier will consist of a layer of geomembrane liner, a geosynthetic drainage composite, a layer of soil fill material, and a suitable cover. The type of cover will depend on the specific area. The cover for a vegetative engineered barrier will consist of a topsoil layer which will be planted with vegetation. The cover for an asphalt engineered barrier will consist of a gravel subbase course covered by asphalt pavement. In addition to these types of engineered barriers, GE plans to use a third type of engineered barrier for certain parcels

(specifically, Parcels J9-23-13, J9-23-19, J9-23-20, and J9-23-22). This barrier will consist of the same liner materials/components, but will be covered by an 18-inch layer of gravel. This type of barrier is necessary at Parcels J9-23-19 and J9-23-20 because the owners/occupants utilize heavy construction equipment (e.g., excavators, cranes, etc.), which would damage a vegetative or asphalt cover system. At Parcels J9-23-13 and J9-23-22, a gravel-covered engineered barrier was selected to match the existing surface cover types at these properties. Since such gravel cover material may become displaced over time (as a result of vehicular traffic, snow plowing, etc.), an additional layer of geotextile fabric will be placed within the gravel cover materials approximately 6 inches below the surface to serve as an indicator of when 6 inches of gravel has been displaced. The engineered barriers will be constructed in accordance with the Technical Specifications in Attachment B. Cross-sections depicting the various cover configurations are provided on Technical Drawings 13 and 14.

5.8 Flood Storage Capacity

As shown on Technical Drawings 10 and 12, certain of the remediation and related activities to be performed at Newell Street Area I will result in the loss of flood storage capacity within the 100-year floodplain. Specifically, the installation of the engineered barrier at Parcel J9-23-16 will result in the loss of flood storage capacity within this RAA. In addition, the surface restoration activities to be performed at Parcel J9-23-17 (including the installation of new bocce courts to replace the courts currently present) may cause a loss of flood storage capacity. On the other hand, certain other activities to be performed in conjunction with the remediation will result in an increase in flood storage capacity. These include demolition of the existing buildings on Parcels J9-23-16 and J9-23-23 (discussed in Section 5.9) and removal of the soil piles located on Parcels J9-23-19 and J9-23-20 (discussed in Section 5.6). In these circumstances, GE has performed calculations to determine the need for additional flood storage capacity at this RAA. Those calculations are presented in Attachment D and summarized below.

Comparison of the final grading configuration on Parcels J9-23-17 and J9-23-23, as depicted on Technical Drawings 10 and 12, to the existing surface grades on Technical Drawings 4 and 6 shows that the installation of the engineered barrier on Parcel J9-23-23 and the surface restoration at Parcel J9-23-17 (including the installation of new bocce courts) would result in a maximum potential loss of flood storage capacity totaling approximately 405 cubic yards. However, demolition of the buildings on Parcels J9-23-16 and J9-23-23, combined with certain regrading activities associated with the installation of the engineered barrier on Parcel J9-23-23 as well as removal of the soil piles on Parcels J9-23-19 and J9-23-20, will result in a gain of flood storage

capacity totaling approximately 2,595 cubic yards at Newell Street Area I. Therefore, the combination of the proposed response actions with the building demolition and soil pile removal activities will result in a net increase in flood storage capacity of at least 2,190 cubic yards within the 100-year floodplain at this RAA.

5.9 Building Demolition Activities at Parcels J9-23-16 and J9-23-23

The existing buildings located at Parcels J9-23-16 (one building) and J9-23-23 (two buildings), which GE owns, are scheduled for demolition during the 2003 construction season. The demolition will include all portions of these structures located above the floor slabs. GE proposes to leave the floor slabs in place. Such building demolition activities will be performed in accordance with GE's *Protocols for Building Demolition and Associated Characterization Activities*, which are attached as Exhibit A-1 to GE's Waste Characterization Plan within its approved POP (submitted on July 14, 2003). In accordance with the CD and the SOW, these demolition activities themselves are not subject to specific EPA approval. However, disposition of the building demolition debris from these buildings at the OPCAs is subject to EPA review and approval. As noted in the Conceptual Work Plan Addendum, all non-asbestos-containing building demolition debris (i.e., brick, block, concrete, metal, etc.) associated with these buildings will be disposed of in the Building 71 OPCA (except for the items excluded from disposition in the OPCAs under the CD and SOW). That OPCA is designated for receipt of materials regardless of whether they are regulated by the Toxic Substances Control Act (TSCA) (i.e., contain PCB concentrations at or over 50 ppm) or constitute hazardous waste under the Resource Conservation and Recovery Act (RCRA).

5.10 Applicable or Relevant and Appropriate Requirements

The remediation activities to be conducted at Newell Street Area I will be subject to several Applicable or Relevant and Appropriate Requirements (ARARs). Attachment B to the SOW identifies the chemical-specific, action-specific, and location-specific ARARs for Removal Actions Outside the River. As noted above, the Removal Action for Newell Street Area I includes soil removal/replacement and installation of engineered barriers. All of these activities will be performed within the 100-year floodplain of the Housatonic River. In these circumstances, the Newell Street Area I Removal Action is subject to the following ARARs identified in Attachment B to the SOW: the action-specific ARARs identified in Table 2, subsection B ("Soil Removal"), subsection C ("Surface Cover Activities"), subsections I and J (regarding consolidation of excavated soils at the OPCAs), and potentially subsection K ("Other"); and the location-specific ARARs identified in Table 3,

subsection B ("Floodplains, Wetlands, and Banks"). If excavation activities involve the removal and on-site storage (at the GE Plant Area) of free product, intact drums, and/or other materials that cannot be consolidated at the OPCAs and thus will be subsequently disposed of off-site, the ARARs identified in Table 2, subsection H ("Temporary On-Site Storage of Free Product, Drums, and Equipment That Will Be Disposed of Off-Site") of Attachment B to the SOW will apply to such storage. In addition, the disposition of excavated materials at GE's OPCAs will be subject to the ARARs for consolidation at the OPCAs (set forth in Table 1 of the Detailed Work Plan for OPCAs).

A summary of the key ARARs that were considered with respect to the response actions proposed herein, along with the associated project component(s) and means by which the ARAR is addressed by the design and implementation activities, is as follows:

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
TSCA Regulations (PCB Remediation Waste) (40 CFR 761.61)	• Soil removal • Surface cover activities	• EPA has determined that Removal Actions conducted in accordance with the CD and SOW will not pose an unreasonable risk of injury to health or the environment.
TSCA Regulations (Decontamination) (40 CFR 761.79)	• Soil removal (equipment cleaning)	• Will be attained by cleaning equipment as necessary in accordance with TSCA regulations (see Section 7.5.9).
RCRA Hazardous Waste Regulations (40 CFR 261.24)	• Soil removal	• Appendix IX+3 evaluations (Section 4 of Conceptual Work Plan Addendum). • Waste profile evaluation showing that soil to be disposed of at Hill 78 OPCA is not a RCRA characteristic hazardous waste (Section 7.5.5).
Clean Water Act NPDES Regulations (Stormwater Discharges) [40 CFR 122.44(k); 40 CFR 122.26(c)(ii)(C); 40 CFR 125.100-.104]	• Soil removal • Surface cover activities	• Implementation of erosion and sedimentation controls (Section 7.4.5).
Massachusetts Air Pollution Control Requirements (310 CMR 7.09)	• Soil removal • Surface cover activities	• Implementation of dust control measures (as necessary) and air monitoring (Sections 7.5.2 and 7.6).

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
TSCA Regulations (Storage for Disposal) (40 CFR 761.61; 40 CFR 761.65)	• Temporary storage of removed materials	• Temporary storage of free product and liquids in tanks or containers at GE's existing on-plant tank system or hazardous waste storage facility, both of which meet the long-term PCB storage requirements of TSCA. • Temporary storage of drums and other equipment in containers at GE's existing on-plant hazardous waste storage facility, which meets the long-term PCB storage requirements of TSCA.
TSCA Regulations (PCB Marking Requirements) (40 CFR 761.40)	• Temporary storage of removed materials	• Will be attained by marking PCB items in accordance with these requirements.
RCRA Hazardous Waste Regulations (Storage of Hazardous Waste) (40 CFR 264, Subparts I and J 40 CFR 262.34)	• Temporary storage of removed materials	• Temporary storage of free product and liquids in tanks or containers at GE's existing on-plant tank system or hazardous waste storage facility. • Temporary storage of drums and other equipment in containers at GE's existing on-plant hazardous waste storage facility. • Storage of materials in tanks will be limited to 90 days or less and will meet the substantive requirements for up to 90-day accumulation in tanks. • Materials in containers will be stored at GE's hazardous waste storage facility, which meets the requirements for long-term storage of hazardous waste in containers.
RCRA Hazardous Waste Management/Disposal Facilities Regulations (Preparedness and Prevention) (40 CFR 264, Subparts C)	• Temporary storage of removed materials	• GE's existing on-plant hazardous waste storage facility meets these requirements.
RCRA Hazardous Waste Management/Disposal Facilities Regulations (General) (40 CFR 264.13 - .19)	• Temporary storage of removed materials	• Operation of GE's existing on-plant hazardous waste storage facility meets these requirements.

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
RCRA Hazardous Waste Management/Disposal Facilities Regulations (Closure) (40 CFR 264.111 - .115)	• Temporary storage of removed materials	• Upon termination of operations, GE's existing on-plant hazardous waste storage facility will be closed in accordance with the substantive requirements of these regulations.
Massachusetts Hazardous Waste Regulations (Storage of Hazardous Waste) (310 CMR 30.680, 30.690 310 CMR 30.340)	• Temporary storage of removed materials	• See discussion of federal RCRA Hazardous Waste Regulations (Storage of Hazardous Waste) above.
Massachusetts Hazardous Waste Regulations (Closure) (310 CMR 30.580)	• Temporary storage of removed materials	• See discussion of federal RCRA Hazardous Waste Regulations (Closure) above.
ARARs Relating to Disposition of Excavated Materials in OPCAs	• Permanent consolidation of removed materials at OPCAs	• Refer to August 25, 1999 letter from GE to EPA re: *Supplemental Addendum to June 1999 Detailed Work Plan*, for relevant ARARs relating to disposition of excavated material at the OPCAs and means of addressing such ARARs.
TSCA Spill Cleanup Policy (40 CFR 761, subpart G)	• New PCB spills (if any) during on-site activities	• GE will consider and address cleanup policy for any new PCB spills that occur during the work.
Executive Order for Floodplain Management [Exec. Order 11988 (1977); 40 CFR Part 6, App. A; 40 CFR 6.302(b)]	• Soil removal and surface cover activities in floodplain	• No practical alternative with less adverse impact on floodplain. • Implementation of erosion and sedimentation controls (Section 7.4.5). • Provision of compensatory flood storage capacity to offset loss in flood storage capacity (Section 5.8). • Restoration of habitat (Section 7.5.10).

ARAR	Associated Project Components	Means by Which ARAR Will Be Addressed
Massachusetts Wetlands Protection Act and Regulations [MGL c. 131 §40; 310 CMR 10.53(3)(q); 310 CMR 10.54-.58]	• Soil removal • Placement of fill materials within 100-year floodplain	• No practical alternative with less adverse impact on resource areas. • All practical measures will be taken to minimize adverse impact on river. • Implementation of erosion and sedimentation controls (Section 7.4.5). • Provision of compensatory flood storage capacity to offset loss in flood storage capacity (Section 5.8). • Restoration of disturbed vegetation (Section 7.5.10).

6. Contractor Selection

Prior to conducting the planned Removal Action as described above, GE will select a Remediation Contractor that is qualified to complete the on-site soil remediation/construction activities. To accomplish this, GE has developed a Request for Proposal (RFP) that describes the project, provides the Technical Drawings contained herein, provides Technical Specifications for completing the work, and solicits bids from prospective contractors. This RFP was provided to prospective Remediation Contractors on July 23, 2003, with a request that they prepare their bids and return them to GE by August 8, 2003.

Based on these requests, GE anticipates that the potential contractors will return their bids to GE for review by approximately August 8, 2003. GE and its Supervising Contractor (Blasland, Bouck & Lee, Inc.) will then review the potential contractors' bids for completeness, relevant experience, the proposed work schedule, and the contractors' financial status. After the review is complete, GE will select the Remediation Contractor and initiate a contractual agreement. GE anticipates that this will occur on or about August 15, 2003.

Upon selection of a successful bidder, the Remediation Contractor will be responsible for providing several submittals to GE, including those identified in Section 7.3 of this Final Work Plan. GE will subsequently provide the Contractor information and submittals to EPA in a supplemental information package, as described in Section 9 of this Final Work Plan.

7. Implementation Plan

7.1 General

As indicated in Section 5.2, the POP contains a series of plans that address several common aspects for Removal Actions Outside the River. As relevant, those plans will be followed in the implementation of the Newell Street Area I Removal Action.

As a supplement to the implementation-related procedures specified in the POP plans, this section provides additional details regarding certain construction activities. Specifically, this section identifies the requirements for project-specific plans to be submitted by the selected Remediation Contractor, describes site-specific elements of the site preparation and construction activities, and summarizes the project-specific perimeter air monitoring approach.

7.2 Project Participants

To the extent possible, the following table identifies the key project participants involved in the design and implementation of the Newell Street Area I remediation/construction activities, along with their project roles and contact information:

Organization/Contact	Role	Address and Phone Number
United States Environmental Protection Agency Bryan Olson	- Lead regulatory agency. - Review and approval of RD/RA Work Plan and Work Plan Addendum. - Oversight of response actions.	USEPA Region 1 1 Congress Street, Suite 1100 Boston, MA 02114 (888) 372-7341

Organization/Contact	Role	Address and Phone Number
General Electric Company Richard W. Gates	- Supervise pre-design, construction, and documentation activities related to the Newell Street Area I Removal Action. - Supervise implementation of the Removal Action and related activities to ensure that they are conducted in accordance with the CD. - Direct/coordinate activities of the Remediation Contractor and other GE-contracted organizations. - Responsible for preparation of a Final Completion Report.	General Electric Company 100 Woodlawn Avenue Building 11-250 Pittsfield, MA 01201 (413) 494-2176
Blasland, Bouck & Lee, Inc. James M. Nuss, P.E., LSP	- Supervising Contractor for GE. - Review Remediation Contractor submittals. - Project coordination and documentation. - Provide technical assistance related to the implementation of the Removal Action. - Assist in verifying that the Removal Action is complete and performed in accordance with the Work Plan. - Prepare Final Completion Report.	Blasland, Bouck & Lee, Inc. 6723 Towpath Road Syracuse, NY 13214 (315) 446-9120
White Engineering, Inc. Michael Kulig, P.E.	- Design consultant to GE for civil engineering work. - Review Remediation Contractor submittals relating to civil engineering work.	White Engineering, Inc. 55 South Merriam Street Pittsfield, MA 01201 (413) 443-8011
Berkshire Environmental Consultants Maura Hawkins	- Design and implement perimeter air monitoring in conjunction with construction activities.	Berkshire Environmental Consultants 152 North Street, Suite 250 Pittsfield, MA 01201 (413) 443-0130
Remediation Contractor (To be determined)	- Implement all construction-related activities	(To be determined)

7.3 Contractor Submittals

Once selected, the Remediation Contractor will be required to provide certain pre-mobilization submittals to demonstrate that the Contractor (a) has an adequate understanding of the scope of the Removal Action; (b) has developed a project-specific sequence that can efficiently perform all on-site activities within the allowable schedule; (c) will utilize acceptable materials, products, and procedures; and (d) will perform all activities in a manner that is protective of on-site workers and the surrounding community. Certain of those submittals relate to the manner in which the work activities will be implemented and, as such, will supplement the information and procedures presented in this plan. Those submittals include an Operations Plan, a HASP, and a Contingency Plan. Each of these submittals is further described below.

Operations Plan

The purpose of the Operations Plan is to summarize the materials, procedures, timelines, and controls that the Contractor intends to utilize during project activities. This plan will be prepared in consultation with GE and its Supervising Contractor and will include the following:

- List of equipment to be used on-site;
- Recreational property protection procedures;
- Work Schedule;
- The Contractor's proposed plan for controlling vehicular and pedestrian traffic during the performance of construction activities;
- Proposed sheetpiling design (if applicable) or alternate excavation stabilization measures;
- The Contractor's qualifications package (if requested by GE);
- Stormwater (including run-on and run-off), erosion, noise, and dust control measures;
- The Contractor's proposed excavation approach;
- Materials handling and staging approach; and
- Equipment cleaning procedures.

Health and Safety Plan

The HASP will identify the Remediation Contractor's project-specific health and safety procedures, and will be developed to address the minimum requirements established in the POP and 29 CFR 1910 and 1926. The plan

will address those activities to be undertaken by the Contractor and present required information including, but not limited to, the following (as applicable):

- Training;
- Identification of key personnel (including the Contractor's Health and Safety Officer);
- Medical surveillance;
- Site hazards;
- Work zones;
- Personal safety equipment and protective clothing;
- Personal air monitoring;
- Personnel/Equipment cleaning
- Confined space entry
- Construction safety procedures
- Standard operating procedures and safety programs; and
- Material safety data sheets.

Contingency Plan

The Contingency Plan will set forth procedures for responding to emergency conditions or events that may occur during the performance of the Removal Action, and will include the following information:

- A spill prevention control and countermeasures plan for all materials brought on the work site;
- Emergency vehicular access/egress;
- Evacuation procedures of personnel from the work site;
- For work sites that include or are adjacent to a surface water drainage way, a flood control contingency plan to identify measures to protect the work site(s) and the waterway from impacts in the event of high water and/or flood conditions;
- A list of all contact personnel with phone numbers and procedures for notifying each
- Routes to local hospitals; and
- Identification of responsible personnel who will be in a position at all times to receive incoming phone calls and to dispatch Contractor personnel and equipment in the event of an emergency situation.

In addition to the required pre-mobilization document submittals specified above, the Remediation Contractor will be required to prepare a submittal(s) specifying the sources and, if necessary, the corresponding analytical data for proposed backfill sources to be used during the performance of this project.

Once developed by the selected Remediation Contractor and approved by GE, each of the above-listed Contractor submittals will be submitted to EPA in a supplemental information package. In addition to these submittals, the Contractor is required to provide GE with various other submittals over the course of this project. The overall purpose of such submittals is to verify that the materials and procedures used in the construction activities are consistent with the design of the Removal Action. In accordance with the POP, all Contractor submittals will be tracked to confirm their receipt and approval. A copy of the Technical Submittal Register provided to the prospective contractors as part of the RFP for this project is provided in Attachment E. (Please note that submittals required by GE but not subject to submittal to EPA as part of the supplemental information package have been shaded.)

7.4 Site Preparation

Immediately prior to or following mobilization to the work area, the selected Remediation Contractor will perform several site preparation activities to establish the necessary site controls, features, and procedures for subsequent implementation of the construction activities. These activities include the following:

- Obtaining utility clearances;
- Establishing site controls and access;
- Site survey and layout;
- Installing erosion and sedimentation control measures; and
- Surface preparation.

General information regarding various site preparation activities (e.g., coordinating with local utilities, permitting, verifying existing conditions, establishing work areas, etc.) is provided in the general CQAP (part of the POP); the information provided below supplements that CQAP by providing additional site-specific details associated with certain of these activities.

7.4.1 Utility Clearances

Above-ground and underground utilities that could potentially be affected by the construction activities will be identified prior to initiating any intrusive subsurface activities (e.g., soil excavation, fence post installation, etc.). As indicated on Technical Drawings 3 through 6, certain above-ground and subsurface utilities are known to be present within and adjacent to Newell Street Area I, including sewer and water lines from the main utility lines located beneath Newell Street to almost every building located within Newell Street Area I (Parcels J9-23-13 through J9-23-25), as well as natural gas lines to several of these buildings. In addition to these utilities, above-ground and underground electrical lines are present within the limits of certain response actions proposed for Newell Street Area I. The selected Contractor will be responsible for coordinating with DIGSAFE to mark out the locations of these utilities at the start of the work and coordinating with the owners of the utilities to coordinate relocation/termination of any utilities, as required.

7.4.2 Work Area Security

The level of work area security will depend on the activities being performed and the location of those activities. Security measures will be selected in consultation with the Remediation Contractor and may consist of temporary fencing or barriers, maintenance of sign-in/sign-out sheets, and implementation of safe work practices, as described below.

Temporary Fencing - Temporary construction fencing will be installed, as needed, to delineate and secure areas during ongoing construction activities. While other fencing configurations of equivalent performance may be considered, such temporary fencing is expected to be at least 4 feet in height, constructed of high density polyethylene, and orange in color.

Sign-In/Sign-Out Sheet - For the duration of construction activities, a sign-in/sign-out sheet will be maintained for the site. All on-site personnel and visitors will be required to sign in upon entering the work area and sign out upon leaving.

In addition, safe work practices will also be employed at this job-site. These activities may include any of the following:

Daily Safety Meetings - Such meetings, commonly referred to as tailgate meetings, are typically held with the contractor to discuss hazards potentially encountered during the planned daily activities.

Posting of Warning Tape - To restrict access during construction activities, warning tape may be installed at certain locations to delineate certain areas, such as the exclusion zone, the contaminant reduction zone, and/or the support zone.

Use of Flagmen or Other Signaling Devices - Certain excavation activities in high traffic areas may necessitate the use of flagmen or other signaling devices (i.e., flashing beacons mounted on sawhorses).

7.4.3 "Clean" Access Area

Since a number of activities will require periodic access/egress between the work site and adjacent areas, a "clean" transition area will be established. Such an area will be used for equipment/material delivery and for the positioning of trucks for subsequent loading and off-site transport of excavated materials. It is expected that each transport area will be constructed of gravel or a layer of geotextile fabric and will be properly delineated from the remainder of the property. The specific location and construction of the area will be developed by the Remediation Contractor in accordance with the anticipated progression of the construction actions, as well as other factors such as the layout of the site, traffic patterns, and material handling procedures.

7.4.4 Survey Control

In accordance with the CQAP, survey controls will be established at the start of the work and maintained throughout the construction activities. GE will provide survey benchmarks so that the Remediation Contractor can establish appropriate horizontal and vertical control consistent with the existing survey data.

As stated in the CQAP, the Remediation Contractor will establish a 50-foot control grid within Newell Street Area I. Prior to placing any engineered barrier materials, the Contractor will be required to survey the current elevation at each grid point, plus up to 10 additional locations to be identified at the discretion of GE. The 10 additional locations to be identified by GE will be for the purposes of verifying breaks in topography or other features that might not otherwise be adequately documented via the 50-foot grid. Once the engineered barrier materials are placed, the Contractor will be required to survey final elevations at the 50-foot grid points, plus the

additional locations identified by GE. This survey will be performed to verify that a minimum 1-foot-thick engineered barrier has been placed in all areas within Newell Street Area I (relative to the initial survey), and to verify that suitable final surface grade has been achieved. Placement of the final surface cover materials will not be permitted until GE has reviewed the Contractor's survey documentation to verify that a suitable surface cover thickness has been provided.

7.4.5 Erosion and Sedimentation Control Measures

Erosion and sedimentation control measures will be implemented to minimize the potential for erosion of exposed soils and subsequent accumulation of materials in site drainage pathways. In addition, these measures will be used to divert rainfall runoff from contacting any soil stockpile areas and/or entering work areas and open excavations.

Specific to this RAA, erosion control measures to be implemented will include the placement of haybales and/or staked silt fencing around the perimeter of the downhill side of the work areas, plus additional area-specific measures as required. The approximate location and layout of the haybale/siltation fencing are indicated on Technical Drawing 2. This fencing will be placed at the start of the site work activities, and will be maintained until a good stand of vegetation is established.

In addition to the haybale/silt fence, other erosion and sedimentation control measures will be implemented as needed. At a minimum, this will include placement of erosion control measures around any temporary soil stockpiles.

7.4.6 Surface Preparation

Various surface preparation activities will be performed prior to or in conjunction with the initial site preparation activities. These surface preparation activities are specified on Technical Drawings 2 through 6.

7.5 Construction Activities

7.5.1 Monitoring Well Decommissioning

Eleven groundwater monitoring wells are located within Newell Street Area I. Specifically, the wells are located on the following properties:

- Parcel J9-23-13 - wells MM-1, MM-2, MM-3;
- Parcel J9-23-16 - wells MW-1R, MW-2R, MW-3R, QP-27;
- Parcel J9-23-17 - well IA-9R ;
- Parcel J9-23-19 - wells SZ-1, SZ-3R;
- Parcel J9-23-23 - well FW-16R.

Only four of these monitoring wells (MM-1, IA-9R, SZ-1, and FW-16R) are currently part of the GMA 1 monitoring well network. These four wells will be protected during the performance of the remediation activities described herein. The remaining seven monitoring wells (which are not used in the GMA 1 program) – i.e., wells MM-2, MM-3, MW-1R, MW-2R, MW-3R, QP-27, and SZ-3R – will be decommissioned prior to the commencement of soil removal activities, as indicated on Technical Drawings 3 through 6. GE will decommission each of these monitoring wells in accordance with the general procedures described in the Appendix GG of GE's FSP/QAPP for the GE-Pittsfield/Housatonic River Site. That Standard Operating Procedure was developed in accordance with Section 4.6 of the MDEP's *Standard References for Monitoring Wells* (April 19, 1991).

7.5.2 Soil Removal, Material Handling, and Transportation and Disposal

Construction activities will require removal and handling of certain existing soils within Newell Street Area I. Specifically, existing soils within the excavation limits and depths as depicted on Technical Drawings 3 through 6 will be removed using conventional construction equipment (e.g., backhoe, loader). The maximum depth of excavation will be approximately 8 feet. Based on data from the ongoing groundwater monitoring program at Newell Street Area I (indicating that depth to groundwater ranges between 7 feet and 12 feet below ground surface [bgs]), excavation of saturated materials is not anticipated for the majority of the soil removal activities. However, if saturated materials are encountered, they will be mixed with drier soil such that the material will pass the paint filter test. If this procedure does not yield a material that will pass the paint filter test, drying

agents may subsequently need to be added. These drying agents could include, but not be limited to, quick-lime, cement, and/or flyash.

As soils are excavated, and prior to their transport to the appropriate OPCA, a number of intermediate on-site handling activities may be necessary. To ensure that such activities are performed in a manner that minimizes the potential for inadvertent releases to the environment, unsafe conditions for on-site and off-site personnel, and delays or complications in project completion, several on-site material handling procedures will be implemented. The specific method(s) of handling the removed soils will be based on, but not limited to, the following considerations:

- The characteristics of the excavated soils and corresponding disposition requirements;
- The locations from which the materials are removed and their proximity to the loading area(s); and
- The overall sequence and schedule of the removal actions.

To reduce the potential for the release of PCBs or other Appendix IX+3 constituents to the environment during removal and handling activities, the number of times that the excavated material is handled will be kept to a minimum. To accomplish this, the Remediation Contractor will conduct direct loading to trucks to the extent practical. Additional information regarding material handling is discussed below.

- To reduce the potential for the migration of PCBs or other Appendix IX+3 constituents due to wind- and rainfall-related factors, temporary stockpiles, staging areas, and work areas where excavation activities are yet to be completed will be protected with a cover (e.g., polyethylene sheeting), which will be anchored when the area is not under active excavation. In addition, if concerns regarding airborne dust are identified or suspected, water will be sprayed to keep the open excavation (or excavated soils) moist.

- To the extent feasible and practicable, material handling and loading areas will not be established in locations that may interfere with construction operations or necessary traffic flow. In addition, material handling areas will be located so as to take into account site topography and avoid (to the extent possible) low-lying drainage areas where surface runoff is likely to accumulate.

- Additional erosion and sedimentation control measures (e.g., hay bales and geotextile fencing) will be utilized as necessary.

Excavated soils will be subject to consolidation at one of GE's OPCAs (Section 7.5.5). Based on the specified soil removal limits, the total volume of existing materials to be removed from the work area is approximately 14,810 in-situ cubic yards. Of this volume, approximately 14,190 in-situ cubic yards will be subject to placement in the Building 71 OPCA, while the remainder (approximately 620 in-situ cubic yards attributed to the soil piles on Parcels J9-23-19 and J9-23-20) may be placed in the Hill 78 OPCA, as discussed in Section 7.5.4, if not utilized as backfill materials within another portion of the RAA, as discussed in Section 5.6.

7.5.3 Groundwater Management

As noted above, the depth to groundwater at Newell Street Area I typically ranges between 7 feet and 13 feet bgs. The deepest excavation, as depicted on Technical Drawings 3 through 6, is approximately 8 feet bgs. As such, groundwater should not be encountered in the majority of the excavations. However, as a contingency, if groundwater enters into the deeper excavations, it is anticipated that sumps equipped with pumps should be able to keep the excavation dry. If such an arrangement is necessary to keep the excavation dry, a tanker truck, and possibly temporary water storage tanks, will be brought on site to collect the pumped groundwater prior to transporting it to GE's Building 64G water treatment plant for treatment and discharge.

7.5.4 Building Demolition

As indicated in Section 5.9, three buildings will be demolished at the GE-owned parcels – one building at Parcel J9-23-16 and two buildings at Parcel J9-23-22. Building demolition activities will be performed in accordance with GE's *Protocols for Building Demolition and Associated Characterization Activities* (Exhibit A-1 to GE's Waste Characterization Plan in the POP) (April 14, 2003).

GE has not conducted any sampling of building materials within either of these buildings scheduled for demolition. Instead, GE has elected to consider all appropriate demolition materials as TSCA- and/or RCRA-regulated materials for purposes of determining the appropriate OPCA for disposition. As such, all demolition materials from the buildings and structure to be demolished (except for specific items that are prohibited from disposition at either of the OPCAs under the CD and SOW) will be consolidated at the Building 71 OPCA, which is authorized to receive such materials regardless of whether they are regulated under TSCA or constitute hazardous waste under RCRA.

7.5.5 Transport and Disposition of Excavated Materials and Remediation-Derived Waste

All excavated materials will be consolidated in GE's OPCAs, excluding items (if any) that are prohibited for disposition at the OPCAs under the CD and SOW. Previous sampling and analysis conducted for soils at Newell Street Area I indicate that soils at most sampling locations that represent the areas where soil will be excavated during the Removal Action either have PCB concentrations over 50 ppm and thus are regulated for disposal under TSCA or appear to have concentrations of other constituents that would cause them to constitute characteristic hazardous waste under RCRA. As such, all excavated soils, other than those to be removed from the soil piles on Parcels J9-23-19 and J9-23-20, will be transported to and consolidated at the Building 71 OPCA, which is authorized to receive TSCA- and RCRA-regulated material. For the soil pile materials from Parcels J9-23-19 and J9-23-20 (approximately 620 in-situ cubic yards), to the extent that those materials are not used as backfill within other portions of this RAA (as discussed in Section 5.6), they will be placed in the Hill 78 OPCA, provided that the characterization data for these materials show that they have PCB concentrations under 50 ppm and do not constitute characteristic hazardous waste under RCRA.

The transportation of excavated materials from Newell Street Area I for disposition at the OPCAs will occur "on-site" as regulated under the terms of the CD, and thus will be subject to the CERCLA on-site permitting exemption referenced in Paragraph 9.a of the CD. In these circumstances, site-specific transportation procedures have been developed for this response action, as listed below, subject to EPA review and approval.

The Remediation Contractor will be required to implement the following procedures for the transport of excavated materials from Newell Street Area I to the appropriate OPCA:

- Employ qualified personnel trained per U.S. Department of Transportation (DOT) requirements for handling and shipping hazardous materials, with such training to include general safety, emergency response, exposure protection, accident prevention, preparation of shipping papers, and securing loads;

- Employ drivers that have a Commercial Driver's License (CDL) with a Hazardous Materials Endorsement;

- Utilize trucks that are DOT-inspected;

- Include in its Health and Safety Plan, Operations Plan, and Contingency Plan detailed provisions for responding to transportation emergencies such as spills, releases, or other incidents;

- Maintain records of the number of loads of materials sent to the OPCA on a daily basis; and

- Utilize the EPA Paint Filter Test as necessary to confirm that the materials are suitable for transport (i.e., no free liquids).

The transport of excavated materials from Newell Street Area I to the appropriate OPCA will be conducted in accordance with the following guidelines:

- After a safety check of the truck, the truck bed will be lined with polyethylene. Excavated soil will be placed in the truck and the load will be covered.

- A Hazardous Materials Bill of Lading (BOL) will be prepared and signed by the truck driver. The DOT shipping description to be used on the BOL will be:

  "RQ, Polychlorinated biphenyls, mixture, 9, UN 2315, PG 111, RQ"

- After another safety check of the vehicle and placarding, the truck will leave the site and proceed to the OPCA utilizing the primary route shown on Figure 3. If, for some reason, the primary route is not used, the secondary route shown on Figure 3 (or an alternate route to be proposed by GE to EPA) will be used.

- Upon arrival of the truck at the OPCA, the OPCA contractor will document receipt of the load, and the material will be off-loaded and placed by the OPCA contractor.

7.5.6 Backfilling of Excavations

Backfilling operations will be initiated as soon as practicable after completion and proper documentation of excavation activities (i.e., survey control). It is anticipated that the excavations will be backfilled and compacted using conventional construction equipment. Clean backfill materials will be placed in 12-inch thick lifts in a loose state and compacted in accordance with the Technical Specifications (Attachment B) prior to additional fill being placed with the excavation. The excavation will be brought up to the predetermined subgrade elevation prior to installing the final surface layer (e.g., topsoil and seed, pavements, engineered barrier).

Backfill material will be clean, natural material, no greater than gravel in size to ensure proper settlement, permeability, and compactability. The specific fill sources to be used for this project will be identified by the selected Remediation Contractor. A description of the process for identifying such sources and, if necessary, submitting the analytical data for them was presented in Section 5.6.

7.5.7 Placement of Engineered Barriers

As part of the remediation activities, engineered barriers will be installed at several separate locations within Newell Street Area I. The locations where barriers will be installed, along with the final surface grading configurations, are provided on Technical Drawings 9 through 12, with construction details (e.g., cross-sections, anchor trenches, etc.) provided on Technical Drawings 13 and 14.

It is anticipated that conventional construction equipment will be used to spread and compact the various soil/soil-like layers that are incorporated within the particular type of cover. It is anticipated that the geotextile cushion, geomembrane liner, and geocomposite will be laid out by hand and anchored with sand bags until the remaining soil/soil-like cover materials are placed. During the placement of any type of engineered barrier, care must be taken by the contractor when covering the geotextile, geomembrane, and geocomposite layers with the soil/soil-like materials such that construction equipment does not track across these layers potentially puncturing the layers. The specific materials to be used and procedures to be followed in installing the sublayers of the engineered barriers are provided in detail in the Technical Specifications in Attachment B. As discussed in Section 5.7, the surface covers for the various engineered barriers will consist of topsoil and grass seed/sod for a vegetative engineered barrier, gravel for a gravel-covered engineered barrier, and a gravel subbase paved with asphalt for an asphalt-covered engineered barrier. The specific materials to be used and procedures to be followed in installing the surface covers for the engineered barriers are also provided in detail in the Technical Specifications in Attachment B.

7.5.8 Installation of Excavation Controls

For the excavations that extend to depths greater than 4 feet and which the Contractor personnel will enter to perform work, some type of excavation sidewall stabilization will be required, as discussed in Section 5.5. In addition, excavations that are adjacent to buildings and will extend to depths below the bottom of the buildings' foundations will likely require some type of stabilization. If the Remediation Contractor plans to install

excavation controls to provide excavation stability and/or maintain the structural stability of any adjacent structures, such controls will be designed and certified by a Professional Engineer licensed in the Commonwealth of Massachusetts.

7.5.9 Equipment Cleaning

Equipment and materials that have come into contact with Newell Street Area I soils during the construction activities will be cleaned prior to re-location to an area outside the work zone (i.e., the excavation and loading areas), prior to handling backfill materials, and prior to its departure from Newell Street Area I. Equipment cleaning will be conducted as specified in Section 3.5 of the Site Management Plan within the POP.

7.5.10 Restoration of Disturbed Vegetation

This section pertains to the restoration of vegetated areas outside the limits of any engineered barriers. (Placement of such barriers was discussed in Section 7.5.7.) Prior to the intiation of remediation actions at Newell Street Area I, the Remediation Contractor will be required to perform an inventory of all existing trees and shrubs (i.e., type, quantity, size, etc.) located within the limits of the remediation actions. As indicated on Technical Drawings 8 through 12, excavation areas that originally contained vegetated surfaces (lawns, vegetated areas, etc.) will first be restored to within 6 inches of the original grade utilizing compacted soil fill materials. In areas requiring the placement of grass seed, 6 inches of topsoil will then be used to restore pre-excavation grades, followed by placement of grass seed and mulch. In areas requiring the placement of sod, 4 inches of topsoil and a layer of sod will be used to restore pre-excavation grades. As part of the site restoration activities, the Contractor will restore removed trees and shrubs as appropriate in consultation with the property owners. All restored trees and shrubs will be installed at least 10 feet outside the limits of any engineered barriers installed on each applicable parcel, to ensure that the barrier components are not impacted at some future time by the root structures of such restored vegetation.

7.6 Perimeter Air Monitoring

Ambient air monitoring for PCBs and particulate matter will be performed during the remediation activities. The scope of the ambient air monitoring program is presented in Attachment F to this Final Work Plan. In

overview, ambient air monitoring for PCBs will include collection of ambient air samples using "high volume" samplers equipped with glass fiber filters and polyurethane foam (PUF) cartridges. The samples will be collected, analyzed, and evaluated using the procedures specified in EPA Compendium Method TO-4A. To obtain representative data on ambient levels of PCBs around the construction site before and during construction activities, two PCB air sampling events will be performed prior to the start of construction activities, and additional such events will be performed at least once every 4 weeks during the course of the construction. Ambient air monitoring for particulates will be performed on a continuous basis during all active construction activities using real-time particulate air monitors.

For both the PCB and particulate monitoring, baseline monitor locations will be established at four locations within Newell Street Area I. During construction, up to four monitor locations will be established around the perimeter of the area subject to remediation actions. The specific locations for air monitoring at Newell Street Area I will change as construction activities proceed. Although subject to change based on field and work conditions, the ambient air monitoring scope of work (Attachment F) identifies preliminary locations for air monitoring for each phase of construction. Finally, a background monitoring location will be established during remediation inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street.

8. Post-Construction Activities

8.1 General

This section addresses the activities to be performed by GE following the completion of construction/remediation activities at Newell Street Area I. These activities include project closeout activities (including the preparation and submittal of a Final Completion Report), Post-Removal Site Control activities, and additional activities relating to properties at which a Conditional Solution is implemented. Each of these topics is further discussed below.

8.2 Project Closeout – Pre-Certification Inspection and Completion Report

Once GE has determined that the response actions for Newell Street Area I are complete (excluding Post-Removal Site Control activities) and that the applicable Performance Standards have been attained, GE will schedule and conduct a pre-certification inspection with EPA and MDEP. This inspection will be conducted within 90 days after GE concludes that the response actions are complete.

After the pre-certification inspection, GE will proceed with remaining closeout activities, which will consist of development and submission of a Final Completion Report to summarize and document the scope of the completed Removal Action activities. At a minimum, the Final Completion Report will include the following:

- A description of the response actions performed;
- Identification of any deviations from the design submittals approved by EPA;
- A listing of response action quantities, including soil volumes removed and areas subject to installation of engineered barriers;
- Results of quality assurance/quality control (QA/QC) testing performed during the remediation activities:
- Survey data to document the current grade and final surface contours;

- Copies of Record Drawings to document the as-built conditions;

- Representative project photographs;

- Documentation regarding the disposition of materials excavated in conjunction with the construction activities; and

- A summary of Post-Removal Site Control activities and a schedule for such activities.

As indicated in Section 9, the Final Completion Report will be submitted to EPA within 30 days after the pre-certification inspection (or at such other time as may be proposed by GE and approved by EPA at the time of that inspection).

8.3 Post-Removal Site Control Plan and Other Post-Construction Inspection and Maintenance Activities

Post-construction inspection, maintenance, and repair activities (I/M activities) will be performed at Newell Street Area I as required by Technical Attachment J to the SOW. Such activities will be performed to ensure that the completed response actions are performing as designed. The scope of those I/M activities are described below and were based on the minimum I/M requirements established by Attachment J to the SOW, as well as anticipated I/M requirements specific to the final design of the Newell Street Area I Removal Action.

8.3.1 Periodic Inspections

GE will initiate post-construction inspections of the restored surfaces at the Newell Street Area I RAA following the completion of the construction activities in that area. Such inspections will be performed both for the engineered barriers and for the other areas that were backfilled and restored.

For the engineered barrier areas, the first inspection will be performed approximately one month after completion of the construction activities to visually identify potential problems associated with such areas, such as settlement or the presence of stressed vegetation. Thereafter, the engineered barrier areas will be inspected

approximately every 6 months (until EPA approves a different frequency for such inspections). These inspections will be performed by GE (or a designated GE representative) to assess the integrity of the engineered barriers (i.e., to identify deficiencies that would affect the integrity of the barriers). Specifically:

- Vegetative engineered barriers will be visually inspected for the following conditions as they would affect the integrity of the barriers: (a) evidence of topsoil erosion; (b) establishment and coverage of vegetation (e.g., bare or sparsely vegetated areas); (c) deficiencies in the soil layer overlying the synthetic cover components (e.g., excessive erosion, surface water ponding, depressions, exposed synthetic cover components, vehicle ruts, or other abnormalities); (d) the damage to synthetic cover components; (e) uneven settlement relative to surrounding areas; (f) the proper functioning of any associated surface water diversions; and (g) overall integrity (including animal burrows, unauthorized excavation, or other conditions that could jeopardize the integrity of the barriers).

- Gravel-covered engineered barriers will be visually inspected for the following conditions as they would affect the integrity of the barriers: (a) evidence of gravel erosion/displacement of gravel cover; (b) establishment of vegetation (e.g., weeds); (c) evidence of depressions and/or surface water ponding; (d) exposure of geotextile indicator material (indicating that 6 inches of gravel cover material has been displaced); (e) damage to synthetic cover components; (f) uneven settlement relative to surrounding areas; (g) the proper functioning of any associated surface water diversions; and (h) overall integrity (unauthorized excavation, or other conditions that could jeopardize the integrity of the barriers).

- Asphalt-covered engineered barriers will be visually inspected for the following conditions as they would affect the integrity of the barriers: (a) excessive cracking, fissures, spalling, or potholes caused by heaving, uneven settlement, or vehicular use: (b) evidence of depressions and/or surface water ponding, excessive rutting, or exposed subbase materials; and (c) the condition of perimeter drainage system discharge locations (e.g., evidence of blockage).

For other backfilled/restored areas, the first inspection will likewise be performed approximately one month after the completion of construction activities. Thereafter, these areas will be inspected every 6 months for the first year after implementation and annually thereafter (subject to subsequent EPA approval of a different frequency). At a minimum, these inspections will include visual observations of the following: (a) erosion controls to verify their continued effectiveness until such time vegetation is sufficiently established; (b) any areas where excessive settlement has occurred relative to the surrounding areas; (c) any drainage or growth

problems due to possible over-compaction of the backfill materials; and (d) other conditions that could jeopardize the performance of the response actions as designed.

In addition, GE will inspect all re-vegetated areas of Newell Street Area I semi-annually during the 2-year period following the planting and installation of vegetative material. These inspections are anticipated to occur in May and October of each year to ensure that the vegetation is growing as anticipated and is providing the desired degree of erosion control. If needed, additional planting, seeding, or sod placement will be performed to replace dead or dying vegetation (discussed below).

