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One Congress Street, Suite 1100  
Boston, MA 02114-2023

Superfund Records Center  
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May 28, 2008

Mr. Andrew A. Silfer  
GE Corporate Environmental Programs  
159 Plastics Avenue  
Pittsfield, MA 01201

**RE: Interim Post-Removal Site Control Plan  
1 ½-Mile Reach Removal Action  
GE-Pittsfield/Housatonic River Site, Pittsfield, Massachusetts**

Enclosed is a hard copy and a CD of the Interim Post-Removal Site Control (PRSC) Plan (May 2008) for the 1 ½-Mile Reach Removal Action. Please note that Appendix C – Construction As-Builts for In-River areas are only provided on the CD.

Pursuant to Paragraph 21.b. of the Consent Decree and the November 21, 2000 Action Memorandum, GE is required to undertake all PRSC activities after EPA completes the 1 ½-Mile Reach Removal Action. EPA has now completed the 1 ½-Mile Removal Action. Accordingly, GE shall implement PRSC activities in accordance with the Interim PRSC Plan until it is revised or until a Final PRSC Plan is included in the 1 ½-Mile Reach Final Completion Report.

If you have any questions, please contact me at (413) 236-0969.

Sincerely,

Dean Tagliaferro  
EPA Project Manager

Enclosure

cc: K. Mooney, GE  
R. McLaren, GE (w/o enclosure)  
S. Streenstrup, MA DEP (2 copies)  
S. Peterson, CT DEP  
D. Young, MA EEOEA  
K. Munney, US F&W

R. Nasman, Berkshire Gas  
J. Kilborn, EPA  
H. Inglis, EPA (CD only)  
Public Information Repositories



**U.S. Army  
Corps of Engineers**  
New England District  
Concord, Massachusetts



**U.S. Environmental  
Protection Agency**  
New England Region  
Boston, Massachusetts

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**INTERIM POST - REMOVAL SITE CONTROL PLAN  
1½-MILE REMOVAL REACH  
GENERAL ELECTRIC (GE)-PITTSFIELD/HOUSATONIC  
RIVER SITE**



**DCN: GE-051908-ADWJ  
May 2008**

**Contract No. DACW33-00-D-0006**



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ACB	Articulated Concrete Block
cfs	cubic feet per second
CD	Consent Decree
cy	cubic yards
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERE	Environmental Restrictions and Easements
GE	General Electric
HDPE	High Density Polyethylene
HRO	Habitat Restoration Objectives
MassDEP	Massachusetts Department of Environmental Protection
PCB	polychlorinated biphenyl
PRSC	Post-Removal Site Control Plan
QA	quality assurance
QAPP	Quality Assurance Project Plan
USGS	United States Geological Survey
WESTON®	Weston Solutions, Inc.
Woodlot	Woodlot Alternatives, Inc.

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**SECTION 1**

**INTRODUCTION**

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## **1. INTRODUCTION**

This Interim Post Removal Site Control (PRSC) Plan outlines actions to be taken by General Electric (GE) under U.S. Environmental Protection Agency (EPA) oversight following the completion of the 1½-Mile Reach Removal Action in the East Branch of the Housatonic River to monitor and maintain the following:

- Condition and integrity of the restored riverbed and riverbanks (including associated infrastructure/ancillary items)
- Condition and integrity of certain non-riverbank areas that were disturbed or affected by the 1½-Mile Reach Removal Action
- Restoration of plant communities
- Restoration of invertebrate communities
- Surface water quality
- Sediment quality

GE shall follow this Interim PRSC Plan until it is revised or until a Final PRSC Plan is included in the 1.5 Mile Reach Final Completion Report.

A Final PRSC Plan will be included as an attachment to the 1½-Mile Reach Removal Action Final Completion Report.

### **1.1 REPORT ORGANIZATION**

This PRSC Plan is divided into four sections. Section 1 presents the project description, objectives, and background information. Section 2 outlines the Maintenance Standards. Section 3 describes the monitoring methods and procedures. Section 4 presents the reporting requirements for the PRSC Plan. Supporting figures, tables, and appendices are presented at the end of this document.

## **1.2 PROJECT BACKGROUND**

In September 2002, immediately following completion of the Upper ½-Mile Reach excavation, EPA initiated construction activities in the next phase of Housatonic River remediation – the 1½-Mile Reach. This Reach extends from the Lyman Street Bridge downstream to the confluence of the East and West Branches of the river. Figure 1-1 shows the 1½-Mile Reach.

EPA performed the cleanup of sediment and bank soils in the 1½-Mile Reach under the terms of the Consent Decree (CD) for the GE-Pittsfield/Housatonic River Site. In the CD, EPA, and GE agreed on a cost sharing formula for the 1½-Mile Reach Removal Action.

EPA's selected removal action for the 1½-Mile Reach is described in a November 2000 Action Memorandum. Implementation of the 1½-Mile Reach Removal Action resulted in the excavation, removal, and disposal of approximately 91,700 cubic yards (cy) of contaminated sediment and riverbank soil. EPA performed the removal action using two "dry excavation" techniques. The first technique used was similar to the method employed by GE in the Upper ½-Mile Reach, and involved the use of a sheetpile coffer dam technique to construct individual work cells along the river. To build a cell, a sheetpile wall was installed along the centerline of the riverbed, followed by the installation of upstream and downstream sheetpile cut-off walls which branched off the centerline sheetpile wall and extended up the riverbank. The river flow was thus diverted around the sheetpile cell, the cell was then dewatered, the sediment and riverbank soil were removed, and the cell was backfilled to the design grade. Next, cutoff walls were removed and installed on the opposite side of the river channel. This method was implemented at the beginning of the 1½-Mile Reach (Lyman Street Bridge) and continued to a point approximately 1,400 feet downstream of Lyman Street.