8.3.2 Maintenance/Repair

GE will be responsible for maintenance and repair of site conditions and features as necessary to meet the requirements of the CD and SOW. Such activities will include addressing any conditions noted during the periodic inspections. Examples of maintenance/repair activities that may be identified and conducted as a result of the periodic inspections include, but are not limited, to placement of additional topsoil in areas of erosion or settlement and repair or replacement of any components of the engineered barriers exhibiting deficiencies or potential problems.

Any such conditions noted as a result of periodic inspections (or as otherwise observed by GE) will be addressed as soon as practicable. The nature of the associated maintenance/repair will be documented in the subsequent inspection report.

8.3.3 Inspection Schedule and Reporting

As noted above, the areas subject to engineered barrier construction and to excavation/backfilling at Newell Street Area I will be inspected approximately one month after completion of the final restoration activities. Thereafter, the engineered barrier areas will be inspected approximately every 6 months until such time as EPA approves a different frequency for such inspections, and the other backfilled/restored areas will be inspected approximately every 6 months for the first year after implementation and annually thereafter (subject to subsequent EPA approval of a different frequency). Additionally, during the 2-year period following the planting and installation of vegetative material, the areas at which such vegetation was planted will be inspected

in May and October to ensure that the vegetation is growing as anticipated and is providing the necessary erosion control.

Inspection reports will be prepared every 6 months, subject to EPA approval of an alternate frequency. These reports will be submitted to the EPA and will document the inspection and maintenance activities performed since the submittal of the previous inspection report. As required by Attachment J to the SOW, these reports will include the following information (as relevant):

- Description of the type and frequency of inspection and /or monitoring activities conducted;
- Description of any significant modifications to the inspection and/or monitoring program made since the submittal of the preceding monitoring report;
- Description of any conditions or problems noted during the inspection and/or monitoring period which are or may be affecting the performance of the response action;
- Description of any measures taken to correct conditions which are affecting the performance of the response action;
- Results of sampling analyses and screening conducted as part of the monitoring and/or inspection program (if any); and
- Description of any measures that may need to be performed to correct any conditions affecting the performance of the response action.

8.4 Additional Activities Relating to Conditional Solutions

In addition to the Post-Removal Site Control activities described above, GE will comply with the requirements of Paragraphs 34 through 38 of the CD with respect to each of the parcels at which a Conditional Solution is implemented. These requirements include, among others: (1) provision of a notification to the property owner and the holders of any easements on the property, within 30 days after completion of the on-site remediation actions, of the CD provisions relating to Conditional Solutions and the residual contamination on the property

(Paragraph 36); (2) annual determination of whether there has been a change in ownership of the property and, if so, provision of notification to the new owner regarding the same items noted above (Paragraph 36); and (3) performance of an annual inspection of the property to determine whether there has been any change in activities and uses of the property since implementation of the remediation that would involve exposure to soil greater than 3 feet in depth or would be inconsistent with the land use for which the Conditional Solution was implemented, and submission of a report to EPA and MDEP on that inspection within 30 days thereafter (Paragraph 38).

9. Schedule

As described in Section 6, GE has sent RFPs to potential remediation contractors and requested that they return their bids by August 8, 2003. GE anticipates selection of a Remediation Contractor by on or about August 15, 2003. GE proposes that within 30 days of selection of a Remediation Contractor, GE will submit a supplemental information package to the EPA as a follow-up to this Work Plan. This supplemental information package is anticipated to include the following:

- Identification of and contact information for the selected Remediation Contractor;
- Copies of the Remediation Contractor's pre-mobilization submittals (i.e., Operations Plan, HASP, and Contingency Plan);
- Identification of backfill sources and locations; and
- Analytical data for samples collected from the backfill sources (unless the backfill sources have already been approved based on previously submitted analytical data).

Following EPA approval of this Final Work Plan and of the supplemental information package, site preparation activities will be initiated. The specific schedule for the implementation and completion of the remediation activities at this RAA will depend on several factors, including the timing of EPA approval of this Final Work Plan and the supplemental information package, the timing of the onset of winter weather conditions, and the receipt of the necessary access permission from non-GE property owners to conduct the proposed remediation activities at their properties. GE currently anticipates that it will be able to commence remediation activities at this RAA during the fall of 2003, and that such activities will be completed during the 2004 construction season. Additional details regarding overall project duration, including an estimate of the duration of the entire project in working weeks will be provided in the Remediation Contractor's Work Schedule – which is a required component of the Contingency Plan submittal (Section 7.3) – that will be provided to EPA as part of the forthcoming supplemental information package. With respect to access, if GE is unable to obtain access permission from particular property owners after using "best efforts" (as defined in the CD) to do so, it will so advise EPA and MDEP and seek their assistance in obtaining such access pursuant to Paragraph 60.f(i) of the CD. In addition, if issues relating to access may cause a delay in the completion of this Removal Action, GE will so advise EPA.

Within 90 days of completing the field construction activities, GE will schedule and conduct a pre-certification inspection with EPA and MDEP, as described in Section 8.2. Within 30 days thereafter, or at such other time as

is proposed by GE and approved by EPA at the time of the inspections. GE will submit a Final Completion Report on this Removal Action. That report will represent the completion of the CD-required construction activities. Periodic inspection reports will thereafter be provided to EPA in accordance with the schedules outlined in Sections 8.3.3 and 8.4.

Figures

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engineers & scientists

REMOVAL ACTION AREA

NEWELL STREET AREA I

0 500' 1000'
APPROXIMATE SCALE

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND & BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES/LIMITS ARE APPROXIMATE.
4. REFER TO FIGURE 2 FOR IDENTIFICATION OF REMOVAL ACTION AREAS RELATED TO THE HOUSATONIC RIVER FLOODPLAIN.

L: ON=*, OFF=REF
P: PAGESET: DL2B
9/4/03 SYR-S4-DMW
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GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA I

REMOVAL ACTION AREA

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 1

Hibbard Playground

J9-23-26

Housatonic River

J9-23-12

SOIL PILE

SOIL PILE #2

J9-23-25

J9-23-23

J9-23-24

J9-23-22

J9-23-21

J9-23-20

PILE

J9-23-19

J9-23-18

J9-23-17

J9-23-16

J9-23-13

EXT.

ONTARIO

STREET

NEWELL STREET

MICHIGAN

HURON ST.

EDISON

NEWELL STREET AREA I

LONGFELLOW AVE.

KNOX

LEGEND

- EDGE OF WATER
- PAVED ROADWAY
- UNPAVED ROADWAY OR TRAIL
- RAILROAD
- VEGETATION
- PROPERTY BOUNDARY
- J9-23-11 PROPERTY ID
- FORMER OXBOW/DEPRESSION AREA
- APPROXIMATE REMOVAL ACTION AREA BOUNDARY (AS DEFINED IN STATEMENT OF WORK)
- PAVED AREA
- RECREATIONAL PROPERTY (GE OWNED)
- RECREATIONAL PROPERTY (NON-GE OWNED)
- COMMERCIAL/INDUSTRIAL PROPERTY (NON-GE OWNED)
- COMMERCIAL/INDUSTRIAL PROPERTY (GE OWNED)
- AREA ADDRESSED AS PART OF 1/2-MILE REACH

NOTES:

1. THE BASE MAP FEATURES PRESENTED ON THIS FIGURE WERE PHOTOGRAMMETRICALLY MAPPED FROM APRIL 1990 AERIAL PHOTOGRAPHS.
2. TAX ASSESSORS' PARCEL IDENTIFICATION NUMBERS AND BOUNDARY INFORMATION OBTAINED FROM CITY OF PITTSFIELD'S TAX ASSESSOR'S OFFICE AND IS CURRENT THROUGH SEPTEMBER 5, 1997.

0 60' 120'
GRAPHIC SCALE

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8/4/03 SYR-54-GMS LAF DMW
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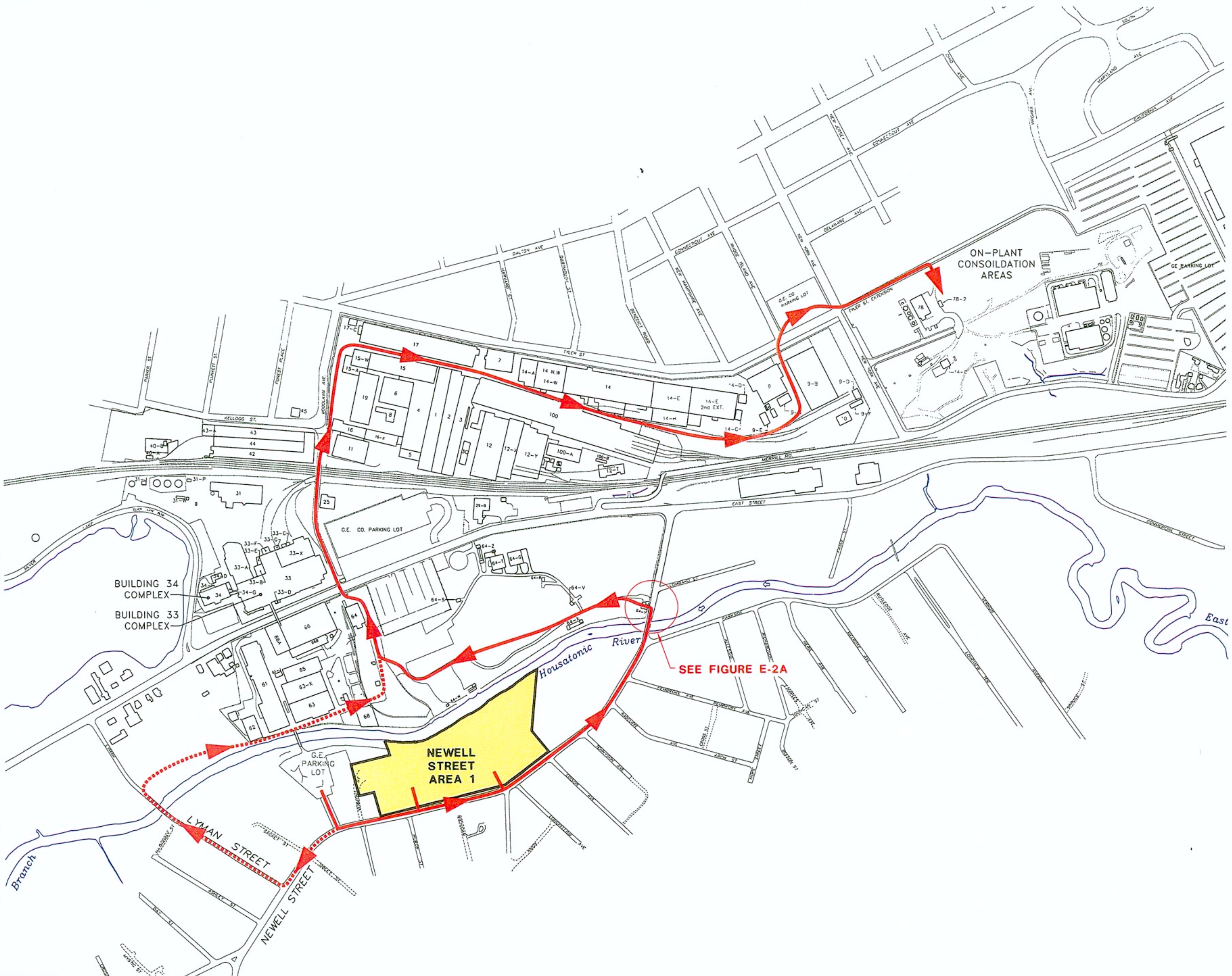
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FINAL RD/RA WORK PLAN FOR NEWELL STREET AREA I

SITE PLAN

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2



LEGEND:

PRIMARY TRAVEL ROUTE TO ON-PLANT CONSOLIDATION AREAS

SECONDARY TRAVEL ROUTE TO ON-PLANT CONSOLIDATION AREAS

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND AND BOUCK ENGINEERS, P.C. P.C. CONSTRUCTION PLANS.
2. BUILDING NUMBER DESIGNATIONS ARE BASED ON A GE DRAWING TITLED "GROUND PLAN, SHEET 1", AND DATED JANUARY 1, 1994.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE BOUNDARIES/LIMITS ARE APPROXIMATE.

0 300' 600'

GRAPHIC SCALE

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P: PAGESET/PLT-DL
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GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I

PROPOSED PRIMARY AND SECONDARY TRAVEL ROUTES FOR EXCAVATED MATERIALS TO OPCAs

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FIGURE 3

Attachments

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Attachment A

Technical Drawings

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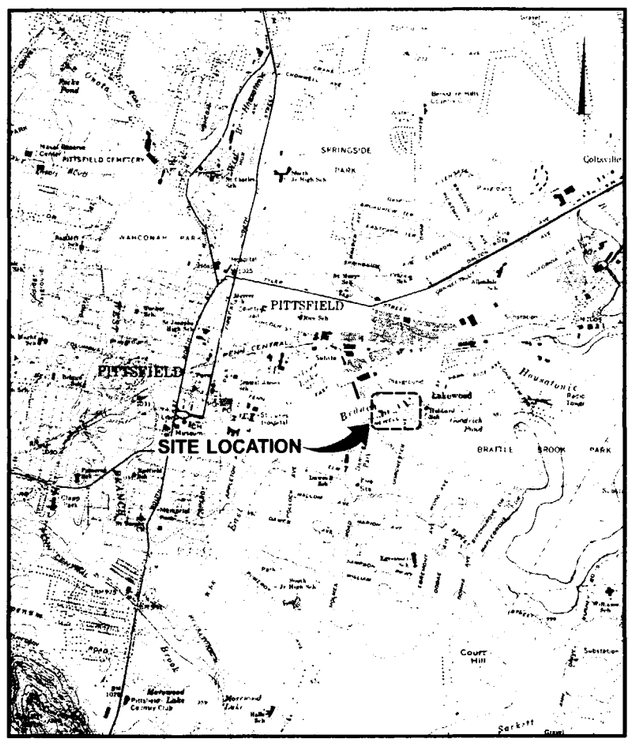
TECHNICAL DRAWINGS

REMEDIAL ACTION
NEWELL STREET AREA I
REMOVAL ACTION AREA (RAA)



REFERENCE: Base Map Source: USGS 7.5 Min. Topo. Quads., Pittsfield West, Mass-New York and Pittsfield East, Mass., 1973.

2000' 0 2000'
APPROX. SCALE: 1 = 2000 FEET

LOCATION MAP

08/04/03 SYR-D85-LBR DJH RLP
C:/10112003/CONTRACT/10112C02.CDR

AUGUST 2003

PREPARED FOR:

General Electric Company
Pittsfield, Massachusetts

PREPARED BY:

BBL®
BLASLAND, BOUCK & LEE, INC.
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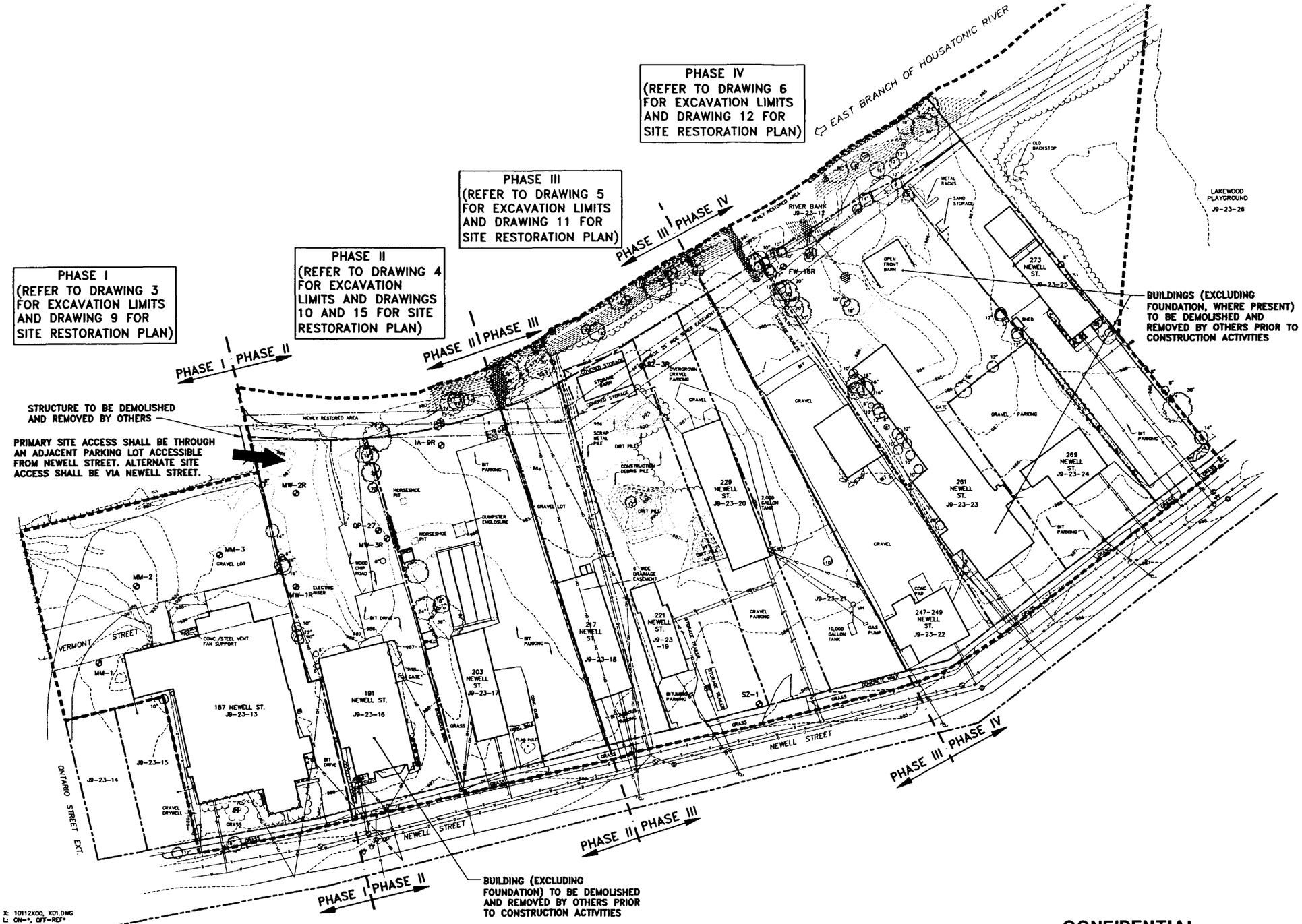
INDEX TO DRAWINGS



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WOODEN FENCE
- WIRE FENCE
- GUARDRAIL
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- J9-23-23 PARCEL ID
- RIP RAP
- LIGHT POLE
- SIGN
- ELECTRIC TRANSFORMER
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- MM-1 MONITORING WELL
- DRAIN LINE
- OH OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- UNDERGROUND ELECTRIC LINE
- BUILDING

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01. CONTOUR INTERVAL IS 1 FOOT.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. CERTAIN MONITORING WELLS TO BE DECOMMISSIONED BY CONTRACTOR IN ACCORDANCE WITH MASSACHUSETTS REGULATIONS. SEE DRAWINGS 3 THROUGH 7 FOR WELLS SUBJECT TO DECOMMISSIONING.

X: 10112X00, X01.DWG
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7/20/03 SYR-85-KMD NES GMS
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Graphic Scale 50' 0 50' 100'

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No.	Date	Revisions	Init

Project Mgr. CRA
Designed by CRA/BSS
Drawn by KMD
Checked by MN/WAR/CRA
Prof. Eng.
PE License

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GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

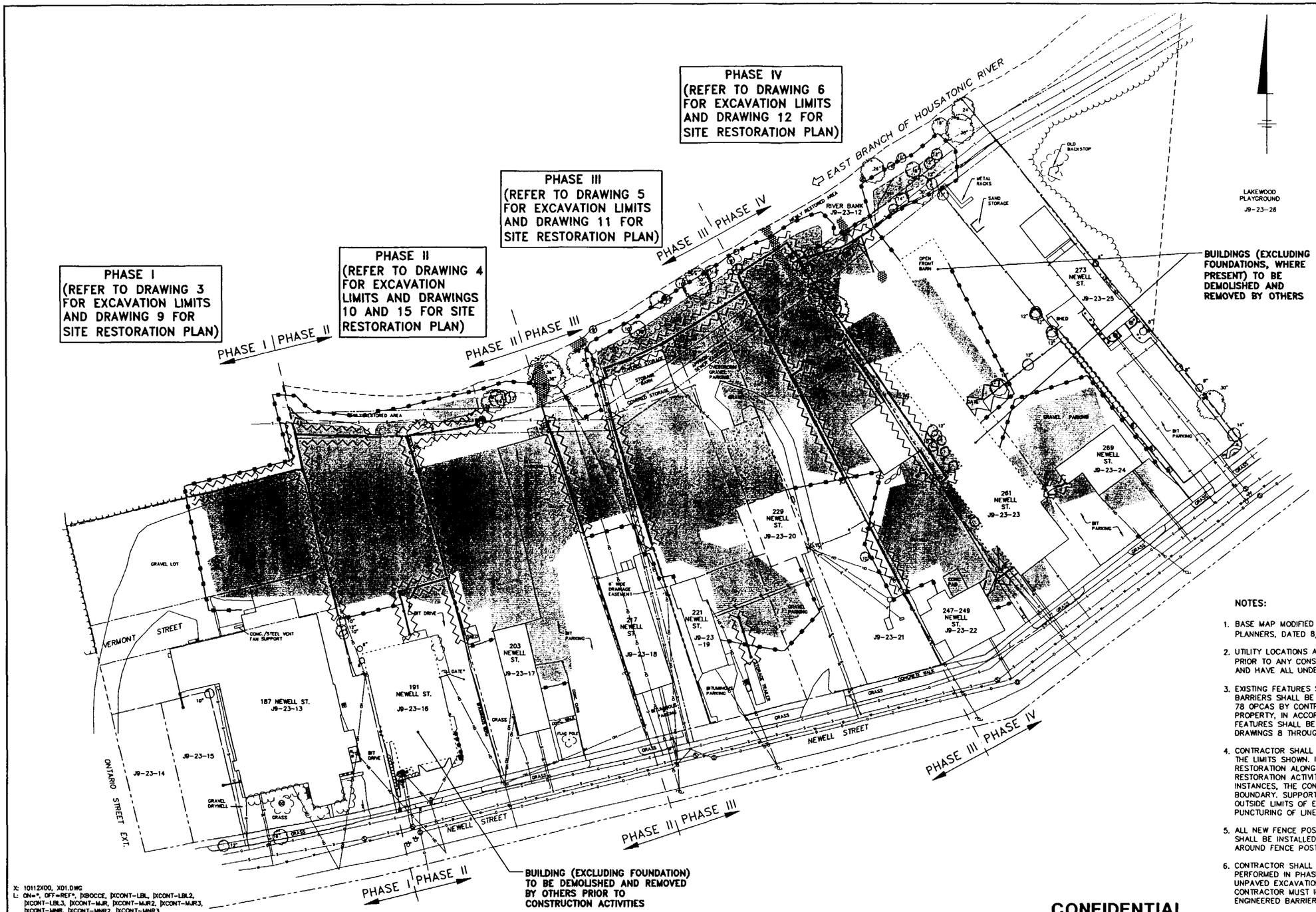
EXISTING SITE PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

1



NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXISTING FEATURES SHOWN WITHIN LIMITS OF SOIL REMOVAL/ENGINEERED BARRIERS SHALL BE REMOVED AND DISPOSED OF AT THE BUILDING 71 OR HILL 78 OPCAS BY CONTRACTOR AS PART OF EXCAVATION ACTIVITIES AT EACH PROPERTY, IN ACCORDANCE WITH DRAWINGS 1 THROUGH 6. CERTAIN EXISTING FEATURES SHALL BE RECONSTRUCTED BY CONTRACTOR IN ACCORDANCE WITH DRAWINGS 8 THROUGH 16.
4. CONTRACTOR SHALL REMOVE AND REPLACE WITH NEW ALL PROPERTY FENCE TO THE LIMITS SHOWN. IF WORK IS PERFORMED IN PHASES, PROPERTY FENCE RESTORATION ALONG PHASE BOUNDARIES SHOULD BE PERFORMED AS PART OF RESTORATION ACTIVITIES FOR WHICHEVER PROPERTY IS RESTORED LAST. IN THESE INSTANCES, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING ALONG PHASE BOUNDARY. SUPPORT STAKES FOR TEMPORARY FENCING MUST BE INSTALLED OUTSIDE LIMITS OF ENGINEERING BARRIER ON RESTORED PROPERTIES TO PREVENT PUNCTURING OF LINER.
5. ALL NEW FENCE POSTS INSTALLED WITHIN THE LIMITS OF ENGINEERED BARRIERS SHALL BE INSTALLED PRIOR TO LINER PLACEMENT. LINER SHALL BE INSTALLED AROUND FENCE POSTS IN ACCORDANCE WITH DETAIL 6 ON DRAWING 14.
6. CONTRACTOR SHALL INSTALL SILT FENCE TO THE LIMITS SHOWN. IF WORK IS PERFORMED IN PHASES, ADDITIONAL SILT FENCE MAY BE REQUIRED AROUND UNPAVED EXCAVATIONS ALONG PHASE BOUNDARIES. IN THESE INSTANCES, THE CONTRACTOR MUST INSTALL SILT FENCE STAKES OUTSIDE THE LIMITS OF ENGINEERED BARRIERS TO PREVENT PUNCTURING OF LINER.
7. DISTANCE OF SILT FENCE FROM SOIL REMOVAL/ENGINEERED BARRIER LIMITS IS EXAGGERATED FOR EASE OF REFERENCE. CONTRACTOR SHALL INSTALL SILT FENCE WITHIN 3 TO 5 FEET OF SOIL REMOVAL/ENGINEERED BARRIER AREAS.

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P: PAGESET/PLT-CDL
7/22/03 SYR-BS-KMD GMS DWW
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Graphic Scale
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Drawn by KMD
Checked by JMN/WAR/CRA
Prof. Eng.
PE License

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NEWELL STREET AREA I RAA REMEDIAL ACTION

FENCE REMOVAL/RESTORATION AND EROSION CONTROLS PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
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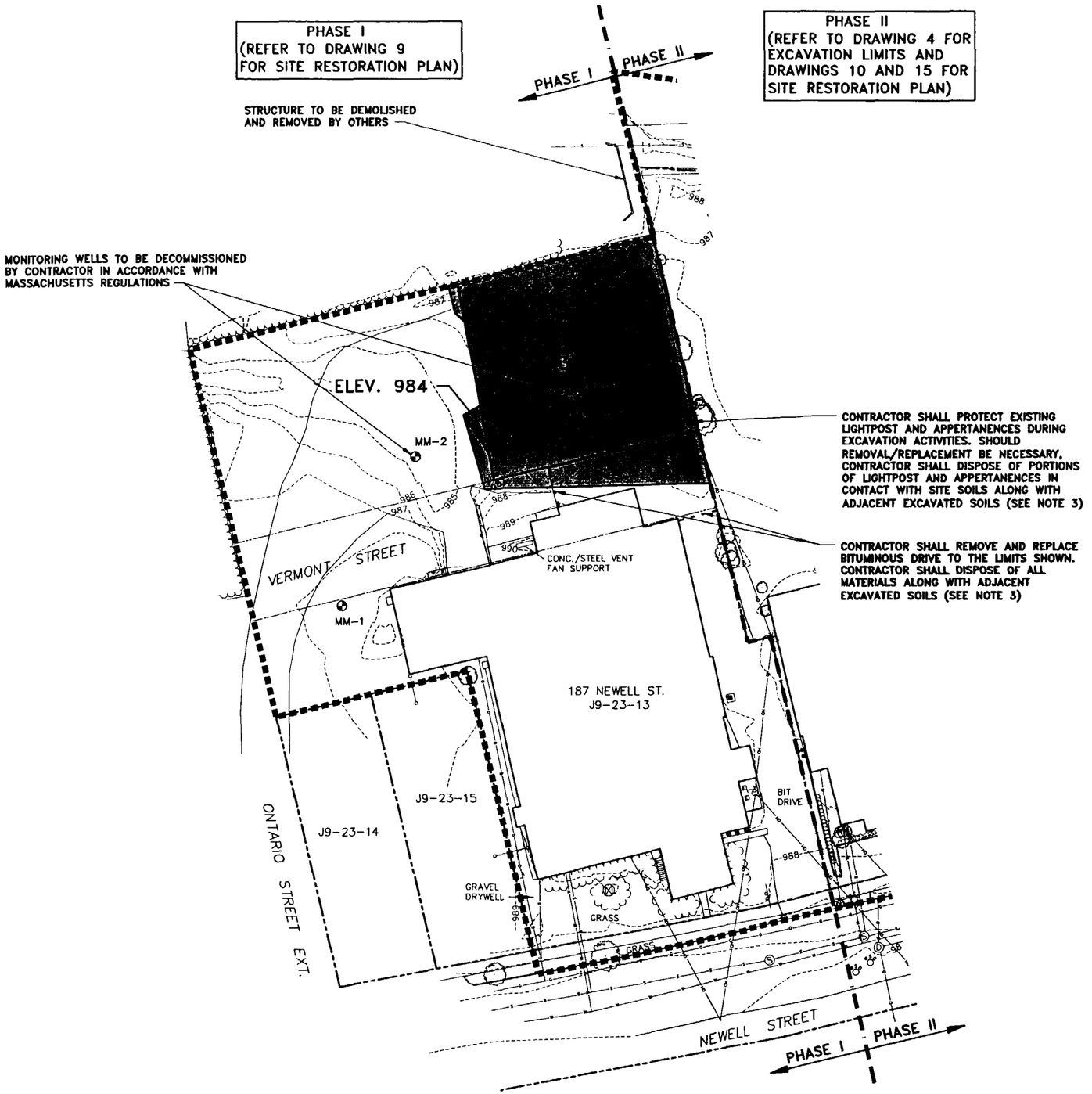
Syracuse, NY 13214
315-446-9120

2



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WOODEN FENCE
- WIRE FENCE
- GUARDRAIL
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- J9-23-23 PARCEL ID
- LIGHT POLE
- SIGN
- ELECTRIC TRANSFORMER
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- MM-1 MONITORING WELL
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- BUILDING
- LIMITS OF TSCA MATERIAL
- 1' DEPTH OF EXCAVATION
- ELEV. 984 BOTTOM ELEVATION OF EXCAVATION

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01. CONTOUR INTERVAL IS 1 FOOT.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXCAVATIONS SHALL BE COMPLETED TO DEPTH OR ELEVATION INDICATED WITHIN SPECIFIED LIMITS. ALL EXCAVATED MATERIALS TO BE DISPOSED OF AT THE APPROPRIATE OPCA.
4. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THE CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS (INCLUDING ROOT SYSTEMS). ABOVE-GRADE PORTIONS OF TREES AND SHRUBS TO BE DISPOSED OF AT A LOCAL PERMITTED RESOURCE RECOVERY FACILITY. PORTIONS OF TREES AND SHRUBS IN CONTACT WITH SITE SOILS WILL BE DISPOSED OF ALONG WITH ADJACENT EXCAVATED SOILS (SEE NOTE 3).

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Graphic Scale
30' 0 30' 60'

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Drawn by KMD
Checked by JMN/WAR/CRA
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NEWELL STREET AREA I RAA REMEDIAL ACTION

PHASE I
EXCAVATION LIMITS

TECHNICAL DRAWINGS

File Number
101.12

Date
JULY 2003

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Corporate Headquarters
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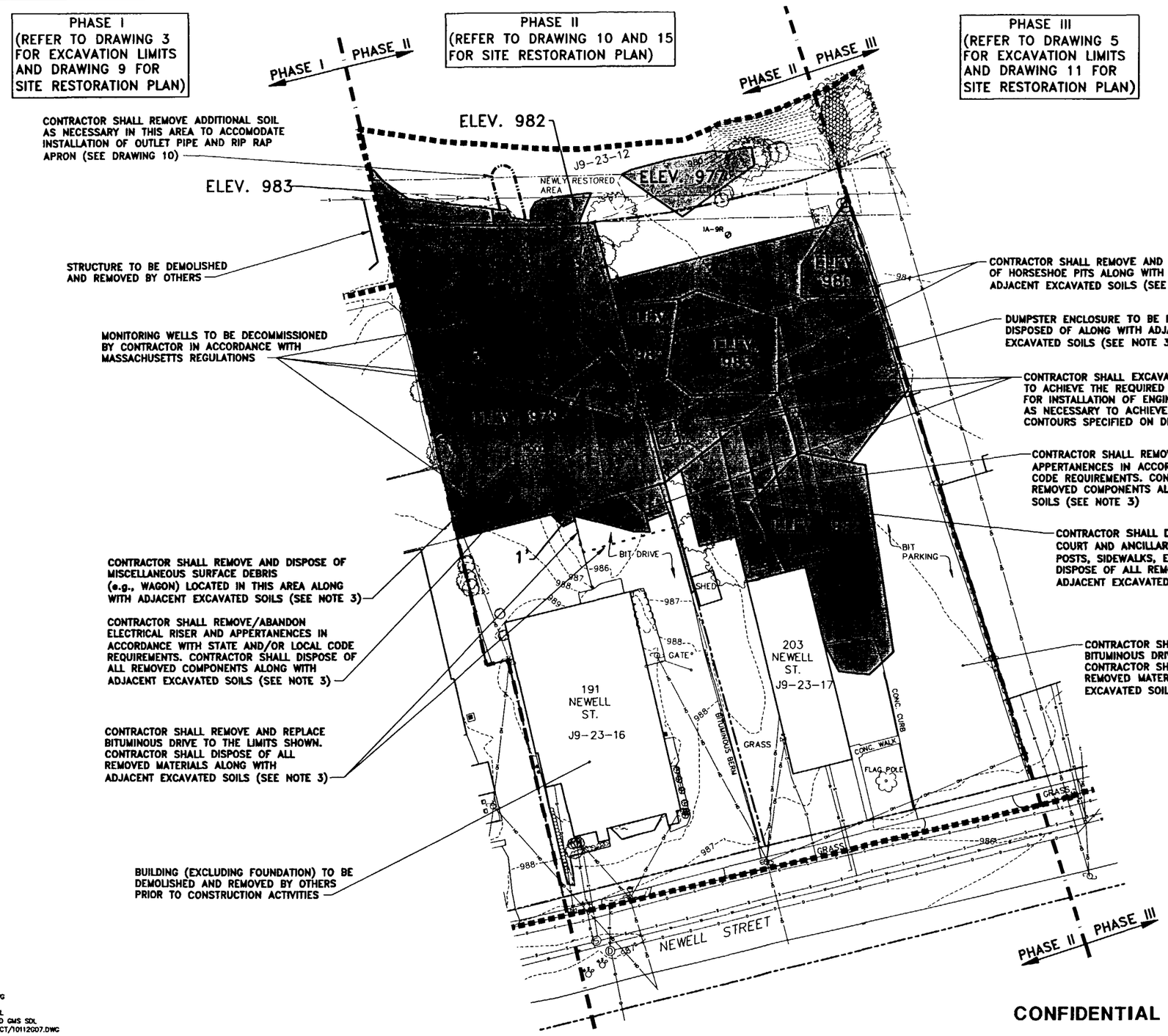
Syracuse, NY 13214
315-446-9120

3

PHASE I
(REFER TO DRAWING 3 FOR EXCAVATION LIMITS AND DRAWING 9 FOR SITE RESTORATION PLAN)

PHASE II
(REFER TO DRAWING 10 AND 15 FOR SITE RESTORATION PLAN)

PHASE III
(REFER TO DRAWING 5 FOR EXCAVATION LIMITS AND DRAWING 11 FOR SITE RESTORATION PLAN)



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WIRE FENCE
- GUARDRAIL
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- J9-23-16 PARCEL ID
- RIP RAP
- CONCRETE
- LIGHT POLE
- SIGN
- ELECTRIC TRANSFORMER
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- QP-27 MONITORING WELL
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- BUILDING
- LIMITS OF TSCA MATERIAL
- 1' DEPTH OF EXCAVATION
- ELEV. 982 BOTTOM ELEVATION OF EXCAVATION

NOTES:

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2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXCAVATIONS SHALL BE COMPLETED TO DEPTH OR ELEVATION INDICATED WITHIN SPECIFIED LIMITS. ALL EXCAVATED MATERIALS TO BE DISPOSED OF AT THE APPROPRIATE OPCA.
4. THE DRAWING DOES NOT REFLECT ALL NEWLY RESTORED VEGETATION ON J9-23-12. CONTRACTOR IS REQUIRED TO INVENTORY ALL PREVIOUSLY RESTORED TREES AND SHRUBS PRIOR TO PERFORMANCE OF SOIL REMOVAL ACTIVITIES. CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS IN ACCORDANCE WITH NOTE 5. ALSO, THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY OTHER RIVERBANK RESTORATION MATERIALS IMPACTED DURING PERFORMANCE OF SOIL REMOVAL ACTIVITIES.
5. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THE CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS (INCLUDING ROOT SYSTEMS). ABOVE-GRADE PORTIONS OF TREES AND SHRUBS TO BE DISPOSED OF AT A LOCAL PERMITTED RESOURCE RECOVERY FACILITY. PORTIONS OF TREES AND SHRUBS IN CONTACT WITH SITE SOILS WILL BE DISPOSED OF ALONG WITH ADJACENT EXCAVATED SOILS (SEE NOTE 3).
6. CONTRACTOR SHALL REMOVE SHEDS ON J9-23-17 AND RESET AS PART OF SITE RESTORATION.

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P: PAGESET/PLT-CDL
8/1/03 SYR-85-KMD GMS SDL
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Graphic Scale
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No.	Date	Revisions	Init

Project Mgr. CBA
Designed by CBA/BSS
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BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

PHASE II EXCAVATION LIMITS

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

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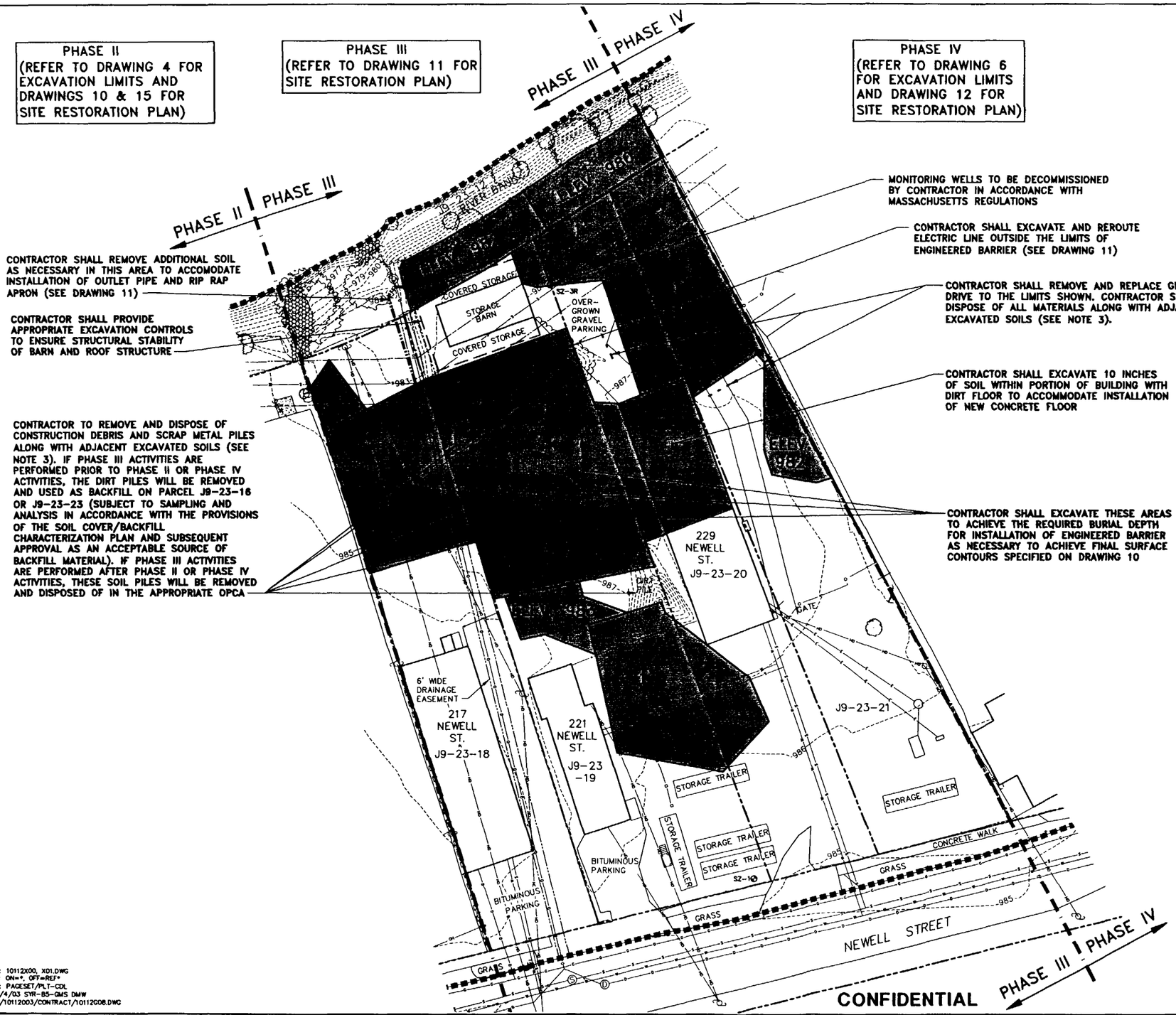
PHASE II
(REFER TO DRAWING 4 FOR EXCAVATION LIMITS AND DRAWINGS 10 & 15 FOR SITE RESTORATION PLAN)

PHASE III
(REFER TO DRAWING 11 FOR SITE RESTORATION PLAN)

PHASE IV
(REFER TO DRAWING 6 FOR EXCAVATION LIMITS AND DRAWING 12 FOR SITE RESTORATION PLAN)



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WOODEN FENCE
- WIRE FENCE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- J9-23-19 PARCEL ID
- RIP RAP
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- SZ-1 MONITORING WELL
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- UNDERGROUND ELECTRIC LINE
- BUILDING
- LIMITS OF TSCA/RCRA MATERIAL
- 1' DEPTH OF EXCAVATION
- ELEV. 983 BOTTOM ELEVATION OF EXCAVATION

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01. CONTOUR INTERVAL IS 1 FOOT.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXCAVATIONS SHALL BE COMPLETED TO DEPTH OR ELEVATION INDICATED WITHIN SPECIFIED LIMITS. ALL EXCAVATED MATERIALS TO BE DISPOSED OF AT THE APPROPRIATE OPCA.
4. CONTRACTOR SHALL RELOCATE CARS AND MISCELLANEOUS VEHICLES WITHIN THE PROPERTY IN QUESTION PRIOR TO INITIATION OF EXCAVATION ACTIVITIES AND RETURN SUCH VEHICLES UPON COMPLETION OF SITE RESTORATION ACTIVITIES. CONTRACTOR SHALL DOCUMENT (BY PHOTOGRAPHY OR VIDEOTAPE) EXISTING CONDITION OF ALL VEHICLES SUBJECT TO RELOCATION AND WILL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM RELOCATION OF THE VEHICLES.
5. QUANTITY AND LOCATION OF STORAGE TRAILERS SHOWN WITHIN THIS DRAWING ARE APPROXIMATE. CONTRACTOR SHALL REMOVE ANY AND ALL STORAGE TRAILERS AS NECESSARY TO FACILITATE EXCAVATION ACTIVITIES, AND RESET AS PART OF RESTORATION ACTIVITIES.
6. THE DRAWING DOES NOT REFLECT ALL NEWLY RESTORED VEGETATION ON J9-23-12. CONTRACTOR IS REQUIRED TO INVENTORY ALL PREVIOUSLY RESTORED TREES AND SHRUBS PRIOR TO PERFORMANCE OF SOIL REMOVAL ACTIVITIES. CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS IN ACCORDANCE WITH NOTE 7. ALSO, THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY OTHER RIVERBANK RESTORATION MATERIALS IMPACTED DURING PERFORMANCE OF SOIL REMOVAL ACTIVITIES.
7. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THE CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AN SHRUBS (INCLUDING ROOT SYSTEMS). ABOVE-GRADE PORTIONS OF TREES AND SHRUBS TO BE DISPOSED OF AT A LOCAL PERMITTED RESOURCE RECOVERY FACILITY. PORTIONS OF TREES AND SHRUBS IN CONTACT WITH SITE SOILS WILL BE DISPOSED OF ALONG WITH ADJACENT EXCAVATED SOILS (SEE NOTE 3).