In segments of the river where bedrock was too close to the surface for use of the sheetpile coffer dam system, a gravity-fed bypass system was used. The bypass system consisted of a temporary dam installed approximately 1,400 feet downstream from the Lyman Street Bridge, and connected to two 54-inch diameter high density polyethylene (HDPE) pipes. River water was diverted into the two pipes and exited the pipes downstream of the active work area. The pipes

were placed along one side of the river channel while the riverbed sediment and riverbank soil on the other side were removed and backfilled. The pipes were then moved to the remediated side of the river and the process was repeated. Additional sections of pipe were added as the removal and restoration progressed downstream. The gravity bypass system was used to remediate and restore approximately 3,400 feet of the river channel to a location 400 feet downstream of the Dawes Avenue Bridge (Station 547+50).

At Station 547+50, the river diversion method reverted back to the sheetpile coffer dam technique for the remaining 2,800 feet of the river, down to the confluence of the East and West Branches.

Conceptual design and design development information for the removal of the riverbed sediment and riverbank soil and restoration are provided in the Engineering Evaluation/Cost Estimate (EE/CA) and Basis of Design documents.

In addition, an Aquatic Habitat Assessment was completed by Woodlot Alternatives, Inc. (Woodlot) in 2000. Design drawings and specifications were completed for the removal action in five segments as follows:

- Phase 1 – Station 500+00 to 514+00
- Transition Phase – Station 514+00 to Station 521+68
- Phase 2A – Station 521+68 to Station 527+60
- Phase 2B and C – Station 527+60 to Station 534+50
- Phase 3 – Station 543+50 to Station 575+33

All of the above-referenced documents, drawings, and specifications are available on EPA's web page (<http://www.epa.gov/region1/ge/thesite/1andhalfmile-reports.html>).

EPA completed excavation activities in March of 2006. Restoration activities, including restoration of support areas, were substantially completed by the end of 2006. In 2007, EPA continued with restoration and maintenance activities.

During 2007, EPA conducted two post-remediation sampling programs. The first program was the Post Remediation Sediment Sampling Program, which consisted of a collection of

95 post-remediation surficial sediment samples in June of 2007 along the entire 1½-Mile Reach. The second sampling program was the aquatic invertebrate and fish sampling program, which consisted of community characterization and polychlorinated biphenyls (PCB) tissue analysis of the benthic macroinvertebrates and collecting qualitative information on fish community composition and relative abundance in the reach. The reports documenting the results of these programs are as follows:

- *Post-Remediation Sediment Sampling Report, August 2007*
- *Post-Remediation Aquatic Community Assessment Report, December 2007*

### **1.3 PROJECT OBJECTIVES**

In the EE/CA and the resulting Action Memorandum, the following goals and objectives were established for the 1½-Mile Removal:

- Implement the Removal Action for the 1½-Mile Reach.
- Perform the restoration, including the enhancement of the river sediment and riverbank habitat, to increase the diversity and productivity of the biological community.
- Restore the riverbank to provide overlying cover, to enhance the riverbank vegetation by establishing plantings using native species.
- Minimize the potential for erosion of residual PCB-containing riverbank soil and river sediment that would result in recontamination of river sediment or transport of PCBs, and which could impair the river restoration by adversely impacting the ecological receptors.
- Increase the variability in water velocity and in low-flow channel width.
- Increase the diversity and amount of substrate cover types and water turbulence cover types.

The design and construction of the 1½-Mile Reach were implemented and managed in accordance with these goals. These goals provide the foundation and measurable objectives for the ongoing monitoring and maintenance in the 1½-Mile Reach.

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**SECTION 2**

**MAINTENANCE STANDARDS**

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## **2. MAINTENANCE STANDARDS**

The objective of the PRSC Plan is to provide for the maintenance and continued restoration of the 1½-Mile Reach Removal Action and to assess and document, over time, the performance of the remediation and restoration work performed on the 1½-Mile Reach, including work intended to achieve both habitat and non-habitat based goals and objectives. Habitat-based goals and objectives include providing riparian cover, enhancing riverbank vegetation by re-establishing riparian plantings with native species, and increasing the diversity and productivity of the biological community. Non-habitat based objectives include preventing erosion of residual PCB-contaminated bank soils, preventing erosion of riprap, preserving river channel stability, and preserving the integrity of ancillary features, including paved areas, retaining walls, fences, and gates.

### **2.1 RIVERBANK SOIL RESTORATION**

The Riverbank Soil Restoration Maintenance Standard is defined as no significant erosion (e.g., ruts, gullies, washouts, or sloughing).

In areas where significant erosion occurs, action will be taken to restore the area to original as-built conditions, and an evaluation will be conducted to determine the cause of the erosion. Corrective action will be taken to prevent or reduce future erosion. In addition, GE will evaluate the source, dispersal and quantity of eroded soil in the river, if any, and will propose to EPA appropriate measures to remove any significant quantity of the contaminated eroded soils to the extent practical.

GE shall implement corrective actions within 30 days of EPA approval of the proposed actions or according to a schedule approved by EPA. If deficiencies or erosion in riverbank soils could result in a high potential for erosion of the underlying soil or sloughing of soil into the Housatonic River, GE shall implement corrective actions as soon as practical, with prior notice to EPA and MassDEP as required by Section 4.3.

## **2.2 RIPRAP PLACED IN THE RIVER CHANNEL, RIVERBANK, OR IN SWALES AND ARTICULATED CONCRETE BLOCK**

The Riprap Maintenance Standard for riprap placed in the river channel, riverbank, or in swales is defined as no significant movement of the riprap or reduction in riprap thickness that threatens the stability of the riverbanks or river channel or results in the erosion of underlying soils or sediment. The Riprap Maintenance Standard for riprap placed in swales is also defined as no movement of riprap that results in the exposure of the underlying geotextile fabric. The Maintenance Standard for the Articulated Concrete Block (ACB) placed in the river channel is defined as no significant damage to (i) the ACB, (ii) the shotcrete that is tying in the ACB to the base of the adjacent retaining wall on Parcel I8-10-5, and (iii) the shotcrete at the transition between the ACB and the adjacent riprap at the downstream end of the ACB.

Corrective action will be taken upon the occurrence of any of the conditions described in the previous paragraph, and an evaluation will be conducted to determine the cause of the occurrence of the condition. Actions will be taken to prevent or reduce future occurrence of the conditions described in the preceding paragraph. In addition, GE will evaluate the source, dispersal and quantity of eroded soil in the river, if any, and will propose to EPA appropriate measures to remove any significant quantity of the contaminated eroded soils to the extent practical.

GE shall implement corrective actions within 30 days of EPA approval of the proposed actions or according to a schedule approved by EPA. If deficiencies in the riprap or ACB could result in a high potential for erosion of the underlying soil or sloughing of soil into the Housatonic River, GE shall implement corrective actions as soon as practical, with prior notice to EPA and MassDEP as required by Section 4.3.

## **2.3 AQUATIC HABITAT ENHANCEMENT STRUCTURES**

The Aquatic Habitat Enhancement Structure Maintenance Standard is defined as no significant movement of any riprap adjacent to the structures and no significant riverbank erosion caused by the presence of the structures. If there is significant movement of any riprap or significant

riverbank erosion, the cause of the movement or the erosion will be evaluated and corrective action will be taken. In addition, if a habitat enhancement structure has significantly moved from its location in the previous inspection, GE will submit to EPA an evaluation whether corrective action is required, considering, among other things, the extent to which the change in location has impacted the ecological value of the structure(s) or has caused or will cause significant erosion of the river or riverbank. Actions will be taken to prevent or reduce future occurrence of the above described conditions. In addition, GE will evaluate the source, dispersal and quantity of eroded soil in the river, if any, and will propose to EPA appropriate measures to remove any significant quantity of the contaminated eroded soils to the extent practical.

GE shall implement corrective actions within 30 days of EPA approval of the proposed actions or according to a schedule approved by EPA. If deficiencies could result in a high potential for erosion of the underlying soil or sloughing of soil into the Housatonic River, GE shall implement corrective actions as soon as practical, with prior notice to EPA and MassDEP as required by Section 4.3.

## **2.4 ANCILLARY ITEMS CONSTRUCTED AS PART OF REMEDIATION ACTIVITIES**

The Maintenance Standard for ancillary items constructed as part of remediation activities (e.g., retaining walls, fencing, guardrails, etc.) is defined as no substantial variation from as-built conditions.

If any observed deficiency does not appear to affect safety or security, GE shall implement corrective actions within 30 days of EPA approval of the proposed actions or according to a schedule approved by EPA. If it is determined that the deficiency could result in unsafe conditions, GE shall implement corrective actions as soon as practical, with prior notice to EPA and MassDEP as required by Section 4.3. For the five retaining walls described below in Section 3.4, GE shall implement corrective actions upon an EPA determination that corrective actions are required, according to a schedule determined by EPA.

## 2.5 RE-VEGETATION OF RIVERBANK AND NON-RIVERBANK PLANTING AREAS

The Riverbank and Non-Riverbank Re-vegetation Maintenance Standards are defined as follows:

- **Riverbank Planting Areas** - Survivability of planted trees and shrubs shall be equal to or greater than 80% of the number of trees and shrubs originally planted.
- **Non-Riverbank Areas, Excluding Fred Garner Park** – Survivability of planted trees and shrubs shall be 100% of the number of trees and shrubs originally planted.
- **Non-Riverbank Fred Garner Park Plantings** - Survivability of planted trees and shrubs in Fred Garner Park shall be equal to or greater than 80% of the number of trees and shrubs originally planted, except that the Maintenance Standard for the following trees in Fred Garner Park shall be 100% survivability: the 8 red maples and the 6 river birches adjacent to the soccer field at Fred Garner Park, and the 16 hemlocks along the walking path.
- **Herbaceous Cover** - The Maintenance Standard for herbaceous cover shall be 95% cover outside the foliar coverage of trees. There is no Maintenance Standard for individual species of the herbaceous seed mix.

## 2.6 INVASIVE SPECIES CONTROL

The Invasive Species Control Maintenance Standard is defined as areal coverage of listed invasive plant species (see Appendix A) that is less than 5% of any monitoring area. Any invasive species present in excess of 5% will be removed by appropriate means.

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**SECTION 3**

**MONITORING PROCEDURES**

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### **3. MONITORING PROCEDURES**

Using the previously defined Maintenance Standards, performance and maintenance monitoring and corrective actions will be performed in accordance with the guidelines described below. Prior to performing monitoring work, previous monitoring reports will be reviewed. All field notes from the maintenance and performance monitoring will be recorded on dedicated field forms and base maps developed from the project CAD files.

#### **3.1 MONITORING OF RIVERBANK SOIL**

Riverbank soil will be monitored to evaluate compliance with the Maintenance Standards and to determine whether corrective actions are required. The monitoring program will consist of visual inspections of all riverbanks in the 1½-Mile Reach and will include a minimum of one formal monitoring inspection each year. These inspections will take place during low flow conditions (i.e., typically in July or August). In addition, formal inspections will be performed after any flow event that exceeds 3,500 cubic feet per second (cfs) as measured at the United States Geological Survey (USGS) Coltsville stream gaging station (USGS No. 01197000).

The monitoring work will consist of observations of subject areas to document characteristics of the riverbank soil, such as sloughing, apparent erosion, and woody and herbaceous plant cover. The monitoring work will be documented on standardized field forms and with photographs. A sample field form is included as Appendix B.

#### **3.2 MONITORING OF RIPRAP AND ARTICULATED CONCRETE BLOCK**

The riprap and ACB will be monitored to evaluate compliance with the Maintenance Standards and to determine whether corrective actions are required. The monitoring program will consist of visual inspections of all riprap located within the 1½-Mile Reach and will include a minimum of one formal monitoring inspection each year. These inspections will take place during low flow conditions (i.e., typically in July or August). In addition, formal inspections will be performed after any flow event that exceeds 3,500 cfs as measured at the USGS Coltsville stream gaging station.