X: 10112X00, X01.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-CDL
8/4/03 SYR-BS-GMS DMW
C/10112003/CONTRACT/10112G08.DWG

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Graphic Scale
30' 0 30' 60'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

Project Mgr. CRA
Designed by CRA/BSS
Drawn by KMD
Checked by LMN/WAR/CRA
Prof. Eng.
PE License

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

PHASE III EXCAVATION LIMITS

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
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315-446-9120

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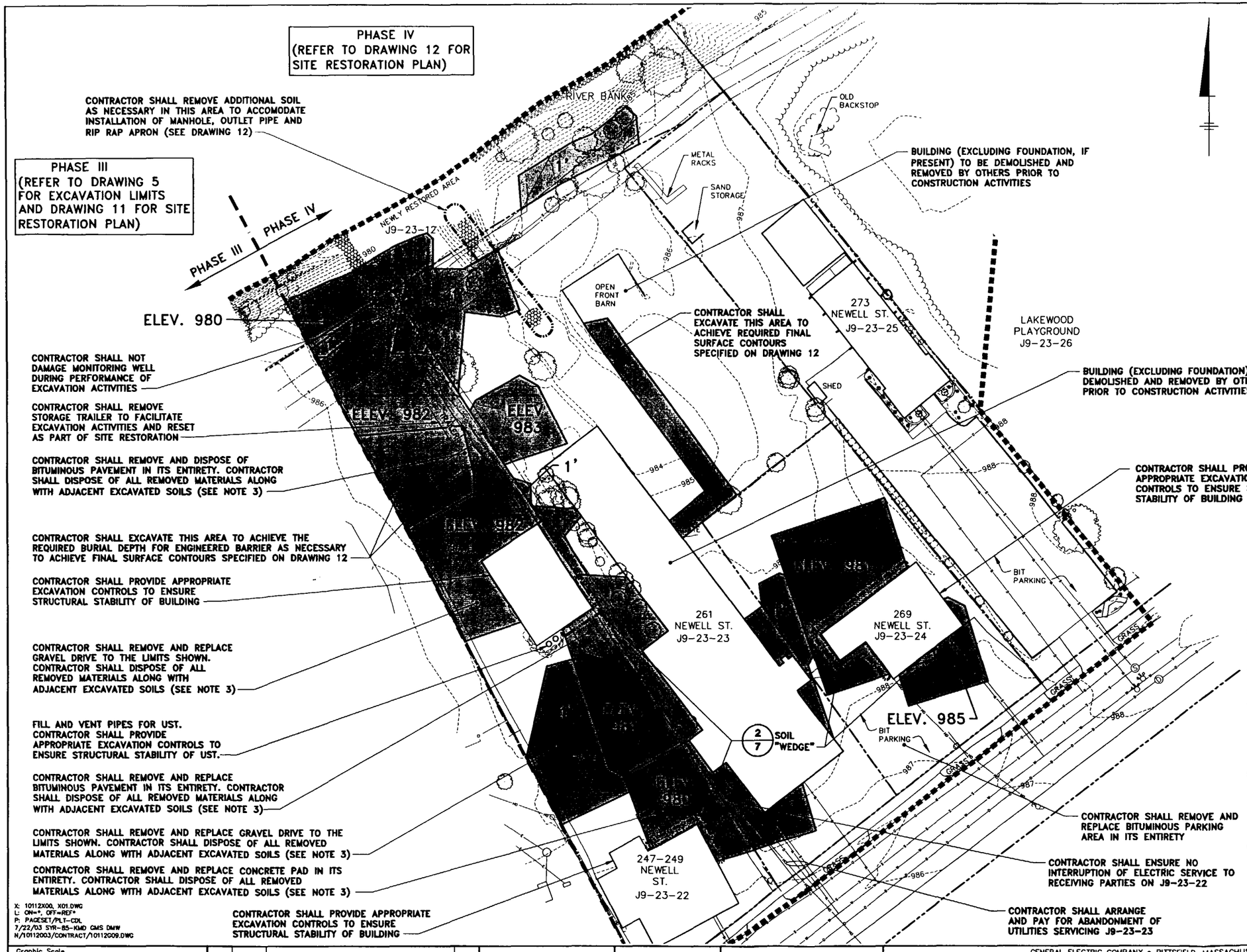

LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WIRE FENCE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- J9-23-26 PARCEL ID
- RIP RAP
- LIGHT POLE
- SIGN
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- FW-16R MONITORING WELL
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- BUILDING
- LIMITS OF TSCA MATERIAL
- 1' DEPTH OF EXCAVATION
- ELEV. 983 BOTTOM ELEVATION OF EXCAVATION

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01. CONTOUR INTERVAL IS 1 FOOT.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXCAVATIONS SHALL BE COMPLETED TO DEPTH OR ELEVATION INDICATED WITHIN SPECIFIED LIMITS. ALL EXCAVATED MATERIALS TO BE DISPOSED OF AT THE APPROPRIATE OPCA.
4. CONTRACTOR SHALL RELOCATE CARS AND MISCELLANEOUS VEHICLES WITHIN THE PROPERTY IN QUESTION PRIOR TO INITIATION OF EXCAVATION ACTIVITIES AND RETURN SUCH VEHICLES UPON COMPLETION OF SITE RESTORATION ACTIVITIES. CONTRACTOR SHALL DOCUMENT (BY PHOTOGRAPHY OR VIDEOTAPE) EXISTING CONDITION OF ALL VEHICLES SUBJECT TO RELOCATION AND WILL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM RELOCATION OF THE VEHICLES.
5. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THE CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AN SHRUBS (INCLUDING ROOT SYSTEMS). ABOVE-GRADE PORTIONS OF TREES AND SHRUBS TO BE DISPOSED OF AT A LOCAL PERMITTED RESOURCE RECOVERY FACILITY. PORTIONS OF TREES AND SHRUBS IN CONTACT WITH SITE SOILS WILL BE DISPOSED OF ALONG WITH ADJACENT EXCAVATED SOILS (SEE NOTE 3).
6. THE DRAWING DOES NOT REFLECT ALL NEWLY RESTORED VEGETATION ON J9-23-12. CONTRACTOR IS REQUIRED TO INVENTORY ALL PREVIOUSLY RESTORED TREES AND SHRUBS PRIOR TO PERFORMANCE OF SOIL REMOVAL ACTIVITIES. CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS IN ACCORDANCE WITH NOTE 5. ALSO, THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY OTHER RIVERBANK RESTORATION MATERIALS IMPACTED DURING PERFORMANCE OF SOIL REMOVAL ACTIVITIES.

X: 10112X00, X01.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-CDL
7/22/03 SYR-85-KMD GMS DMW
N/10112003/CONTRACT/10112G09.DWG

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Graphic Scale
30' 0 30' 60'

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NEWELL STREET AREA I RAA REMEDIAL ACTION

PHASE IV EXCAVATION LIMITS

TECHNICAL DRAWINGS

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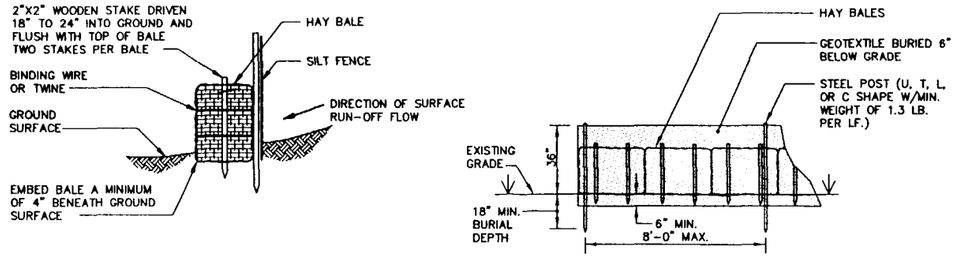
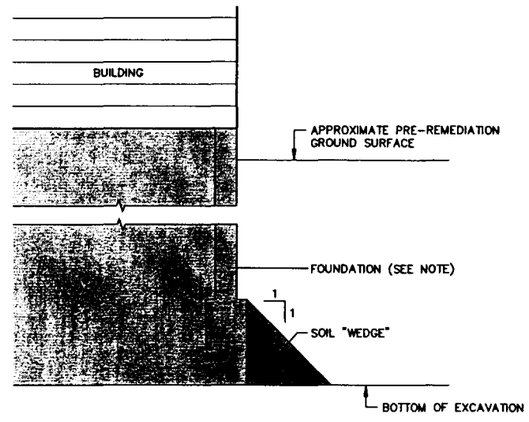


NOTES:

1. UNTIL SUCH TIME THAT ALL EXCAVATION ACTIVITIES HAVE BEEN COMPLETED AND BACKFILL MATERIAL HAS BEEN PLACED IN ALL AREAS, SILT ACCUMULATIONS ADJACENT TO EROSION CONTROL MEASURES SHALL BE IMMEDIATELY REMOVED AND DISPOSED WITH SOILS SUBJECT TO OFF-SITE TRANSPORT AND DISPOSAL.
2. ONCE BACKFILL HAS BEEN PLACED, THE CONTRACTOR SHALL REMOVE SILT ACCUMULATIONS WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF OF THE HEIGHT OF SILT FENCE.
3. HAY BALES/SILT FENCE WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE. CONTRACTOR SHALL BACKFILL EXCAVATIONS (AS NECESSARY AND RESTORE SURFACE COVER.
4. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE HAY BALES/SILT FENCING AS LONG AS THEY ARE NECESSARY.

HAY BALE/SILT FENCE (1)

NOT TO SCALE



NOTE:

1. FOUNDATION DEPICTED FOR REFERANCE PURPOSES ONLY, AND MAY NOT REFLECT ACTUAL DESIGN/CONSTRUCTION OF THESE STRUCTURES.

SOIL WEDGE (2)

NOT TO SCALE

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THE FOLLOWING GENERAL NOTES APPLY TO DRAWINGS 3 THROUGH 6

1. THE SOILS SUBJECT TO EXCAVATION AND HANDLING AS PART OF THIS CONTRACT POTENTIALLY CONTAIN PCBs AND OTHER HAZARDOUS CONSTITUENTS AND SHOULD BE HANDLED IN ACCORDANCE WITH APPLICABLE REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING APPROPRIATE HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES AND SUBCONTRACTORS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING SURVEY CONTROL TO VERIFY EXISTING GRADES AND POST-EXCAVATION ELEVATIONS. GE WILL IDENTIFY LOCATION(S) AND ELEVATION(S) OF SUITABLE BENCHMARKS TO BE USED FOR SURVEY CONTROL.
3. THE DRAWINGS MAY NOT INDICATE ALL SURFACE FEATURES SUBJECT TO REPLACEMENT AS PART OF SITE RESTORATION ACTIVITIES. THIS WILL NOT RELIEVE THE CONTRACTOR FROM REMOVING AND REPLACING (IF NECESSARY) ANY AND ALL SUCH ITEMS AT NO ADDITIONAL COST TO GE.
4. LOCATIONS OF UNDERGROUND UTILITIES AND STRUCTURES ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL (SHOWN OR NOT SHOWN) ABOVE AND BELOW GROUND UTILITIES AND STRUCTURES THAT MAY EXIST WITHIN THE PROJECT LIMITS PRIOR TO COMMENCEMENT OF WORK.
5. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY PROTECTION OF (AND/OR REMOVAL AND REPLACEMENT, AS NECESSARY, AS DETERMINED BY THE APPROPRIATE UTILITY COMPANY) ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF EXCAVATION.
6. EXCAVATION LIMITS SHOWN ON THE TECHNICAL DRAWINGS REPRESENT SOILS THAT REQUIRE REMOVAL TO ACHIEVE THE NECESSARY REMEDIAL ACTION OUTCOME. ADDITIONAL REMOVAL BEYOND THAT SHOWN MAY BE REQUIRED, AT NO EXPENSE TO GE, TO FACILITATE CONSTRUCTION ACCESS, RESTORATION, ETC.
7. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE MEASURES TO AVOID DAMAGE TO STRUCTURES THAT ARE NOT SUBJECT TO REMOVAL AND REPLACEMENT AS PART OF THIS CONTRACT. THE CONTRACTOR SHALL REPAIR ANY STRUCTURAL OR EXTERNAL DAMAGES TO SUCH STRUCTURES AT NO ADDITIONAL COST TO GE.
8. THE CONTRACTOR SHALL COORDINATE SITE ACTIVITIES TO AVOID INFRINGEMENT UPON NORMAL TRAFFIC FLOW ON ADJACENT ROADWAYS.
9. ABOVEGROUND PORTIONS OF ITEMS SUBJECT TO REMOVAL AND REPLACEMENT TO ACCOMMODATE EXCAVATION ACTIVITIES (e.g., FENCING, SHEDS, ETC.) MAY BE SALVAGED FOR REUSE. SALVAGED MATERIALS, PROVIDED THAT THEY ARE STRUCTURALLY SOUND, MAY BE USED WHEN RECONSTRUCTING THESE ITEMS. BELOW-GRADE COMPONENTS AND/OR COMPONENTS THAT HAVE CONTACTED SOILS SUBJECT TO EXCAVATION SHALL BE HANDLED AND DISPOSED OF WITH THE ASSOCIATED SOILS. ALL SUCH ITEMS SHALL BE BROKEN INTO SUFFICIENTLY SMALL PIECES (IF NECESSARY) TO BE ACCEPTABLE FOR OFF-SITE TRANSPORT AND DISPOSAL WITH THE SOILS. BELOW-GRADE COMPONENTS SHALL BE REPLACED AS PART OF SITE RESTORATION ACTIVITIES.
10. THE CONTRACTOR SHALL INVENTORY ALL TREES AND SHRUBS LOCATED WITHIN THE LIMITS OF EXCAVATION. THE CONTRACTOR SHALL THEN REMOVE AND DISPOSE OF ALL TREES AND SHRUBS (INCLUDING ROOT SYSTEMS). ABOVE-GRADE PORTIONS OF TREES AND SHRUBS TO BE DISPOSED OF AT A LOCAL PERMITTED RESOURCE RECOVERY FACILITY. PORTIONS OF TREES AND SHRUBS IN CONTACT WITH SITE SOILS WILL BE DISPOSED OF ALONG WITH ADJACENT EXCAVATED SOILS.
11. THE CONTRACTOR SHALL PROVIDE A WATER TRUCK AND APPROPRIATE EQUIPMENT FOR DUST SUPPRESSION WITHIN SOIL EXCAVATION, STAGING, AND LOADING AREAS. THESE AREAS SHALL BE WATERED BASED ON VISUAL OBSERVATIONS, THE RESULTS OF AIR MONITORING ACTIVITIES, AND/OR DIRECTION FROM GE.
12. THE CONTRACTOR SHALL ENSURE PERIMETER AIR MONITORING (TO BE PERFORMED BY OTHERS) IS BEING PERFORMED DURING EXCAVATION OR OTHER SOIL HANDLING ACTIVITIES.
13. THE HORIZONTAL LIMITS OF EXCAVATION ACTIVITIES WILL BE PHYSICALLY DELINEATED IN THE FIELD BY THE CONTRACTOR. WITHIN THESE LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXECUTING AND VERIFYING THE SPECIFIED DEPTH OR ELEVATION OF EXCAVATION IN ACCORDANCE WITH OSHA REQUIREMENTS.
14. TSCA MATERIALS SUBJECT TO EXCAVATION ARE SHOWN AS SHADED ON EACH WORK SITE DRAWING; ALL OTHER AREAS SUBJECT TO EXCAVATION ARE CONSIDERED TO BE NON-TSCA MATERIALS.
15. WHEN EXCAVATING MATERIALS FROM A GIVEN AREA CONTAINING BOTH TSCA AND NON-TSCA MATERIALS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEGREGATING THESE MATERIALS (ACCORDING TO THEIR TSCA OR NON-TSCA CLASSIFICATION) FOR THE PURPOSES OF MATERIAL HANDLING, TEMPORARY STAGING AND TRANSPORT AND DISPOSAL AT THE APPROPRIATE ON-PLANT CONSOLIDATION AREA (OPCA).
16. THE CONTRACTOR MAY CONSTRUCT AND MAINTAIN TEMPORARY STAGING AREAS FOR EXCAVATED MATERIALS. THE STAGING AREAS SHALL BE CONSTRUCTED WITHIN THE EXCAVATION LIMITS SPECIFIED ON EACH DRAWING. THE CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING PERIMETER EROSION AND SEDIMENTATION CONTROLS (IN THE FORM OF SILT FENCING, HAY BALES, AND/OR SHEET PILING, AS INDICATED), RUN-OFF WATER COLLECTION, AND DUST SUPPRESSION IN THIS AREA. THE CONTRACTOR SHALL COVER THE STAGED MATERIALS WITH POLYETHYLENE LINERS WHEN NO ACTIVITIES ARE BEING PERFORMED IN THE STAGING AREA.
17. THE CONTRACTOR MAY CONSTRUCT TEMPORARY SOIL STOCKPILES FOR EXCAVATED MATERIALS AT AREAS DESIGNATED BY GE (i.e., NEWELL STREET AREA II PARKING LOT, BUILDING SLABS ON PARCELS J9-23-16 AND J9-23-23). THE CONTRACTOR WILL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING PERIMETER EROSION AND SEDIMENTATION CONTROLS (IN THE FORM OF SILT FENCING, HAY BALES, AND/OR SHEET PILING, AS INDICATED), RUN-OFF WATER COLLECTION, AND DUST SUPPRESSION IN THIS AREA. THE CONTRACTOR SHALL COVER THE STOCKPILED MATERIALS WITH POLYETHYLENE LINERS WHEN NO ACTIVITIES ARE BEING PERFORMED IN THE STOCKPILE AREA.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING EXCAVATED/REMOVED MATERIALS TO THE OPCAS. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE THREE DAYS NOTICE TO GE PRIOR TO TRANSPORTATION OF EXCAVATED/STOCKPILED MATERIALS TO THE OPCAS. THE CONTRACTOR IS REQUIRED TO PROVIDE NO LESS THAN 300 YARDS OF MATERIALS PER DAY WHEN TRANSPORTING MATERIALS TO THE OPCAS FOR CONSOLIDATION.
19. CONTRACTOR SHALL INSTALL AN INTERIM COVER (E.G., POLYETHYLENE SHEETING) OVER WORK AREAS WHERE EXCAVATION ACTIVITIES ARE YET TO BE COMPLETED. THE INTERIM COVER SHALL BE PROPERLY ANCHORED TO RESIST WIND FORCES AND PREVENT STORMWATER FROM ENTERING SUCH WORK AREAS.
20. DRIVEWAYS, CONCRETE SURFACES, PLANTERS, AND/OR OTHER ITEMS SUBJECT TO REMOVAL AND REPLACEMENT SHALL BE RECONSTRUCTED TO SIMILAR DIMENSIONS AND APPEARANCE AS THE ORIGINAL ITEM. DRIVEWAYS SUBJECT TO PARTIAL REMOVAL SHALL BE REMOVED VIA SAW-CUT. RECONSTRUCTION SHALL MEET ALL LOCAL AND/OR STATE BUILDING CODES. CONTRACTOR SHALL OBTAIN ALL APPROPRIATE BUILDING PERMITS ASSOCIATED WITH RECONSTRUCTION ACTIVITIES.
21. WITHIN THE LIMITS OF EXCAVATION, THE CONTRACTOR SHALL RESTORE ALL PREVIOUSLY VEGETATED AREAS BY PLACING AND COMPACTING FILL MATERIALS (TO ACHIEVE A GRADE OF APPROXIMATELY 6 INCHES BELOW PRE-REMOVAL GRADE, WHERE APPROPRIATE), TOPSOIL, AND THEN GRASS SEED OR SOD (J9-23-17 ONLY). PLACEMENT OF OTHER VEGETATIVE LANDSCAPE ITEMS WILL BE PERFORMED BY OTHERS. DRIVEWAYS, CONCRETE SURFACES, AND OTHER SURFACES IMPACTED BY EXCAVATION ACTIVITIES SHALL BE RESTORED TO THEIR ORIGINAL LOCATION, ELEVATION, AND CONDITION. OTHER SURFACE FEATURES SHALL BE REPLACED OR RESTORED AS INDICATED.
22. UPON BACKFILLING OF EXCAVATED AREAS, THE CONTRACTOR SHALL MAINTAIN IN PLACE OR INSTALL ADDITIONAL EROSION CONTROLS IN THE LOCATIONS INDICATED ON EACH WORK SITE DRAWING. THE EROSION CONTROLS WILL BE REMOVED BY THE CONTRACTOR WHEN REQUESTED BY GE.
23. BACKFILLED AND RESTORED AREAS WILL BE SUBJECT TO FINAL SURVEY VERIFICATION (BY THE CONTRACTOR). THE CONTRACTOR SHALL REPAIR ANY ITEMS THAT ARE NOT RESTORED TO THE LOCATIONS AND/OR ELEVATIONS REQUIRED BY THIS CONTRACT.
24. THE CONTRACTOR SHALL RESTORE TO PRE-REMEDIATION CONDITIONS ALL SUPPORT AREAS THAT ARE IMPACTED BY REMEDIATION ACTIVITIES, INCLUDING EQUIPMENT AND MATERIALS STORAGE AREAS, SOIL LOADING AND STAGING AREAS, AND PARKING AREAS.
25. ALL EQUIPMENT OPERATED WITHIN THE LIMITS OF EXCAVATION SHALL BE CLEANED PRIOR TO USE OR STORAGE ELSEWHERE ON THE SITE OR TRANSPORTED OFF-SITE. A CONTAINED/LINED WHEEL WASH AREA SHALL BE PROVIDED BY THE CONTRACTOR TO BE USED AS NECESSARY FOR CLEANING EXCAVATION EQUIPMENT AND/OR TRANSPORTATION VEHICLES PRIOR TO THEIR REMOVAL FROM THE WORK SITE. WATER USED TO CLEAN EQUIPMENT SHALL BE RESTRICTED TO AND COLLECTED WITHIN A DESIGNATED EQUIPMENT CLEANING AREA. ALL SUCH WATERS SHALL BE CONTAINERIZED AND TRANSPORTED FOR APPROPRIATE OFF-SITE DISPOSAL BY THE CONTRACTOR.

X: 10112X00.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-CDL
7/21/03 SYR-85-KMD LAF GMS
C/10112003/CONTRACT/10112G04.DWG

Graphic Scale

NOT TO SCALE

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NEWELL STREET AREA I RAA REMEDIAL ACTION

SOIL REMOVAL
GENERAL NOTES AND DETAILS

TECHNICAL DRAWINGS

File Number 101.12
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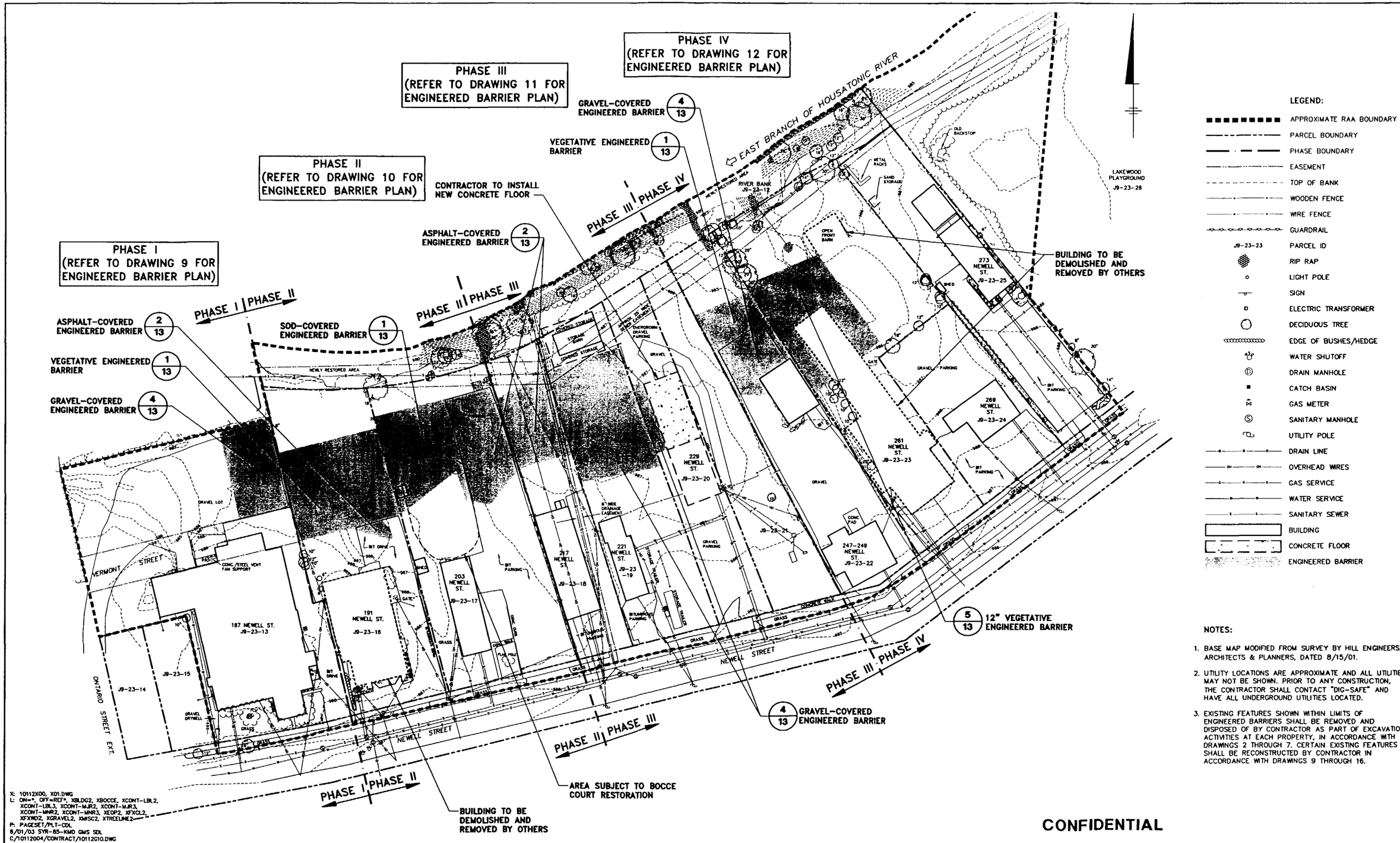

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. EXISTING FEATURES SHOWN WITHIN LIMITS OF ENGINEERED BARRIERS SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR AS PART OF EXCAVATION ACTIVITIES AT EACH PROPERTY, IN ACCORDANCE WITH DRAWINGS 2 THROUGH 7. CERTAIN EXISTING FEATURES SHALL BE RECONSTRUCTED BY CONTRACTOR IN ACCORDANCE WITH DRAWINGS 9 THROUGH 16.

X: 10112X00, X01.DWG
L: ON=*, OFF=REF*, XBLDG2, XBOCCE, XCONT-LBL2, XCONT-LBL3, XCONT-MJR2, XCONT-MJR3, XCONT-MNR2, XCONT-MNR3, XEOP2, XFXCL2, XFXWD2, XGRAVEL2, XMISC2, XTREELINE2
P: PAGESET/PLT-CDL
8/01/03 SYR-85-KMD GMS SDL
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50' 0 50' 100'

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SITE RESTORATION PLAN

TECHNICAL DRAWINGS

File Number 101.12
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8

PHASE II
(REFER TO DRAWING 10 FOR ENGINEERED BARRIER PLAN)

LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- WIRE FENCE
- J9-23-13 PARCEL ID
- EDGE OF BUSHES/HEDGE
- OH OH OVERHEAD WIRES
- BUILDING
- ENGINEERED BARRIER (SEE NOTE 5)
- 987.5 PROPOSED CONTOUR (SEE NOTE 3)
- 986 EXISTING CONTOUR
- PROPOSED COLLECTION PIPE AND FLOW DIRECTION (SEE NOTE 7)
- H.P. HIGH POINT

NOTES:

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2. THIS DRAWING ONLY PRESENTS RESTORATION DETAILS ASSOCIATED WITH INSTALLATION OF THE ENGINEERED BARRIER. REFER TO DRAWINGS 2 AND 3 FOR OTHER PROPERTY SPECIFIC RESTORATION DETAILS.
3. PROPOSED CONTOUR INTERVAL IS 0.5 FOOT. EXISTING CONTOUR INTERVAL IS 1 FOOT. PROPOSED CONTOURS REPRESENT TOP OF FINAL GRADE. CONTRACTOR SHALL ESTABLISH LINER GRADING BASED ON TOP OF FINAL GRADE AND REQUIRED COVER THICKNESS. LINER GRADING IN DRAINAGE ANCHOR TRENCHES SHALL BE ADJUSTED AS NECESSARY TO ACHIEVE PIPE INVERT ELEVATIONS.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
5. EDGE OF ENGINEERED BARRIER REPRESENTS OUTER LIMIT OF ANCHOR TRENCH.
6. COLLECTION PIPE FOR PHASE I ENGINEERED BARRIER CONNECTS TO PHASE II ENGINEERED BARRIER. IN THE EVENT OF A DELAY BETWEEN PHASE I AND II ENGINEERED BARRIER CONSTRUCTION, THE CONTRACTOR SHALL TEMPORARILY TERMINATE THE PHASE I COLLECTION PIPE AT THE EDGE OF THE PHASE I ENGINEERED BARRIER AND EITHER INSTALL A REMOVABLE END CAP ON THE COLLECTION PIPE OR WRAP THE OPEN END OF THE PIPE WITH 2 LAYERS OF NON-WOVEN GEOTEXTILE TO PREVENT ENTRY OF BACKFILL OR DEBRIS INTO PIPE.
7. COLLECTION PIPES SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE. MINIMUM PIPE SLOPE SHALL BE 0.5%.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING APPROPRIATE PIPE FITTINGS AT BENDS, CONNECTIONS, AND/OR INTERSECTIONS.
9. IF PHASE I SITE RESTORATION IS PERFORMED PRIOR TO PHASE II SITE RESTORATION THE CONTRACTOR WILL BE REQUIRED TO PERFORM A TEMPORARY TERMINATION FOR THE ENGINEERED BARRIER IN ACCORDANCE WITH DETAIL 9 OF DRAWING 13.
10. CONTRACTOR SHALL REPLACE AN EQUAL NUMBER AND TYPE OF TREES AND SHRUBS AS REMOVED DURING SITE PREPARATION ACTIVITIES. ALL RESTORED TREES AND SHRUBS MUST BE INSTALLED AT LEAST 10 FEET OUTSIDE THE LIMITS OF THE ENGINEERED BARRIER.

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P: PAGESET/PLT-CDL
7/22/03 SYR-85-KMD GMS DMW
C/10112003/CONTRACT/10112G02.DWG

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Graphic Scale
10' 0 10' 20'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

Project Mgr. CBA
Designed by BMS/CAA
Drawn by KMD
Checked by JMN/WAR/PHB
Prof. Eng.
PE License

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

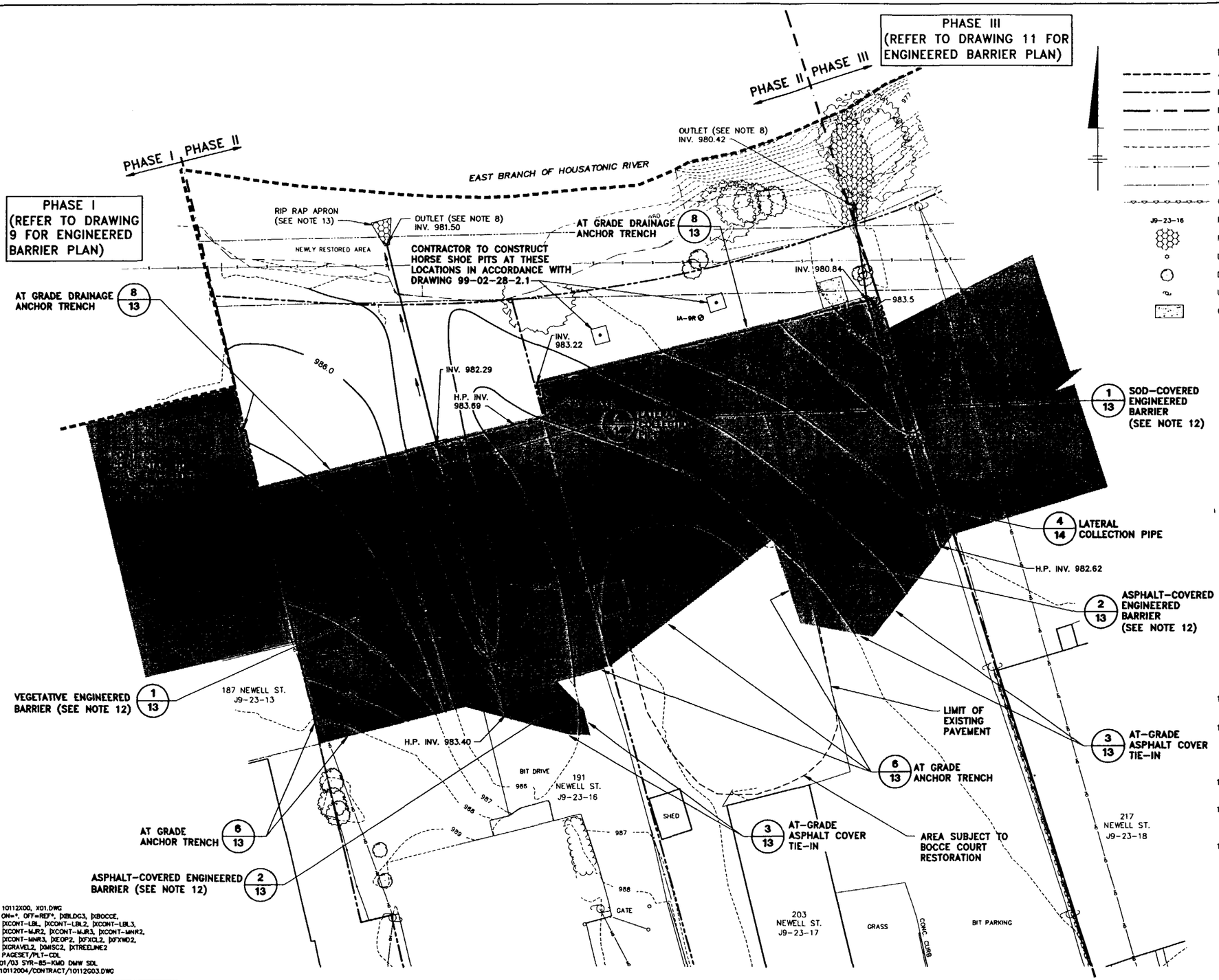
PHASE I
ENGINEERED BARRIER PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

9



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDARY
- EASEMENT
- TOP OF BANK
- WOODEN FENCE
- WIRE FENCE
- GUARDRAIL
- J9-23-16 PARCEL ID
- RIP RAP
- LIGHT POLE
- DECIDUOUS TREE
- UTILITY POLE
- CONCRETE
- MONITORING WELL
- DRAIN LINE
- OVERHEAD WIRES
- SANITARY SEWER
- BUILDING
- ENGINEERED BARRIER (SEE NOTE 5)
- 987.5 PROPOSED CONTOUR (SEE NOTE 3)
- 987.5 EXISTING CONTOUR
- PROPOSED COLLECTION PIPE AND FLOW DIRECTION (SEE NOTE 7)
- PROPOSED OUTLET PIPE AND FLOW DIRECTION (SEE NOTE 9)
- H.P. HIGH POINT
- TEMPORARY EROSION CONTROL MAT (INSTALL PER MANUFACTURER'S RECOMMENDATIONS)

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. THIS DRAWING ONLY PRESENTS RESTORATION DETAILS ASSOCIATED WITH INSTALLATION OF ENGINEERED BARRIER. REFER TO DRAWINGS 2 AND 4 FOR OTHER PROPERTY-SPECIFIC RESTORATION DETAILS.
3. PROPOSED CONTOUR INTERVAL IS 0.5 FOOT. EXISTING CONTOUR INTERVAL IS 1 FOOT. PROPOSED CONTOURS REPRESENT TOP OF FINAL GRADE. CONTRACTOR SHALL ESTABLISH LINER GRADING BASED ON TOP OF FINAL GRADE AND REQUIRED COVER THICKNESS. LINER GRADING IN DRAINAGE ANCHOR TRENCHES SHALL BE ADJUSTED AS NECESSARY TO ACHIEVE PIPE INVERT ELEVATIONS.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
5. EDGE OF ENGINEERED BARRIER REPRESENTS OUTER LIMIT OF ANCHOR TRENCH.
6. COLLECTION PIPES FROM PHASE I ENGINEERED BARRIER CONTINUE ONTO PHASE II ENGINEERED BARRIER. IN THE EVENT OF A DELAY BETWEEN CONSTRUCTION OF ENGINEERED BARRIERS FOR ADJACENT PHASES, THE CONTRACTOR SHALL TEMPORARILY TERMINATE THE PHASE II ENGINEERED BARRIER AND EITHER INSTALL REMOVABLE END CAPS ON THE COLLECTION PIPES OR WRAP THE OPEN ENDS OF THE PIPES WITH TWO LAYERS OF NON-WOVEN GEOTEXTILE TO PREVENT THE ENTRY OF BACKFILL OR DEBRIS INTO THE PIPES.
7. COLLECTION PIPES SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE. MINIMUM PIPE SLOPE SHALL BE 0.5%.
8. LOCATION OF DOWNSTREAM TERMINATIONS AND INVERT ELEVATIONS OF OUTLET PIPE ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL ADJUST BOTH AS NECESSARY SO THAT A MINIMUM 1% INVERT SLOPE IS MAINTAINED FROM THE EDGE OF THE ENGINEERED BARRIER TO THE DOWNSTREAM TERMINATIONS.
9. OUTLET PIPE SHALL BE 4"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING APPROPRIATE PIPE FITTINGS AT BENDS, CONNECTIONS, AND/OR INTERSECTIONS.
11. PARCEL J9-23-17 SHALL HAVE AN ASPHALT-COVERED ENGINEERED BARRIER IN THE EXISTING PAVED AREAS AND A SOD-COVERED ENGINEERED BARRIER ELSEWHERE WITH THE EXCEPTION OF THE NEW BOCCE COURTS, WHICH WILL HAVE A MODIFIED ENGINEERED BARRIER. PARCEL J9-23-16 SHALL HAVE AN ASPHALT-COVERED ENGINEERED BARRIER IN EXISTING PAVED AREAS AND A VEGETATIVE ENGINEERED BARRIER ELSEWHERE.
12. RIP RAP APRON SHALL USE TYPE 1 RIP RAP. APRON SHALL BE 10 FEET IN LENGTH, 2 FEET IN WIDTH AT UPSTREAM END, AND 8 FEET IN WIDTH AT DOWNSTREAM END.
13. IF PHASE II SITE RESTORATION IS PERFORMED PRIOR TO PHASE I AND PHASE III SITE RESTORATIONS, THE CONTRACTOR WILL BE REQUIRED TO PERFORM A TEMPORARY TERMINATION FOR THE ENGINEERED BARRIER IN ACCORDANCE WITH DETAIL 9 OF DRAWING 13.
14. CONTRACTOR SHALL REPLACE AN EQUAL NUMBER AND TYPE OF TREES AND SHRUBS AS REMOVED DURING SITE PREPARATION ACTIVITIES. ALL RESTORED TREES AND SHRUBS MUST BE INSTALLED AT LEAST 10 FEET OUTSIDE THE LIMITS OF THE ENGINEERED BARRIERS.