Prior to performing monitoring work, as-built drawings (Appendix C) and previous monitoring reports will be reviewed to determine materials size, slope, thickness, extents, and whether deficiencies and/or corrective actions have been noted previously. The monitoring work will include observations of subject areas to document readily observable characteristics of the riprap, such as fairness of the slope, sloughing, apparent erosion, and size distribution of the riprap. If it is not clear whether riprap within the subject areas has moved, as-built drawings should be reviewed and, if necessary, survey work shall be performed and the results compared with the as-built drawings.

Also, inspections will be performed on the ACB located in the riverbed immediately downstream of the Elm Street Bridge. The work will include observations regarding the physical conditions of the blocks to document any cracked blocks and any other structural deficiencies. The transition between the ACB and the adjacent retaining wall located at Parcel I8-10-5 shall be inspected to make sure that the shotcrete which ties into the ACB into the base of the wall is in stable condition and no cracking has occurred. The transition between the downstream end of the ACB and the adjacent riverbed riprap immediately downstream of the terminus of the ACB will be monitored for stability of the ACB and the adjacent riprap, and that the shotcrete which ties the ACB into the adjacent riprap is stable and no cracking and any other structural deficiencies have occurred. Variation in elevations of the ACB and the riverbed riprap immediately downstream should also be noted.

The monitoring work will be documented on standardized field forms and with photographs. A sample field form is included as Appendix B.

### **3.3 MONITORING OF AQUATIC HABITAT ENHANCEMENT STRUCTURES**

Aquatic habitat enhancement structures will be monitored to evaluate compliance with the Maintenance Standards and functional value (at the time of the assessment) of these features and to determine whether corrective actions are required. The structural stability of the aquatic habitat enhancement structures will be assessed as part of the monitoring work for riprap and will include visual inspections of the structures. This monitoring will be performed once a year

during low flow conditions (i.e., typically in July or August). Inspections will also be performed after any flow event that exceeds 3,500 cfs as measured at the USGS Coltsville stream gaging station. The functional value of the aquatic habitat enhancement structures will be monitored on the same schedule as the stability monitoring.

The structural stability monitoring of the aquatic habitat enhancement structures will include observations to document characteristics of the structures, such as shape and location. These observations will be documented on standardized field forms and with photographs. This monitoring will include inspection of adjacent sections of riverbed and riverbank riprap to determine if the riprap is experiencing scour due to the presence of the aquatic habitat enhancement structures.

The functional monitoring will include observations of flow speed and depth variability, sediment deposition and scour, and the occurrence of riverine fauna in the vicinity of the structures. These observations will be performed in a qualitative manner during each monitoring event and will not be used to require corrective actions. Although the function of these structures is not a Maintenance Standard, this monitoring work will provide a determination of whether the Habitat Restoration Objectives (HRO) of the project are achieved.

Monitoring of the structural stability and functional assessment of the aquatic enhancement structures will be performed by personnel familiar with the design criteria and desired function of the aquatic enhancement structures.

### **3.4 MONITORING OF ANCILLARY ITEMS CONSTRUCTED AS PART OF REMEDIATION ACTIVITIES**

The ancillary items constructed as part of remediation activities (e.g., retaining walls, fencing, guardrails, paved areas, and restored support areas) will be monitored to assess the condition of these features, compliance with the Maintenance Standards, and to determine whether corrective action is required. The monitoring program will include visual inspections of identified features and will be performed once a year along with the riverbank soil and riprap monitoring inspections which will take place during low flow (i.e., typically in July or August).

Personnel experienced in the design and construction of the specific features will perform the inspections. In addition, at least every five years a registered professional structural or a geotechnical engineer experienced in the design and construction of the specific features will perform the inspections. The inspector will review as-built drawings (Appendix C and Appendix D) and previous monitoring reports prior to performing the inspections. The monitoring work will be documented on standardized field forms (Appendix E) and with photographs.

Non-critical restoration items shall be inspected once a year for a period of two years after the installation or restoration. Items that were installed or restored prior to 2006 no longer need to be inspected. Items installed or restored in 2006 need to be inspected in 2008. (No ancillary items were installed or restored in 2007.)

Non-critical restoration items include fencing, pavement, guardrails and restored areas. Non-critical restoration items installed or restored in 2006 include, but are not limited to:

- Restored areas including fencing and pavement on Parcel I9-4-201.
- Restored areas including pavement and a portion of fencing adjacent to parking lot on Parcel I8-24-1.
- Pavement, fencing and gates on Parcel I8-24-5.
- Restored areas including pavement on Hathaway Street.
- Restored areas including fencing, gates and guardrail on Parcel I8-23-6.
- Black stone mix parking lot on Parcels I9-4-25 and I9-4-203.
- Restored areas including fencing and guardrail on Parcels I8-10-2 and I8-10-3.
- Restored areas including fencing and gate along the parking lot on Parcel I8-4-201/202.
- Restored areas including fencing and gates on Parcels I6-1-67 and I6-1-68 and I6-1-69.
- Restored areas including pavement, guardrail and gate at Fred Garner Park (Parcel I7-1-101).

- Backflow prevention valves at Fred Garner Park (including the need to clean out and flush out the valves).

Critical restoration items shall be inspected once a year for a period of five years, beginning in 2008. After five years, GE shall propose an appropriate long-term monitoring frequency to EPA for approval. GE will implement the modified long-term monitoring program upon approval by EPA. These critical restoration items include:

- The five retaining walls adjacent to the following Parcels: I8-23-6, I8-24-1, I8-10-5, I8-10-4, City Layout for High Street-abutting High Street (formerly lot I8-10-1).
- Handrails on Silver Lake Outfall Structure.
- Guardrails along High Street and Deming Street.
- Fencing along the retaining walls on Parcels: I8-10-5, I8-10-4, City Layout for High Street-abutting High Street (formerly lot I8-10-1).
- Fencing along Caledonia Street.

Inspections for the five retaining walls shall be performed as described below. The indicator items described below shall be inspected and reviewed to determine if the retaining wall is stable and functioning per design or if more rigorous, detailed follow-up evaluation is necessary.