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8/01/03 SYR-85-KMD DWW SDL
C/10112004/CONTRACT/10112G03.DWG

Graphic Scale
20' 0 20' 40'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

Project Mgr. CBA
Designed by BMS/CAA
Drawn by KMD
Checked by JMN/WAR/PHB
Prof. Eng.
PE License

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

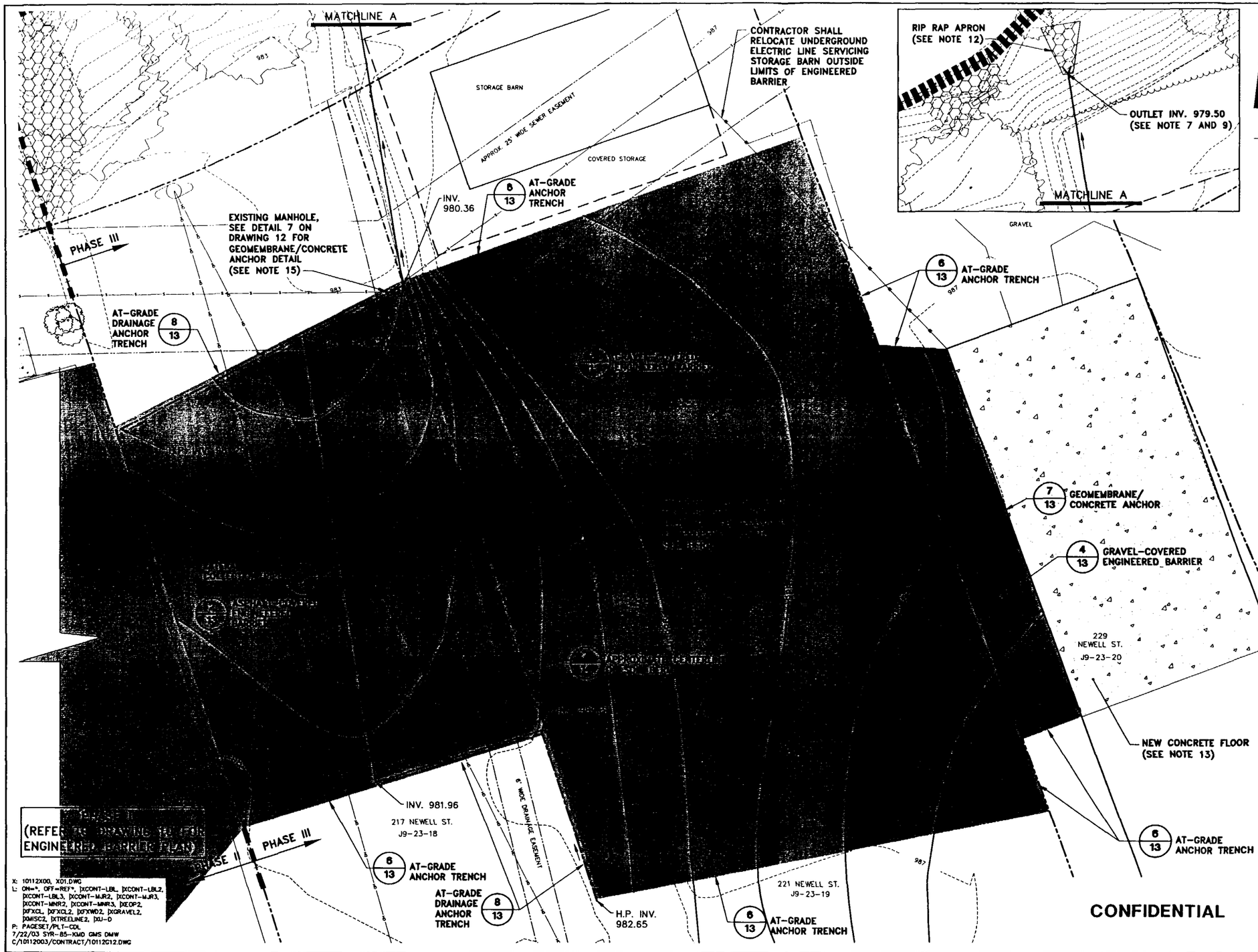
PHASE II
ENGINEERED BARRIER PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

10



LEGEND:

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDRY
- EASEMENT
- TOP OF BANK
- WIRE FENCE
- J9-23-18 PARCEL ID
- RIPRAP
- LIGHT POLE
- DECIDUOUS TREE
- OVERHEAD WIRES
- BUILDING
- ENGINEERED BARRIER (SEE NOTE 5)
- 987.5 PROPOSED CONTOUR (SEE NOTE 3)
- 986 EXISTING CONTOUR
- PROPOSED COLLECTION PIPE AND FLOW DIRECTION (SEE NOTE 6)
- PROPOSED OUTLET PIPE AND FLOW DIRECTION (SEE NOTE 8)
- PROPOSED SOIL BERM (APPROXIMATE CENTERLINE)
- H.P. HIGH POINT

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. THIS DRAWING ONLY PRESENTS RESTORATION DETAILS ASSOCIATED WITH INSTALLATION OF THE ENGINEERED BARRIERS. REFER TO DRAWINGS 2 AND 5 FOR OTHER PROPERTY SPECIFIC RESTORATION DETAILS.
3. PROPOSED CONTOUR INTERVAL IS 0.5 FOOT. EXISTING CONTOUR INTERVAL IS 1 FOOT. PROPOSED CONTOURS REPRESENT TOP OF FINAL GRADE. CONTRACTOR SHALL ESTABLISH LINER GRADING BASED ON TOP OF FINAL GRADE AND REQUIRED COVER THICKNESS. LINER GRADING IN DRAINAGE ANCHOR TRENCHES SHALL BE ADJUSTED AS NECESSARY TO ACHIEVE PIPE INVERT ELEVATIONS.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
5. EDGE OF ENGINEERED BARRIER REPRESENTS OUTER LIMIT OF ANCHOR TRENCH.
6. COLLECTION PIPES SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE. MINIMUM PIPE SLOPE SHALL BE 0.5%.
7. LOCATIONS OF DOWNSTREAM TERMINATIONS AND INVERT ELEVATIONS OF OUTLET PIPE ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL ADJUST BOTH AS NECESSARY SO THAT A MINIMUM 1% INVERT SLOPE IS MAINTAINED FROM THE EDGE OF THE ENGINEERED BARRIER TO THE DOWNSTREAM TERMINATIONS.
8. OUTLET PIPE SHALL BE 8"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE.
9. THE OUTLET PIPE CONTINUES IN THIS DIRECTION HORIZONTALLY AND DAYLIGHTS AT THE DEFINED OUTLET INVERT ELEVATION. AT THE OUTLET A RIP RAP APRON SHALL BE INSTALLED AS DESCRIBED IN NOTE 12.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING APPROPRIATE PIPE FITTINGS AT BENDS, CONNECTIONS, AND/OR INTERSECTIONS.
11. IF PHASE III SITE RESTORATION IS PERFORMED PRIOR TO PHASE II SITE RESTORATION THE CONTRACTOR WILL BE REQUIRED TO PERFORM A TEMPORARY TERMINATION FOR THE ENGINEERED BARRIER IN ACCORDANCE WITH DETAIL 9 OF DRAWING 13.
12. RIP RAP APRON SHALL USE TYPE 1 RIP RAP. APRON SHALL BE 10 FEET IN LENGTH, 2 FEET IN WIDTH AT UPSTREAM END, AND 8 FEET IN WIDTH AT DOWNSTREAM END.
13. CONTRACTOR SHALL PLACE A POLYETHYLENE VAPOR BARRIER BELOW A 4" LAYER OF STONE AND A 6" LAYER OF CONCRETE REINFORCED WITH GALVANIZED WIRE MESH. CONTRACTOR SHALL SUBMIT ALL DETAIL DESIGN INFORMATION (i.e. LOCATION OF CONTROL AND EXPANSION JOINTS).
14. CONTRACTOR SHALL REPLACE AN EQUAL NUMBER AND TYPE OF TREES AND SHRUBS AS REMOVED DURING SITE PREPARATION ACTIVITIES. ALL RESTORED TREES AND SHRUBS MUST BE INSTALLED AT LEAST 10 FEET OUTSIDE THE LIMITS OF THE ENGINEERED BARRIERS.
15. CONTRACTOR TO ADJUST HORIZONTAL ALIGNMENT OF COLLECTION PIPE AS NECESSARY TO CIRCUMVENT EXISTING MANHOLE. ADJUSTMENTS SHALL BE MADE USING 45° ELBOWS.

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P: PAGESET/PLT-CDL
7/22/03 SYR-85-KMD GMS DMW
C/10112003/CONTRACT/10112G12.DWG

Graphic Scale 10' 0 10' 20'

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

Project Mgr. CBA
Designed by PMS/CAA
Drawn by KMD
Checked by JMN/WAR/PHB
Prof. Eng.
PE License

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

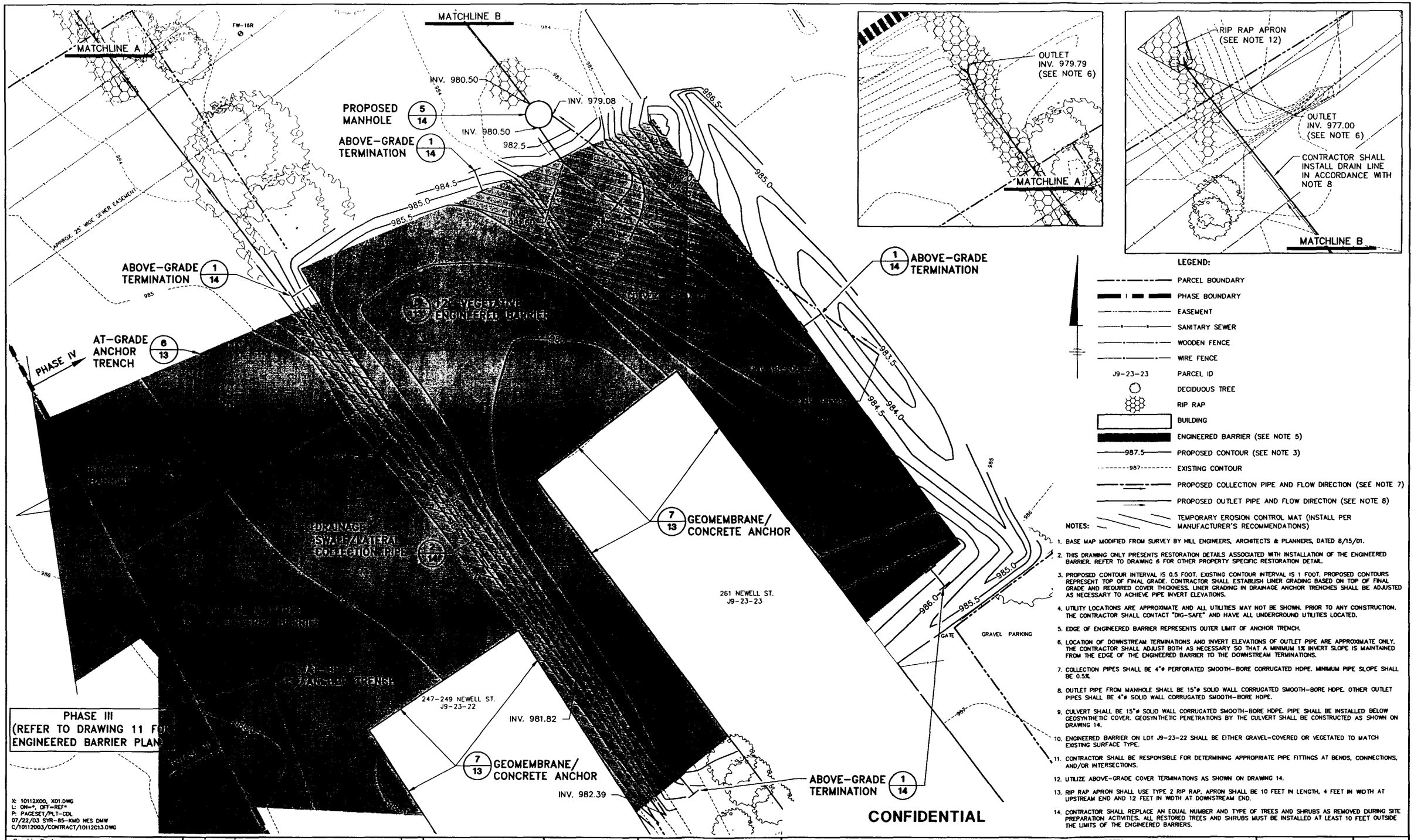
PHASE III
ENGINEERED BARRIER PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

11



LEGEND:

- PARCEL BOUNDARY
- PHASE BOUNDARY
- EASEMENT
- SANITARY SEWER
- WOODEN FENCE
- WIRE FENCE
- J9-23-23 PARCEL ID
- DECIDUOUS TREE
- RIP RAP
- BUILDING
- ENGINEERED BARRIER (SEE NOTE 5)
- 987.5 PROPOSED CONTOUR (SEE NOTE 3)
- 987 EXISTING CONTOUR
- PROPOSED COLLECTION PIPE AND FLOW DIRECTION (SEE NOTE 7)
- PROPOSED OUTLET PIPE AND FLOW DIRECTION (SEE NOTE 8)
- TEMPORARY EROSION CONTROL MAT (INSTALL PER MANUFACTURER'S RECOMMENDATIONS)

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. THIS DRAWING ONLY PRESENTS RESTORATION DETAILS ASSOCIATED WITH INSTALLATION OF THE ENGINEERED BARRIER. REFER TO DRAWING 6 FOR OTHER PROPERTY SPECIFIC RESTORATION DETAIL.
3. PROPOSED CONTOUR INTERVAL IS 0.5 FOOT. EXISTING CONTOUR INTERVAL IS 1 FOOT. PROPOSED CONTOURS REPRESENT TOP OF FINAL GRADE. CONTRACTOR SHALL ESTABLISH LINER GRADING BASED ON TOP OF FINAL GRADE AND REQUIRED COVER THICKNESS. LINER GRADING IN DRAINAGE ANCHOR TRENCHES SHALL BE ADJUSTED AS NECESSARY TO ACHIEVE PIPE INVERT ELEVATIONS.
4. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
5. EDGE OF ENGINEERED BARRIER REPRESENTS OUTER LIMIT OF ANCHOR TRENCH.
6. LOCATION OF DOWNSTREAM TERMINATIONS AND INVERT ELEVATIONS OF OUTLET PIPE ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL ADJUST BOTH AS NECESSARY SO THAT A MINIMUM 1% INVERT SLOPE IS MAINTAINED FROM THE EDGE OF THE ENGINEERED BARRIER TO THE DOWNSTREAM TERMINATIONS.
7. COLLECTION PIPES SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE. MINIMUM PIPE SLOPE SHALL BE 0.5%.
8. OUTLET PIPE FROM MANHOLE SHALL BE 15"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE. OTHER OUTLET PIPES SHALL BE 4"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE.
9. CULVERT SHALL BE 15"ø SOLID WALL CORRUGATED SMOOTH-BORE HDPE. PIPE SHALL BE INSTALLED BELOW GEOSYNTHETIC COVER. GEOSYNTHETIC PENETRATIONS BY THE CULVERT SHALL BE CONSTRUCTED AS SHOWN ON DRAWING 14.
10. ENGINEERED BARRIER ON LOT J9-23-22 SHALL BE EITHER GRAVEL-COVERED OR VEGETATED TO MATCH EXISTING SURFACE TYPE.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING APPROPRIATE PIPE FITTINGS AT BENDS, CONNECTIONS, AND/OR INTERSECTIONS.
12. UTILIZE ABOVE-GRADE COVER TERMINATIONS AS SHOWN ON DRAWING 14.
13. RIP RAP APRON SHALL USE TYPE 2 RIP RAP. APRON SHALL BE 10 FEET IN LENGTH, 4 FEET IN WIDTH AT UPSTREAM END AND 12 FEET IN WIDTH AT DOWNSTREAM END.
14. CONTRACTOR SHALL REPLACE AN EQUAL NUMBER AND TYPE OF TREES AND SHRUBS AS REMOVED DURING SITE PREPARATION ACTIVITIES. ALL RESTORED TREES AND SHRUBS MUST BE INSTALLED AT LEAST 10 FEET OUTSIDE THE LIMITS OF THE ENGINEERED BARRIERS.

CONFIDENTIAL

Graphic Scale 10' 0 10' 20'

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No.	Date	Revisions	Init

Project Mgr. CRA
Designed by BMS/CAA
Drawn by KMD
Checked by WAR/PHB
Prof. Eng.
PE License

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS
NEWELL STREET AREA I RAA REMEDIAL ACTION

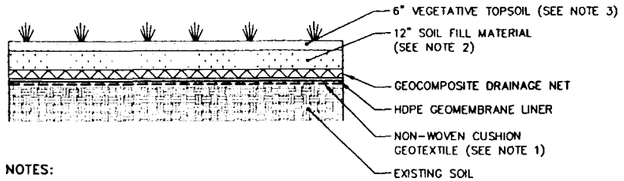
PHASE IV
ENGINEERED BARRIER PLAN

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

12

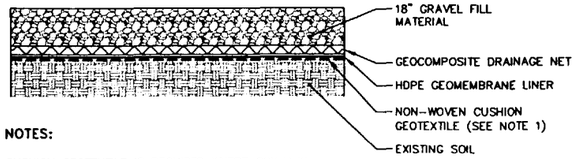


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.
2. AT CONTRACTOR'S DISCRETION, SOIL FILL MATERIAL MAY BE REPLACED WITH TOPSOIL.
3. 6 INCH VEGETATIVE TOPSOIL LAYER TO BE REPLACED BY 4 INCH TOPSOIL LAYER AND SOD WHERE NOTED.

VEGETATIVE ENGINEERED BARRIER (1)

NOT TO SCALE

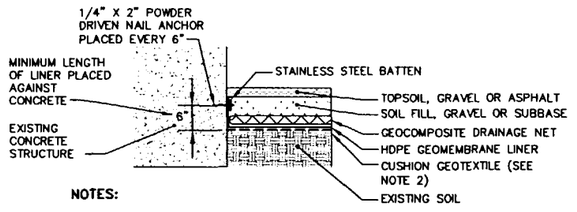


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.

GRAVEL-COVERED ENGINEERED BARRIER (4)

NOT TO SCALE



NOTES:

1. THIS DETAIL APPLICABLE TO COVER TERMINATIONS ADJACENT TO BUILDINGS, MANHOLES OR CONCRETE SLABS.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.
3. CONTRACTOR SHALL EVALUATE THE FEASIBILITY OF USING THIS BATTEN STRIP METHOD ON THE MANHOLE PRIOR TO PROCEEDING.

GEOMEMBRANE/CONCRETE ANCHOR (7)

NOT TO SCALE

GENERAL NOTES:

1. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. "AT-GRADE" REFERS TO ENGINEERED BARRIERS THAT ARE RECESSED INTO EXISTING GRADE.

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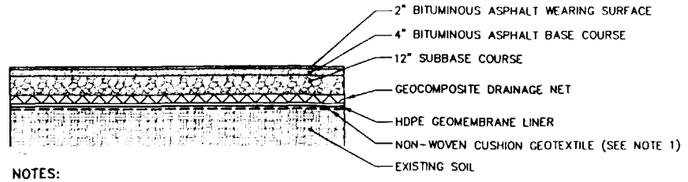
P: PAGESET/PLT-CDL
7/22/03 SYR-85-KMD ROC-85-SLM SYR-85-GMS, DMW
C/10112003/CONTRACT/10112G05.DWG

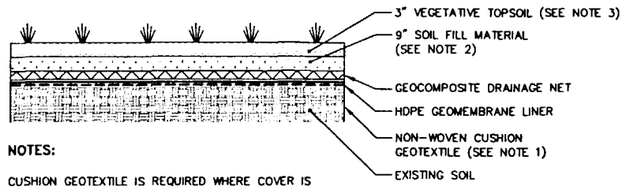


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.

ASPHALT-COVERED ENGINEERED BARRIER (2)

NOT TO SCALE

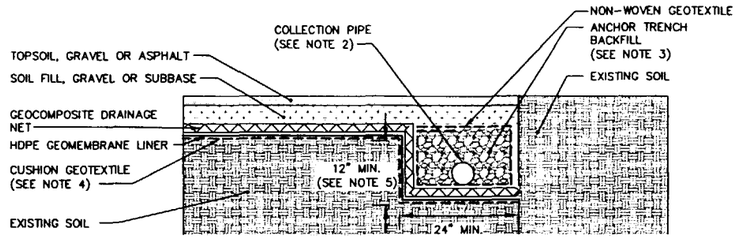


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.
2. AT CONTRACTOR'S DISCRETION, SOIL FILL MATERIAL MAY BE REPLACED WITH TOPSOIL.
3. PRIOR TO INSTALLATION OF THIS TYPE OF BARRIER, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING VEGETATION.

12" VEGETATIVE ENGINEERED BARRIER (5)

NOT TO SCALE

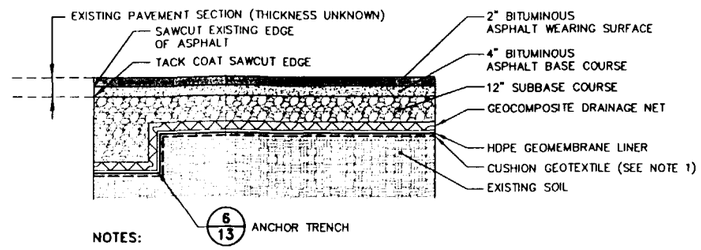


NOTES:

1. THIS DETAIL APPLICABLE TO AT-GRADE COVER TERMINATIONS WITH COLLECTION PIPES.
2. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
3. ANCHOR TRENCH SHALL BE BACKFILLED WITH FILTER STONE WRAPPED IN NON-WOVEN GEOTEXTILE.
4. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.
5. ANCHOR TRENCH DEPTH MAY EXCEED 12-INCH MINIMUM AS NECESSARY TO ACHIEVE COLLECTION PIPE INVERTS SHOWN ON DRAWINGS 9 THROUGH 12.

AT-GRADE DRAINAGE ANCHOR TRENCH (8)

NOT TO SCALE

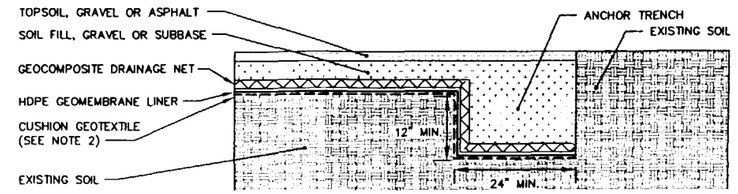


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.

AT-GRADE ASPHALT COVER TIE-IN (3)

NOT TO SCALE

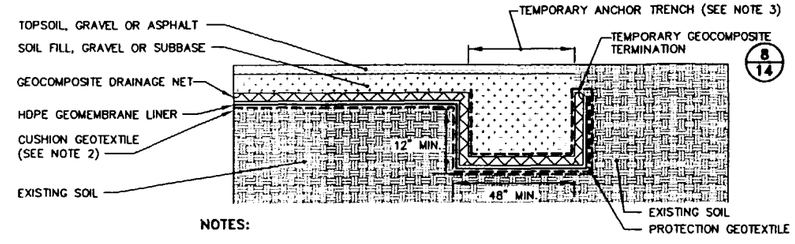


NOTES:

1. THIS DETAIL APPLICABLE TO AT-GRADE COVER TERMINATIONS WITHOUT COLLECTION PIPES.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.

AT-GRADE ANCHOR TRENCH (6)

NOT TO SCALE



NOTES:

1. THIS DETAIL APPLICABLE TO TEMPORARY AT-GRADE COVER TERMINATIONS.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE UNCOMPACTED NATIVE MATERIAL.
3. UPON CONTINUATION OF ENGINEERED BARRIER CONSTRUCTION, THE CONTRACTOR SHALL CAREFULLY EXCAVATE TEMPORARY ANCHOR TRENCH BACKFILL, DISCARD PROTECTION GEOTEXTILE, AND BACKFILL TEMPORARY ANCHOR TRENCH.
4. IT IS RECOMMENDED THAT THE CONTRACTOR MARK OR RECORD THE LOCATION OF THE TEMPORARY ANCHOR TRENCH TO MINIMIZE DAMAGE TO THE GEOSYNTHETICS FOR FUTURE CONTINUATION OF ENGINEERED BARRIER.

TEMPORARY AT-GRADE TERMINATION (9)

NOT TO SCALE

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Graphic Scale

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No.	Date	Revisions	Init

Project Mgr. CBA
Designed by BMS/CAA
Drawn by JER
Checked by JMN/WAR/PHB
Prof. Eng.
PE License

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COVER DETAILS

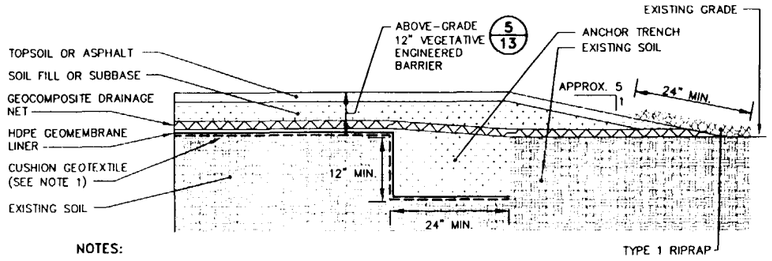
TECHNICAL DRAWINGS

File Number 101.12

Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

13

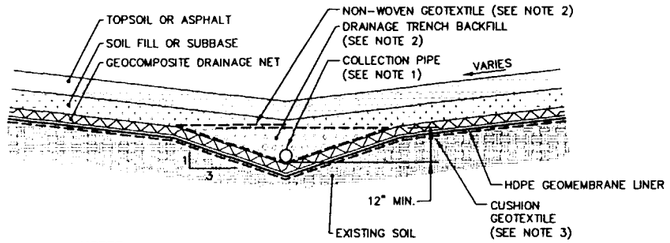


NOTES:

1. THIS DETAIL APPLICABLE TO ABOVE-GRADE COVER TERMINATIONS.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE NATIVE MATERIAL.

ABOVE-GRADE TERMINATION (1)

NOT TO SCALE

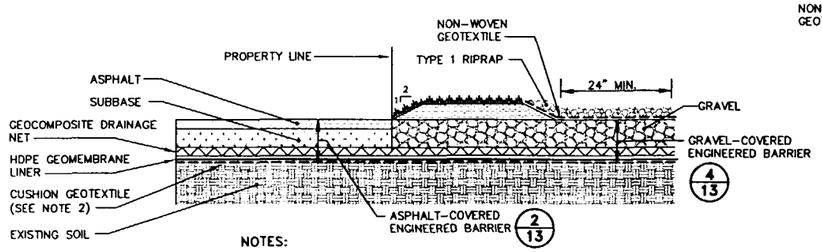


NOTES:

1. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH BORE CORRUGATED HDPE.
2. DRAINAGE TRENCH TO BE BACKFILLED WITH FILTER STONE WRAPPED IN NON-WOVEN GEOTEXTILE. GEOTEXTILE SEAM TO BE SEWN.
3. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE NATIVE MATERIAL.

LATERAL COLLECTION PIPE (4)

NOT TO SCALE

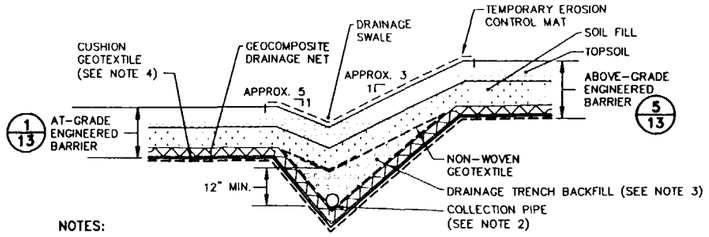


NOTES:

1. SOIL BERM SHALL BE COMPOSED OF TOPSOIL AND SOD.
2. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE NATIVE MATERIAL.

SOIL BERM (7)

NOT TO SCALE

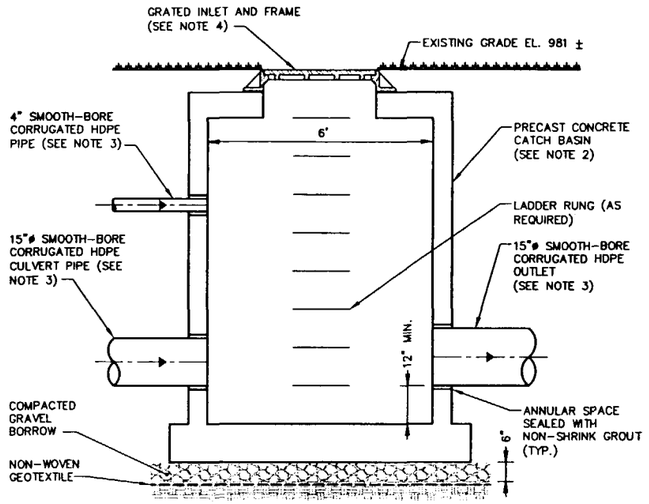


NOTES:

1. THIS DETAIL APPLICABLE TO DRAINAGE SWALES WITH A COLLECTION PIPE.
2. COLLECTION PIPE SHALL BE 4"ø PERFORATED SMOOTH-BORE CORRUGATED HDPE.
3. DRAINAGE TRENCH SHALL BE BACKFILLED WITH FILTER STONE WRAPPED IN NON-WOVEN GEOTEXTILE. GEOTEXTILE SEAM TO BE SEWN.
4. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE NATIVE MATERIAL.

DRAINAGE SWALE/LATERAL COLLECTION PIPE (2)

NOT TO SCALE



NOTES:

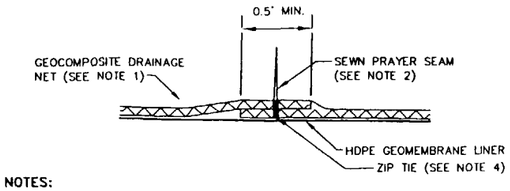
1. REFER TO DRAWING 12 FOR APPROXIMATE LOCATION OF CATCH BASIN.
2. PRECAST CONCRETE MANHOLE SHALL BE RATED FOR H-20 LOADING.
3. REFER TO DRAWING 12 FOR INVERT ELEVATIONS.
4. GRATED INLET AND FRAME SHALL BE RATED FOR H-20 LOADING. CONTRACTOR TO DETERMINE APPROPRIATE SIZE AND CONFIGURATION. GRATE SHALL BE CAPABLE OF PASSING 1 CFS WITH 1 INCH OF HEAD.

MANHOLE DETAIL (5)

NOT TO SCALE

GENERAL NOTES:

1. GEOSYNTHETICS ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
2. "ABOVE-GRADE" REFERS TO ENGINEERED BARRIERS THAT ARE CONSTRUCTED ON TOP OF EXISTING GRADE.
3. "AT-GRADE" REFERS TO ENGINEERED BARRIERS THAT ARE RECESSED INTO EXISTING GRADE.

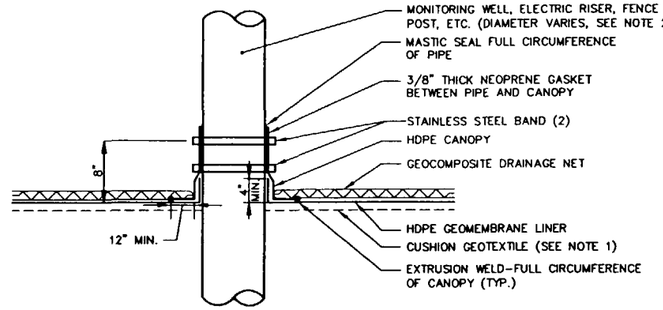


NOTES:

1. ALL GEOCOMPOSITE SHALL SHINGLE DOWNSLOPE.
2. THE TOP GEOTEXTILE COMPONENTS OF THE TWO GEOCOMPOSITE LAYERS SHALL BE PEELED BACK SO THAT A PRAYER SEAM MAY BE SEWN ABOVE THE GEOCOMPOSITE OVERLAP.
3. IF GEOTEXTILE IS UNABLE TO BE PEELED BACK WITHOUT CAUSING DAMAGE, A PATCH OF GEOTEXTILE SHALL BE HEAT BONDED TO THE TOP GEOTEXTILE LAYER OF THE OVER THE SEAM.
4. ZIP TIES SHALL BE PLACED EVERY 5' ALONG ADJACENT PANELS AND EVERY 6" ALONG BUTT SEAMS AND IN ANCHOR TRENCHES.

TYPICAL GEOCOMPOSITE SEAM (3)

NOT TO SCALE

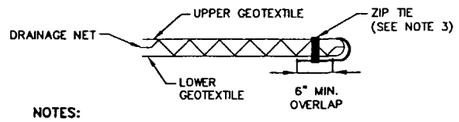


NOTES:

1. CUSHION GEOTEXTILE IS REQUIRED WHERE COVER IS INSTALLED ABOVE NATIVE MATERIAL.
2. THIS DETAIL MAY BE USED FOR OTHER PENETRATIONS THROUGH THE GEOSYNTHETICS.

GEOSYNTHETICS PENETRATION SEAL (6)

NOT TO SCALE



NOTES:

1. THIS DETAIL APPLICABLE TO TEMPORARY TERMINATION OF GEOSYNTHETICS, WHERE NECESSARY.
2. DRAINAGE NET AND LOWER GEOTEXTILE SHALL BE CUT SO THAT THE UPPER GEOTEXTILE MAY BE WRAPPED AROUND THE END OF THE GEOCOMPOSITE.
3. ZIP TIES SHALL BE PLACED EVERY 5' ALONG THE EDGES OF THE GEOCOMPOSITE.

TEMPORARY GEOCOMPOSITE TERMINATION (8)

NOT TO SCALE

X: 10112X00.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-CDL
7/22/03 SYR-85-KMD ROC-85-SLM SYR-85-GMS, DMW
C/10112003/CONTRACT/10112G11.DWG

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COVER DETAILS

TECHNICAL DRAWINGS

File Number 101.12
Date JULY 2003

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

Attachment B

Technical Specifications

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BLASLAND, BOUCK & LEE, INC.
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ATTACHMENT B – MATERIALS & PERFORMANCE SPECIFICATIONS

Section 01400 – Responsibilities of CQA Parties

Section 02200 – Earthwork

Section 02207 – Restoration of Surfaces

Section 02209 – Sod

Section 02212 – Topsoil, Seeding, and Mulch

Section 02219 – Geocomposite

Section 02222 – Fill Materials

Section 02232 – Geotextile Fabric

Section 02234 – Flexible Membrane Liner

Section 02600 – Bituminous Concrete Pavements

MATERIALS AND PERFORMANCE - SECTION 01400

RESPONSIBILITIES OF CQA PARTIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section outlines the responsibilities of the various parties involved with the construction of the geosynthetic components of the engineered barriers and the interrelationship between the parties. More detailed descriptions of the responsibilities and specific quality assurance/quality control procedures are presented throughout the Technical Specifications (see Section 1.02 below).

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork

B. Section MP-02222 – Fill Materials

C. Section MP-02232 – Geotextile Fabric

D. Section MP-02234 – Flexible Membrane Liner

E. Section MP-02219 – Geocomposite

1.03 DEFINITIONS

A. ASTM – American Society of Testing and Materials.

B. Contractor – The person or persons selected by GE to perform the remediation activities at Newell Street Area I. In this section, the term "Contractor" also includes any subcontractors retained by the Contractor for the construction and testing of the engineered barriers (e.g., geosynthetics installation contractor, soils testing laboratory, etc.).

C. CQA – Construction Quality Assurance.

D. CQA Laboratory – The person or persons selected by GE or GE's Representative to perform CQA testing on soil and geosynthetic samples collected prior to and during the installation of the engineered barriers.

E. FML – Flexible Membrane Liner.

F. HDPE – High Density Polyethylene.

G. GE's Representative - The person or persons responsible for the design and construction oversight aspects of the project. For this project, GE's Representative is Blasland, Bouck & Lee, Inc. (BBL), headquartered in Syracuse, New York.

H. Layer – A compacted stratum of soil composed of one or more lifts placed without deviation from design grade.

I. Manufacturer – The person or persons retained by the Contractor to supply the geosynthetic materials.

J. MARV – Minimum Average Roll Value.

K. Technical Specifications – Material and performance specifications prepared for the construction materials of the engineered barriers.

L. QA/QC – Quality Assurance/Quality Control.

1.04 ROLES AND RESPONSIBILITIES OF PARTIES

A. The following generally outlines the various roles and responsibilities of the parties involved in the construction and testing of the engineered barriers. Additionally, more specific requirements relating to the various components of the engineered barriers are presented elsewhere in the RFP.

B. GE's Representative shall be responsible for the following:

1. Reviewing Contractor submittals.

2. Collecting conformance samples from geosynthetics following shipment to the site to verify that the materials meet the project requirements. GE's Representative shall submit the conformance samples to the CQA Laboratory for analysis.

3. Performing regular site walk-throughs to review progress and implementation of QA/QC procedures.

4. Reviewing any deviation from the Technical Specifications and Technical Drawings.

5. Reviewing the Contractor's certifications regarding the acceptability of the subgrade to receive geosynthetics. GE's Representative shall either approve or reject the certification. If the certification is rejected, GE's Representative shall identify to the Contractor which areas are deficient.

6. Observing and documenting daily construction activities and the performance and results of QA/QC procedures. The resulting documentation will be used to prepare a certification report and shall not be relied upon solely by the Contractor to document his work activities or the results of QA/QC procedures.

7. Reviewing daily construction reports with the Contractor.

8. Recording on-site activities that could result in damage to components of the engineered barriers.

9. Assisting with the collection of QA/QC samples (i.e., identifying which FML seams to sample for field and laboratory testing) and submitting samples to the CQA Laboratory for testing.

10. Resolving any disputes between the CQA Laboratory and the Contractor.

11. Reviewing field and laboratory QA/QC testing results for conformance with the Technical Specifications and Technical Drawings; providing an interpretation of data to determine areas that are in conformance or not in conformance with the Technical Specifications and Technical Drawings; and identifying areas that require rework and/or repair.

12. Determining acceptance of installed portions of the engineered barriers to permit further construction.

13. Maintaining contact with GE and the Contractor regarding conformance with the required QA/QC procedures.

14. Coordinating engineering and QA/QC activities among the involved parties, including EPA and the Massachusetts Department of Environmental Protection.

C. The Contractor shall be responsible for the following:

1. Installing the various components of the engineered barriers in accordance with the Technical Specifications and Technical Drawings.

2. Identifying to GE's Representative any deviations from the requirements of the Technical Specifications and Technical Drawings that are necessary to accommodate unforeseen field conditions. The Contractor shall not proceed with work associated with the deviation until GE's Representative has reviewed the deviation, consulted with GE, and issued approval to proceed.

3. Certifying that the subgrade is acceptable for placement of geosynthetics.

4. Coordinating its employees and any subcontractors with GE's Representative to facilitate the implementation of the required QA/QC procedures as required by the Technical Specifications and as directed by GE's Representative.

5. Ensuring that the results of laboratory destructive testing of FML seams meet the requirements in the Technical Specifications prior to proceeding with the installation of overlying engineered barrier components.

6. Addressing deficiencies in any component of the engineered barriers that are either identified by QA/QC testing or as directed by GE's Representative.

7. Replacing substandard geosynthetics if the conformance samples collected by GE's Representative identify material deficiencies.

8. Documenting daily work activities and the performance and results of QA/QC testing.

9. Maintaining a set of Record Drawings to document any deviations from the work specified in the RFP. Deviations shall be noted on the Record Drawings as soon as possible following their identification by the Contractor, GE, or GE's Representative.

10. Providing all documentation required in the Technical Specifications and as requested by GE or GE's Representative, including a completion report documenting the installation of the engineered barriers and the associated QA/QC test results.

11. Additional roles and responsibilities as described elsewhere in the RFP.

D. The CQA Laboratory shall be responsible for the following:

1. Materials testing of conformance samples collected by GE's Representative.

2. Destructive seam testing of production-seamed FML samples collected by the Contractor and submitted by GE's Representative.

1.04 DOCUMENTATION

A. The documentation of CQA activities will support a determination of whether construction activities have been carried out in accordance with the Technical Drawings and Specifications. The documentation process includes recognition of construction tasks that should be observed and documented; assignment of responsibilities for the observation, testing, and documentation of these tasks; and finally, the completion of the required reports, data sheets, forms, and check lists to provide an accurate record of the work performed during construction. This section outlines the documentation activities performed by GE that are in addition to the requirements of the Contractor, as discussed throughout these Technical Specifications.

GE's Representative will be responsible for the preparation of completed and signed reports, data sheets, forms, and check lists, as described below, to document that the appropriate CQA requirements have been satisfied.

B. GE's Representative will complete a daily summary report of each day's construction activities. The daily construction report will contain, at a minimum, the following information:

1. Date, project name, location, and the number and names of people on-site;
2. Time work starts and ends, in addition to the time of work stoppages related to inclement weather or insufficient equipment or personnel;
3. Data on weather conditions, including temperature, humidity, wind direction and speed, cloud cover, and precipitation;
4. Contractor's work force, equipment, and materials delivered to or removed from the job site;
5. Chronological description of work in progress, including notices to or requests from the Contractor and/or Installer;
6. Results of testing performed on-site by CQA personnel;
7. Problem/Deficiency identification and documentation describing corrective actions taken for field problems and non-conformance with this plan;
8. A listing of laboratory samples collected, marked, and delivered to the CQA Laboratory;
9. A record of communications with other on-site parties, outside companies, or regulatory agencies, regarding the day's construction activities; and
10. A record of calibrations or standardizations performed on field testing equipment, including actions related to and results of recalibrations.

C. Daily Construction Reports prepared by GE's Representative will include documentation of problems and/or deficiencies noted during construction (e.g., when construction material or activity is observed or tested that does not meet the specified requirements), and corrective action employed to address the problems or deficiencies. The documentation reports will be cross-referenced to the reports, data sheets, forms, and check lists that contain data or observations leading to the determination of a problem or deficiency. Problem and deficiency identification and corrective action documentation will include the following information:

1. A description of the problem or deficiency, including reference to supplemental data or observations related to the determination of the problem or deficiency;

2. Location of the problem or deficiency, including how and when the problem or deficiency was discovered. In addition, an estimate of how long the problem or deficiency existed prior to identification may be included; and

3. A recommended corrective action for resolving the problem or deficiency. If the corrective action has already been implemented, then observations and documentation showing that the problem or deficiency was resolved will be included. If the problem or deficiency has not been resolved by the end of the day upon which it was discovered, then the documentation will state that the deficiency was unresolved at the end of the day.

If the problem or deficiency has not been resolved, then GE's Representative will discuss the corrective actions necessary to resolve the problem or deficiency as soon as possible.

GE's Representative will determine if the problem or deficiency is an indication of a situation that might require changes to the Technical Drawings and Specifications. If this situation develops, a meeting will be held with the appropriate people on site to determine if revisions to the Technical Drawings and Specifications should be made. Revisions to the Technical Drawings and Specifications shall be approved by GE's Representative.

D. Photographs will be taken to document observations, problems, deficiencies, and work in progress. Photographs will be in color print format and will be filed in chronological order in a permanent protective file by GE's Representative.

The following information will be documented in the daily report or a log book for each photograph:

1. Date and time;
2. Location where photograph was taken; and
3. Description of the subject matter.

E. A Completion of Work Report will be assembled by GE's Representative at the end of construction. The Completion of Work Report will contain at least the following information:

1. Record drawings showing the installation of each construction material as it relates to the plan views and individual details;
2. Written correspondence with the Agencies and other permitting authorities;
3. A summary of field observations and tests performed, laboratory samples collected, and test results reported;
4. A summary of problems and deficiencies encountered during construction, including recurring problems and/or deficiencies that were discovered;
5. Documentation that acceptance criteria were met, including a comparison of documented procedure data with proposed Technical Drawings and Specifications and CQA requirements; and
6. Certification that construction was performed in accordance with CQA requirements.

1.05 MEETINGS AND COORDINATION

A. Prior to the start of construction activity, a pre-construction meeting will be held among GE, GE's Representative, and the Contractor. The CQA-related topics covered at this meeting will include, but may not be limited to the following:

1. Procedures and timing for each organization to receive relevant CQA documents and supporting information;
2. CQA requirements and their role relative to the design criteria and the Technical Drawings and Specifications;
3. The responsibilities of each organization;
4. Lines of authority and communication for each organization;
5. The established procedures or protocol for construction deficiencies, repairs, and retesting;
6. Methods of documenting and reporting construction observation data;
7. Methods for distributing and storing documents and reports;
8. Work area security and safety protocol;
9. Procedures for the location and protection of construction materials, and for the prevention of damage of the materials from inclement weather or other adverse conditions;
10. A site walk-through to review site conditions as well as staging and storage locations; and
11. The Contractor's proposed construction schedule.

The pre-construction meeting will be documented by GE's Representatives, and minutes will be transmitted to the attending parties.

B. A progress meeting shall be held at least weekly at the work area. At a minimum, the meeting will be attended by GE's Representative and the Contractor. The purpose of the meetings will be to:

1. Review the work activity for the week;
2. Discuss the Contractor's personnel and equipment assignments for the week;
3. Review the previous week's activities and accomplishments;
4. Review the upcoming work schedule and overall project schedule;
5. Discuss possible problems;
6. Review new test data; and
7. Discuss outstanding issues.

The project progress meetings meeting will be documented by GE's Representative, and minutes transmitted to the attending parties.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. All labor, materials, services, and equipment necessary to complete the earthwork activities as depicted on the Technical Drawings and/or as directed by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-01400 – Responsibilities of CQA Parties

B. Section MP-02207 – Restoration of Surfaces

C. Section MP-02222 – Fill Materials

D. Section 3.22 – Air Monitoring

E. Section 3.23 – Dust Suppression

F. Section 3.24 – Soil Removal and Disposition

G. Section 3.28 – Material Handling and Staging

1.03 SUBMITTALS

A. Contractor's proposed equipment and compaction method(s).

1.04 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

A. American Society for Testing and Materials (ASTM).

1.05 DEFINITION

A. Earthwork is defined to include, but is not limited to, clearing, pavement removal, rough grading, excavation for subgrades, trenching, handling and disposal of surplus materials, maintenance of excavations, removal of water, backfilling operations, embankments and fills, and compaction.

PART 2 - PRODUCTS

Specified elsewhere.

PART 3 - EXECUTION

3.01 UNAUTHORIZED EXCAVATION

A. The Contractor shall not be entitled to any compensation for excavations carried beyond or below the lines and subgrades prescribed on the Technical Drawings. The Contractor shall refill such unauthorized excavations at its own expense and in conformance with the provisions of this section.

B. Should the Contractor, through negligence or for reasons of its own, carry its excavation below the designated subgrade, appropriate materials specified in Section MP-02222 - Fill Materials shall be furnished and placed as backfill in sufficient quantities to reestablish the required subgrade surface. Fill material used for backfilling shall be spread and compacted in conformance with the requirements of later subsections of this section and to the percentage compaction outlined therein. The cost of any tests required as a result of this refilling operation shall be borne by the Contractor.

C. All material that slides, falls, or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid to the Contractor for any materials ordered for refilling the void areas left by the slide, fall, or cave-in.

3.02 BACKFILL MATERIALS

A. Fill material shall be used as specified for backfill. Requirements for off-site fill material are specified in Section MP-02222 - Fill Materials.

B. Existing on-site material, designated as "native fill" or "existing soil" material shall not be used as backfill.

3.03 GENERAL BACKFILLING REQUIREMENTS

A. Backfill shall be started at the lowest section of the area to be backfilled.

B. Drainage of the areas being backfilled shall be maintained at all times.

C. Areas to be backfilled shall be inspected prior to backfilling operations. All unsuitable materials and debris shall be removed.

D. Backfill material shall not be placed when moisture content is too high to allow proper compaction.

E. When material is too dry for adequate compaction, water shall be added to the extent necessary.

F. Backfill material shall not be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments when placed.

G. No calcium chloride or other chemicals shall be added to prevent freezing.

H. Material incorporated in the backfilling operation that is not in satisfactory condition shall be subject to rejection and removal at the Contractor's expense.

I. The maximum lift thickness is 12 inches (measured prior to compaction).

J. For backfill placed directly over geosynthetics (i.e., in areas where engineered barriers are installed), the minimum lift thickness is 12 inches. If the final backfill thickness is less than 12 inches, the contractor shall remove the excess material by back-blading to prevent operation of placement equipment on geosynthetics with less than 12 inches of cover.

3.04 METHOD OF COMPACTION

A. General

1. The Contractor shall adopt compaction methods that shall produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support.
2. Methods used shall avoid disturbance to underlying fine-grained soils, subsurface utilities, and the geosynthetics used in the engineered barriers.

3. Before filling or backfilling is begun, the Contractor shall submit in its Operations Plan the equipment and method for compaction which it proposes to use.

4. Hydraulic compaction by ponding or jetting shall not be permitted.

5. Backfill material shall not be left in an uncompacted state at the close of a day's construction.

6. Prior to terminating work, the final layer of compacted fill, after compaction, shall be rolled with a smooth-drum roller if necessary to eliminate ridges of soil left by tractors, trucks or other equipment used for compaction.

7. As backfill progresses, the surface shall be graded such that no ponding of water shall occur on the surface of the fill.

8. Fill shall not be placed on snow, ice or soil that was permitted to freeze prior to compaction.

9. Unsatisfactory materials shall be removed prior to fill placement.

B. Equipment: Unless otherwise specified on the Technical Drawings or in this RFP, equipment for compaction shall be the largest equipment consistent with space limitations of the work areas and the need to protect adjacent facilities.

1. Compaction of fill material in confined areas shall be accomplished by means of a drum-type, power driven, hand-guided vibratory compactor, or by hand-guided vibratory plate tampers.

2. If the proposed method does not produce the degree of compaction required, an alternate method shall be adopted until the required compaction is achieved.

3. The moisture content of backfill or fill material shall be adjusted, if necessary, to achieve the required degree of compaction.

C. Minimum Compaction Requirements

1. Unless otherwise specified on the Technical Drawings or in this RFP, the degree of compaction specified for the various items listed in Table 1 shall be the minimum allowable.

2. Unless the Contractor can successfully demonstrate that its methods shall produce the required degree of compaction, materials to be compacted shall be placed in layers not exceeding the uncompacted thicknesses listed in Table 1.

3. In-place density tests shall be required at a minimum of one test per each lift of backfill placed or at a frequency of 1 passing test per 2,500 square feet of subgrade, 100 cubic yards of soil fill, or 100 linear feet of trench, whichever is greater.

4. GE or GE's Representative may order additional in-place density tests to ascertain conformance with the compaction requirements shown in Table 1.

5. The Contractor shall dig test holes at no additional cost to GE when requested for the purpose of taking an in-place density test below the current fill level.

6. The Contractor shall provide free access to trenches and fill areas for the purpose of making such tests. Payment for all compaction tests shall be made by the Contractor.

7. The Contractor shall anticipate time needed due to testing procedures and shall not have claims for extra compensation occasioned by such time.

8. Minimum field compaction requirements in Table 1 are expressed as a percentage of the maximum dry unit weight of the material compacted using the Modified Proctor Compaction Test (ASTM D1557).

TABLE 1

Type of Backfill	Maximum Uncompacted Lift Thickness[1] (inches)	Minimum Compaction (percent)
1. Subgrade -Native Soil	Not applicable	Proof-rolling
2. Embankments and Fills	12	90
3. Pipe Trenches	8	92
4. Pipe and Manhole Bedding	8	92
5. Road and Parking Lot Subbase	8	95
6. Topsoil	8	Compact by placing/grading only

Note:
1. Maximum uncompacted lift thicknesses do not apply to backfill placed directly over geosynthetics in areas receiving engineered barriers.

9. Laboratory compaction curves for the full range of soil materials shall be provided by the Contractor.

10. When proof-rolling existing (or native) soils, the layer shall be acceptable when deformations caused by substantial site equipment (e.g., roller, fully loaded dump truck) are no deeper than 1 inch. All soft or wet materials that continue to deform more than 1 inch shall be removed and replaced with suitable material.

3.05 GRADING

A. After the completion of all fill and backfill operations, the Contractor shall grade the site to the lines, grades, and elevations shown on the Technical Drawings, taking into account any subsequent site restoration requirements (e.g. installation of engineered barriers).

3.06 EXISTING FACILITIES

A. General

1. Existing subsurface facilities may be encountered during construction of the work, or located in close proximity to the work.

2. These facilities may include, but are not necessarily limited to, sewers, drains, water mains, conduits and their appurtenances. These facilities may not be shown on the Technical Drawings. However, the sizes, locations, and heights or depths, if indicated, are only approximate and the Contractor shall conduct its operations with caution and satisfy itself as to the accuracy of the information given. The Contractor shall not claim nor shall it be entitled to receive compensation for damages sustained by reason of the inaccuracy of the information given or by reason of its failure to properly maintain and support such structures.

3. There may be other subsurface facilities, the existence and/or location of which are not known, such as individual water and gas services, electrical conduits, storm drains, etc. The Contractor shall consult with GE or GE's Representatives of such facilities and, if possible, shall determine, prior to construction, the location and depth of any such facilities that may exist in the area to be excavated.

4. If underground facilities are known to exist in an area but their location is uncertain, the Contractor shall exercise reasonable care in its excavation technique to avoid damage to them.

5. The Contractor shall notify Massachusetts DIGSAFE at least 72 hours prior to any site work.

B. Notification and Protection Procedures

1. Except where superseded by state or local regulations, or in the absence of any applicable regulations, the Contractor shall, at a minimum, include the following procedures in its operations:

   a) Prior to Excavating:

      1) Determine correct field location of all nearby underground facilities or arrange for Representatives of the utilities to locate them.

      2) Notify owners of nearby underground facilities when excavation is to take place, allowing them reasonable time to institute precautionary procedures or preventive measures which they deem necessary for protection of their facilities.

      3) In cooperation with owners of nearby facilities, provide temporary support and protection of those underground facilities that may be especially vulnerable to damage by virtue of their physical condition or location, or those that could create hazardous conditions if damaged.

   b) Immediately notify any utility owner of any damage to its underground facilities resulting from the Contractor's operations, and arrange for repairs to be made as soon as possible.

c) In case of an electrical short, or escape of gas or hazardous fluids (resulting from damage to an underground facility), immediately notify the local Fire Department and all persons who might be endangered and assist in evacuation of people from the area.

3.07 OTHER REQUIREMENTS

A. Unfinished work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways shall have temporary pavement.

B. Hauling Material on Street

1. When hauling material over the streets or pavement, the Contractor shall provide suitably tight-sealing vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets, and pavements clean and free from dirt, mud, stone, and other hauled material.

2. When hauling materials that contain PCBs or other hazardous constituents, the Contractor shall abide by all applicable federal, state, and local codes, including, but not limited to, manifesting and placarding (if necessary).

C. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of its operations to such a degree that it will not endanger the safety and welfare of the general public.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02207

RESTORATION OF SURFACES

PART 1 - GENERAL

1.01 DESCRIPTION

A. All types of surfaces, structures and appurtenances disturbed, damaged, or destroyed during the performance of the work under or as a result of the operations of the Contract, shall be restored and maintained, as specified herein or as directed by GE or GE's Representative.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to or better than the condition of each before the work began, as approved by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork

B. Section MP-02212 – Topsoil, Seeding, and Mulch

C. Section MP-02222 – Fill Materials

D Section MP-02232 – Geotextile Fabric

E. Section MP-02209 – Sod

F. Section MP-02600 – Bituminous Concrete Pavements

1.03 SUBMITTALS

A. A schedule of restoration operations shall be submitted by the Contractor for review.

B. Materials cut sheets for chain link fencing.

C. Name of proposed fencing installer shall be submitted by the Contractor for review.

1.04 SCHEDULE OF RESTORATION

A. After an accepted schedule has been agreed upon, it shall be adhered to unless otherwise revised with the approval of GE or GE's Representative.

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

PART 2 - PRODUCTS

2.01 CHAIN LINK FENCING

A. Chain Link Fencing shall comply with the following specifications:

10' Fence:

Fabric:	2" Aluminized Mesh, 9 gauge, selvage to be knuckle/knuckle	
Framework:	Top and bottom rails:	1-5/8" schedule 40
	Line posts	2-1/2" schedule 40
	Brace Rail	1-5/8" schedule 40
	Corner Posts	3" schedule 40
	End Posts	3" schedule 40
	Gate Posts	4" schedule 40
	Gate Frame	2" schedule 40

6' or 8' Fence:

Fabric:	2" Aluminized Mesh, 6 gauge, selvage to be knuckle/knuckle	
Framework:	Top and bottom rails:	1-5/8" schedule 40
	Line posts	2-1/2" schedule 40
	Brace Rail	1-5/8" schedule 40
	Corner Posts	2-1/2" schedule 40
	End Posts	3" schedule 40
	Gate Posts	3" schedule 40
	Gate Frame	2" schedule 40

Post Attachment: install fencing using bolted flanges to concrete slabs or install concrete footings where posts will be located in grass area.

10' Fence: in lawn or earth areas install 48" deep x 12" diameter concrete footings at posts. Install 48" deep x 14" diameter concrete footings at corners.

8' Fence: in lawn or earth areas install 48" deep x 12" diameter concrete footings at posts.

6' Fence: in lawn or earth areas, drive fence posts to depth of 4' minimum.

PART 3 - EXECUTION

3.01 GRAVEL OR ASPHALT PAVEMENT

A. All pavement and other areas surfaced with gravel or asphalt shall be replaced with material to match the existing surface unless otherwise specified.

1. The thickness of the asphalt or gravel shall be at least equal to the existing.

2. After compaction, the surface shall conform to the slope and grade of the area being replaced.

3.02 CURBS AND GUTTER REPLACEMENT

A. Curbs and gutters removed or damaged in connection with or as a result of the construction operations shall be replaced with new construction.

B. The minimum length of curb or gutter to be left in place or replaced shall be 5 feet. Where a full section is not being replaced, the existing curb or gutter shall be saw cut to provide a true edge.

1. The restored curb or gutter shall be the same shape, thickness and finish as being replaced and shall be constructed of concrete, stone, asphalt, or other material so as to match the material of the curb or gutter being replaced.

3.03 GRASSED AREAS

A. The furnishing and placing of topsoil, seed and mulch shall be as directed by GE or GE's Representative.

B. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

C. Any washout or damage that occurs shall be regraded and reseeded until a good sod is established.

D. The Contractor shall maintain the newly seeded areas in good condition, including regrading, reseeding, remulching, and watering.

3.04 OTHER TYPES OF RESTORATION

A. Drainage structures, including culverts, manholes, catch basins, sidewalks, pavements and piping, that are destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location and grade unless otherwise shown on the Technical Drawings. When there is minor damage to a drainage structure and with the consent of GE or GE's Representative, a repair may be undertaken, if satisfactory results can be obtained.

B. Fences and gates destroyed, damaged, removed or otherwise altered as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location unless otherwise noted.

C. Chain link fencing shall be installed by a properly licensed, qualified fencing installer.

3.05 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02209

SOD

PART 1 – GENERAL

1.01 DESCRIPTION

A. This work shall consist of the construction of lawn on the areas indicated on the plans in accordance with these specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork.

B. Section MP-02207 – Restoration of Surfaces.

C. Section MP-02212 – Topsoil, Seeding, and Mulch.

D. Section MP-02222 – Fill Materials.

1.03 SUBMITTALS

A. The Contractor shall submit the name and location of the source for sod.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Sod shall be composed of the grass mixture as recommended by the New England Sod Producer's Association and shall be specified as:

Tall Fescue	80 – 100%
Kentucky Bluegrass	0 – 20%
Perennial Ryegrass	0 – 20%

B. Sods shall have been nursery grown on cultivated agricultural land specifically for sod purposes. The sod shall be free of objectionable grassy and broad leaf weeds. Sods shall be considered free of such weeds if less than 5 such plants are found per 100 square feet of area.

C. The sod shall be machine cut at a uniform minimum thickness of 1 inch at the time of cutting. Measurement for thickness shall exclude top growth and thatch.

D. Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be 5%. Broken pads and torn or uneven ends will not be acceptable.

PART 3 – EXECUTION

3.01 INSTALLATION

A. A foundation for the sod shall consist of loam borrow, plantable soil borrow or topsoil rehandled and spread in quantities sufficient to produce a depth of at least 4 inches after tamping and natural settlement has taken place for 1 month. Soil surface shall have a continuous surface free of stones, sticks or roots greater than 1 inch in any dimension, without voids or irregularities. Prior to placement of sod, loam shall be lightly scarified with a rake and watered lightly.

1. Fresh sod shall then be placed in final position on the designated areas. All sods shall be harvested, delivered and installed within 48 hours. When air temperature exceeds 90°F the period of time from harvest to installation shall be less than 24 hours.

2. Planting season for sod shall be from April 15 to June 1 and from August 15 to November 1. Any requests to deviate from this schedule must be submitted by the Contractor to GE in writing. Sod shall not be planted in soil with a temperature greater than 90°F.

3. Work shall progress in such a manner that workers are not walking on installed sod. Sod shall be placed parallel with the contour. Vertical joints between sods shall be staggered. Ends and sides of sod shall be butted closely together so that sod is not stretched and ends do not dry out. Contractor shall use full pieces throughout, and trim excess with clean straight cuts. Waste sod and scraps shall not be assembled to create a new piece. All sods shall be very carefully handled, to prevent loosening and separation of the loam from the roots. The sod shall be settled by watering it and by tamping on a board laid over it.

4. If sod cannot be installed immediately upon arrival to the site, the sod shall be stored in a shaded location, sprinkled with water, and covered with burlap, straw or other acceptable material which shall be kept moist when required and as directed. The sod shall be placed in layers so that the grassy side of the first or bottom layer shall be uppermost, whereas in the next succeeding layer in immediate contact with the corresponding surface of the preceding layer. The sod shall not be stored in such a manner to compress the thickness of sod below 2 inches.

B. On slopes steeper than 3:1, sod shall be held securely in place with wooden pegs. The pegs shall be placed at intervals not greater than 3 feet. Pegs shall be at least 1 foot in length, driven flush with the surface of the sod. Other approved methods of fastening sod to slopes may be used where pegging is not practicable. Pegs shall not be used within the limits of the engineered barriers, regardless of slope.

C. When the sod has been set in final position, loam shall be used to fill the joint and as a surface dressing to cover the sodded areas to a depth of about 0.25 inch. A grass seed mixture conforming to the specification stated in MP-02212 shall be mixed with clean, dry sand or dry sandy loam and sown upon the loam surface dressing at the rate of 0.45 pounds per 100 square yards. The sodded areas shall then be compacted, and the compaction shall be equivalent to that provided by hand roller with a mass of between 75 and 100 pounds per foot of width and to produce a smooth, uniform surface.

3.02 MAINTENANCE

A. The Contractor shall maintain all of the sodded areas for a minimum of 30 days following installation, or until the work has been officially accepted by GE, whichever is longer, without additional

compensation. Before acceptance of the work, a satisfactory uniform stand of grass will be required. Partial acceptances will not be granted.

1. If necessary, suitable signs and barricades shall be placed to protect the sodded areas. Barriers shall be removed prior to final inspection.

2. Maintenance shall include watering, mowing, and any reseeding or resodding determined necessary by GE.

3. Sod shall be watered in sufficient quantities to maintain adequate soil moisture to a depth of 4 inches. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage of the turf by the watering equipment.

4. Mowing shall occur before turf exceeds 5 inches, and shall be cut to a height of 3 inches.

3.03 WARRANTY

A. The Contractor shall provide a full warranty on the sod for a period extending no less than one year from the date of acceptance by GE. The warranty shall include materials and costs associated with replacement of sod that does not survive the warranty period.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02212

TOPSOIL, SEEDING, AND MULCH

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work under this section consists of furnishing and placing of topsoil, fertilizer, seed, mulch, erosion control matting, and maintenance of seeded areas until final acceptance.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-02200 – Earthwork

B. Section MP-02207 – Restoration of Surfaces

C. Section 3.31 – Soil Fill Sources

D. Section 3.33 – Site Restoration and Warranty

1.03 SUBMITTALS

A. Analysis of the seed (to demonstrate compliance with the seed mix identified in Section 2.01 of this specification) and fertilizer (to identify chemical composition), and proposed application rates (to demonstrate compliance with the fertilizer application rate identified in Section 3.01B of this specification).

B. Should hydroseed be used, the Contractor shall submit all data including material and application rates.

C. Sample of topsoil to be tested by GE for chemical contaminants as discussed in Section 3.31 - Soil Fill Sources.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Any off-site topsoil shall be unfrozen, friable, natural loam and shall be free of clay lumps, brush needs, litter, stumps, stones, and other extraneous matter. The topsoil shall have an organic content between 5% and 20%, and a pH between 5.5 and 7.5.

B. Fertilizer shall be a standard quality commercial carrier of available plant food elements. A complete prepared and packaged material containing a minimum of 5% nitrogen, 10% phosphoric acid, and 10% potash.

1. Each bag of fertilizer shall bear the manufacturer's guaranteed statement of analysis.

C. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix. All seed shall meet the State standards of germination and purity.

D. Seed mix:

65% Kentucky Blue Grass
20% Perennial Rye Grass
15% Fescue

E. Mulch shall be stalks of oats, wheat, rye, or other approved crops free from noxious weeds and coarse materials.

F. Temporary erosion control matting shall be S75 as manufactured by North American Green, or equivalent.

G. Permanent erosion control matting shall be P300P as manufactured by North American Green, or equivalent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The topsoil shall be applied in a single loose lift of not less than 6 inches. No compaction is required or allowed. Following placement of topsoil and prior to fertilizer application, all stones greater than 1-inch in diameter, sticks, and other deleterious material shall be removed.

B. The fertilizer shall be applied to the surface uniformly at the rate of 20 pounds per 1,000 square feet.

1. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disk or other suitable method traveling across the slope if possible.

   - After the soil surface has been fine-graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate specified by the seed manufacturer.

   - The seed shall be raked lightly into the surface.

   - Seeding and mulching shall not be done during windy weather.

   - Mulch (where used) shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches in uniform thickness at loose measurement with a minimum of 90% surface coverage. Excessive amounts or bunching of mulch shall not be permitted.

2. Unless otherwise specified, mulch shall be left in place and allowed to decompose.

3. Any mulch that has not disintegrated at time of first mowing shall be removed.

- Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be performed in such a manner as to prevent washing out of seed and mulch.

- Hydroseeding may be accepted as an alternative method of applying fertilizer, seed, and mulch. The Contractor must submit all data regarding materials and application rates to GE or GE's Representative for review.

- Temporary and permanent erosion control matting shall be installed in accordance with manufacturer's specifications.

3.02 MAINTENANCE

A. All erosion rills or gullies within the topsoil layer shall be filled with additional approved topsoil, graded smooth, and re-seeded and mulched.

B. The Contractor shall also be responsible for repairs to all erosion of the seeded areas until all new grass is firmly established and reaches a height of not less than 4 inches. All bare or poorly vegetated areas must be re-seeded and mulched.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02219

GEOCOMPOSITE

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide all labor, materials, tools, and equipment necessary to furnish and install geocomposite where specified in the Technical Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-01400 – Responsibilities of CQA Parties

B. Section MP-02232 – Geotextile Fabric

C. Section MP-02234 – Flexible Membrane Liner

1.03 REFERENCES

A. American Society of Testing and Materials (ASTM);

1.	D1505-98	Specific Gravity
2.	D1238-01	Melt Flow Index
3.	D1603-01	Carbon Black Content
4.	D374-99	Thickness
5.	D4716-01	Constant Head Transmissivity
6.	D3776-96	Weight
7.	D1777-96	Thickness
8.	D4632-91	Grab Tensile and Grab Elongation
9.	D4833-00	Puncture
10.	D4751-99a	A.O.S.
11.	D4533-98	Trapezoidal Tear
12.	D4491-99a	Water Flow Rate
13.	D413-98	Ply Adhesion

1.04 SUBMITTALS

A. Operational Submittals

1. Manufacturer's data for the geocomposite including physical properties and roll size.
2. The origin (supplier's name and production plant) and identification (brand name and number) of the geotextile and geonet used to fabricate the geocomposite.
3. Geocomposite material sample.
4. Manufacturer's quality assurance/quality control program.
5. Certified results of all quality control testing.
6. Written certification that the MARVs given are guaranteed by the Manufacturer.
7. Contractor's proposed transportation, handling, and storage techniques.
8. Shop drawings, and proposed installation techniques.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. GSE Lining Technology, Inc.; or

B. Equal.

2.02 MATERIALS

A. The geocomposite shall be comprised of a high-density polyethylene (HDPE) drainage net composited with two, 12 oz/yd^2 non-woven geotextiles. The geotextiles shall be heat bonded to both sides of the drainage net.

1. The drainage net to be used in the composite shall be a profiled mesh made by extruding two sets of high density strands together to form a diamond shaped, three-dimensional net to provide planar fluid flow. The drainage net shall be made of HDPE containing carbon black, anti-oxidants, and heat stabilizers that shall be manufactured from resin provided from one resin supplier.

2. The geotextile shall be a non-woven, needle punched polymeric material.

B. The geocomposite shall meet the following specifications:

1. Drainage Net

Property	Test Method	Test Value
Specific Gravity (g/cm^3)	ASTM D1505	0.94 minimum
Melt Flow Index (g/10 min)	ASTM D1238 – Condition E	0.3 maximum
Carbon Black Content (%)	ASTM D1603	2.0 minimum

2. Geotextile

Property	Test Method	Test Value
Fabric Weight (oz/yd^2)	ASTM D-5261-92	12 minimum
Grab Strength (lbs.)	ASTM D-4632	203 minimum
Puncture Resistance (lbs.)	ASTM D-4833	79 minimum
A.O.S. (mm)	ASTM D-4751	0.43 max. avg. roll value
Permittivity (sec^{-1})	ASTM D-4491	0.1 minimum

3. Composited Materials

Property	Test Method	Minimum Test Value
Transmissivity (m^2/s)	ASTM D4716*	1.13×10^{-3}
Ply Adhesion (lb/in width)	ASTM D413	0.5

* Test methods to be performed with the following modifications:

Substrate Material:	60-mil HDPE geomembrane
Superstrate Material:	Neoprene or 6-inches of representative soil
Applied Normal Compressive Load:	5,000 lbs/sq.ft.
Seating Time:	100 hours (minimum)
Hydraulic Gradient:	0.1

2.03 DELIVERY, STORAGE AND HANDLING

A. The geocomposite shall be packaged and shipped by appropriate means so as to prevent damage. Geocomposite rolls will be wrapped in relatively opaque and water tight plastic to prevent damage during shipping and storage. Geocomposite rolls that have been delivered to the job site will be unloaded and stored in their original, unopened wrappers in a secure, dry area, and protected from weathering. Materials shall be delivered only after the required submittals have been received and reviewed by GE or GE's Representative.

B. The geocomposite shall be furnished in rolls, marked or tagged with the following information:

1. Manufacturer's Name
2. Product Identification
3. Lot/Batch Number
4. Roll Number
5. Roll Dimensions

C. The geocomposite shall be stored in an area approved by GE or GE's Representative that prevents damage to the product or packaging.

D. The geocomposite shall be kept clean and free from dirt, dust, mud, and any other debris.

E. Any geocomposite found to be damaged shall be replaced with new material at the Contractor's expense.

2.04 QUALITY ASSURANCE

A. Field delivered material shall meet the specification values according to the manufacturer's specification sheet. The Contractor shall submit written certification that the delivered material meets the manufacturer's specifications. The Contractor shall submit to GE or GE's Representative certified quality control test results conducted by the manufacturer during the manufacturing of the geocomposite delivered to the project site. The results must identify the sections of field delivered geocomposite they represent. The Contractor shall also provide the lot and roll number for the material delivered to the site.

B. The manufacturer shall have developed and shall adhere to its own quality assurance program in the manufacture of the geocomposite.

C. Prior to installation, the Contractor shall provide the Installer's written verification that the geocomposite has not been damaged due to improper transportation, handling, or storage.

D. Each of the installer's personnel shall have recorded 500,000 sq. ft. of successful material installation.

E. The Contractor shall provide shop drawings for indicating panel layouts and installation sequence.

F. The Contractor shall provide quality control certificates for the geocomposite, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include lot and roll identification numbers, testing procedures and results of quality control tests. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

a. Unit weight (geotextile component) (ASTM D5261).

b. Thickness (ASTM D1777).

c. Geotextile-geonet ply adhesion (ASTM D413).

d. Transmissivity Testing (ASTM D4716).

Quality control tests for the first three parameters listed above shall be performed at least once every 40,000 ft^2 of geocomposite produced. Quality control tests for transmissivity testing shall be performed at least once every 100,000 ft^2 of geocomposite produced.

G. Field delivered material will be subject to the following conformance tests by GE or GE's Representative:

a. Geotextile-geonet ply adhesion (ASTM D-413); and

b. Transmissivity (ASTM D-4716).

All conformance test results will be reviewed and material accepted or rejected by GE or GE's Representative prior to the deployment of the geocomposite. GE or GE's Representative will review results from laboratory conformance testing. If the Contractor has reason to believe that failing tests may be the result of the CQA Laboratory incorrectly conducting the tests, the Contractor may request that the sample in question be retested by the CQA Laboratory with a technical representative of the Manufacturer present during the testing. This retesting shall be done at the expense of the Contractor. Alternatively, the Contractor may have the sample retested at two different approved CQA Laboratories at the expense of the Contractor. If both laboratories produce passing results, the material may be accepted. If both laboratories do not produce passing results, then the original CQA Laboratory's test results will be accepted. The use of these procedures for dealing with failed test results is subject to the approval of GE or GE's Representative.

If a test result is not in conformance with a required MARV, all material from the lot represented by the failing test shall be considered out of specification and rejected. Alternatively, at the option of GE or GE's Representative, additional conformance test samples may be taken to "bracket" the portion of the lot not meeting specification (note that this procedure is valid only when all rolls in the lot are consecutively produced and numbered from one manufacturing line). To isolate the out-of-specification material, additional samples must be taken from rolls that have roll numbers immediately adjacent to the roll that was sampled and failed. If both additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number) will

be rejected. If one or both of the additional tests fail, then the entire lot will be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot.

PART 3 - EXECUTION

3.01 PREPARATION

A. The areas designated for placement of geocomposite shall be free from any deleterious material.

B. If the geocomposite is not clean before installation, it shall be washed by the Contractor until accepted by GE or GE's Representative.

3.02 INSTALLATION

A. Geocomposite shall be installed at locations shown on the Technical Drawings.

B. Adjacent rolls shall be installed so that the geonet component will have a minimum overlap of 4 inches.

C. The geonet shall be tied with plastic fasteners every 5 feet along the slope, every 6 inches on butt seams, and every 6 inches in the anchor trench.

D. The geotextiles shall be continuously sewn using a polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile.

E. The geocomposite shall be unrolled downslope, keeping the net in slight tension to minimize wrinkles and folds.

F. If a tri-planar material is used, it must be installed in the appropriate flow direction.

G. Adequate loading shall be placed to prevent uplift by wind.

H. Holes or tears in the geocomposite shall be repaired in accordance with the manufacturer's recommendations.

I. Any portion of the geocomposite exhibiting a flaw shall be repaired. Prior to acceptance of the geocomposite, the Installer shall locate and repair all damaged areas as directed by GE's Representative.

3.03 QUALITY CONTROL

A. The Contractor shall provide as-built drawings identifying panel layout, locations or imperfections, and repairs and any other appropriate observations.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02222

FILL MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Work under this section shall include, but not necessarily be limited to, supplying all labor and materials, excavating, transporting, dumping, spreading, and compacting fill material in the locations and to the depth shown on the Technical Drawings and/or as directed by GE or GE's Representative.

B. Applicable Standards and Specifications

1. American Society for Testing Materials (ASTM).
2. American Association of State Highway and Transportation Officials (AASHTO).

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-01400 – Responsibilities of CQA Parties

B. Section MP-02200 – Earthwork

1.03 SUBMITTALS

A. Refer to Sections 3.2 and 3.35 of the Conditions of Work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Fill materials shall be of the types listed below:

1. Soil Fill:

a. Soil fill material shall be free from excessive moisture, frost, stumps, trees, roots, sod, muck, marl, vegetable matter, or other unsuitable materials, and demonstrated to be clean based on chemical analysis. Soil Fill shall consist of clean common earth fill free from organic material, coatings, sharp angular stones, and other deleterious materials, and shall have a maximum particle size of 3 inches. Soil Fill shall have the following gradation by weight:

Percent Passing	Sieve
100	3-inch
10-30	No. 200

2. Subbase/Gravel:

   a. Subbase/gravel shall have a percentage of wear, by the Los Angeles test, of not more than 45. Fine aggregate shall consist of natural or crushed sand. The composite material shall be free from clay, loam or other plastic material, and shall conform to the following grading requirements:

Sieve Designation	Percent Passing
2-inch	100
1.5-inch	70 - 100
3/4-inch	50 - 85
No. 4	30 - 55
No. 50	8 - 24
No. 200	3 - 10

   b. Sampling and testing shall be in accordance with the following standard AASHTO methods:

      Sieve Analysis – T27
      Passing No. 200 (75μm) – T11

3. Filter Stone:

   a. Material placed above collection piping shall be washed, rounded run-of-bank gravel, with a d_{max} of 1 ½-inches and a d_{min} of 3/4-inches.

   b. Filter stone shall be wrapped with non-woven geotextile as shown on the Technical Drawings.

4. Riprap:

   a. Type 1 Riprap shall have a d_{50} of 2 inches and a d_{max} of 4 inches and be placed in a 12-inch thick layer at pipe outfalls and in an 8-inch thick layer at the termination of above-grade engineered barriers.

   b. Type 2 Riprap shall have a d_{50} of 3 inches and a d_{max} of 6 inches and be placed in a 12-inch thick layer.

   c. Riprap shall be underlain by a layer of non-woven geotextile.

B. Backfill material shall be inspected prior to placement and all roots, vegetation, organic matter, or other foreign debris shall be removed.

C. With the exception of riprap, stones larger than 6 inches in any dimension shall be removed or broken. Additional size requirements for backfill placed within 6 inches of the bottoms of engineered barriers are as specified.

D. Stones shall not be allowed to form clusters with voids.

PART 3 - EXECUTION

3.01 FILL PLACEMENT

A. In general, fill material shall be placed and compacted in horizontal layers not exceeding those thicknesses indicated in Section MP-02200 - Earthwork. Subgrade that will receive fill material shall be first approved by GE or GE's Representative. Fill material shall not be placed on ground that will not support the weight of construction equipment.

B. Each layer of fill material shall be thoroughly tamped or rolled to the required degree of compaction by mechanical tampers or vibrators. Successive layers shall not be placed until the layer under construction has been thoroughly compacted.

C. Where required, the Contractor shall, at its own expense, moisture-condition the fill to meet the compaction requirements. If the material is too wet for satisfactory compaction due to rain or other causes, it shall be allowed to dry or be removed as required before compaction.

D. No compaction is required for riprap.

3.02 FIELD TESTING AND QUALITY CONTROL

A. In-place nuclear density testing (ASTM D2922 and D3017) shall be performed by an independent testing laboratory, at the Contractor's expense, at the frequency specified in Section MP-02200 - Earthwork.

B. If a defect (e.g., insufficient layer thickness, materials that exceed particle size requirements, etc.) is discovered in a finished fill material layer, GE or GE's Representative will determine the extent and nature of the defect by additional testing, observation, a review of records, or other means that GE or GE's Representative deems appropriate. The Contractor shall be responsible for correcting all deficiencies to the satisfaction of GE or GE's Representative.

3.03 CRITERIA AND TOLERANCES

A. Fill material shall be constructed to such heights as to make allowance for post-construction settlement. Any settlement that occurs before final acceptance of the Contract shall be corrected to make the backfill conform to the required lines and grades.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02232

GEOTEXTILE FABRIC

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall supply all labor, materials, tools, and equipment required to furnish and install cushion geotextile fabric beneath the engineered barriers and as shown on the Technical Drawings or as indicated by GE or GE's Representative.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-01400 – Responsibilities of CQA Parties

B. Section MP-02234 – Flexible Membrane Liner

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1.	D5261-92	Unit Weight
2.	D4632-91	Grab Tensile and Grab Elongation
3.	D3786	Mullen Burst
4.	D4833-00	Puncture
5.	D4533-91	Trapezoidal Tear
6.	D4355-99	Ultraviolet Resistance
7.	D4751	Filtration
8.	D4491	Permeability

1.04 SUBMITTALS

A. Manufacturer's data for geotextile including, at a minimum, physical properties, packaging, and installation techniques.

B. The origin (resin supplier's name and resin production plant) and identification (brand name and number) of the resin used to manufacture the geotextile.

C. Copies of dated quality control certificates issued by the resin supplier.

D. Manufacturer's quality assurance/quality control program.

E. Certified results of all quality control testing.

F. Reports on quality control tests conducted by the Manufacturer to verify that the resin used to manufacture the geotextile meets the Manufacturer's resin specifications.

G. Reports on quality control tests conducted by the Manufacturer to verify that the geotextile manufactured for the project meets the project specifications.

H. A list of the materials that comprise the geotextile, expressed in the following categories as percent by weight: base polymer, carbon black, other additives.

I. Written certification that the MARVs given in the specification are guaranteed by the Manufacturer.

J. Contractor's proposed transportation, handling, storage, and installation techniques.

K. Shop drawings.

L. Manufacturer's standard warranty provided for the geotextiles.

PART 2 - PRODUCT

2.01 ACCEPTABLE MANUFACTURERS

A. Synthetics Industries.

B. Amoco.

C. Equal.

2.02 MATERIALS

A. For these specifications and the Technical Drawings, the terms "geotextile" and "geotextile fabric" shall be considered synonymous.

B. The non-woven geotextile shall be of needle-punched construction and consist of long-chain polymeric fibers or filaments composed of polypropylene, shall be free of any chemical treatment that reduces permeability, and shall be inert to chemicals commonly found in soil.

C. The non-woven geotextile indicated on the Technical Drawings for cushioning beneath the FML shall have the MARV for each physical property listed below:

Property	Unit of Measure	Test Method	Minimum Test Value
Grab Tensile	lbs.	ASTM D4632	203
Grab Elongation	%	ASTM D4632	50
Mullen Burst	psi	ASTM D3786	247
Puncture	lbs	ASTM D4833	79
Trapezoidal Tear	lbs	ASTM D4533	79
UV Resistance	% Retained @ 500 hrs.	ASTM D4355	50
Unit Weight	oz./yd.^{2}	ASTM D5261	16

D. The non-woven geotextile indicated on the Technical Drawings for use with filter stone around subsurface collection pipes and beneath manhole subbase and riprap shall have the MARV for each physical property listed below:

Property	Unit of Measure	Test Method	Minimum Test Value
Grab Tensile	lbs.	ASTM D4632	158
Grab Elongation	%	ASTM D4632	50
Mullen Burst	psi	ASTM D3786	189
Puncture	lbs	ASTM D4833	56
Trapezoidal Tear	lbs	ASTM D4533	56
UV Resistance	% Retained @ 500 hrs.	ASTM D4355	50
Permittivity	sec^{-1}	ASTM D4491	1.8
Apparent Opening Size	mm	ASTM D4751	70/140

2.03 DELIVERY, STORAGE AND HANDLING

A. The geotextile shall be furnished in a protective wrapping that shall be labeled with the following information: Manufacturer's name, product identification, lot number, roll number, and dimensions.

B. The geotextile shall be protected from ultraviolet light, precipitation, mud, soil, excessive dust, puncture, cutting, and/or other damaging conditions prior to and during delivery and on-site storage. The geotextile shall be shipped and stored in relatively opaque and watertight wrappings. The geotextile shall be stored on-site at a location approved by GE or GE's Representative.

2.04 QUALITY ASSURANCE

A. The field-delivered fabric shall meet the specification values according to the Manufacturer's specification sheet. The Contractor shall submit written certification that the delivered material meets the Manufacturer's specifications. The Contractor shall provide the quality control test results conducted by the Manufacturer during the manufacturing of the geotextile fabric delivered to the project site. The results shall identify the sections/panels of field-delivered fabric they represent. The Contractor shall also provide the lot and roll number for the fabric delivered to the site.

B. The Manufacturer shall have developed and shall adhere to its own quality assurance program in the manufacture of the geotextile.

C. The Installer shall verify, in writing and prior to installation, that the geotextile fabric has not been damaged due to improper transportation, handling, or storage.

D. The Contractor shall provide shop drawings indicating panel layouts and installation sequence.

E. The Contractor shall provide quality control certificates, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include lot and roll identification numbers,

testing procedures, and results of quality control tests. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

a. Unit weight (ASTM D5261).

b. Grab strength (ASTM D4632).

c. Trapezoidal tear strength (ASTM D4533).

d. Burst strength (ASTM D3786).

e. Puncture structure (ASTM D4833).

f. UV resistance (ASTM D4355).

g. Filtration (ASTM D4751).

h. Permeability (ASTM D4491).

Quality control tests listed above as a, b, c, d, and e shall be performed for each lot number at a minimum frequency of once every 100,000 ft^2 of geotextile produced. Quality control tests listed above as f, g, and h shall be performed at the frequency specified by the Manufacturer in its quality control plan.

F. Field delivered material will be subject to the following conformance tests by GE or GE's Representative:

a. Unit Weight (ASTM D5261);

b. Grab Strength (ASTM D4632);

c. Trapezoidal tear strength (ASTM D4533);

d. Burst strength (ASTM D3786); and

e. Puncture strength (ASTM D4833).

All conformance test results will be reviewed and material accepted or rejected by GE or GE's Representative prior to the deployment of the geotextile. GE or GE's Representative will review results from laboratory conformance testing. If the Contractor has reason to believe that failing tests may be the result of the CQA Laboratory incorrectly conducting the tests, the Contractor may request that the sample in question be retested by the CQA Laboratory with a technical representative of the Manufacturer present during the testing. This retesting shall be done at the expense of the Contractor. Alternatively, the Contractor may have the sample retested at two different approved CQA Laboratories at the expense of the Contractor. If both laboratories produce passing results, the material may be accepted. If both laboratories do not produce passing results, then the original CQA Laboratory's test results will be accepted. The use of these procedures for dealing with failed test results is subject to the approval of GE or GE's Representative.

If a test result is not in conformance with a required MARV, all material from the lot represented by the failing test shall be considered out of specification and rejected. Alternatively, at the option of GE or GE's Representative, additional conformance test samples may be taken to "bracket" the portion of the lot not meeting specification (note that this procedure is valid only when all rolls in the lot are consecutively produced and numbered from one manufacturing line). To isolate the out-of-specification material, additional samples must be taken from rolls that have roll numbers immediately

adjacent to the roll that was sampled and failed. If both of the additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number) will be rejected. If one or both of the additional tests fail, then the entire lot will be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to installing the geotextile, placement surfaces shall be leveled and uniformly compacted, as necessary, to provide a stable interface for the geotextile that is as smooth as possible.

B. Prior to installing the geotextile, the Installer shall certify in writing that the surface on which the geotextile will be installed is acceptable. The certification is subject to the review and approval or rejection by GE or GE's Representative.

3.02 GEOTEXTILE INSTALLATION

A. The following procedures and requirements will be followed during the geotextile installation.

1. Placement:

   a. Placement of the geotextile shall not be conducted during adverse weather conditions. The geotextile shall be kept dry during storage and up to the time of deployment. During windy conditions, all geotextiles shall be secured with sandbags or an equivalent approved anchoring system. Removal of the sandbags or equal shall only occur upon placement of an overlying soil layer.

   b. Proper cutting tools shall be used to cut and size the geotextile materials. Care shall be exercised while cutting geotextiles.

   c. During the placement of geotextiles, all dirt, dust, sand, and mud shall be kept off to prevent clogging. If excessive containment materials are present on the geotextile, it shall be cleaned or replaced as directed by GE or GE's Representative.

   d. Geotextile shall be covered within the time period recommended by the manufacturer, and in no case later than two weeks after its placement.

   e. In all cases, seams on slopes shall be parallel to the line of slope. No horizontal seams shall be allowed on slopes.

2. Seaming and Repairing

   a. Geotextiles shall be continuously sewn using a polymeric thread with chemical and ultraviolet resistance properties equal to or exceeding those of the geotextile.

   b. Repair of tears or holes in the geotextile shall require the following procedures:

      1. On slopes: A patch made from the same geotextile shall be double seamed into place; with each seam 1/4-inch to 3/4-inch apart and no closer than 1 inch

from any edge. Should any tear exceed 10% of the width of the roll, that roll shall be removed from the slope and replaced.

2. Non-slopes: A patch made from the same geotextile shall be spot-seamed in place with a minimum 24-inch overlap in all directions.

3.03 POST-CONSTRUCTION

A. Upon completing the installation, the Contractor shall submit to GE or GE's Representative:

1. All quality control documentation and the as-built panel drawings.

3.04 WARRANTY

A. The Contractor shall obtain from the Manufacturer and submit to GE or GE's Representative, a standard warranty provided for the geotextiles (see Section 1.02 above).

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02234

FLEXIBLE MEMBRANE LINER

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Under this section, the Contractor shall furnish and install 60-mil thick, textured or smooth high-density polyethylene (HDPE) Flexible Membrane Liner (FML) material as shown on the Technical Drawings, and as specified herein and/or directed.

2. The Contractor shall be responsible for all Quality Assurance/Quality Control (QA/QC) testing specified herein and as indicated on the Technical Drawings. All QA/QC testing, with the exception of non-destructive tests, shall be conducted by an independent laboratory at the Contractor's expense.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section MP-01400 – Responsibilities of CQA Parties

B. Section MP-02219 – Geocomposite

C. Section MP-02234 – Geotextile Fabric

1.03 APPLICABLE CODES, STANDARDS, SPECIFICATIONS, AND PUBLICATIONS

A. American Society for Testing and Materials (ASTM)

1.	D638-01	Tensile Properties of Plastics
2.	D792-00	Specific Gravity and Density of Plastics by Displacement
3.	D1004-94a	Initial Tear Resistance of Plastic Film and Sheeting
4.	D1505-98	Density of Plastics by the Density Gradient Technique
5.	D1603-01	Carbon Black in Olefin Plastics
6.	D5397-99	Environmental Stress-Cracking of Ethylene Plastics
7.	D5994-98	Core Thickness of Textured Geomembrane
8.	D5596-94	Microscopical Examination of Pigment Dispersion in Plastic Compounds
9.	D4833-97	Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
10.	D4218-96	Carbon Black Content

11. D4437-99 Integrity of Field Seams

B. Geosynthetic Research Institute (GRI)

1. GRI Test Method GM 13: Test Properties, Testing Frequencies and Recommended Warranty for High-Density Polyethylene (HDPE) Smooth and Textured Geomembranes

C. Where reference is made to one of the above codes, standards, specifications, or publications the revisions in effect at the time of bid shall apply.