### **The Retaining Walls Located at Parcels I8-23-6 and I8-24-1**

The retaining wall located at Parcel I8-23-6 is a cantilevered retaining wall constructed of steel sheet piling and is completely covered with riprap. The retaining wall located on Parcel I8-24-1 is a cantilevered retaining wall constructed of a combination of steel H-piles and steel sheet piling and is completely covered with riprap. Since these walls are not exposed, visual inspection of the walls is not feasible. Therefore, the inspection shall focus on the riverbank and the area beyond the top of the riverbank to determine if there has been any movement of the riverbank and potentially the walls. The observations shall extend from the toe of the riverbank to a distance of approximately 20 feet beyond the top of the riverbank. Cracks in the vegetated areas or in the asphalt pavement running more-or-less parallel to the top of the riverbank may indicate potential movement of the slope and therefore the walls. Likewise, a pronounced drop in the

ground surface elevation within this zone may also indicate slope and wall deflection. If defects are observed in the flat area beyond the top of the riverbank, it is likely this will result in a visible bulge on the riverbank above the top of the sheet pile riprap cover indicating potential wall deflection. Excessively leaning trees, utility poles or fence posts may also be a predictor of slope or wall deflection. However, it should be noted that some cracking of the asphalt may occur as a result of normal wear and should be distinguished from those cracks that would indicate potential wall or slope deflection.

The riprap covering the retaining wall is primarily for aesthetics. If the sheet pile wall becomes exposed as a result of shifting or movement of the riprap, the riprap may need to be repositioned and/or replaced as needed to provide complete coverage of the wall.

If any of the any of the above described indicators of potential wall deflection have been observed, GE shall propose a more rigorous, detailed follow-up evaluation of the structural stability of the retaining wall and riverbank to EPA for approval. Based on the outcome of this evaluation, corrective actions may be required.

### **The Retaining Wall Located at Parcel I8-10-5**

The upper portion of the retaining wall located at Parcel I8-10-5 is constructed of pre-cast concrete panels resting on a structural member. The upper portion of the retaining wall is supported on small diameter piles (mini piles) and is maintained in a vertical alignment by anchors installed into the bank. The retaining wall was constructed in front of a deteriorated timber crib wall. The lower portion of the wall is constructed of concrete grout applied on a steel mesh, and is held in place with soil nails.

Inspection of the upper and lower portion of the wall shall focus on two areas: the exposed wall face and the parking lot. The exposed wall face shall be visually inspected to assess the condition of the concrete. Areas of deteriorating or deteriorated concrete (e.g., flaking, spalling) shall be identified and a determination shall be made as to the urgency for repairs to be implemented. Repairs may include chipping and removal of deteriorated concrete and placement of new

concrete or non-shrink grout. Particular attention should be paid to the area immediately surrounding the anchor heads. If cracks that follow a consistent pattern (e.g., parallel lines, circular) are observed around any anchor head, additional inspection of the wall shall be completed to assess the cause of the cracking. If wall deflection is suspected, a monitoring program of surveying particular points on the wall at regular intervals may be warranted. The results of the program would quantify wall deflection over time and would allow an assessment as to the severity of the deflection.

The interface between the retaining wall and the abutment of the Elm Street Bridge shall be included in the inspection. If an excessively wide gap has developed, corrective measures shall be taken. The cause of the gap shall also be determined. In addition, the interface between the retaining wall and articulating concrete block placed at the base of the wall shall be evaluated. If a gap is observed between the wall and the block, the gap will be filled with grout.

Observations in the parking lot should extend from the wall to a distance of approximately 20 feet behind the wall. Cracks in the asphalt pavement running more-or-less parallel to the wall may indicate potential deflection of the wall. Likewise, leaning of the fence may also be an indication that the wall is experiencing excessive outward deflection. If cracking of the pavement is observed or if the fence is leaning, additional inspection of the wall shall be initiated. It shall be noted that some cracking of the asphalt may occur as a result of normal wear and shall be distinguished from those cracks that would indicate potential wall deflection.

The formation of a depressed area along the rear of the retaining wall may indicate deflection of the wall, densification of the historic backfill materials or collapse of the original timber crib wall. If it is determined that the formation of the depression is not as a result of wall deflection, the depressed area can be repaired by placing additional asphalt in order to eliminate the depression and to provide positive drainage. Removal of a portion of the existing asphalt may be warranted prior to installing new asphalt. However, if it is determined that the formation of the depression was potentially caused by wall deflection, then GE shall perform an additional evaluation of the structural integrity of the wall.

If any of the any of the above described indicators of potential wall deflection have been observed, GE shall propose a more rigorous, detailed follow up evaluation of the structural stability of the retaining wall to EPA for approval. Based on the outcome of this evaluation, corrective actions may be required.

### **The Retaining Walls Located at Parcels I8-10-4 and City Layout for High Street- Abutting High Street Formally Parcel I8-10-1**

The retaining walls located on Parcel I8-10-4 and on the City Layout for High Street-abutting High Street formally Parcel I8-10-1 are tieback anchored and cantilevered retaining walls, respectively, constructed of steel sheet piling with timber façades. Since the structural elements of the walls are not exposed, visual inspection of the walls are not feasible. Rather, the inspections shall focus on the condition of the timber façades and the parking area behind the wall on Parcel I8-10-4 and portion of High Street adjacent to the retaining wall.

Visual inspections of the pavement shall extend for a distance of approximately 20 feet behind the walls. Cracks in the asphalt pavement running more-or-less parallel to the wall within this area may indicate potential deflection of the walls. Likewise, a pronounced drop in the ground surface elevation within this zone may also indicate wall deflection. Excessively cracked curbs, and excessively leaning trees, utility poles or fence posts may also be a predictor of wall deflection. It should be noted that some cracking of the asphalt may occur as a result of normal wear and should be distinguished from those cracks that would indicate potential wall deflection.

The timber façades shall be inspected in order to identify any missing, loose or damaged boards. GE shall repair any deficient items in the façades. Since the façades are for aesthetic purposes, there will be no impacts on the functionality of the wall due to damage of the façade.

If any of the any of the above described indicators of potential wall deflection have been observed, GE shall propose a more rigorous, detailed follow-up evaluation of the structural stability of the retaining wall (for example, a program to monitor wall deflection) to EPA for approval. Based on the outcome of this evaluation, corrective actions may be required.

### **3.5 MONITORING AND MAINTENANCE OF RIVERBANK AND NON-RIVERBANK RE-VEGETATION**

The riverbank and non-riverbank re-vegetation will be monitored to evaluate compliance with the Maintenance Standards. The monitoring program will include quantitative assessments of plant survivorship and herbaceous cover in designated monitoring plots; and qualitative assessments of riverbank vegetation using meander surveys in planted areas. Also, the monitoring will allow for such observations as the necessity of any tree and/or tree cage maintenance. This work will include two monitoring visits per year, one in May and the other in July. The purpose of the spring visit will be to assess conditions and plant survivorship, and to identify segments of the planting areas where potential corrective actions or maintenance may be required. The purpose of the summer visit will be to assess conditions, measure plant survivorship and areal herbaceous vegetation cover and to assess compliance with the Maintenance Standards. Prior to performing monitoring work, as-built drawings and specifications and previous monitoring reports will be reviewed. The monitoring work will be documented on standardized field forms and with photographs. A sample field form for the monitoring of riprap is included as Appendix C.

For the monitoring of riverbank re-vegetation, the qualification for the lead monitor will include a minimum of five years of experience in the design and implementation of similar re-vegetation projects and an undergraduate degree in a science pertinent to the proposed restoration work (e.g., botany, biology).

#### **3.5.1 Riverbank Trees and Shrubs**

The monitoring of trees and shrubs within the riverbank will include quantitative assessments of plant survivorship in designated monitoring plots and qualitative assessments of riverbank vegetation using meander surveys in planted areas. Monitoring will include an assessment of trees and shrubs suitable for the determination of plant densities in each monitoring area and an evaluation of plant health and vigor (e.g., growth, stress) based on readily observable

characteristics. Readily apparent causes of poor performance, such as drought stress, herbivory, and erosion, will also be noted as part of the monitoring work.

For vegetation monitoring purposes, the 1½-Mile Reach has been divided into four monitoring sub-reaches between the Lyman Street and the confluence of the East and West Branches of the river. These sub-reaches are delimited by the four bridge crossings in the 1½-Mile Reach (Lyman Street, Elm Street, Dawes Avenue, and Pomeroy Avenue, respectively, from upstream to downstream) and the confluence of the East and West Branches of the river. The four sub-reaches represented by these five delimiters are numbered 1 through 4, respectively, moving downstream from the Lyman Street Bridge. In addition, each of the four sub-reaches was divided into monitoring areas defined by the “east” (river-left [looking downstream]) and “west” (river-right) sides of the river, with three monitoring plots established within each monitoring area. This resulted in a total of 8 monitoring areas and 24 permanent monitoring plots (3 plots in each monitoring area) to be used for the quantitative assessment of the vegetation monitoring.

The monitoring plots were established in such a way that they represent between 10% and 20% of the total of each monitoring area and provide an unbiased representation of the entire monitoring area. Within each monitoring area, surface area estimates were acquired for both the non-GeoWeb<sup>®</sup> re-vegetation area and the GeoWeb<sup>®</sup> re-vegetation area. Then, a proportional number of plots were established in both the non-GeoWeb<sup>®</sup> and GeoWeb<sup>®</sup> areas, to make sure that the plots represent approximately 10% of each monitoring area.

The 24 permanent monitoring plots were established based on construction as-builts. The plots were staked out on the riverbanks, surveyed and used for vegetation monitoring in 2006 and 2007. Therefore, for the future monitoring, each monitoring plot has assigned dimensions and target planting densities.

See Table 3-1 for a list of the 24 plots, their respective numbering scheme, dimensions and assigned target planting densities. See Figure 2-1 through Figure 2-4 for the locations of the plots.

To quantify plant survivorship, planted trees and shrubs will be counted in each monitoring plot. The monitor(s) will walk through each plot, determining the number, type, and condition of the installed plants, and tallying the observations on appropriate field forms (Appendix F). Plants are to be counted as either alive or dead, with the live category including stressed plants. Stressed plants will be noted based on readily apparent physical characteristics such as leaf wilt, bug infestation, die back, herbicide injury, and/or animal damage. Non-stressed plants will be those that are growing vigorously as determined by characteristics such as relative size, annual growth, leaf color and stem integrity. Participants in the inspection will utilize best professional judgment to assess the apparent stress and/or vigor of the planted specimens.

Natural regeneration of plants can occur from such sources as sprouts from stumps and/or roots of trees, from shrubs previously cut to facilitate remediation work, and from seed dispersion of “parent” plants adjacent to the project site. Where natural regeneration of plant species listed in Appendix G has occurred, these plants will be included in the overall plant count, if such plants are a minimum of two feet tall. When a stump has many sprouts extending from the base, in excess of two feet, it shall be tallied as one plant. Natural regeneration of species not listed in Appendix G will be noted and recorded in the “comments” section of the field forms.

The qualitative assessments of the riverbank re-vegetation will be performed using meander surveys in each designated monitoring area. The meander survey will be performed by the same personnel performing the quantitative survey. General characteristics of the monitoring area and any exceptional characteristics, such as concentrations of dead or stressed plants, shall be noted. The meander survey will also be used to determine whether the monitoring plot assessed as part of the quantitative monitoring is representative of the entire monitoring area. As part of the qualitative survey, photographs will be taken within the monitoring areas with exceptional characteristics, such as dead or stressed plants.

Also, qualitative monitoring of the dogwood band at the bottom of the re-vegetated slope will be performed along the entire length of each monitoring area from Elm Street Bridge to the confluence. Areas where there are noticeable gaps observed within the red-osier dogwood band will be identified and noted on the field forms.

If it is determined that the monitoring plots are not representative of the entire monitoring area, and therefore, unsuitable for use in determining survivorship for the entire monitoring area, additional monitoring plots will be proposed for EPA approval and additional quantitative surveys performed.