1.04 QUALIFICATIONS

A. FML Manufacturer

1. The Contractor shall submit to GE or GE's Representative for approval the following information regarding the FML Manufacturer:

a. Corporate background and information.

b. Manufacturing capabilities including:

1) Quality control procedures for manufacturing; and

2) List of material properties including certified test results, to which FML samples are attached.

c. A list of at least 10 completed facilities, totaling a minimum of 10,000,000 ft^2, for which the Manufacturer has manufactured FMLs. For each facility, the following information shall be provided:

1) Name and purpose of facility, its location, and date of installation.

2) Name of Owner, Project Manager, Designer, Fabricator (if any), and Installer.

3) Thickness of FML, surface area of FML manufactured.

d. Origin (resin supplier's name, resin production plant) and identification (brand name, number) of the resin.

e. Copies of dated quality control certificates issued by the resin supplier.

f. Results of tests conducted by the Manufacturer to verify that the resin used to manufacture the FML meets the project specifications for melt flow index and density.

g. A statement that the amount of reclaimed polymer added to the resin during manufacturing was done with appropriate cleanliness and did not exceed 2% by weight.

h. Written certification that the MARVs given in the specification are guaranteed by the Manufacturer.

B. Installer

1. The Installer must be trained and approved and/or licensed by the FML Manufacturer for the installation of FML.

2. The Contractor shall submit to GE or GE's Representative for approval the following written information, relative to the Installer:

a. Copy of Installer's letter of approval or license by the Manufacturer.

b. Resume of the "master seamer" to be assigned to this project, including dates and duration of employment.

3. All personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests. At least one seamer shall have experience seaming a minimum of 1,000,000 ft^2 of FML of the type for this project, using the same type of seaming apparatus in use at the site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Solmax Geosynthetics.

B. GSE Lining Technology, Inc.

C. Equal.

2.02 MATERIALS

A. HDPE Lining Material Specifications:

1. HDPE FML material shall meet the following minimum specification values listed below and as listed in GRI GM13.

Property	Test Method	Specification Limit	Specification Limit
		60 mil Textured	60 mil Smooth
Density (min.)	ASTM D1505/D792	.940	0.940
Carbon Black Content	ASTM D1603 (3) /D4218	2.0 - 3.0%	2.0 – 3.0 %

Property	Test Method	Specification Limit 60 mil Textured	Specification Limit 60 mil Smooth
Carbon Black Dispersion	ASTM D5596	8 of 10 views in categories 1 or 2 All 10 views in categories 1, 2 or 3	8 of 10 views in categories 1 or 2 All 10 views in categories 1, 2 or 3
Thickness (nominal)	ASTM D5994	60 mil	60 mil
Thickness (min. avg.)		57 mil	NA
lowest individual 8 of 10 values		54 mil	NA
lowest individual of 10 values		51 mil	54 mil
Tensile Strength at Break (min.)	ASTM D638 Type IV	90 ppi	228 ppi
Tensile Strength at Yield (min.)		126 ppi	126 ppi
Elongation at Break (min.)		100%	700%
Elongation at Yield (min.)		12%	12%
Tear Resistance (min.)	ASTM D1004	42 lbs	42 lbs
Puncture Resistance (min.)	ASTM D4833	90 lbs	108 lbs
Stress Crack Resistance	ASTM D5397	200 Hour	200 Hour

B. Welding Material

1. The resin used in the welding material must be identical to the liner material.

2. All welding materials shall be of a type recommended and supplied by the manufacturer and shall be delivered in the original sealed containers, each with an indelible label bearing the brand name, Manufacturer's mark number, and complete directions as to proper storage.

C. Labeling FML Rolls

1. Labels on each roll or factory panel shall identify the following:

   a. Thickness of the material;
   b. Length and width of the roll or factory panel.
   c. Manufacturer.
   d. Directions to unroll the material.
   e. Product identification.
   f. Lot number.
   g. Roll or field panel number.

2.03 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall be liable for all damages to the materials incurred prior to and during transportation to the site.

B. Handling, storage, and care of the FML prior to and following installation at the site is the responsibility of the Contractor. The Contractor shall be liable for all damages to the materials incurred prior to final acceptance of the lining system by GE or GE's Representative.

C. The Contractor shall notify GE or GE's Representative of the anticipated delivery time.

2.04 QUALITY ASSURANCE

A. The Contractor shall provide quality control certificates, signed by a responsible party employed by the Manufacturer. The quality control certificates shall include lot and roll identification numbers, testing procedures, and results of quality control tests. At a minimum, results shall be given in accordance with the Technical Drawings and Specifications for:

a. Density (ASTM D1505);

b. Carbon black content (ASTM D1603);

c. Carbon black dispersion (ASTM D5596);

d. Thickness (ASTM D5994);

e. Tensile properties (ASTM D638); and

f. Tear strength (ASTM D1004).

These quality control tests shall be performed for each lot number at a minimum frequency of once every 40,000 ft^2 of FML produces. The Manufacturer shall provide a certification letter that will provide data for puncture, environmental stress, low temperature, and burial.

F. Field delivered material shall be subject to the following conformance tests by GE or GE's Representative:

a. Density (ASTM D1505);

b. Carbon black content (ASTM D1603);

c. Carbon black dispersion (ASTM D5596);

d. Thickness (ASTM D5994); and

e. Tensile characteristics (ASTM D638).

All conformance test results will be reviewed and material accepted or rejected by GE or GE's Representative prior to the deployment of the FML. GE or GE's Representative will review results from laboratory conformance testing. If the Contractor has reason to believe that failing tests may be the result of the CQA Laboratory incorrectly conducting the tests, the Contractor may request that the sample in question be retested by the CQA Laboratory with a technical representative of the Manufacturer present during the testing. This retesting shall be done at the expense of the Contractor. Alternatively, the Contractor may have the sample retested at two different approved CQA Laboratories at the expense of the Contractor. If both laboratories produce passing results, the material may be accepted. If both laboratories do not produce passing results, then the original CQA Laboratory's test results will be accepted. The use of these procedures for dealing with failed test results is subject to the approval of GE or GE's Representative.

If a test result is not in conformance with a required MARV, all material from the lot represented by the failing test shall be considered out of specification and rejected. Alternatively, at the option of GE or GE's Representative, additional conformance test samples may be taken to "bracket" the portion of the lot not meeting specification (note that this procedure is valid only when all rolls in the lot are consecutively produced and numbered from one manufacturing line). To isolate the out-of-specification material, additional samples must be taken from rolls that have roll numbers immediately adjacent to the roll that was sampled and failed. If both of the additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number) will be rejected. If one or both of the additional tests fail, then the entire lot will be rejected or the procedure repeated with two additional tests that bracket a greater number of rolls within the lot.

2.04 ADDITIONAL SUBMITTALS

A. The Contractor shall submit the following items for approval at least one week prior to installation:

1. Shop drawings that shall include:

a. Layout plan;

b. Quality control program manuals covering all phases of manufacturing and installation; and

c. Complete and detailed written instructions for the storage, handling, installation, seaming, inspection plan fail criteria for liner inspections, and QA/QC testing procedures of the liner in compliance with these specifications and the condition of its warranty.

PART 3 - EXECUTION

3.01 FML INSTALLATION

A. Related Earthwork

1. The Contractor shall ensure that all related earthwork requirements under this section are complied with:

a. The FML installations shall be performed on a firm, smooth, soil or geotextile-covered surface free from stones or protruding objects.

b. No FML shall be placed onto an area that has become softened by precipitation. Appropriate methods of moisture control are the responsibility of the Contractor.

c. No FML shall be placed on frozen soil material. Such material shall be removed and replaced with new soil fill as specified in the Section MP-02222 - Fill Materials.

d. The FML Installer shall certify in writing that the final surface on which the FML is to be installed is acceptable.

e. All surfaces on which the FML is to be installed shall be acceptable to GE or GE's Representative prior to FML installation.

f. Free edges of FML shall be secured so as to prevent uplift by wind or the intrusion of water under the liner. Edge protection shall include sandbags, polyethylene sheeting, or other methods as deemed necessary by the Contractor and approved by GE or GE's Representative.

g. The FML shall be anchored within an anchor trench constructed to the dimensions shown in the Technical Drawings. Care shall be taken while backfilling the trenches to prevent damage to the FML.

B. FML Deployment

1. FML shall be deployed according to the following procedures:

a. Placement of the FML panels shall be according to the approved location and position plan provided by the Installer. Placement shall follow all instructions on the boxes or wrapping containing the FML materials that describe the proper methods of unrolling panels.

b. FML deployment shall not be undertaken if weather conditions will preclude material seaming following deployment.

c. The method of placement must ensure that:

1) Deployed FML must be visually inspected for uniformity, tears, punctures, blisters, or other damage or imperfections. Any such imperfections shall be immediately repaired and reinspected.

2) No equipment used shall damage the FML by handling, trafficking, leakage of hydrocarbons, or other means.

3) No personnel working on the FML shall smoke, wear damaging shoes, or engage in other activities that could damage the FML.

4) The prepared surface underlying the FML must not be allowed to deteriorate after acceptance, and must remain acceptable up to the time of FML placement and until completion of the project.

5) Adequate temporary loading and/or anchoring (e.g., sand bags), not likely to damage the FML, shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels).

6) Direct contact with the FML shall be minimized (i.e., the FML in excessively high-traffic areas shall be protected by geotextiles, extra FML, or other suitable materials).

7) The method used to unroll or adjust the panels does not cause excessive scratches or crimps in the FML and does not damage the supporting soil or underlying geotextile (where applicable).

8) The method used to place the panels minimizes wrinkles (especially differential wrinkles between adjacent panels).

d. Any damage to the FML panels or portions of the panels as a result of placement must be replaced or repaired at no cost to GE or GE's Representative. The decision to replace or repair any panel or portions of panels shall be made by GE or GE's Representative.

e. The Installer shall assign an "identification number" to each FML panel placed. The number system used shall be simple, logical, and shall identify the relative location in the field.

C. Seaming

1. The seaming procedures below shall be implemented, where applicable, during installation of the FML. The seaming procedures are as follows:

a. Generally, all seams whether field or factory, shall be oriented parallel to the line of slope, not across slope. At liner penetrations and corners, the number of seams shall be minimized.

b. The area of the FML to be seamed shall be cleaned and prepared according to the procedures specified by the material manufacturer. Any abrading of the FML shall not extend more than one-half inch on either side of the weld. Care shall be taken to eliminate or minimize the number of wrinkles and "fishmouths" resulting from seam orientation.

c. Field seaming is prohibited when either the air or sheet temperature is below 32°F, or when the sheet temperature exceeds 122°F, or when the air temperature is above 104°F. At air or sheet temperatures between 32°F and 40°F, seaming shall be conducted directly behind a preheating device. In addition, seaming shall not be conducted when FML material is wet from precipitation, dew, fog, etc., or when winds are in excess of 20 miles per hour.

d. Seaming shall not be performed on frozen or excessively wet underlying soil surfaces.

e. Seams shall have an overlap beyond the weld large enough to perform destructive peel tests, but shall not exceed 5 inches.

f. The Contractor shall perform trial seams on excess FML material. A 1-foot by 3-foot seamed liner sample shall be fabricated with the seam running down the 3-foot length in the center of the sample. Such trial seaming shall be conducted prior to the start of each seaming succession for each seaming crew, change in machine or every 4 hours, after any significant change in weather conditions or FML temperature, or after any change in seaming equipment. From each trial seam, four field test specimens shall be taken. The test specimens shall be 1-inch by 12-inch strips cut perpendicular to the trial seam. Two of these specimens shall be shear tested and two shall be peel tested using a field tensiometer, and recorded as pass (failure of liner material) or fail (failure of seam). Upon initial failure, a second trial seam shall be made; if both trial seams fail, then the seaming device and its operator shall not perform any seaming operations until the deficiencies are corrected and two successive passing trial seams are

produced. Completed trial seam samples cannot be used as portions of a second sample and must be discarded.

g. Where fishmouths occur, the material shall be cut, overlapped, and an overlap weld shall be applied. Where necessary, patching using the same liner material shall be welded to the FML sheet.

h. Acceptable seaming methods for FML are:

1) Extrusion welding using extrudate with identical physical, chemical, and environmental properties; and

2) Hot wedge welding using a proven fusion welder and master seamer.

i. Seaming device shall not have any sharp edges that might damage the FML. Where self-propelled seaming devices are used, it shall be necessary to prevent "bulldozing" of the device into the underlying soil.

D. Seam Testing

1. The Contractor shall perform nondestructive seam testing on 100 percent of field seams. The following test method and procedures may be used:

a. Air pressure testing may be used if double-track hot-wedge welding has been used to seam the HDPE FML. Using approved pressure testing equipment, the following procedures will be followed:

1) Seal both ends of the air channel separating the double-track hot-wedge welds.
2) Insert pressure needle into air channel and pressurize the air channel to 27 psi.
3) Monitor pressure gauge for 3 minutes and determine whether pressure is maintained without a loss of more than 2 psi.
4) If the pressure test fails, then localize the leak and mark the area for repair.

a) Air pressure testing will be conducted under the direct observation of GE or GE's Representative.

b. Vacuum testing will be used on all seams not tested using air pressure testing. Using an approved vacuum box, the following procedures will be followed:

1) Apply a soapy water mixture over the seam.

2) Place vacuum box over soapy seam and form a tight seal.

3) Create a vacuum by reducing the vacuum box pressure to 5 psi for 10 seconds.

4) Observe through the vacuum box window any bubbles.

5) Where bubbles are observed, mark seam for repair.

6) Move vacuum box further down seam overlapping tested seam by 3 inches.

7) Where hot-wedge seaming has been performed, the overlap must be cut back to the weld.

a) All vacuum testing will be conducted under the direct observation of GE or GE's Representative.

2. In addition to nondestructive seam testing, the Contractor will perform destructive testing. The destructive testing procedures are as follows:

a. Test samples will be prepared by the Installer every 500 feet of seam length, a minimum of one test for each seaming machine per day, or more frequently at the discretion of GE or GE's Representative. Sample location and size will be selected by GE or GE's Representative. The sample size (12 x 56 inches) will be large enough to produce three sets of test specimens for the following tests:

1) Seam Shear Strength, ASTM D4437.
2) Peel Adhesion, ASTM D4437.

b. Ten specimens will compose a set. Five of these will be tested for peel and the other five for shear strength. Each specimen will be 1-inch wide and 12-inches long with the field seam at the center of the specimen. The 56-inch sample length will first be cut at the ends to produce two field peel test specimens. The remaining 54 inches will be divided up into thirds and one-third submitted to the Contractor, one-third to the independent testing laboratory, and one-third to GE or GE's Representative for storage and future reference.

c. Test specimens will be considered passing if the minimum values below are met or exceeded for four of the five test specimens tested by the independent laboratory. All acceptable seams will lie between two locations where samples have passed.

d. The cost of destructive testing will be borne by the Contractor.

e. Seams will meet the following minimum criteria:

Field Seam Properties	Specification Limit	Test Method
Shear Strength at Yield (lb/in width)	120 ppi	ASTM D4437
Peel Adhesion – Fusion	91 ppi and Film tear bond	ASTM D4437
Peel Adhesion - Extrusion	78 ppi and Film tear bond	ASTM D4437

3. If a sample fails destructive testing, the Contractor shall ensure that: the seam is reconstructed in each direction between the location of the sample that failed and the location of the next acceptable sample; or the welding path is retraced to an intermediate location at least 10 feet in each direction from the location of the sample that failed the test, and a second sample is taken for an additional field test. If this second test sample passes, the seam must be then reconstructed between the location of the second test and the original sampled location. If the second sample fails, the process must be repeated.

a. All costs for work performed to achieve passing tests along with costs for retesting will be borne by the Contractor.

4. If double-track hot-wedge welding is used, GE or GE's Representative and the Installer must agree on the track weld that will be used in the destructive testing. The weld chosen inside or outside must be consistently tested, and must pass according to the criteria above.

5. All holes created by cutting out destructive samples will be patched by the Contractor immediately with an oval patch of the same material welded to the membrane using extrusion welding. The patch seams will be tested using a vacuum box and using the procedures described above. Work will not proceed with materials covering the FML until passing results of destructive testing have been achieved.

6. At the ends of each field seam, two field test specimens will be taken and field tested with a field tensiometer. Both specimens must pass prior to placing the membrane in the anchor trench or continuing with additional seams. Failure of these specimens will require correcting the seaming device and repair of the preceding seam according to the failure testing and procedures described above.

E. Liner Repair

1. All imperfections, flaws, construction damage, and destructive and nondestructive seam failures shall be repaired by the Installer of the FML. The appropriate methods of repair are listed below:

a. Patching, used to repair holes, tears, undispersed raw materials, and contamination by foreign matter.

b. Grinding and rewelding, used to repair small sections of extruded seams.

c. Spot welding or seaming, used to repair pinholes or other minor, localized flaws.

d. Capping, used to repair large lengths of failed seams.

e. Topping, used to repair areas of inadequate seams which have an exposed edge.

f. Removing bad seams and replacing with a strip of new material welded into placed, used with large lengths of fusion seams.

F. Construction Material Placement and Penetrations

1. Wrinkles that develop from normal placement procedures must be controlled such that the underlying FML does not fold over. Small wrinkles, defined as having their height less than or equal to one-half their base width, may be trapped and pushed down by the overlying soil. Any wrinkle that becomes too large and uncontrollable or that folds the FML over must be brought to the attention of GE or GE's Representative. If necessary, the FML shall be uncovered, cut, laid flat, seamed by extrusion welding, and non-destructively tested.

3.02 POST-CONSTRUCTION

A. The Installer of the FML materials shall prepare and the Contractor shall submit to GE or GE's Representative, record drawings illustrating the following information:

1. Dimensions of all FML field panels.

2. Panel locations referenced to the Technical Drawings.

3. All field seams and panels with the appropriate number or code.

4. Location of all patches, repairs, and destructive testing samples.

3.03 WARRANTY

A. The Contractor shall obtain and submit to GE or GE's Representative from the Manufacturer a standard warranty provided for the FML.

- END OF SECTION -

MATERIALS AND PERFORMANCE - SECTION 02600

BITUMINOUS CONCRETE PAVEMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall be responsible for providing all labor, equipment, and materials required for replacement of bituminous concrete paving over removed driveways or other paved areas as shown on the drawings and as specified herein.

1.02 TIME OF CONSTRUCTION

A. The Contractor shall:

1. Apply prime and tack coats when ambient temperature is above 50°F (10°C), and when temperature has not been below 35°F (1°C) for 12 hours immediately prior to application. The Contractor may not install paving when the base is wet or contains excess moisture.

2. Construct bituminous concrete wearing surface when atmospheric temperature is above 40°F (4°C) and when the base is dry. Base course may be placed when air temperature is above 30°F (1°C) and rising.

3. Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.01 SUBBASE COURSE

A. Subbase course material must be capable of achieving the gradation and compaction requirements as presented in Section MP 02222.

2.02 BASE COURSE AGGREGATE

A. The crushed aggregate for the bituminous concrete base course shall conform to the requirements of the Mass Highway Standard Specifications for Bridges and Highways (Mass Highway Specifications).

2.03 BITUMINOUS BINDER

A. The binder shall be asphalt cement conforming to the requirements of AASHTO 20.

2.04 WEARING SURFACE

A. The wearing surface shall be Type 1-2. The material shall conform to quality requirements as stated in the Mass. Highway Specifications.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. Remove loose matter from the compacted subbase surface immediately before applying prime coat.

B. Proof-roll prepared subbase to check for unstable areas and areas requiring additional compaction.

C. Notify appropriate personnel of unsatisfactory conditions. Paving work may not proceed until deficient subbase areas have been corrected and are ready to receive paving.

D. Apply tack coat to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. The Contractor shall distribute tack coat at rate of 0.05 to 0.15 gallons per square yard of surface.

E. Allow drying of all surfaces until they are of the proper condition to receive paving.

3.02 PAVING

A. General

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

B. Pavement Placing

1. Place in strips not less than 10 inches wide, unless otherwise acceptable to GE. After strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.

C. Joints

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

3.03 ROLLING

A. General

1. Begin rolling when mixture will bear roller weight without excessive displacement.

2. Compact mixture with hot tampers or vibrating plate compactors in areas inaccessible to rollers.

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

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

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

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

F. Protection - After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

- END OF SECTION -

Attachment C

Soil Wedge Calculations

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

TABLE C-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCELS J9-23-22

EVALUATION OF SOIL WEDGES

I. Soil Wedge A (Figures C-1, C-2, and C-3)

A. Soil Wedge Characteristics

1. Total Length of Wedge	41.19 ft
2. Length of Wedge Attributed to J9-23-23-H-18	41.19 ft
3. Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-3)	0.5 ft^2

B. Remaining Soil Wedge Volume and Concentration

1. Total Volume of Wedge (41.19 lf * 0.5 ft^2) / 27 cf/cy	0.76 cy
2. PCB Concentration Attributed to J9-23-23-H-18 (4-6')	2,340 ppm
3. Volume x Average PCB Concentration (0.76 cy * 2,340 ppm)	1,778 cy-ppm **[1]**
4. Wedge Volume x Clean Backfill Concentration (0.76 cy * 0.021 ppm)	0.02 cy-ppm **[2]**

II. Soil Wedge B (Figures C-1, C-2, and C-4)

A. Soil Wedge Characteristics

1. Total Length of Wedge	56.26 ft
2. Length of Wedge Attributed to J9-23-22-J-18	56.26 ft
3. Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-4)	2 ft^2

B. Remaining Soil Wedge Volume and Concentration

1. Total Volume of Wedge (56.26 lf * 2 ft^2) / 27 cf/cy	4.17 cy
2. PCB Concentration Attributed to J9-23-22-J-18 (4-6')	2,415 ppm
3. Volume x Average PCB Concentration (4.17 cy * 2,415 ppm)	10,071 cy-ppm **[3]**
4. Wedge Volume x Clean Backfill Concentration (4.17 cy * 0.021 ppm)	0.09 cy-ppm **[4]**

III. Soil Wedges A and B Combined

1. Volume x Average PCB Concentration Add **[1]** plus **[3]** (1,778 cy-ppm + 10,071 cy-ppm)	11,849 cy-ppm **[5]**
2. Wedge Volume x Clean Backfill Concentration Add **[2]** plus **[4]** (0.02 cy-ppm + 0.09 cy-ppm)	0.11 cy-ppm **[6]**

TABLE C-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCELS J9-23-22

EVALUATION OF SOIL WEDGES

IV. Effects of Soil Wedges on Overall Parcel Average (1- to 6-Foot Depth Increment)

A. Parcel-Wide Information

1. Volume of Soil in Depth Increment (Table C-2)	5,287.17 cy **[7]**
2. Post-Remediation Average PCB Concentration (Table C-2)	136.05 ppm
3. Volume x Average PCB Concentration (Table C-2)	719,315.99 cy-ppm **[8]**

B. Revised Average PCB Concentration

1. "Volume x Average PCB Concentration" **[8]**, Subtract **[6]**, and Add **[5]**

   (719,315.99 cy-ppm) - (0.11 cy-ppm) + (11,849 cy-ppm) 731,164.88 cy-ppm **[9]**

2. Divide **[9]** by Soil Volume for Depth Increment **[7]** to Yield Revised Average PCB Concentration for 1- to 6-Foot Depth Increment at Parcel J9-23-22

   (731,164.88 cy-ppm)/(5,287.17 cy) 138.29 ppm

V. Effects of Soil Wedge on Overall Parcel Average (0- to 15-Foot Depth Increment)

A. Parcel-Wide Information

1. Volume of Soil in Depth Increment (Table C-3)	14,633.41 cy **[10]**
2. Post-Remediation Average PCB Concentration (Table C-3)	61.49 ppm
3. Volume x Average PCB Concentration (Table C-3)	899,747.17 cy-ppm **[11]**

B. Revised Average PCB Concentration

1. "Volume x Average PCB Concentration" **[11]**, Subtract **[6]**, and Add **[5]**

   (899,747.17 cy-ppm) - (0.11 cy-ppm) + (11,849 cy-ppm) 911,596.06 cy-ppm **[12]**

2. Divide **[12]** by Soil Volume for Depth Increment **[10]** to Yield Revised Average PCB Concentration for 0- to 15-Foot Depth Increment at Parcel J9-23-22

   (911,596.06 cy-ppm)/(14,633.41 cy) 62.30 ppm

TABLE C-2
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 1- TO 6-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 3-FOOT DEPTH INCREMENT

J9-23-22-D-16	336,426,428	3,301	1 - 3	[illegible]	244.52	0.02	5.13
J9-23-22-F-16	333,333B	3,345	1 - 3	[illegible]	247.75	0.02	5.20
J9-23-22-F-16	363A	20	1 - 3	[illegible]	1.50	0.02	0.03
J9-23-22-H-16	331	4,719	1 - 3	49	349.55	49.00	17,128.19
J9-23-22-J-18*	340	2,759	1 - 3	[illegible]	204.33	0.02	4.29
J9-23-22-K-18	340A	2,231	1 - 3	5.2	165.23	5.20	859.18
MO-1	322,322A	2,846	1 - 2	140	105.40	88.50	18,654.95
			2 - 3	37	210.79		
J9-23-12-B-16	440	100	1 - 3	[illegible]	7.41	0.02	0.16
SLO457	430	24	1 - 1.5	53.63	0.45	81.84	148.29
			1.5 - 2	110	0.91		
			2 - 2.5	53.74	1.36		
			2.5 - 3	110	1.81		
J9-23-21-J-16	361	2,801	1 - 3	9	207.52	9.00	1,867.65
FW-1	434	36	1 - 2	[illegible]	1.34	0.02	0.06
			2 - 3	[illegible]	2.68		
FW-16	435,437,438	1,481	1 - 2	130	54.85	96.00	10,530.99
			2 - 3	62	109.70		
FW-25	432	455	1 - 2	[illegible]	16.86	0.02	0.71
			2 - 3	[illegible]	33.72		
J9-23-23-F-18B	333A	834	1 - 3	[illegible]	61.77	0.02	1.30
J9-23-23-F-18B	333B	92	1 - 3	87	6.84	87.00	595.14
J9-23-23-H-18/N1-BH000326-0-0010*	364	3,506	1 - 3	[illegible]	259.73	0.02	5.45
Totals:	–	28,551	–	–	2,114.87	–	49,806.71

3- TO 6-FOOT DEPTH INCREMENT

J9-23-22-D-16/N1-BH000322-0-0030	339,408,410	3,301	3 - 6	16	366.78	16.12	5,911.26
J9-23-22-F-16/N1-BH000321-0-0030	322,322A,380A	3,365	3 - 6	960	373.88	960.00	358,923.73
J9-23-22-H-16	321	4,719	3 - 6	15	524.33	15.00	7,864.98
J9-23-22-J-18/N1-BH000314-0-0030	316	2,759	3 - 6	[illegible]	306.50	0.02	6.44
J9-23-22-K-18	316A	2,231	3 - 6	0.019	247.84	0.02	4.71
MO-1	331,331A	2,846	3 - 4	37	105.40	265.67	83,999.96
			4 - 6	380	316.19		
J9-23-12-B-16	422	100	3 - 6	140	11.12	140.00	1,557.11
SLO457	412	24	3 - 6	560	2.72	560.00	1521.96
J9-23-21-J-16	378	2,801	3 - 6	4.7	311.27	4.70	1,462.99
FW-1	416	36	3 - 4	210	1.34	102.67	412.83
			4 - 6	49	4.02		
FW-16	417,419,420	1,481	3 - 4	62	54.85	640.67	105,419.56
			4 - 6	930	164.55		
FW-25	414	455	3 - 4	210	16.86	376.67	19,053.06
			4 - 6	460	50.58		
J9-23-23-F-18B	414A	926	3 - 6	810	102.92	810.00	83,362.50
J9-23-23-H-18	381,381A	3,506	3 - 6	[illegible]	389.60	0.02	8.18
Totals:	–	28,551	–	–	3,172.30	–	669,509.28

TABLE C-2
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 1- TO 6-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 1- TO 6-FOOT DEPTH INCREMENT

Totals:	–	28,551	–	–	5,287.17	–	719,315.99

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in GE's *Proposed CD Backfill Data Set* (March 11, 2003).

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT

Sample Location (ID)	Polygon ID	Polygon Area (sq. ft.)	Sample Depth (ft.)	PCB Conc. (ppm)	[illegible] (cy)	Weighted PCB Concentration (ppm)	Average PCB Conc. Times Total Volume
DD-N	2129,2842	290	0 - 0.5	[illegible]	5.36	0.02	0.11
DD-N*	2129A,2129B,2842A	88	0 - 0.5	[illegible]	1.63	0.02	0.03
DD-S	2131,2519A	325	0 - 0.5	[illegible]	6.02	0.02	0.13
DD-S*	2131A,2519	355	0 - 0.5	[illegible]	6.58	0.02	0.14
J9-23-22-C-16/N1-BH000323-0-0000*	2092,2092A,2844	403	0 - 0.5	[illegible]	7.47	0.02	0.16
J9-23-22-G-17	2557	338	0 - 0.5	33	6.27	33.00	206.81
J9-23-22-G-17*	2155,2557A,2802,2995	658	0 - 0.5	[illegible]	12.19	0.02	0.26
J9-23-22-H-16	2165	296	0 - 0.5	[illegible]	5.49	0.02	0.12
J9-23-22-H-16	2165A	932	0 - 0.5	2.8	17.26	2.80	48.33
J9-23-22-H-17	2151A	639	0 - 0.5	[illegible]	11.83	0.02	0.25
J9-23-22-H-17*	2151,2913	905	0 - 0.5	[illegible]	16.76	0.02	0.35
J9-23-22-J-17	2153A,2438	428	0 - 0.5	0.89	7.93	0.89	7.06
J9-23-22-J-17*	2153,2438A,2438B	880	0 - 0.5	[illegible]	16.29	0.02	0.34
J9-23-22-J-17	2438C	36	0 - 0.5	[illegible]	0.68	0.02	0.01
J9-23-22-J-18*	2164	1,192	0 - 0.5	[illegible]	22.07	0.02	0.46
J9-23-22-K-17	2158	1,269	0 - 0.5	0.06	23.50	0.06	1.41
J9-23-22-K-18	2156	1,377	0 - 0.5	34	25.49	34.00	866.78
MO-1	2097,2912	362	0 - 0.5	[illegible]	6.70	0.02	0.14
MO-3	2162	25	0 - 0.5	[illegible]	0.46	0.02	0.01
MO-3N1	2170	50	0 - 0.5	[illegible]	0.93	0.02	0.02
MO-3N2	2171	106	0 - 0.5	[illegible]	1.96	0.02	0.04
MO-3N3	2172	172	0 - 0.5	[illegible]	3.18	0.02	0.07
MO-3N4	2173	545	0 - 0.5	[illegible]	10.09	0.02	0.21
MO-3N4	2173A	71	0 - 0.5	0.93	1.31	0.93	1.21
MO-3S1	2176	399	0 - 0.5	[illegible]	7.38	0.02	0.15
MO-3S1	2176A	27	0 - 0.5	7.3	0.50	7.30	3.66
MO-3E1	2169	924	0 - 0.5	[illegible]	17.11	0.02	0.36
MO-3E1*	2169A	2	0 - 0.5	[illegible]	0.04	0.02	0.00
MO-3E1	2169B	5	0 - 0.5	12	0.09	12.00	1.04
MO-3W1	2174	42	0 - 0.5	[illegible]	0.78	0.02	0.02
MO-3W2	2978	2	0 - 0.5	[illegible]	0.04	0.02	0.00
MO-4	2102	25	0 - 0.5	[illegible]	0.46	0.02	0.01
MO-4N1	2130,2756	240	0 - 0.5	[illegible]	4.45	0.02	0.09
MO-4S1	2124,2718	244	0 - 0.5	[illegible]	4.52	0.02	0.09
MO-4S1*	2124A	78	0 - 0.5	[illegible]	1.44	0.02	0.03
MO-4E1	2123,2636,2956	50	0 - 0.5	[illegible]	0.93	0.02	0.02
MO-4E2	2125,2719,2864	95	0 - 0.5	[illegible]	1.75	0.02	0.04
MO-4E3	2126,2785	118	0 - 0.5	[illegible]	2.19	0.02	0.05
MO-4E3*	2785A	9	0 - 0.5	[illegible]	0.17	0.02	0.00
MO-4E4	2132,2520,2911	617	0 - 0.5	[illegible]	11.42	0.02	0.24
MO-4E4*	2911A	69	0 - 0.5	[illegible]	1.28	0.02	0.03
MO-4W1	2122,2637	120	0 - 0.5	[illegible]	2.23	0.02	0.05
MO-5*	2100	25	0 - 0.5	[illegible]	0.46	0.02	0.01
MO-5N1*	2113,2944	50	0 - 0.5	[illegible]	0.93	0.02	0.02
MO-5N2*	2964	41	0 - 0.5	[illegible]	0.76	0.02	0.02
MO-5S1*	2133	264	0 - 0.5	[illegible]	4.89	0.02	0.10
MO-5E1*	2115,2486	405	0 - 0.5	[illegible]	7.50	0.02	0.16
MO-5W1*	2114,2690	224	0 - 0.5	[illegible]	4.15	0.02	0.09
MO-6*	2099	25	0 - 0.5	[illegible]	0.46	0.02	0.01

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT (continued)

MO-6N1*	2104	50	0 - 0.5	[illegible]	0.93	0.02	0.02
MO-6N2*	2105,2487	100	0 - 0.5	[illegible]	1.85	0.02	0.04
MO-6N3	2106,2106A,2846A	259	0 - 0.5	[illegible]	4.79	0.02	0.10
MO-6N3*	2106B,2106C,2846	87	0 - 0.5	[illegible]	1.61	0.02	0.03
MO-6S1*	2112	23	0 - 0.5	[illegible]	0.43	0.02	0.01
MO-6E1*	2109	50	0 - 0.5	[illegible]	0.92	0.02	0.02
MO-6E2*	2110,2987	93	0 - 0.5	[illegible]	1.73	0.02	0.04
MO-6E3	2111A	11	0 - 0.5	[illegible]	0.20	0.02	0.00
MO-6E3*	2111,2845,2943	420	0 - 0.5	[illegible]	7.78	0.02	0.16
MO-6W1*	2107	50	0 - 0.5	[illegible]	0.92	0.02	0.02
MO-6W2*	2108,2470,2759	192	0 - 0.5	[illegible]	3.56	0.02	0.07
MO-7	2101	25	0 - 0.5	[illegible]	0.46	0.02	0.01
MO-7N1	2116A	28	0 - 0.5	[illegible]	0.51	0.02	0.01
MO-7N1*	2116	22	0 - 0.5	[illegible]	0.41	0.02	0.01
MO-7N2	2117	29	0 - 0.5	[illegible]	0.53	0.02	0.01
MO-7N2*	2117A	96	0 - 0.5	[illegible]	1.77	0.02	0.04
MO-7N3	2121A	7	0 - 0.5	[illegible]	0.13	0.02	0.00
MO-7N3*	2121	302	0 - 0.5	[illegible]	5.60	0.02	0.12
MO-7S1	2120	205	0 - 0.5	[illegible]	3.79	0.02	0.08
MO-7E1	2119A	174	0 - 0.5	[illegible]	3.22	0.02	0.07
MO-7E1*	2119	515	0 - 0.5	[illegible]	9.53	0.02	0.20
MO-7W1	2118	285	0 - 0.5	[illegible]	5.27	0.02	0.11
MO-8*	2192	1,926	0 - 0.5	[illegible]	35.67	0.02	0.75
MO-9	2194	919	0 - 0.5	14	17.01	14.00	238.19
MO-9*	2194A	868	0 - 0.5	[illegible]	16.08	0.02	0.34
MO-10	2163A,2163B	86	0 - 0.5	[illegible]	1.59	0.02	0.03
MO-10*	2163	1,685	0 - 0.5	[illegible]	31.21	0.02	0.66
MO-11	2161	1,026	0 - 0.5	12	19.01	12.00	228.06
MO-P1	2209	347	0 - 0.5	[illegible]	6.43	0.02	0.14
MO-P1*	2209A	49	0 - 0.5	[illegible]	0.91	0.02	0.02
MO-P2*	2135	726	0 - 0.5	[illegible]	13.45	0.02	0.28
J9-23-21-D-15*	2757	47	0 - 0.5	[illegible]	0.87	0.02	0.02
J9-23-21-D-15	2757A	3	0 - 0.5	[illegible]	0.06	0.02	0.00
SZ-25	2436	38	0 - 0.5	0.68	0.70	0.68	0.47
FW-16	2473	30	0 - 0.5	[illegible]	0.55	0.02	0.01
FW-17	2880	63	0 - 0.5	[illegible]	1.17	0.02	0.02
FW-17*	2880A	27	0 - 0.5	[illegible]	0.49	0.02	0.01
FW-P1*	2982	0	0 - 0.5	[illegible]	0.00	0.02	0.00
FW-P2	2682	24	0 - 0.5	[illegible]	0.45	0.02	0.01
FW-P2*	2682A	293	0 - 0.5	[illegible]	5.42	0.02	0.11
FW-P3*	2832	584	0 - 0.5	[illegible]	10.82	0.02	0.23
FW-P3	2832A	10	0 - 0.5	[illegible]	0.19	0.02	0.00
J9-23-23-F-18B*	2135A	25	0 - 0.5	[illegible]	0.46	0.02	0.01
J9-23-23-H-18*	2720,2721	344	0 - 0.5	[illegible]	6.37	0.02	0.13
J9-23-23-I-18/N1-BH000325-0-0000*	2760	572	0 - 0.5	[illegible]	10.59	0.02	0.22
Totals:	–	28,558	–	–	528.85	–	1,611.63

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0.5- TO 1-FOOT DEPTH INCREMENT

J9-23-22-C-16/N1-BH000323-0-0000	898	234	0.5 - 1		4.33	0.02	0.09
J9-23-22-C-16/N1-BH000323-0-0000*	898A,898B,898C	1,337	0.5 - 1		24.76	0.02	0.52
J9-23-22-G-17*	901,1083,1085,1085B,1332	1,392	0.5 - 1		25.78	0.02	0.54
J9-23-22-G-17	1083A	54	0.5 - 1		0.99	0.02	0.02
J9-23-22-G-17	1085A	517	0.5 - 1	33	9.58	33.00	316.07
J9-23-22-H-16	903	1,743	0.5 - 1	2.8	32.28	2.80	90.38
J9-23-22-H-16*	903B	333	0.5 - 1		6.16	0.02	0.13
J9-23-22-H-16	903C	1,471	0.5 - 1		27.24	0.02	0.57
J9-23-22-H-17*	902, 1333	1,458	0.5 - 1		26.99	0.02	0.57
J9-23-22-H-17	902A	1,084	0.5 - 1		20.07	0.02	0.42
J9-23-22-J-17	922, 1076	1,466	0.5 - 1	0.89	27.14	0.89	24.16
J9-23-22-J-17*	922A,1076A,1076B	1,013	0.5 - 1		18.76	0.02	0.39
J9-23-22-J-17	1076C	700	0.5 - 1		12.96	0.02	0.27
J9-23-22-J-18*	886	1,192	0.5 - 1		22.07	0.02	0.46
J9-23-22-K-17	927	1,327	0.5 - 1	0.06	24.58	0.06	1.47
J9-23-22-K-18	926	1,377	0.5 - 1	34	25.49	34.00	866.78
MO-1	919,1330	2,681	0.5 - 1		49.65	0.02	1.04
MO-1*	919A,919B	2,029	0.5 - 1		37.58	0.02	0.79
J9-23-21-D-15	1251A,1251D	188	0.5 - 1		3.48	0.02	0.07
J9-23-21-D-15*	1251,1251B,1251C	1,288	0.5 - 1		23.86	0.02	0.50
J9-23-21-I-15	1247	69	0.5 - 1		1.28	0.02	0.03
N1-BH000802-0-0000*	903A	12	0.5 - 1		0.22	0.02	0.00
SZ-30*	1249	206	0.5 - 1		3.81	0.02	0.08
FW-1*	1259	507	0.5 - 1		9.39	0.02	0.20
FW-16	1260B,1260D	341	0.5 - 1		6.31	0.02	0.13
FW-16*	1260,1260C	356	0.5 - 1		6.59	0.02	0.14
FW-25*	1081A,1329	457	0.5 - 1		8.47	0.02	0.18
J9-23-23-D-17/N1-BH000344-0-0000*	1258	200	0.5 - 1		3.70	0.02	0.08
J9-23-23-F-18B	1081	1,545	0.5 - 1	4.6	28.62	4.60	131.64
J9-23-23-F-18B*	1081B	50	0.5 - 1		0.92	0.02	0.02
J9-23-23-G-18	1257	9	0.5 - 1		0.17	0.02	0.00
J9-23-23-H-18*	1255, 1331	536	0.5 - 1		9.93	0.02	0.21
J9-23-23-I-18/N1-BH000325-0-0000*	1254	1,382	0.5 - 1		25.58	0.02	0.54
Totals:	–	28,552	–	–	528.74	–	1,438.51

1- TO 3-FOOT DEPTH INCREMENT

J9-23-22-D-16	336,426,428	3,301	1 - 3		244.52	0.02	5.13
J9-23-22-F-16	333,333B	3,345	1 - 3		247.75	0.02	5.20
J9-23-22-F-16	363A	20	1 - 3		1.50	0.02	0.03
J9-23-22-H-16	331	4,719	1 - 3	49	349.55	49.00	17,128.19
J9-23-22-J-18*	340	2,759	1 - 3		204.33	0.02	4.29
J9-23-22-K-18	340A	2,231	1 - 3	5.2	165.23	5.20	859.18
MO-1	322,322A	2,846	1 - 2	140	105.40	88.50	18,654.95
			2 - 3	37	210.79		
J9-23-12-B-16	440	100	1 - 3		7.41	0.02	0.16

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 3-FOOT DEPTH INCREMENT (continued)

SLO457	430	24	1 - 1.5	53.63	0.45	81.84	148.29
			1.5 - 2	110	0.91		
			2 - 2.5	53.74	1.36		
			2.5 - 3	110	1.81		
J9-23-21-J-16	361	2,801	1 - 3	9	207.52	9.00	1,867.65
FW-1	434	36	1 - 2		1.34	0.02	0.06
			2 - 3		2.68		
FW-16	435,437,438	1,481	1 - 2	130	54.85	96.00	10,530.99
			2 - 3	62	109.70		
FW-25	432						
J9-23-23-F-18B	333A						
J9-23-23-F-18B	333B						
J9-23-23-H-18/N1-BH000326-0-0010*	364	3,506	1 - 3		259.73	0.02	5.45
Totals:	–	27,169	–	–	2,012.53	–	49,209.56