At the completion of the monitoring, the results of the quantitative survey will be used to determine the number of live and dead plants in each monitoring plot. Live tree and shrub totals in each monitoring plot will be summarized and then divided by the number of trees and shrubs originally planted in each monitoring plot to calculate a percentage of tree and shrub survivorship in each plot. Tree and shrub survivorship shall be calculated separately. Next, the percentage of tree and shrub survivorship within the representative monitoring plots will be averaged together to calculate the tree or shrub survivorship for the monitoring area. If the tree and shrub survivorship for a monitoring area meets the Maintenance Standard, then no corrective actions are required, unless the meander survey identifies an area with substantial tree or shrub mortality. If the tree or shrub survivorship for a monitoring area does not meet the numerical Maintenance Standard or if a meander survey identified an area with substantial plant mortality, then GE shall evaluate survivorship in the entire monitoring area and propose a plan to EPA for approval to quantitatively assess either the entire monitoring area or, if appropriate, a portion of the monitoring area, such as a planting area (described below). Based on this evaluation and assessment, GE shall propose additional plantings, if necessary, to EPA for approval, to meet the Maintenance Standard.

### **As-Built Planting Plans for the Entire Riverbank**

Planting areas have been established based on physical boundaries such as property lines and furthermore by non-GeoWeb<sup>®</sup> and GeoWeb<sup>®</sup> areas. There are a total of 48 planting areas in the 1½-Mile Reach. The planting areas were established to provide an intermediate option for possible plant recount and re-planting if a monitoring area happens to fail the maintenance standard. Please see Appendix H for Riverbank As-Built Drawings (Drawing 1 through 4). These

plans will be used as baseline conditions if and when quantitative assessments are required outside of the 24 monitoring plots.

## **Calculations of Percent Survivorship and Comparison to the Maintenance**

### **Standards: Trees**

For monitoring plots where the actual number of originally planted trees is not known but is based upon an estimate, the density of live trees counted in the quantitative assessment shall be compared to the design planting density (target density) of trees. For the non-GeoWeb<sup>®</sup> riverbanks, the design planting density was 700 trees/acre and for the GeoWeb<sup>®</sup> riverbanks, the design planting density was 500 trees/acre. The density of live trees in such a monitoring plot shall be calculated by dividing the number of live trees counted in the quantitative inspection and dividing that number by the area of the plot to obtain a per acre density of trees. This density is then divided by either 700 trees/acre or the 500 trees/acre (as appropriate) to determine the percent survivorship.

For monitoring plots where the actual number of originally planted is known, the density of live trees counted in the quantitative assessment shall be compared to the actual density of planted trees as shown in Table 3-1. In such monitoring plots, the density of live trees is calculated by dividing the number of live trees counted in the quantitative inspection and dividing by the area of the plot to obtain a per acre density of trees. This density is then divided by the actual “as-built” density of trees (as opposed to the design estimate) as shown in Table 3-1 to determine the percent survivorship.

## **Calculations of Percent Survivorship and Comparison to the Maintenance**

### **Standards: Shrubs**

The compliance with the Maintenance Standards for shrubs will be determined by comparing the density of counted live shrubs to the actual density of planted shrubs as shown in Table 3-1. The density of live shrubs is calculated by dividing the number of live shrubs counted in the quantitative inspection and dividing by the area of the plot to obtain a per acre density of shrubs.

This density is then divided by the actual “as-built” density of shrubs (as opposed to the design estimate) as shown in Table 3-1 to determine the percent survivorship.

Since shrubs were not planted in all monitoring plots, only the following monitoring plots are to be used to determine compliance with numerical Maintenance Standards: Plot 1-W-3, 1-E-1, 1-E-3, 2-W-3, 2-E-1, 3-W-1, 3-W-2, 3-W-3, 3-E-1, 3-E-3, 4-W-3, 4-E-2, and 4-E-3.

GE shall perform appropriate corrective action to achieve the Maintenance Standard for riverbank re-vegetation within 30 days of EPA approval of the proposed action or according to a schedule approved by EPA. Re-planting of trees and shrubs to maintain these Maintenance Standards shall be performed within the spring (April 1<sup>st</sup> to May 31<sup>st</sup>) or fall (September 1<sup>st</sup> to November 15<sup>th</sup>) planting season. All re-planting work will comply with the original project specifications unless the monitoring work indicates that alternative designs are better able to achieve the Maintenance Standards and upon approval of such alterations by EPA.

### **3.5.2 Non-Riverbank Trees and Shrubs**

Supplemental vegetation monitoring will be performed to assess tree and shrub health within non-riverbank upland planting areas on residential, recreational and commercial properties within the 1½-Mile Reach.

The monitoring of trees and shrubs on the re-vegetated non-riverbank areas will include quantitative assessments of the vegetation. All plants are to be counted as either alive or dead, with the live category including stressed plants. Stressed plants will be noted based on readily apparent physical characteristics such as leaf wilt, bug infestation, die back, herbicide injury, and/or animal damage. Non-stressed plants will be those that are growing vigorously as determined by characteristics such as relative size, annual growth, leaf color, and stem integrity. Participants in the inspection will utilize best professional judgment to assess the apparent stress and/or vigor of the planted specimens.

The following properties will be inspected: Parcel I8-24-1, Parcel I9-5-13, Parcel I6-1-66, Parcel I6-1-67, and Fred Garner Park (Parcel I7-1-101). A percent survivability for each property, compared to the number of trees and shrubs originally planted, shall be calculated.

See Table 3-2 for a list of trees and shrubs planted in the non-riverbank upland areas. See Appendix I for non-Riverbank As-Built Drawings (Drawing 1 through 4).

GE shall perform appropriate corrective action to achieve the Maintenance Standard for non-riverbank re-vegetation within 30 days of EPA approval of the proposed action or according to a schedule approved by EPA. Re-planting of trees and shrubs to maintain these Maintenance Standards shall be performed within the spring (April 1<sup>st</sup> to May 31<sup>st</sup>) or fall (September 1<sup>st</sup> to November 15<sup>th</sup>) planting season. All re-planting work will comply with the original project specifications unless the monitoring work indicates that alternative designs are better able to achieve the Maintenance Standards and upon approval of such alterations by EPA.