3- TO 6-FOOT DEPTH INCREMENT

J9-23-22-D-16/N1-BH000322-0-0030	339,408,410	3,301	3 - 6	16	366.78	16.12	5,911.26
J9-23-22-F-16/N1-BH000321-0-0030	322,322A,380A	3,365	3 - 6	960	373.88	960.00	358,923.73
J9-23-22-H-16	321	4,719	3 - 6	15	524.33	15.00	7,864.98
J9-23-22-J-18/N1-BH000314-0-0030	316	2,759	3 - 6		306.50	0.02	6.44
J9-23-22-K-18	316A	2,231	3 - 6	0.019	247.84	0.02	4.71
MO-1	331,331A	2,846	3 - 4	37	105.40	265.67	83,999.96
			4 - 6	380	316.19		
J9-23-12-B-16	422	100	3 - 6	140	11.12	140.00	1,557.11
SLO457	412	24	3 - 6	560	2.72	560.00	1521.96
J9-23-21-J-16	378	2,801	3 - 6	4.7	311.27	4.70	1,462.99
FW-1	416	36	3 - 4	210	1.34	102.67	412.83
			4 - 6	49	4.02		
FW-16	417,419,420	1,481	3 - 4	62	54.85	640.67	105,419.56
			4 - 6	930	164.55		
FW-25	414						
J9-23-23-F-18B	414A						
J9-23-23-H-18	381,381A	3,506	3 - 6		389.60	0.02	8.18
Totals:	–	27,169	–	–	3,018.80	–	567,093.72

6- TO 8-FOOT DEPTH INCREMENT

J9-23-22-D-16	221,221A,221B	3,301	6 - 8	0.018	244.52	0.02	4.28
J9-23-22-H-16	220	7,139	6 - 8	0.019	528.83	0.02	9.78
J9-23-22-J-18	219	5,326	6 - 8	8	394.52	8.00	3,156.14

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

6- TO 8-FOOT DEPTH INCREMENT (continued)

MO-1	228	4,081	6 - 8	0.48	302.28	0.48	145.10
J9-23-12-B-16	323	100	6 - 8	0.27	7.41	0.27	2.00
SLO457	311	24	6 - 8	270	1.81	270.00	489.20
J9-23-21-J-16	257	3,264	6 - 8	**0.021**	241.79	0.02	4.96
SZ-5	262,262A	1,461	6 - 8	**0.025**	108.24	0.03	2.71
SZ-30	307						
FW-1	324	36	6 - 8	61	2.68	61.00	163.53
FW-16	326,326A,326B	1,481	6 - 8	2,300	109.70	2300.00	252,308.30
FW-25	327						
J9-23-23-F-18	220B	22	6 - 8	53	1.61	53.00	85.59
J9-23-23-F-18BS	259						
J9-23-23-H-18B	220A	7	6 - 8	21	0.52	21.00	10.90
Totals:	–	26,243	–	–	1,943.92	–	256,382.48

8- TO 10-FOOT DEPTH INCREMENT

J9-23-22-D-16	3349,3349A,3349B	3,301	8 - 10	**0.018**	244.52	0.02	4.28
J9-23-22-H-16	3348	8,213	8 - 10	**0.019**	608.34	0.02	11.25
J9-23-22-J-18	3347	5,326	8 - 10	8	394.52	8.00	3,156.17
MO-1	3357	4,199	8 - 10	23	311.04	23.00	7,153.89
J9-23-12-B-16	3519	100	8 - 10	0.27	7.41	0.27	2.00
SLO457	3501	24	8 - 10	270	1.81	270.00	489.20
J9-23-21-J-16	3432	3,264	8 - 10	**0.021**	241.79	0.02	4.96
SZ-30	3497	220	8 - 10	17	16.31	17.00	277.20
FW-1	3518	36	8 - 10	66	2.68	66.00	176.93
FW-16	3522,3522A,3522B	1,481	8 - 10	0.39	109.70	0.39	42.78
FW-25	3517,3517A						
J9-23-23-F-18	3436	22	8 - 10	53	1.61	53.00	85.43
J9-23-23-F-18BS	3434						
J9-23-23-H-18B	3516	7	8 - 10	21	0.52	21.00	10.87
Totals:	–	26,193	–	–	1,940.26	–	11,414.96

10- TO 12-FOOT DEPTH INCREMENT

J9-23-22-D-16	678,678C,678D	3,301	10 - 12	11	244.52	11.00	2,689.76
J9-23-22-H-16	677	8,213	10 - 12	**0.021**	608.34	0.02	12.47
J9-23-22-J-18	672	5,326	10 - 12	0.29	394.52	0.29	114.41
MO-1	691	4,199	10 - 12	3.3	311.04	3.30	1,026.43
J9-23-12-B-16	866	100	10 - 12	**0.021**	7.41	0.02	0.15
SLO457	826	24	10 - 12	9.2	1.81	9.20	16.67
J9-23-21-J-16	757	3,264	10 - 12	**0.021**	241.79	0.02	4.96

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

10- TO 12-FOOT DEPTH INCREMENT

SZ-30	865	220	10 - 12	54	16.31	54.00	880.52
FW-1	678A	36	10 - 12	3.2	2.68	3.20	8.58
FW-16	787,787A,787B	1,481	10 - 12	1.05	109.70	1.05	115.18
FW-25	840A						
J9-23-23-F-18	860	22	10 - 12	7	1.61	7.00	11.28
J9-23-23-F-18BS	840						
J9-23-23-H-18B	677A	7	10 - 12	0.041	0.52	0.04	0.02
Totals:	–	26,193	–	–	1,940.26	–	4,880.43

12- TO 14-FOOT DEPTH INCREMENT

J9-23-22-D-16	495,495A,495B	5,055	12 - 14	11	374.41	11.00	4,118.49
J9-23-22-H-16	494	8,183	12 - 14	**0.021**	606.12	0.02	12.43
J9-23-22-J-18	491	5,326	12 - 14	0.29	394.52	0.29	114.41
J9-23-12-B-16	696	100	12 - 14	**0.021**	7.41	0.02	0.15
SLO457	690	24	12 - 14	9.2	1.81	9.20	16.67
J9-23-21-J-16	590	3,264	12 - 14	**0.021**	241.79	0.02	4.96
SZ-6	686	771	12 - 14	0.030	57.11	0.03	1.71
SZ-30	687						
FW-1	694	36	12 - 14	0.85	2.68	0.85	2.28
FW-16	695,695A,695B	1,481	12 - 14	0.27	109.70	0.27	29.62
J9-23-23-F-18	623	22	12 - 14	7	1.61	7.00	11.28
J9-23-23-F-18BS	621						
J9-23-23-H-18B	691	7	12 - 14	0	0.52	0.04	0.02
Totals:	–	24,269	–	–	1,797.69	–	4,312.02

14- TO 15-FOOT DEPTH INCREMENT

J9-23-22-D-16	441	5,657	14 - 15	11	209.51	11.00	2,304.59
J9-23-22-H-16	440	8,216	14 - 15	**0.021**	304.28	0.02	6.24
J9-23-22-J-18	437	5,326	14 - 15	0.29	197.26	0.29	57.21
J9-23-12-B-16	607	817	14 - 15	**0.021**	30.25	0.02	0.62
SLO457	604	29	14 - 15	9	1.06	9.20	9.74
J9-23-21-J-16	517	3,264	14 - 15	**0.021**	120.90	0.02	2.48
SZ-30	601	1,373	14 - 15	20	50.86	20.00	1,017.15
FW-1	606	194	14 - 15	**0.025**	7.19	0.03	0.18
J9-23-23-F-18	548	22	14 - 15	7	0.81	7.00	5.64
J9-23-23-F-18BS	546						
J9-23-23-H-18B	336	7	14 - 15	0.041	0.26	0.04	0.01
Totals:	–	24,904	–	–	922.37	–	3,403.85

See Notes on Page 7.

TABLE C-3
POST-REMEDIATION CONDITIONS
PARCEL J9-23-22 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Totals:	–	26,583	–	–	14,633.41	–	899,747.17

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in GE's *Proposed CD Backfill Data Set* (March 11, 2003).

TABLE C-4

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCELS J9-23-24

EVALUATION OF SOIL WEDGES

I. Soil Wedge A (Figures C-5, C-6, and C-7)

A. Soil Wedge Characteristics

1.	Total Length of Wedge	127.98 ft
2.	Length of Wedge Attributed to J9-23-22-H-20	127.98 ft

B. Remaining Soil Wedge Volume and Concentration (Top 2' of Wedge)

1.	Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-7)	2 ft^2
2.	Total Volume of Wedge (127.98 lf * 2 ft^2) / 27 cf/cy	9.48 cy
3.	PCB Concentration Attributed to J9-23-22-H-20 (4-6')	6,800 ppm
4.	Volume x Average PCB Concentration (9.48 cy * 6,800 ppm)	64,464 cy-ppm **[1]**
5.	Wedge Volume x Clean Backfill Concentration (9.48 cy * 0.021 ppm)	0.20 cy-ppm **[2]**

C. Remaining Soil Wedge Volume and Concentration (Bottom 1' of Wedge)

1.	Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-7)	2.5 ft^2
2.	Total Volume of Wedge (127.98 lf * 2.5 ft^2) / 27 cf/cy	11.85 cy
3.	PCB Concentration Attributed to J9-23-22-H-20 (6-10')	490 ppm
4.	Volume x Average PCB Concentration (11.85 cy * 490 ppm)	5,807 cy-ppm **[3]**
5.	Wedge Volume x Clean Backfill Concentration (11.85 cy * 0.021 ppm)	0.25 cy-ppm **[4]**

II. Soil Wedge B (Figures C-4, C-5, and C-6)

A. Soil Wedge Characteristics

1.	Total Length of Wedge	18.48 ft
2.	Length of Wedge Attributed to J9-23-22-H-20	18.48 ft

B. Remaining Soil Wedge Volume and Concentration (Top 2' of Wedge)

1.	Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-7)	2 ft^2
2.	Total Volume of Wedge (18.48 lf * 2 ft^2) / 27 cf/cy	1.37 cy
3.	PCB Concentration Attributed to J9-23-22-H-20 (4-6')	6,800 ppm
4.	Volume x Average PCB Concentration (1.37 cy * 6,800 ppm)	9,316 cy-ppm **[5]**
5.	Wedge Volume x Clean Backfill Concentration (1.37 cy * 0.021 ppm)	0.03 cy-ppm **[6]**

TABLE C-4

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCELS J9-23-24

EVALUATION OF SOIL WEDGES

C. Remaining Soil Wedge Volume and Concentration (Bottom 1' of Wedge)

1. Cross-Sectional Area of Each 1-Foot Section of Wedge (Figure C-7)	2.5 ft^2	
2. Total Volume of Wedge (18.48 lf * 2.5 ft^2) / 27 cf/cy	1.71 cy	
3. PCB Concentration Attributed to J9-23-22-H-20 (6-10')	490 ppm	
4. Volume x Average PCB Concentration (1.71 cy * 490 ppm)	838 cy-ppm	**[7]**
5. Wedge Volume x Clean Backfill Concentration (1.71 cy * 0.021 ppm)	0.04 cy-ppm	**[8]**

III. Soil Wedges A and B Combined

1. Volume x Average PCB Concentration Add **[1]**, **[3]**, **[5]**, and **[7]**

   (64,464 cy-ppm + 5,807 cy-ppm + 9,316 cy-ppm + 838 cy-ppm) — 80,425 cy-ppm **[9]**

2. Wedge Volume x Clean Backfill Concentration Add **[2]**, **[4]**, **[6]**, and **[8]**

   (0.20 cy-ppm + 0.25 cy-ppm + 0.03 cy-ppm + 0.04 cy-ppm) — 0.52 cy-ppm **[10]**

IV. Effects of Soil Wedges on Overall Parcel Average (1- to 6-Foot Depth Increment)

A. Parcel-Wide Information

1. Volume of Soil in Depth Increment (Table C-5)	3,563.46 cy **[11]**
2. Post-Remediation Average PCB Concentration (Table C-5)	25.05 ppm
3. Volume x Average PCB Concentration (Table C-5)	89,277.64 cy-ppm **[12]**

B. Revised Average PCB Concentration

1. "Volume x Average PCB Concentration" **[12]**, Subtract **[10]**, and Add **[9]**

   (89,277.64 cy-ppm) - (0.52 cy-ppm) + (80,425 cy-ppm) — 169,702.12 cy-ppm **[13]**

2. Divide **[13]** by Soil Volume for Depth Increment **[11]** to Yield Revised Average PCB Concentration for 1 to 6-Foot Depth Increment at Parcel J9-23-24

   (169,702.12 cy-ppm)/(3,563.46 cy) = — 47.62 ppm

TABLE C-4

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCELS J9-23-24

EVALUATION OF SOIL WEDGES

V. Effects of Soil Wedges on Overall Parcel Average (0- to 15-Foot Depth Increment)

A. Parcel-Wide Information

1. Volume of Soil in Depth Increment (Table C-6)	10,690.36 cy **[14]**
2. Post-Remediation Average PCB Concentration (Table C-6)	61.94 ppm
3. Volume x Average PCB Concentration (Table C-6)	662,168.87 cy-ppm **[15]**

B. Revised Average PCB Concentration

1. "Volume x Average PCB Concentration" **[15]**, Subtract **[10]**, and Add **[9]**

   (662,168.87 cy-ppm) - (0.52 cy-ppm) + (80,425 cy-ppm) 742,593.35 cy-ppm **[16]**

2. Divide **[16]** by Soil Volume for Depth Increment **[14]** to Yield Revised Average PCB Concentration for 0- to 15-Foot Depth Increment at Parcel J9-23-24

   (742,593.35 cy-ppm)/(10,690.36 cy) = 69.46 ppm

TABLE C-5
POST-REMEDIATION CONDITIONS
J9-23-24 - 1- TO 6-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

1- TO 3-FOOT DEPTH INCREMENT

	Polygon ID		Sample Depth (ft)	PCB Conc. (ppm)			
J9-23-24-H-20*	342,348	4,923	1 - 3		364.65	0.02	7.66
J9-23-24-J-20	341	5,127	1 - 3	0.33	379.79	0.33	125.33
J9-23-24-J-20	341A	783	1 - 3		58.02	0.02	1.22
J9-23-23-F-18/N1-BH000346-0-0010	442	364	1 - 3	17	26.96	16.55	446.15
J9-23-23-F-20	443	3,355	1 - 3	6.1	248.50	6.10	1,515.82
J9-23-23-H-18B	342A	1,726	1 - 3	48	127.88	48.00	6,138.38
J9-23-25-F-22/N1-BH000371-0-0010	443A	24	1 - 3	2	1.80	2.00	3.59
J9-23-25-H-22	346	2,243	1 - 3	1.3	166.15	1.30	215.99
J9-23-25-H-22	346A	697	1 - 3		51.65	0.02	1.08
Totals:	--	19,243	--	--	1,425.38	--	8,455.23

3- TO 6-FOOT DEPTH INCREMENT

J9-23-24-H-20	318,364	4,923	3 - 6		546.97	0.02	11.49
J9-23-24-J-20	317	5,910	3 - 6	9.3	656.71	9.30	6,107.38
J9-23-23-F-18	426	364	3 - 6	610	40.44	610.00	24,666.37
J9-23-23-F-20	425	3,355	3 - 6	130	372.74	130.00	48,456.63
J9-23-23-H-18B	376	1,726	3 - 6	8.2	191.82	8.20	1,572.96
J9-23-25-F-22	424	24	3 - 6	0.45	2.69	0.45	1.21
J9-23-25-H-22	362	2,940	3 - 6	**0.020**	326.70	0.02	6.37
Totals:	--	19,243	--	--	2,138.08	--	80,822.41

SUMMARY - 1- TO 6-FOOT DEPTH INCREMENT

Totals:	--	19,243	--	--	3,563.46	--	89,277.64

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.
4. * = The shaded numbers in bold and italics represent the placement of clean backfill following soil removal to address a deeper sample at this location.
5. Shaded numbers in bold and italics represent the placement of clean backfill material following the performance of the proposed remediation. The backfill concentration corresponds to the average PCB concentration as presented in GE's *Proposed CD Backfill Data Set* (March 11, 2003).

TABLE C-6
POST-REMEDIATION CONDITIONS
J9-23-24 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT (UNPAVED SURFACES)

FW-19	2205	513	0 - 0.5		9.51	0.02	0.20
FW-19*	2205A	442	0 - 0.5		8.19	0.02	0.17
FW-19	2205B	137	0 - 0.5	1.6	2.53	1.60	4.05
J9-23-24-G-19	2154	1,314	0 - 0.5	2.2	24.33	2.20	53.52
J9-23-24-G-20	2207A	1,233	0 - 0.5	3.4	22.84	3.40	77.65
J9-23-24-G-20*	2207	1,126	0 - 0.5		20.84	0.02	0.44
J9-23-24-G-21/N1-BH000365-0-0000	2054	729	0 - 0.5	6.4	13.49	6.40	86.34
J9-23-24-G-21/N1-BH000365-0-0000*	2054A	419	0 - 0.5		7.75	0.02	0.16
J9-23-24-H-20	2150	1,270	0 - 0.5		23.53	0.02	0.49
J9-23-24-H-21	2147A	640	0 - 0.5	93	11.85	93.00	1,102.21
J9-23-24-H-21*	2147	828	0 - 0.5		15.33	0.02	0.32
J9-23-24-I-20	2659A	33	0 - 0.5	0.76	0.61	0.76	0.46
J9-23-24-I-20*	2659	96	0 - 0.5		1.78	0.02	0.04
J9-23-24-I-21	2658	109	0 - 0.5		2.02	0.02	0.04
J9-23-24-J-21	2143A	310	0 - 0.5	0.21	5.73	0.21	1.20
J9-23-23-F-19	2474	89	0 - 0.5	2.5	1.65	2.50	4.13
J9-23-23-F-20	2475	826	0 - 0.5	4.2	15.30	4.20	64.25
J9-23-23-H-18B	2833	297	0 - 0.5		5.49	0.02	0.12
J9-23-23-H-19	2157A	19	0 - 0.5	90	0.36	90.00	32.07
J9-23-23-I-19	2659A	8	0 - 0.5		0.15	0.02	0.00
J9-23-25-F-21	2684	341	0 - 0.5	0.32	6.31	0.32	2.02
J9-23-25-H-22	2900	182	0 - 0.5	0.049	3.38	0.05	0.17
J9-23-25-I-22	2683	262	0 - 0.5	0.079	4.86	0.08	0.38
Totals:	–	11,222	–	–	207.81	–	1,430.42

0.5- TO 1-FOOT DEPTH INCREMENT (UNPAVED SURFACES)

J9-23-24-G-19	881	1,402	0.5 - 1	2.2	25.96	2.20	57.12
J9-23-24-G-20	877A	1,258	0.5 - 1	3.4	23.30	3.40	79.21
J9-23-24-G-20*	877	1,206	0.5 - 1		22.33	0.02	0.47
J9-23-24-G-21/N1-BH000365-0-0000	876	729	0.5 - 1	6.4	13.49	6.40	86.34
J9-23-24-G-21/N1-BH000365-0-0000*	876A	419	0.5 - 1		7.75	0.02	0.16
J9-23-24-H-20*	878	1,633	0.5 - 1		30.24	0.02	0.63
J9-23-24-H-21	887A	640	0.5 - 1	93	11.85	93.00	1,102.19
J9-23-24-H-21*	887	828	0.5 - 1		15.33	0.02	0.32
J9-23-24-I-20	1054B	33	0.5 - 1	0.76	0.61	0.76	0.46
J9-23-24-I-20*	1054	96	0.5 - 1		1.78	0.02	0.04
J9-23-24-I-21	1052	109	0.5 - 1		2.02	0.02	0.04
J9-23-24-J-21	874A	310	0.5 - 1	0.21	5.73	0.21	1.20
J9-23-23-F-19	1268	89	0.5 - 1	2.5	1.65	2.50	4.13
J9-23-23-F-20	1269	826	0.5 - 1	4.2	15.30	4.20	64.25
J9-23-23-H-18B	1267	810	0.5 - 1		15.00	0.02	0.31
J9-23-23-H-19	1267A	43	0.5 - 1	90	0.79	90.00	71.02
J9-23-23-I-19	1054A	8	0.5 - 1		0.15	0.02	0.00
J9-23-25-F-21	1266	341	0.5 - 1	0.32	6.31	0.32	2.02
J9-23-25-H-22	1262	182	0.5 - 1	0.049	3.38	0.05	0.17
J9-23-25-I-22	1215	262	0.5 - 1	0.079	4.86	0.08	0.38
Totals:	–	11,222	–	–	207.81	–	1,470.47

See Notes on Page 3.

TABLE C-6
POST-REMEDIATION CONDITIONS
J9-23-24 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

0- TO 0.5-FOOT DEPTH INCREMENT (PAVED SURFACES)

J9-23-24-I-20	2146	1,087	0 - 0.5	0.76	20.12	0.76	15.29
J9-23-24-I-20*	2146A	690	0 - 0.5		12.78	0.02	0.27
J9-23-24-I-21	2144	1,372	0 - 0.5		25.40	0.02	0.53
J9-23-24-I-21*	2144A	51	0 - 0.5		0.95	0.02	0.02
J9-23-24-J-20	2148	1,533	0 - 0.5	0.22	28.38	0.22	6.24
J9-23-24-J-21	2143	2,278	0 - 0.5	0.21	42.18	0.21	8.86
J9-23-23-I-19	2659B	1	0 - 0.5	330	0.01	330.00	4.52
J9-23-25-I-22	3001	1,010	0 - 0.5	0.079	18.71	0.08	1.48
Totals:	–	8,021	–	–	148.53	–	37.22

0.5- TO 1-FOOT DEPTH INCREMENT (PAVED SURFACES)

J9-23-24-I-20	882	1066.53	0.5 - 1	0.76	20.12	0.76	15.29
J9-23-24-I-20*	882B	690.29	0.5 - 1		12.78	0.02	0.27
J9-23-24-I-21	875	1,372	0.5 - 1		25.40	0.02	0.53
J9-23-24-I-21*	875A	51	0.5 - 1		0.95	0.02	0.02
J9-23-24-J-20	884	1,533	0.5 - 1	0.22	28.38	0.22	6.24
J9-23-24-J-21	874	2,278	0.5 - 1	0.21	42.18	0.21	8.86
J9-23-23-I-19	882A	1	0.5 - 1	330	0.01	330.00	4.52
J9-23-25-I-22	1348	1,010	0.5 - 1	0.079	18.71	0.08	1.48
Totals:	–	8,021	–	–	148.53	–	37.21

1- TO 3-FOOT DEPTH INCREMENT

J9-23-24-H-20*	342,348	4,923	1 - 3		364.65	0.02	7.66
J9-23-24-J-20	341	5,127	1 - 3	0.33	379.79	0.33	125.33
J9-23-24-J-20	341A	783	1 - 3		58.02	0.02	1.22
J9-23-23-F-18/N1-BH000346-0-0010	442	364	1 - 3	17	26.96	16.55	446.15
J9-23-23-F-20	443	3,355	1 - 3	6.1	248.50	6.10	1,515.82
J9-23-23-H-18B	342A	1,726	1 - 3	48	127.88	48.00	6,138.38
J9-23-25-F-22/N1-BH000371-0-0010	443A	24	1 - 3	2	1.80	2.00	3.59
J9-23-25-H-22	346	2,243	1 - 3	1.3	166.15	1.30	215.99
J9-23-25-H-22	346A	697	1 - 3		51.65	0.02	1.08
Totals:	–	19,243	–	–	1,425.38	–	8,455.23

3- TO 6-FOOT DEPTH INCREMENT

J9-23-24-H-20	318,364	4,923	3 - 6		546.97	0.02	11.49
J9-23-24-J-20	317	5,910	3 - 6	9.3	656.71	9.30	6,107.38
J9-23-23-F-18	426	364	3 - 6	610	40.44	610.00	24,666.37
J9-23-23-F-20	425	3,355	3 - 6	130	372.74	130.00	48,456.63
J9-23-23-H-18B	376	1,726	3 - 6	8.2	191.82	8.20	1,572.96
J9-23-25-F-22	424	24	3 - 6	0.45	2.69	0.45	1.21
J9-23-25-H-22	362	2,940	3 - 6	0.020	326.70	0.02	6.37
Totals:	–	19,243	–	–	2,138.08	–	80,822.41

See Notes on Page 3.

TABLE C-6
POST-REMEDIATION CONDITIONS
J9-23-24 - 0- TO 15-FOOT DEPTH INCREMENT

NEWELL STREET AREA I
GENERAL ELECTRIC COMPANY - PITTSFIELD, MASSACHUSETTS

6- TO 10-FOOT DEPTH INCREMENT

J9-23-24-H-20/N1-BH000362-0-0060	295,340	4,923	6 - 10	490	729.29	490.00	357,353.73
J9-23-24-J-20	296	5,910	6 - 10	0.020	875.61	0.02	17.07
J9-23-23-F-18	390	364	6 - 10	53	53.92	53.00	2,857.52
J9-23-23-F-20	389	3,355	6 - 10	5.7	496.99	5.70	2,832.85
J9-23-23-H-18B	295A	1,726	6 - 10	21	255.77	21.00	5,371.08
J9-23-25-F-22	388	24	6 - 10	380	3.59	380.00	1,364.62
J9-23-25-H-22	338	2,940	6 - 10	0.021	435.60	0.02	8.93
Totals:	--	19,243	--	--	2,850.77	--	369,805.82

10- TO 15-FOOT DEPTH INCREMENT

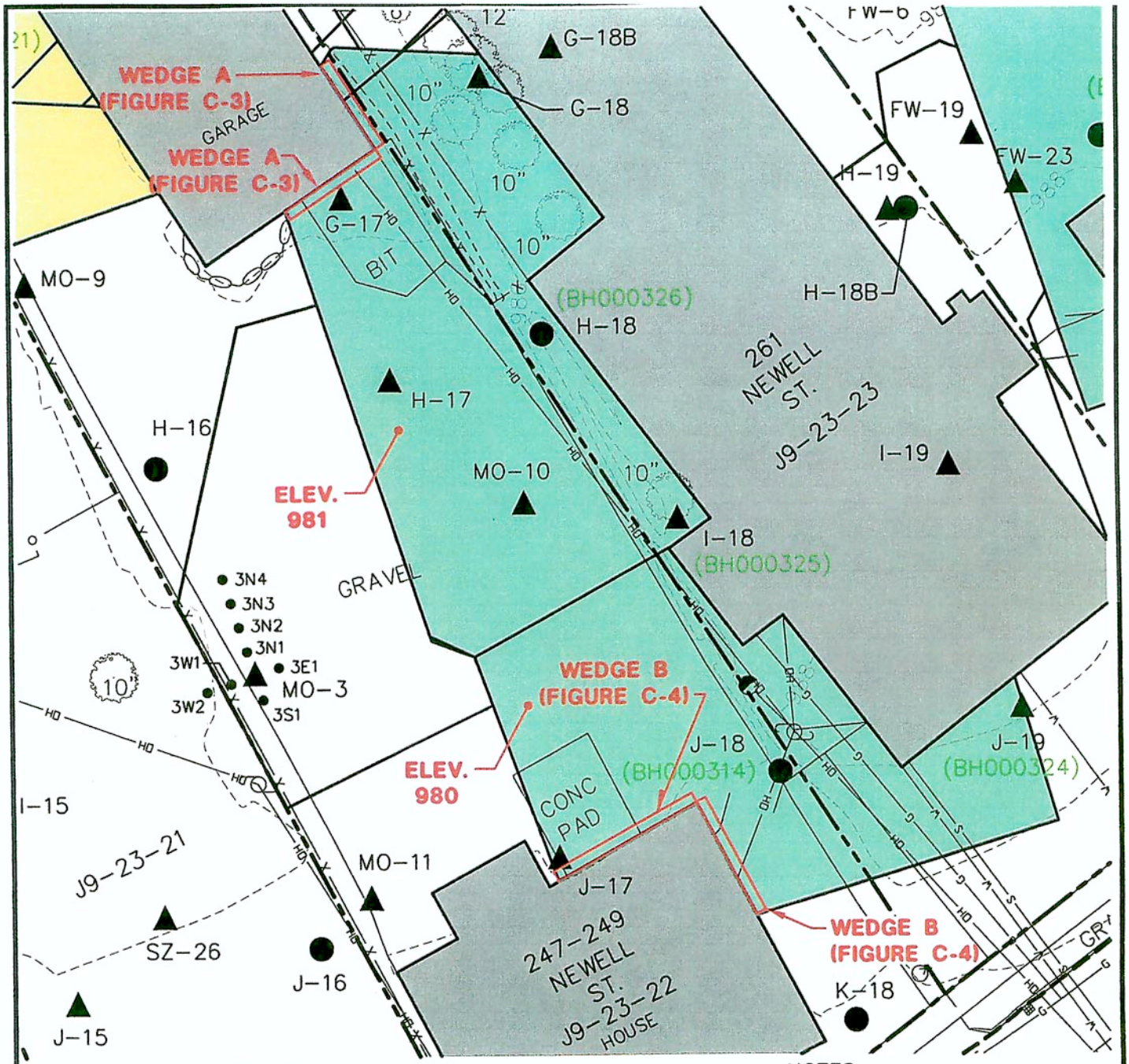
FW-6	255	3,064	10 - 15	1.1	567.48	1.10	624.23
J9-23-24-H-20/N1-BH000362-0-0060	254,263	4,142	10 - 15	260	767.01	260.00	199,421.93
J9-23-24-J-20	256	5,910	10 - 15	0.021	1,094.52	0.02	22.99
J9-23-23-F-18	255A	11	10 - 15	7	2.12	7.00	14.83
J9-23-23-F-20	267	2,340	10 - 15	0.020	433.29	0.02	8.45
J9-23-23-H-18B	254A	810	10 - 15	0.041	150.04	0.04	6.15
J9-23-25-F-22	266	24	10 - 15	0.020	4.49	0.02	0.09
J9-23-25-H-22	261	2,940	10 - 15	0.021	544.50	0.02	11.43
Totals:	--	19,243	--	--	3,563.44	--	200,110.09

SUMMARY - 0- TO 15-FOOT DEPTH INCREMENT

Totals:	--	19,243	--	--	10,690.36	--	662,168.87

Notes:

1. Non-detectable PCBs included as one-half the detection limit in calculations and shown in bold.
2. For instances where a duplicate sample was available, the average of the samples was included in table.
3. All calculations and rounding are performed by the computer software. Therefore, certain quantities in above table are displayed as rounded numbers for table clarity.



LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- J9-23-22 — PARCEL ID
- X — WIRE FENCE
- ▲ J-15 OR • 3N1 — GE EXISTING SURFACE SOIL SAMPLE LOCATION
- ● J-18 — GE EXISTING SOIL BORING LOCATION
- (BH000326) — EPA SPLIT SAMPLE IDENTIFICATION
- OH — OVERHEAD WIRES
- G — GAS SERVICE
- W — WATER SERVICE
- S — SANITARY SEWER
- BUILDING
- DECIDUOUS TREE
- UTILITY POLE
- 1-FOOT REMOVAL
- 3-FOOT REMOVAL
- 6-FOOT REMOVAL

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITIES ARE SHOWN IN AN APPROXIMATED WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON

0 30' 60'

GRAPHIC SCALE

X: 10112X07.DWG
P: PAGESET/PLT-AP
8/04/03 SYR-85-RLP SDL DMW
N/10112001/10112P78.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-22

SOIL "WEDGE" LOCATIONS

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
C-1

LEGEND

- PARCEL BOUNDARY
- EASEMENT
- J9-23-22 PARCEL ID
- WIRE FENCE
- RIP RAP
- DECIDUOUS TREE
- TOP OF BANK
- CATCH BASIN
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- BUILDING
- F-16 GE EXISTING SOIL BORING LOCATION
- BH000472 EPA SOIL BORING LOCATION
- FW-15 EXISTING MONITORING WELL LOCATION
- (BH000321) EPA SPLIT SAMPLE IDENTIFICATION
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH
- 426 POLYGON ID
- AREA PROPOSED FOR PLACEMENT OF AN ENGINEERED BARRIER

0 60' 120'

GRAPHIC SCALE

X: 10112X08.DWG
L: ON=*, OFF=*REF*
P: PAGESET/PLT-AP
8/4/03 SYR-85-RLP SDL DMW
N/10112001/10112P79.DWG

NOTES:

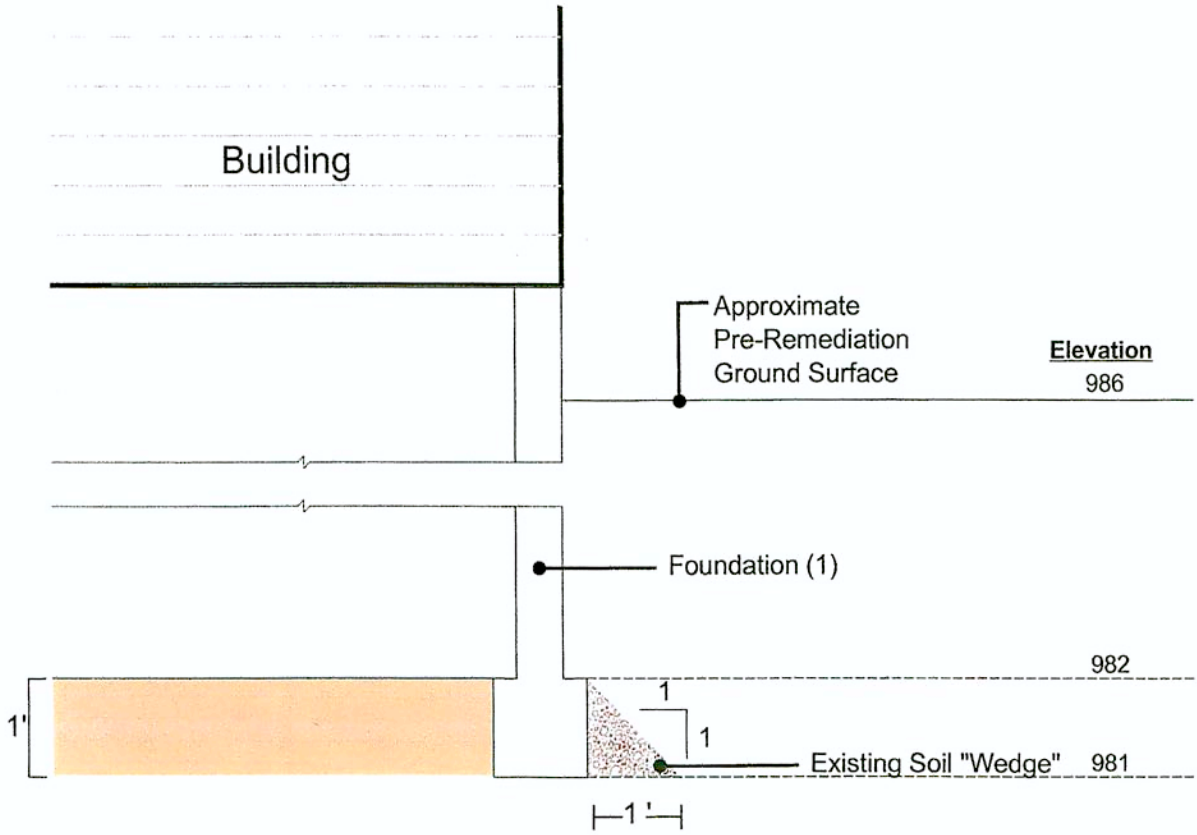
1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITIES ARE SHOWN IN AN APPROXIMATED WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-22

THEISSEN POLYGON MAP
DEPTHS GREATER THAN 1-FOOT

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE C-2



CROSS SECTION

NOT-TO-SCALE

Note:

1. Foundation depicted for reference purposes only, and may not reflect actual design/construction of these structures.

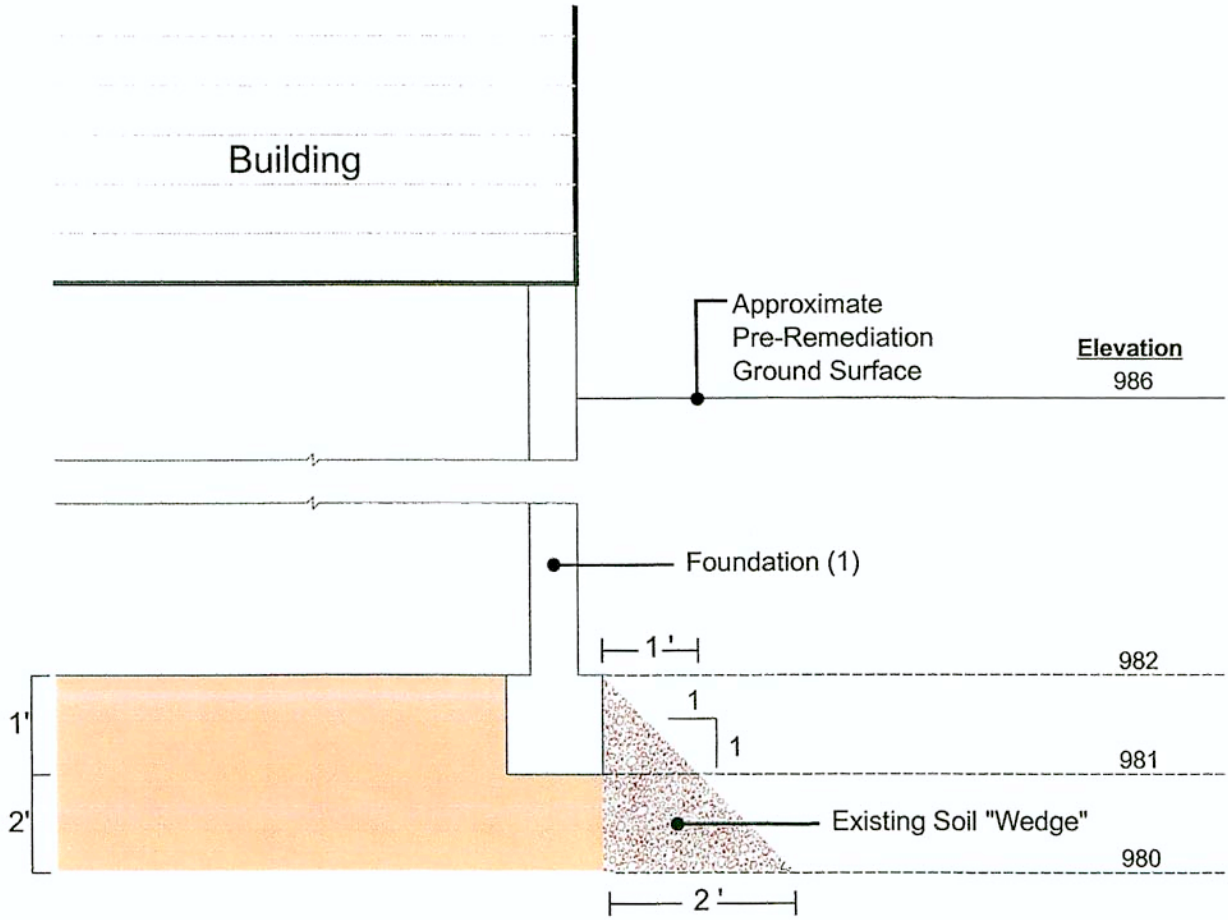
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-22

CROSS-SECTION OF SOIL "WEDGE" A

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
C-3

08/04/03 SYR-D85-DJH LBR
C:10112007/10112g03.cdr



CROSS SECTION

NOT-TO-SCALE

Note:

1. Foundation depicted for reference purposes only, and may not reflect actual design/construction of these structures.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-22

CROSS-SECTION OF SOIL "WEDGE" B

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE C-4

08/04/03 SYR-D85-DJH LBR
C:10112007/10112g02.cdr

LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- J9-23-24 PARCEL ID
- X WIRE FENCE
- ▲ G-19 GE EXISTING SURFACE SOIL SAMPLE LOCATION
- ● MM-3 GE EXISTING SOIL BORING LOCATION
- (BH000362) EPA SPLIT SAMPLE IDENTIFICATION
- D DRAIN LINE
- OH OVERHEAD WIRES
- G GAS SERVICE
- W WATER SERVICE
- S SANITARY SEWER
- BUILDING
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- UTILITY POLE
- 1-FOOT REMOVAL
- 3-FOOT REMOVAL
- 6-FOOT REMOVAL

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITIES ARE SHOWN IN AN APPROXIMATED WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.

0 30' 60'

GRAPHIC SCALE

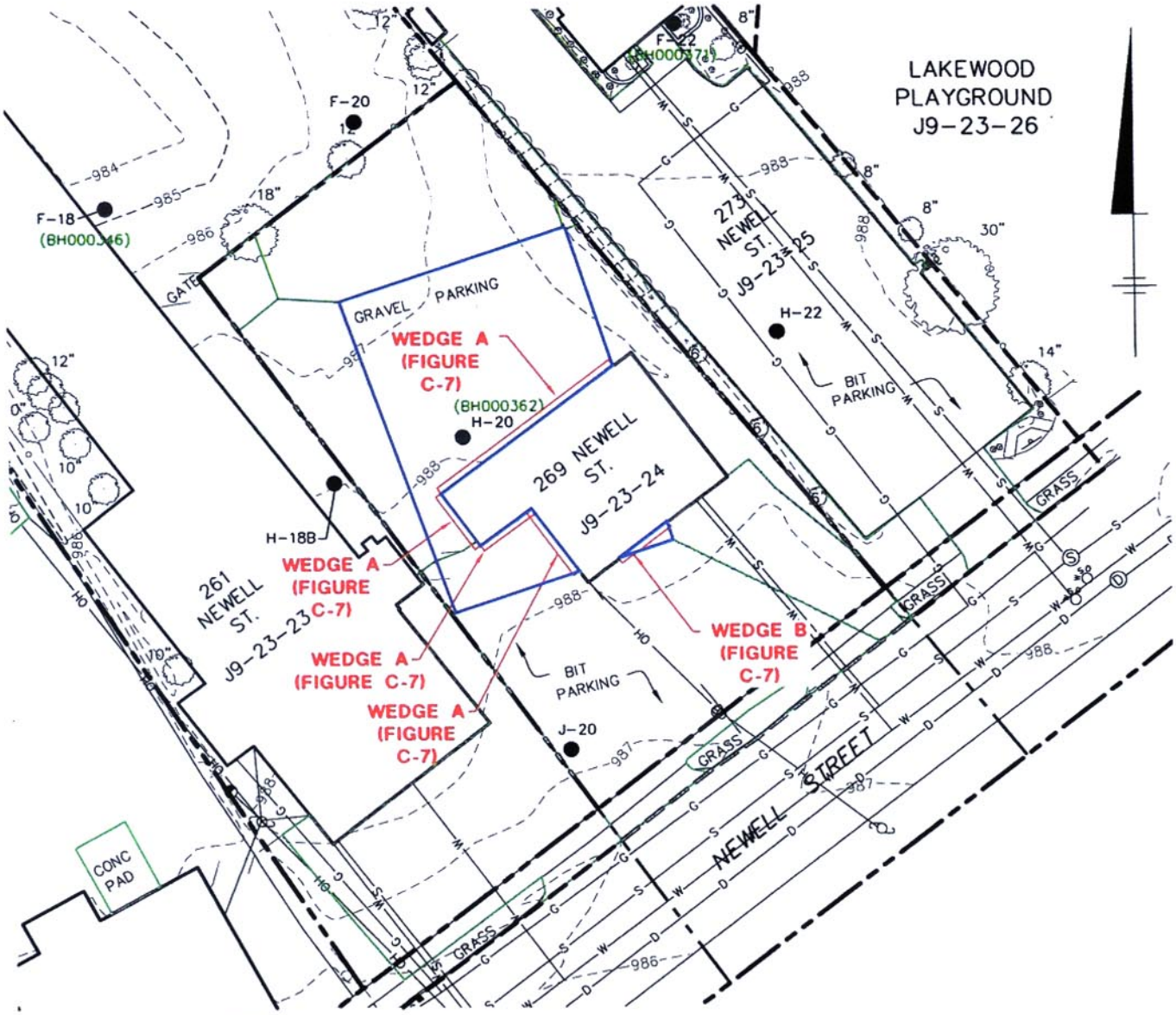
X: 10112X03
L: ON=*; OFF=*REF*,*BNDS,*,PAVED,*VIEWPORT
P: PAGESET/PLT-AP
8/4/03 SYR-54-DMW SDL DMW
N/10112001/10112P76.DWG

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-24

SOIL "WEDGE" LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE C-5



LEGEND

- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- J9-23-24 PARCEL ID
- EDGE OF BUSHES/HEDGE
- D DRAIN LINE
- DH OVERHEAD WIRES
- G GAS SERVICE
- W WATER SERVICE
- S SANITARY SEWER
- BUILDING
- DECIDUOUS TREE
- Ⓓ STORM WATER MANHOLE
- Ⓢ SANITARY MANHOLE
- UTILITY POLE
- MM-3 GE EXISTING SOIL BORING LOCATION
- BH000467 EPA SOIL BORING LOCATION
- (BH000321) EPA SPLIT SAMPLE IDENTIFICATION
- HORIZONTAL LIMITS OF AREA ASSOCIATED WITH GIVEN SAMPLE, DEVELOPED USING THE THEISSEN POLYGON APPROACH.
- AREA PROPOSED FOR SOIL REMOVAL IN A DEEPER DEPTH INCREMENT

0 50' 100'

GRAPHIC SCALE

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITIES ARE SHOWN IN AN APPROXIMATED WAY ONLY AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES MARKED ON THE GROUND.

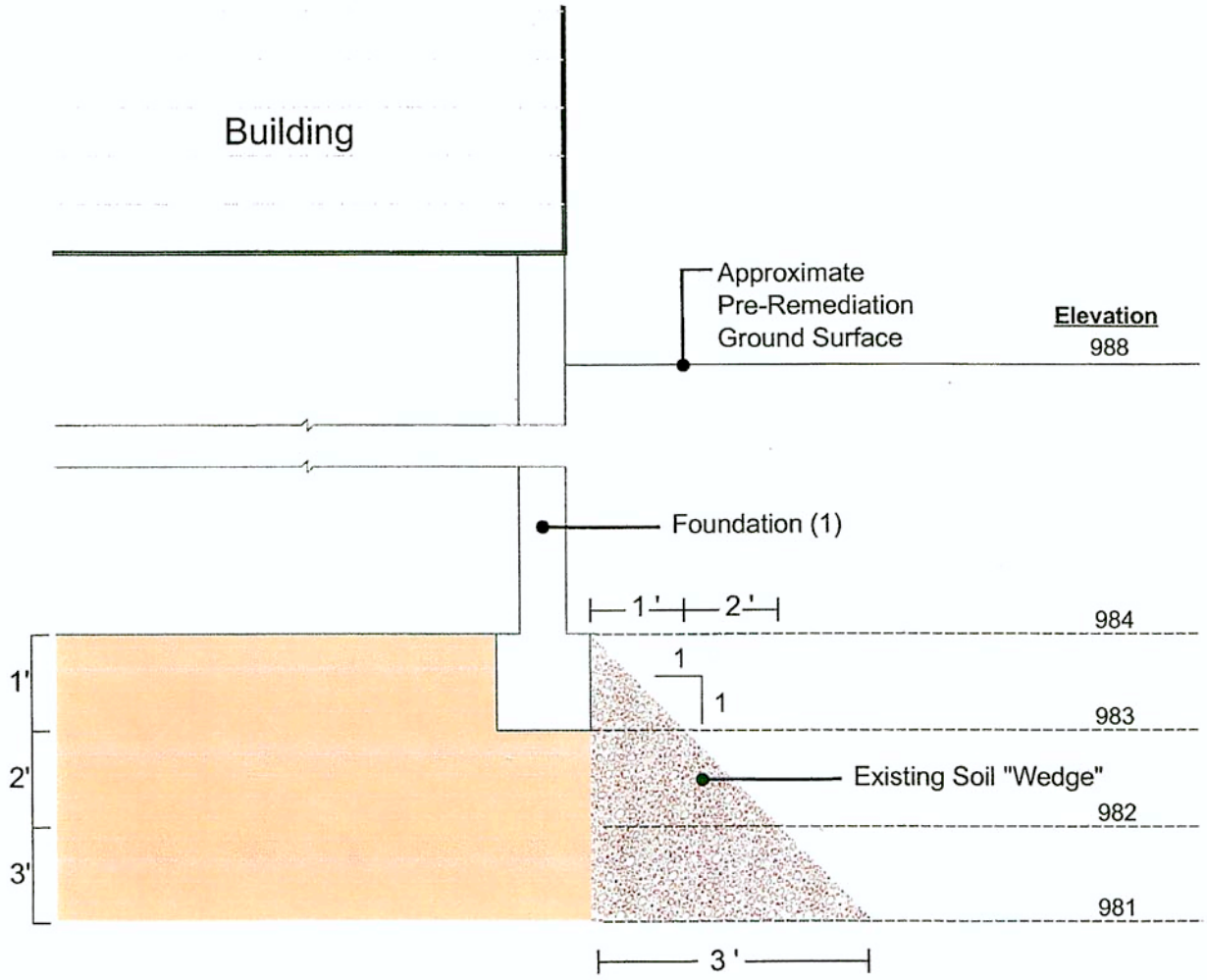
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
PARCEL J9-23-24

THEISSEN POLYGON MAP DEPTHS GREATER THAN 1-FOOT

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE C-6

X: 10112X02
L: ON=*, OFF=*REF*
P: PAGESET/PLT-AP
8/4/03 SYR-54-DMW SDL DMW
N/10112007/10112P28.DWG



CROSS SECTION

NOT-TO-SCALE

Note:

1. Foundation depicted for reference purposes only, and may not reflect actual design/construction of these structures.

GENERAL ELECTRIC COMPANY
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PARCEL J9-23-24

CROSS-SECTION OF SOIL "WEDGES" A & B

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engineers & scientists

FIGURE C-7

08/04/03 SYR-D85-DJH LBR
C:10112007/10112g01.cdr

Attachment D

Flood Storage Capacity Calculations

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

TABLE D-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FLOOD STORAGE CAPACITY CALCULATIONS

I. FLOOD STORAGE GAINED FROM DEMOLITION OF EXISTING BUILDINGS AT PARCELS J9-23-16 AND J9-23-23:

PARCEL J9-23-16:

Area of building at Parcel J9-23-16: 8,170 square feet (SF)

Existing average surface elevation of area under building:

~ 90% @ ELEV. 989'
~ 10% @ ELEV. 988'

(989 * 0.9) + (988 * 0.1) = **988.9'** (average overall elevation)

Flood storage **gained** from building demolition at Parcel J9-23-16:

The elevation of the 100-year floodplain is approximately 990.5 feet.
Average overall elevation under building at Parcel J9-23-16 is approximately 988.9 feet.

Therefore, (990.5' - 988.9') * 8,170 SF = 13,072 cubic feet (CF) → ~ **485 cubic yards** (CY)

PARCEL J9-23-23:

Area of building at Parcel J9-23-23: 12,630 (SF)

Existing average surface elevation of area under building:

~ 20% @ ELEV. 986'
~ 25% @ ELEV. 986.5'
~ 30% @ ELEV. 987.5'
~ 25% @ ELEV. 988'

(986 * 0.2) + (986.5 * 0.25) + (987.5 * 0.3) + (988 * 0.25) = **987.1'** (average overall elevation)

Flood storage **gained** from building demolition at Parcel J9-23-23:

The elevation of the 100-year floodplain is approximately 990.5 feet.
Average overall elevation under building at Parcel J9-23-23 is approximately 987.05 feet.

Therefore, (990.5' - 987.1') * 12,630 SF = 42,942 cubic feet (CF) → ~ **1,590 CY**

TABLE D-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FLOOD STORAGE CAPACITY CALCULATIONS

II. FLOOD STORAGE GAINED DUE TO REMOVAL OF THE SOIL PILES AT PARCELS J9-23-19 AND J9-23-20:

Flood storage gain = (average area below elev. 990.5') * (distance from elev. 990.5' to bottom of pile)

Note: The "average area below elev. 990.5' " was estimated as the surface area of the soil pile taken at the midpoint between the base of the pile and elevation 990.5'.

North Pile: [(840.7') * (4')] / 27 CY/ft. = 125 CY
Middle Pile: [(1822.5) * (3.5')] / 27 CY/ft. = 235 CY
South Pile: [(1055.1') * (3')] / 27 CY/ft. = 120 CY

Therefore, flood storage **gain** due to removal of soil piles = 125 + 235 + 120 → **480 CY**

III. FLOOD STORAGE GAINED DUE TO RE-GRADING EAST OF 1-FOOT VEGETATIVE BARRIER INSTALLATION AT PARCEL J9-23-23:

Area of re-grading: 2,228.96 SF

Approximate existing elevation: 985'
Approximate elevation after re-grading: 984.5'

Therefore, flood storage **gain**: (985' - 984.5') * 2,228.96 = 1,114.5 CF → **41 CY**

IV. FLOOD STORAGE LOST DUE TO DEMOLITION & CONSTRUCTION OF BOCCE COURTS AT PARCEL J9-23-17:

[Calculations provided by White Engineering, Inc. Pittsfield, MA]

Raw Cut Volume:	47.49 cu yd
Compacted Cut Volume:	0.00 cu yd
Total Cut Volume:	47.49 cu yd
Raw Fill Volume:	128.51 cu yd
Compacted Fill Volume:	0.00 cu yd
Total Fill Volume:	128.51 cu yd
Net Fill Volume:	**81.02 cu yd**

TABLE D-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

FLOOD STORAGE CAPACITY CALCULATIONS

V. FLOOD STORAGE LOST DUE TO INSTALLATION OF 1-FOOT VEGETATIVE ENGINEERED BARRIER AT PARCEL J9-23-23:

(8,720 SF of engineered barrier) * (~ 1foot of engineered barrier) = 8,720 CF → **325 CY**

OVERALL GAIN OF FLOOD STORAGE: 485 + 1,590 + 480 + 41 = 2,596 CY
OVERALL LOSS OF FLOOD STORAGE: 81 + 325 = 406 CY

→ **OVERALL NET GAIN OF FLOOD STORAGE: *2,190 CY***

Attachment E

Contractor Submittal Tracking Form

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engineers & scientists

General Electric Company
Pittsfield, Massachusetts

Newell Street Area 1

Technical Submittal Register

Item No.	Description	Specification Reference (see Note 2)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Submittal/Date (see Note 1.)	Final Status/Date (see Note 1.)	Notes
1	Operations Plan - The Plan shall address, but not be limited to the following items:	Section 3.4						
	• List of Equipment to be used on-site.	Section 3.4						
	• Recreational property protection procedures.	Section 3.4						
	• Work Schedule (refer to Section 3.7 of the Conditions of Work)	Section 3.4						
	• The Contractor's proposed plan for controlling vehicular and pedestrian traffic while performing construction and operational activities (refer to Section 3.14 of the Conditions of Work).	Section 3.4						
	• Proposed sheetpiling design (if applicable) or alternate excavation stabilization measures (Section 3.21 of the Conditions of Work).	Section 3.4						
	• The Contractor's qualifications package (if requested by GE).	Section 3.4						
	• Stormwater (including run-on and run-off), erosion, noise, and dust control measures.	Section 3.4						
	• The Contractor's proposed excavation approach (Section 3.24 of the Conditions of Work).	Section 3.4						
	• Materials handling and staging approach (Section 3.28 of the Conditions of Work).	Section 3.4						
	• Equipment cleaning procedures (refer to Section 3.34 of the Conditions of Work).	Section 3.4						
2	Health and Safety Plan - The Plan shall address, but not be limited to the following items (Refer to Note 3):	Section 3.5						
	• Identification of Key Personnel - Identify by name and by title, the on-site and off-site health and safety personnel responsible for the implementation of health and safety procedures. All on-site personnel involved in the measures must have OSHA 40-hour Hazardous Waste Training (29 CFR 1910.120 and 1926.65) and the corresponding 8-hour refresher course update.	Section 3.5						
	• Training - Describe and provide certification of all supervisory and on-site personnel having received appropriate health and safety training.	Section 3.5						
	• Medical Surveillance - Certify that all supervisory and on-site personnel have received appropriate medical examinations and are able to conduct the tasks required for this project.	Section 3.5						
	• Task-Specific Hazard/Risk Analysis - Identify and provide a means of mitigating all foreseeable biological, chemical, and physical hazards associated with the work, including, but not limited to, hazards associated with exposure to constituents of concern, heavy equipment operation, site conditions, weather, materials handling, work around excavated areas, and work near water.	Section 3.5						
	• Work Zones - Provide a site plan which depicts the designation of zones including: (1) Exclusion Zones (2) Decontamination Zones, and (3) Support Zones. The level of personal protection for each zone must be included.	Section 3.5						
	• Personal Safety Equipment and Protective Clothing - Identify personal safety equipment and protective clothing to be used and available on-site. This shall include identification of expected levels of protection (USEPA Protection Levels A, B, C, and D) for each task, and the action levels for personal protective equipment upgrades. A respiratory protection program that meets the requirements of 29 CFR 1910.134, and which establishes specific requirements for any respirator use shall be included.	Section 3.5						
	• Personal Air Monitoring - Identify protocols and criteria associated with personal air monitoring of on-site personnel.	Section 3.5						
	• Personnel Decontamination - Describe methods and procedures to be used for personnel decontamination.	Section 3.5						
	• Confined Space Entry - Describe procedures for confined space entry in accordance with OSHA's Confined Space Standard.	Section 3.5						
	• Material Safety Data Sheets - Provide Material Safety Data Sheets (MSDSs) for all materials to be brought on site, as well as constituents which are expected to be encountered in the course of implementation of the remedial activities.	Section 3.5						
	• Construction Safety Procedures (OSHA 1926.1 - 1926.652, Subpart A-P) to address excavation shoring and trenching safety, as well as daily site safety inspection checklist to evaluate these items.	Section 3.5						
	• Standard Operating Procedures and Safety Programs as required by applicable sections of 29 CFR 1910 and 1926.	Section 3.5						

General Electric Company
Pittsfield, Massachusetts

Newell Street Area I

Technical Submittal Register

Item No.	Description	Specification Reference (see Note 2)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Status/Date (see Note 1)	Final Status/Date (see Note 1)	Notes
3	Contingency Plan - The Plan shall address, but not be limited to the following items:	Section 3.6						
	• Spill prevention control and countermeasures plan for all materials brought on site.	Section 3.6						
	• Emergency vehicular access/egress.	Section 3.6						
	• Evacuation procedures of personnel from the work sites.	Section 3.6						
	• For work sites that include or are adjacent to a surface water drainage way, a flood control contingency plan to identify measures to protect the work site(s) and the waterway from impacts in the event of a high water and/or flood conditions.	Section 3.6						
	• List of all contact personnel with phone numbers to include: GE; the Contractor; the City of Pittsfield; fire officials; ambulance service; local, county, and State Police; and local hospitals, including routes to local hospitals and procedures for notifying each.	Section 3.6						
	• Identification of responsible personnel who will be in a position at all times to receive incoming phone calls and to dispatch Contractor personnel and equipment in the event of an emergency situation. The telephone number(s) must be supplied to GE not less than five days prior to commencing the work.	Section 3.6						
4	Name, location, and quantity of each source and type of backfill material and sod proposed by the Contractor in accordance with Section 3.35 of the Conditions of Work.	Section 3.2						
5	Name of subcontractor(s) to be used for the Work.	Section 3.2						
6	Record Drawings in accordance with Section 3.38 of the Conditions of Work.	Section 3.2						
7	All sample and analytical results, including all laboratory deliverables (e.g., wipe samples).	Section 3.2						
8	Copies of all non-environmental, construction-related permits (i.e., demolition and/or building permits, permits for working within City of Pittsfield right-of-ways/easements, etc.) that are necessary to implement remediation and/or restoration activities.	Section 1.3						
9	Proposed substitutions for materials or modifications to procedures specified in the Contract Drawings in accordance with Section 3.3 of the Conditions of Work.	Section 3.2						
10	Earthwork - Proposed equipment and compaction method(s).	Materials and Performance - Section 02200 (1.03)(A) & (3.04)(A3)						
11	Restoration of Surfaces - A schedule of restoration operations.	Materials and Performance - Section 02207 (1.03)(A)						
12	Restoration of Surfaces - Material cut sheets for chain link fencing.	Materials and Performance - Section 02207 (1.03)(B)						
13	Restoration of Surfaces - Name of proposed fencing installer.	Materials and Performance - Section 02207 (1.03)(C)						
14	Sod - Name and location of the source(s) for sod.	Materials and Performance - Section 02209 (1.03)(A)						
15	Sod - Contractor shall provide a full warranty on the sod for a period extending no less than one year from the date of acceptance by GE. The warranty shall include materials and costs associated with replacement of sod that does not survive the warranty period.	Materials and Performance - Section 02209 (3.03)(A)						
16	Topsoil, Seeding and Mulch - Analysis of the seed and fertilizer, and proposed application rates.	Materials and Performance - Section 02212 (1.03)(A)						
17	Topsoil, Seeding and Mulch - Should hydroseed be used, the Contractor shall submit all data including material and application rates.	Materials and Performance - Section 02212 (1.03)(B)						
18	Topsoil, Seeding and Mulch - Sample of topsoil to be tested by GE for chemical contaminants as discussed in Section 3.31 - Soil Fill Sources.	Materials and Performance - Section 02212 (1.03)(C)						

General Electric Company
Pittsfield, Massachusetts

Newell Street Area I

Technical Submittal Register

Item No.	Description	Specification Reference (see Note 1)	Date Received	Review Conducted by: GE Project Manager	Review Conducted by: Design Engineer	Interim Signoff Date (see Note 1)	Final Signoff Date (see Note 1)	Notes
19	Geocomposite - Manufacturer's data for the geocomposite including physical properties and roll size.	Materials and Performance - Section 02219 (1.04)(A1)						
20	Geocomposite - Geocomposite material sample.	Materials and Performance - Section 02219 (1.04)(A2)						
21	Geocomposite - Manufacturer's quality assurance/quality control program.	Materials and Performance - Section 02219 (1.04)(A3)						
22	Geocomposite - Certified results of all quality control testing.	Materials and Performance - Section 02219 (1.04)(A4)						
23	Geocomposite - Contractor's proposed transportation, handling, and storage techniques.	Materials and Performance - Section 02219 (1.04)(A5)						
24	Geocomposite - Shop drawings indicating panel layouts and proposed installation techniques.	Materials and Performance - Section 02219 (1.04)(A6)/(2.04)(E)						
25	Geocomposite - Quality Assurance: The contractor shall submit written certification that the delivered material meets the manufacturer's specifications. The Contractor shall provide the quality control test results conducted by the manufacturer during the manufacturing of the geocomposite delivered to the project site. The results must identify the sections of field-delivered geocomposite they represent. The Contractor shall also provide the lot and roll number for the material delivered to the site.	Materials and Performance - Section 02219 (2.04)(A)						
26	Geocomposite - Quality Assurance: The contractor shall verify, in writing and prior to installation, that the geocomposite has not been damaged due to improper transportation, handling, or storage.	Materials and Performance - Section 02219 (2.04)(C)						
27	Geocomposite - Quality Control: The contractor shall provide as-built drawings identifying panel layout, locations of imperfections, and repairs and any other appropriate observations.	Materials and Performance - Section 02219 (3.04)(A)						
28	Geotextile Fabric - Manufacturer's data for geotextile including, at a minimum, physical properties, roll dimensions, and installation techniques.	Materials and Performance - Section 02232 (1.03)(A)						
29	Geotextile Fabric - Manufacturer's quality assurance/quality control program.	Materials and Performance - Section 02232 (1.03)(B)						
30	Geotextile Fabric - Certified results of all quality control testing.	Materials and Performance - Section 02232 (1.03)(C)						
31	Geotextile Fabric - Proposed transportation, handling, storage, and installation techniques.	Materials and Performance - Section 02232 (1.03)(D)						
32	Geotextile Fabric - Shop drawings indicating panel layout and installation sequence.	Materials and Performance - Section 02232 (1.03)(E)/(2.04)(D)						
33	Geotextile Fabric - Manufacturer's standard warranty provided for the geotextiles.	Materials and Performance - Section 02232 (1.03)(F)/(3.04)(A)						
34	Geotextile Fabric - All quality control documentation and the as-built panel drawings, upon completing the installation.	Materials and Performance - Section 02232 (3.03)(A1)						
35	Geotextile Fabric - Quality Assurance: The contractor shall submit written certification that the delivered material meets the manufacturer's specifications. The Contractor shall provide the quality control test results conducted by the manufacturer during the manufacturing of the geotextile fabric delivered to the project site. The results shall identify the sections/panels of field-delivered fabric they represent. The Contractor shall also provide the lot and roll number for the fabric delivered to the site.	Materials and Performance - Section 02232 (2.04)(A)						
36	Geotextile Fabric - Quality Assurance: The contractor shall verify, in writing and prior to installation, that the geotextile fabric has not been damaged due to improper transportation, handling, or storage.	Materials and Performance - Section 02232 (2.04)(C)						

General Electric Company
Pittsfield, Massachusetts

Newell Street Area I

Technical Submittal Register

Item No.	[illegible]	Specification Reference (See Note 2)	Date Received	Review Conducted by:		Interim Status/Date (see Note 1)	Final Status/Date (see Note 1)	Notes
				GE Project Manager	GE Design Engineer			
37	Flexible Membrane Liner - FML Manufacturer's corporate background and information.	Materials and Performance - Section 02234 (1.04)(A1.a)						
38	Flexible Membrane Liner - Manufacturing capabilities including: quality control procedures for manufacturing, and list of material properties including certified test results, to which FML samples are attached.	Materials and Performance - Section 02234 (1.04)(A1.b)						
39	Flexible Membrane Liner - A list of at least 10 completed facilities, totaling a minimum of 10,000,000 ft^2, for which the Manufacturer has manufactured FMLs. For each facility, the following information shall be provided: Name and purpose of facility, its location, and date of installation; Name of Owner, Project Manager, Designer, Fabricator (if any), and installer; and Thickness and surface area of FML manufactured.	Materials and Performance - Section 02234 (1.04)(A1.c)						
40	Flexible Membrane Liner - Origin (resin supplier's name, resin production plant) and identification (brand name, number) of the resin.	Materials and Performance - Section 02234 (1.04)(A1.d)						
41	Flexible Membrane Liner - Copy of FML Installer's letter of approval or license by the Manufacturer.	Materials and Performance - Section 02234 (1.04)(B2.a)						
42	Flexible Membrane Liner - Resume of the "master seamer" to be assigned to this project, including dates and duration of employment.	Materials and Performance - Section 02234 (1.04)(B2.b)						
43	Flexible Membrane Liner - Shop drawings, including the following: Layout plan; Quality control program manuals covering all phases of manufacturing and installation; and complete and detailed written instructions for the storage, handling, installation, seaming, inspection plan fail criteria for liner inspections, and QA/QC testing procedures of the liner in compliance with these specifications and the condition of its warranty.	Materials and Performance - Section 02234 (2.04)(A1)						
44	Flexible Membrane Liner - FML installer's written certification that the final surface on which the FML is to be installed is acceptable.	Materials and Performance - Section 02234 (3.01)(A1.d)						
45	Flexible Membrane Liner - Upon completion, the Contractor shall submit record drawings illustrating the following information: Dimensions of all FML field panels; Panel locations referenced to the Technical Drawings; All field seams and panels with the appropriate number or code; and Location of all patches, repairs, and destructive testing samples.	Materials and Performance - Section 02234 (3.02)(A)						
46	Flexible Membrane Liner - The Contractor shall obtain and submit to GE or GE's Representative from the Manufacturer a standard warranty provided for the FML.	Materials and Performance - Section 02234 (3.03)(A)						

Notes:

1. Submittal status nomenclature is as follows:
   - R - Reviewed
   - N - Reviewed and noted
   - S - Resubmit
   - J - Rejected

2. All specifications are referenced to the *Request for Proposal - Newell Street Area I* (BBL, July 2003).

3. The Health and Safety Plan is required for GE record-keeping purposes only and therefore GE and BBL will conduct a review of the plan for completeness only. Determination of the appropriate level of worker safety, equipment, and procedures based on site conditions must be made by the Contractor based on site visits, review of available information, and anticipated site activities.

4. Shading indicates submittals required by GE from Remediation Contractor that will not be included as part of the Final RD/RA Work Plan.

Attachment F

Ambient Air PCB & Particulate Monitoring Program

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engineers & scientists

SCOPE OF WORK
for
Ambient Air PCB & Particulate Monitoring
at Newell Street Area I

General Electric Company
Pittsfield, Massachusetts

Prepared by

Berkshire Environmental Consultants, Inc.
152 North Street, Suite 250
Pittsfield, MA 01201

August 2003

TABLE OF CONTENTS

1.0 INTRODUCTION

This Scope of Work (SOW) describes the ambient air monitoring for polychlorinated biphenyls (PCBs) and particulate matter which will be conducted during remediation and related activities at Newell Street Area I under the Final Removal Design/Removal Action Work Plan (Final Work Plan) for this area. This area includes properties from 187-269 Newell Street on the north side of Newell Street along the Housatonic River, in Pittsfield, Massachusetts.

2.0 SAMPLING OBJECTIVE

The objectives of this sampling program are two-fold:

1. To obtain valid and representative data on levels of PCBs in the ambient air around Newell Street Area I before and during remediation activities to ensure that those activities are not causing an unacceptable increase in ambient air concentrations of PCB; and

2. To obtain valid and representative data on levels of particulate matter in the ambient air around this area before and during construction activities to ensure that the construction activities are not causing an unacceptable increase in ambient air concentrations of particulate matter.

3.0 SITE ACTIVITIES

As described in the Final Work Plan, the on-site activities to be performed at Newell Street Area I include the demolition of existing buildings located on Parcels J9-23-16 and J9-23-23 and the performance of soil remediation activities (including soil removal/replacement and/or the installation of engineered barriers) at 11 parcels within Newell Street Area I. It is anticipated that the remediation activities described in the Final Work Plan will be performed in phases (Phases I – IV), as illustrated on the Technical Drawings provided in Attachment A to the Final Work Plan. These phases will be conducted in no particular order, and multiple phases may be performed concurrently.

This ambient air monitoring program includes particulate monitoring during the building demolition activity and both PCB and particulate monitoring during the phased remediation activities. The building demolition will occur prior to any remediation activity. As the remediation will occur in phases, the air monitoring program will progress in step with the remediation activities. The monitoring locations will be moved as remediation proceeds, as discussed further below.

4.0 PCB MONITORING PROGRAM

4.1 *High Volume PCB Sampling*

The high volume PCB sampling program will include the following elements:

High-Volume Monitoring Locations	4 (3 for Phase I)
Background Sites	1
Co-Located Sites (Field Duplicates)	1
Sampling Time	24 hours per sampling event
Sampling Period	Duration of remediation activities
Frequency of Sampling	Twice prior to the onset of remediation and once every four weeks during remediation*
No. of Blanks Per Sampling Event	1
Sampling Method	EPA Compendium Method TO-4A
Analytical Method	GC/ECD or GC/MS as described in EPA Method TO-4A

* Sampling frequency may be increased if either PCB or particulate monitoring levels exceed threshold values.

Ambient air monitoring for PCBs will be conducted during construction activities that are part of the soil remediation (referred to below in this section as "construction"). Sampling will be conducted for two 24-hour periods prior to the initiation of construction and will be performed once every 4 weeks during construction. The ambient air monitoring frequency for PCBs may be increased to bi-weekly in the event that ambient particulate concentrations at any one location consistently exceed the proposed particulate notification level (i.e., 120 $\mu g/m^3$). "Consistently exceeding" will be defined as concentrations greater than 120 $\mu g/m^3$ on three consecutive 10-hour days or 5 days in any two-week period. Once PCB concentrations are below PCB action levels (see Section 10 of this Scope of Work) for two consecutive bi-weekly events, then PCB sampling frequency will revert to once every 4 weeks.

PCB baseline monitoring will be conducted prior to any on-site construction activity at four locations within Newell Street Area I, as shown on Figure 1. During construction activity, PCB monitoring will be conducted at four (three for Phase I) locations surrounding each phase of activity. Preliminary monitoring sites have been identified for each phase of construction (as shown on Figure 1). The specific locations for these monitors will be selected based on the location and nature of the construction activity, predominant wind direction, the location of potential receptors, physical obstructions (e.g., trees, buildings, etc.), the availability of power, site security, and site accessibility. In addition, a background monitor will be operated during construction

activities at a location inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street.

The detection limit (DL) for PCB analysis of the high volume samples will be 0.0003 $\mu g/m^3$, in consideration of the following:

Avg. Sampling Rate	0.225 m^3/min.
Avg. Sample Volume	324 m^3/PUF
Analytical DL	0.1 µg/PUF
Project DL	0.0003 $\mu g/m^3$

The sampling method to be used for PCBs in the high volume samples is US EPA Compendium Method TO-4A, Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD. This method employs a modified high volume sampler consisting of a glass fiber filter with a polyurethane foam (PUF) backup absorbent cartridge to sample ambient air at a rate of 0.225 m^3/min). A General Metal Works Model GPS-1 Sampler or equivalent will be used. The filter and cartridge will be placed in clean, sealed containers and returned to the laboratory for analysis.

Procedures for sample media preparation and calibration of the sampling system are specified in Method TO-4A. TO-4A further specifies procedures for calculation and data reporting, and the assessment of data for accuracy and precision.

The samplers will be monitored at six-hour intervals over the 24-hour sampling period. During these six-hour checks, instrument magnehelic pressure readings (an indicator of air flow) will be taken. As necessary, the air flow may be adjusted to meet the target flow rate. At the end of the sampling period, the PUF cartridges will be removed from the sampling train. Each PUF cartridge (inside a glass holder) will be wrapped in hexane rinsed aluminum foil. The PUF samples will be labeled, wrapped, packaged in blue ice and sent under chain-of-custody to the contract laboratory for analysis.

The PCB sampling probe height for all high volume monitors will be approximately 2.0 meters above the ground. This height is adequate to represent the breathing zone and to be above the influence of ground activity around the monitor. The location of the samplers will be in conformance, to the extent practical, with the siting requirements for ambient monitors in Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), U.S. EPA. May, 1987.

4.2 *Analytical Procedures*

In the high volume samples, the PCBs will be recovered by Soxhlet extraction with 10% diethyl ether in hexane. The extracts will be reduced in volume using Kuderna-Danish (K-D) concentration techniques and subjected to column chromatographic cleanup. The extracts will be analyzed for PCBs using gas chromatography with either electron capture detection (GC/ECD) or mass spectrometry detection (GC/MS) as described TO-4A.

The samples will be analyzed for the following PCB Aroclors:

PCB-1016	PCB-1221
PCB-1232	PCB-1242
PCB-1248	PCB-1254
PCB-1260	

5.0 PARTICULATE MONITORING

Ambient air monitoring for particulate matter will be conducted during all construction activities. Specifically, real-time ambient particulate monitoring will be performed during all active on-site activities, including both building demolition and soil remediation. Such monitoring will be conducted at four locations (which will vary as the phased site activities progress) and at one appropriate background location inside GE Gate 31 on the corner of Woodlawn Avenue and Tyler Street. Preliminary monitoring sites have been identified (Figure 1). The specific locations for stations will be selected based on the location and nature of the construction activities, predominant wind direction, location of potential receptors, physical obstructions, availability of power, site accessibility, and site security.

At the background station and one on-site location, real-time particulate monitoring will be performed using a MIE dataRAM Model DR-2000 real-time particulate monitor. Each monitor Model DR-2000 is equipped with a temperature conditioning heater and in-line impactor head to monitor and record particulate concentrations with a mean diameter less than 10 micrometers (PM_{10}). At the remaining three on-site locations, real-time particulate monitoring will be performed using a MIE dataRAM Model pDR-1000. Particulate monitoring will typically be conducted at all stations for approximately 10 hours daily, from 7 a.m. to 5 p.m., during construction activities. Additional site activities may warrant a longer monitoring period. Particulate data will be recorded and averaged by the instruments' dataloggers every 15 minutes.

Calibrations and maintenance will be conducted at the frequency and in accordance with the procedures recommended by the manufacturer. All calibrations will be recorded.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Quality assurance and quality control (QA/QC) procedures for the PCB air sampling program follow those described in GE's *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP) and Method TO-4A. Quality assurance and quality control for the particulate sampling will be based on manufacturer's recommendations.

7.0 PCB SAMPLE DOCUMENTATION, HANDLING AND SHIPMENT

Each filter holder and PUF cartridge holder will be pre-marked with a permanent identification number. As each sample is collected, it will be recorded on a field data form along with the date, time and location of collection.

All samples will be securely wrapped for shipment. PCB samples will be preserved at 4°C and shipped on blue ice. Samples will be shipped under chain-of-custody by commercial overnight carrier or courier to the analytical laboratory. Complete details on the PCB sample shipment procedures are contained in the FSP/QAPP.

8.0 METEOROLOGICAL MONITORING

Meteorological data from the Climatronics Electronic Weather Station (EWS) operated at the GE facility in Pittsfield, Massachusetts will be included with the sampling results. This EWS has been operating continuously since 1991 at the GE facility in East Street Area 2 providing data to support other GE activities under the MCP. The EWS measures and records wind speed, wind direction, precipitation, temperature, relative humidity and integrated solar radiation. The siting of the meteorological station was established with the approval of DEP. The station was installed and continues to operate in accordance with EPA On-site Meteorological Program Guidance for Regulatory Modeling Applications and a Site Specific Meteorological Monitoring Quality Assurance Project Plan. The operation of the EWS has been successfully audited by Massachusetts Department of Environmental Protection (DEP).

Barometric pressure will be measured and recorded on each sampling day. In addition, a portable relativity humidity indicator will be used for field verification of humidity conditions.

9.0 DOCUMENTATION AND REPORTING

Particulate data will be summarized and reported to the GE Project Manager and the Blasland, Bouck & Lee (BBL) Project Manager. If there is an exceedance of a reporting threshold, GE will be notified as soon as possible. All field and laboratory data recorded during ambient monitoring will be documented according to the procedures in the FSP/QAPP. A written report summarizing the results will be provided to GE and BBL within one month after the conclusion of sampling and will include the following:

Date and Time of Sampling
Sampling Locations
Calibration and Maintenance Activities
Pollutants Monitored
Number of Samples Collected
Analytical Results
Quality Assurance Assessment
Meteorological Data Summary
Discussion of Problems or Disruptions
Signature of Individual Responsible for Monitoring Program

10.0 ACTION LEVELS

10.1 *PCBs*

The notification and action levels for PCB concentrations in ambient air are 0.05 $\mu g/m^3$ (24-hour average) and 0.1 $\mu g/m^3$ (24-hour average), respectively. These are the same levels established by EPA for the other remediation activities in Pittsfield. Any exceedance of the notification level will be immediately reported to the GE Project Manager.

10.2 *Particulate Matter*

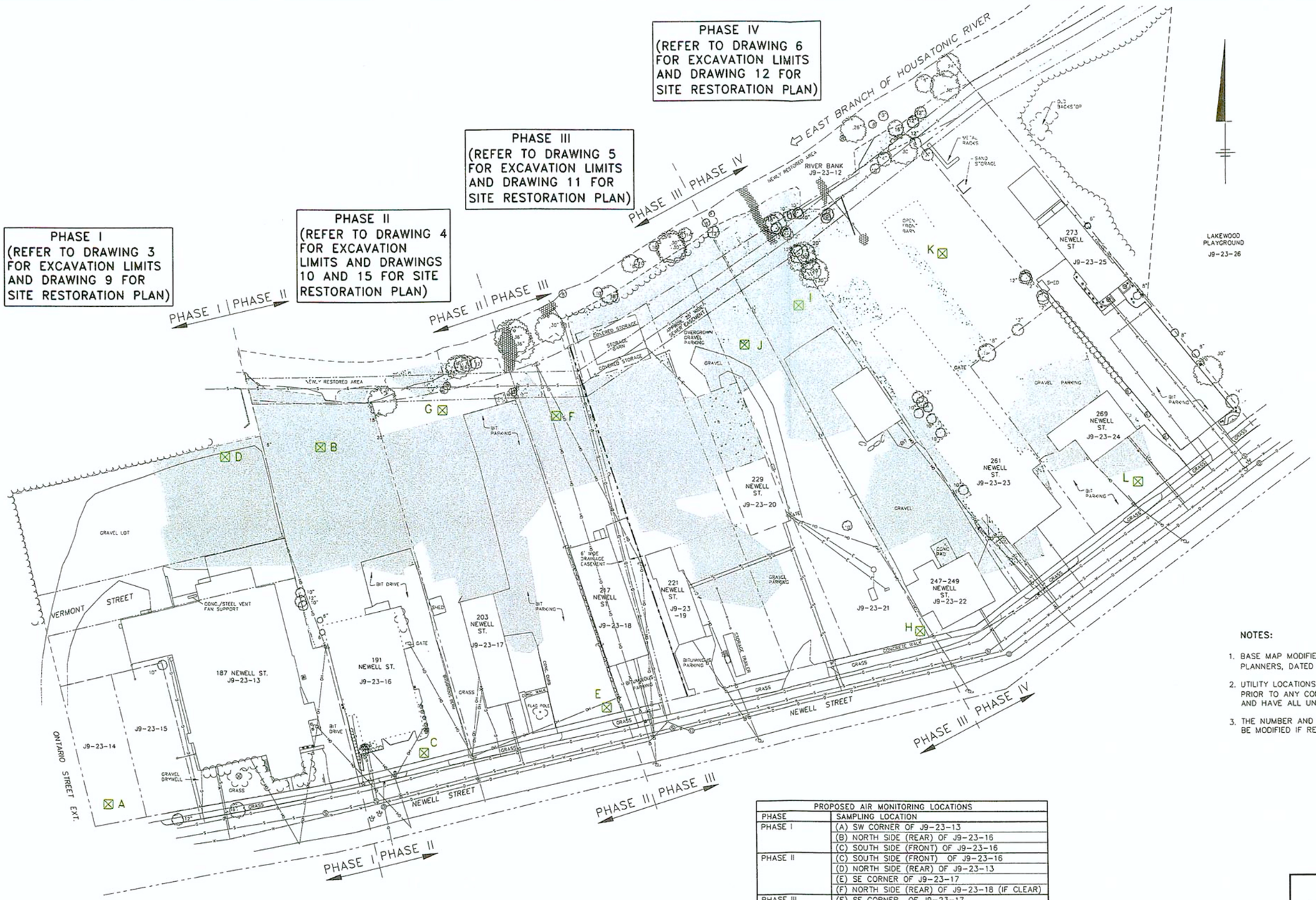
For each day of monitoring, the particulate data from the on-site monitors will initially be compared with the data from the background monitor. If the average 10-hour PM_{10} concentration at any on-site monitor exceeds the average concentration at the background monitor, the on-site concentrations will then be compared with the notification level of 120 $\mu g/m^3$ (micrograms per cubic meter) -- which represents 80 percent of the current 24-hour National Ambient Air Quality Standard (NAAQS) for PM_{10} (150 $\mu g/m^3$). This level has been selected to allow notice to GE before concentrations reach the level of the 24-hour NAAQS. Any exceedances of the notification level or the NAAQS will be immediately reported to the GE Project Manager.

PHASE I
(REFER TO DRAWING 3 FOR EXCAVATION LIMITS AND DRAWING 9 FOR SITE RESTORATION PLAN)

PHASE II
(REFER TO DRAWING 4 FOR EXCAVATION LIMITS AND DRAWINGS 10 AND 15 FOR SITE RESTORATION PLAN)

PHASE III
(REFER TO DRAWING 5 FOR EXCAVATION LIMITS AND DRAWING 11 FOR SITE RESTORATION PLAN)

PHASE IV
(REFER TO DRAWING 6 FOR EXCAVATION LIMITS AND DRAWING 12 FOR SITE RESTORATION PLAN)



LEGEND:

- APPROXIMATE PROPOSED AMIBIENT AIR PCB AND PARTICULATE MONITORING LOCATION
- APPROXIMATE RAA BOUNDARY
- PARCEL BOUNDARY
- PHASE BOUNDARY
- EASEMENT
- TOP OF BANK
- J9-23-23 PARCEL ID
- RIP RAP
- CONCRETE
- LIGHT POLE
- SIGN
- ELECTRIC TRANSFORMER
- DECIDUOUS TREE
- EDGE OF BUSHES/HEDGE
- WATER SHUTOFF
- DRAIN MANHOLE
- CATCH BASIN
- GAS METER
- SANITARY MANHOLE
- UTILITY POLE
- DRAIN LINE
- OVERHEAD WIRES
- GAS SERVICE
- WATER SERVICE
- SANITARY SEWER
- BUILDING
- FUTURE CONCRETE FLOOR
- LIMITS OF SOIL REMOVAL/ENGINEERED BARRIER INSTALLATION

NOTES:

1. BASE MAP MODIFIED FROM SURVEY BY HILL ENGINEERS, ARCHITECTS & PLANNERS, DATED 8/15/01.
2. UTILITY LOCATIONS ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG-SAFE" AND HAVE ALL UNDERGROUND UTILITIES LOCATED.
3. THE NUMBER AND LOCATION OF AIR MONITORING LOCATIONS SHOWN ABOVE MAY BE MODIFIED IF REMEDIAL ACTIVITY OCCURS CONCURRENTLY IN MULTIPLE PHASES.

PROPOSED AIR MONITORING LOCATIONS	
PHASE	SAMPLING LOCATION
PHASE I	(A) SW CORNER OF J9-23-13
	(B) NORTH SIDE (REAR) OF J9-23-16
	(C) SOUTH SIDE (FRONT) OF J9-23-16
PHASE II	(C) SOUTH SIDE (FRONT) OF J9-23-16
	(D) NORTH SIDE (REAR) OF J9-23-13
	(E) SE CORNER OF J9-23-17
	(F) NORTH SIDE (REAR) OF J9-23-18 (IF CLEAR)
PHASE III	(E) SE CORNER OF J9-23-17
	(G) NORTH SIDE (REAR) OF J9-23-17
	(H) SE CORNER OF J9-23-21
	(I) NORTH SIDE (REAR) OF J9-23-22
PHASE IV	(H) SE CORNER OF J9-23-21
	(J) NORTH SIDE (REAR) OF J9-23-21
	(K) NORTH SIDE (REAR) OF J9-23-24
	(L) SOUTH SIDE (FRONT) OF J9-23-24
BASELINE PCB MONITORING	(C) SOUTH SIDE (FRONT) OF J9-23-16
	(D) NORTH SIDE (REAR) OF J9-23-13
	(K) NORTH SIDE (REAR) OF J9-23-24
	(L) SOUTH SIDE (FRONT) OF J9-23-24

CONFIDENTIAL

0 50' 100'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
SCOPE OF WORK FOR AMBIENT AIR PCB PARTICULATE MONITORING NEWELL STREET AREA I

PROPOSED AMBIENT AIR PCB AND PARTICULATE MONITORING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1

X: 10112X01.DWG
L: ON=*, OFF=*REF*
P: PAGESET/PLT-DL
8/4/03 SYR-85-KMD LAF DMW
C/10112004/10112G01.DWG