### **3.5.3 Tree and Tree Cage Maintenance**

During each of the two re-vegetation monitoring visits per year, observations such as the necessity of any tree and/or tree cage maintenance will be performed. This will include monitoring for:

- The necessity of tree pruning. Trees that have grown through the wire mesh of the tree protective cage shall be pruned.
- The need for protective tree cage expansions and adjustment of interlocking tree guards/ties to allow for tree growth. In cases where the interlocking tree guards/ties are not present, they need to be installed to centralize the trees within their cages to prevent the trees from rubbing and damaging themselves on the tree protective cages. Neglecting the maintenance of interlocking tree ties will most likely result in tree mortality.
- The need to maintain and re-staking of tree cages that have fallen down.
- The need to remove cages around dead trees.
- The need to remove vines, such as false hedge bindweed or grapevine, from both the trees and tree cages.

The monitoring work will be documented on standardized field forms and with photographs.

If it is determined that corrective actions are necessary, they should be implemented within 30 days of EPA approval of the proposed action by GE or on a schedule otherwise approved by EPA. If pruning is required, timing of pruning for the species of concern is not critical, but trees should not be pruned in late winter or early spring when the sap is flowing. It is recommended that a professional arborist perform necessary tree trimming. If an arborist is not available, then the person that will perform the pruning shall receive proper instructions from an arborist.

### **3.5.4 Herbaceous Vegetation Cover**

The monitoring program for herbaceous vegetation cover will consist of visual inspections of planted areas and qualitative assessments of herbaceous areal coverage to assess compliance with the Maintenance Standard. This work will include one monitoring visit in July along with the tree and shrub inspections.

For the quantitative monitoring, herbaceous areal cover will be determined by walking through each monitoring plot (24) as well as the following non-riverbank areas: Parcel I8-24-1, Parcel I6-1-66, Parcel I6-1-67, and Fred Garner Park (Parcel I7-1-101) and visually estimating the total cover to the nearest 5%. In addition, qualitative monitoring will be performed during the riverbank meander survey to determine if the herbaceous cover recorded in the plots during the qualitative monitoring are representative of the entire monitoring areas and to identify significant areas of bare soil. If there are any areas identified during the quantitative monitoring or the meander survey that do not meet the Maintenance Standard, GE shall identify specific problem areas and perform necessary re-seeding.

For riverbank areas that are predominately covered by vegetation, estimating the percentage of bare ground and subtracting it from 100% provides the most accurate means of estimating herbaceous cover. Bare soil within the drip line of a tree and mulch beneath trees and shrubs are not counted as bare ground. The percentage of bare ground will be estimated based on visual observation using best professional judgment. Additional comments on herbaceous cover

(e.g., dominant herbaceous species present, erosion or slope stability concerns, planting maintenance tasks) should be noted on the field forms (Appendix F) and summarized in the Herbaceous Vegetation Cover and Invasive Species Monitoring Summary Table (Appendix J). Representative photographs shall also be taken during the inspections.

Appropriate corrective action to achieve the Maintenance Standard for herbaceous cover will be performed in all areas that do not meet the Maintenance Standards and should be performed within 30 days of EPA approval of the proposed action by GE or on a schedule otherwise approved by EPA.

### **3.6 MONITORING FOR PLANT INVASIVE SPECIES**

Invasive plant species will be monitored to evaluate compliance with the applicable Maintenance Standard and to determine whether corrective actions are required. In addition, monitoring is required to determine appropriate prevention and maintenance activities.

Monitoring of invasive plant species will be performed by personnel with at least five years of experience in the design and implementation of similar re-vegetation projects and with an undergraduate degree in a science pertinent to the proposed restoration work (e.g., botany, biology).

#### **3.6.1 Compliance Inspections**

The invasive plant species quantitative and qualitative inspections will be performed in the summer of each year and shall be performed concurrently with the summer riverbank re-vegetation monitoring survey (July). Invasive plant species that are subject to this section are those listed by Weatherbee *et al.* (1998) for the Commonwealth of Massachusetts. See Appendix A.

Prior to performing the inspections, previous monitoring reports will be reviewed. Quantitative assessments of invasive plant cover will be performed by walking through each monitoring plot (24 plots) and visually estimating the percentage of the invasive species cover in each

monitoring plot (to the nearest 5%). Also, the percent of invasive species cover will be determined in each of the following non-riverbank areas: Parcel I8-24-1, Parcel I6-1-66, Parcel I6-1-67, and Fred Garner Park (Parcel I7-1-101). In addition, invasive species cover qualitative monitoring will be performed during the riverbank meander survey. The qualitative monitoring will determine if the percentage of the invasive species cover recorded in the plots during the qualitative monitoring are representative of the entire monitoring areas and if there are any monitoring areas or portions thereof that do not meet the Maintenance Standard. The results for both quantitative and qualitative monitoring will be documented on the field forms (Appendix F) and summarized in the Herbaceous Vegetation Cover and Invasive Species Monitoring Summary Table (Appendix J). Representative photographs shall also be taken during the inspections.

If there are any areas identified during the quantitative inspections or the qualitative monitoring that do not meet the Maintenance Standard, GE shall identify specific problem areas, flag them and perform necessary corrective actions to meet the Maintenance Standard. The necessary corrective actions for invasive plants may include either physical removal and/or the application of herbicides. The corrective actions are to be implemented within 30 days of inspections. Personnel performing the invasive species control shall be licensed in the State of Massachusetts and shall be familiar with the PRSC Plan and project goals.

### **3.6.2 Prevention and Maintenance Activities**

In addition to the compliance inspections described in Subsection 3.6.1, GE shall also perform a qualitative invasive species survey in May. This survey will be used by GE to develop an invasive plant control plan to be implemented during the spring and summer growing seasons. GE shall implement this plan without advance EPA approval provided GE provides EPA, MassDEP and the Lead Administrative Trustee with advance notice of such corrective actions. Within 30 days of implementing any corrective action, GE shall submit to EPA for approval a report describing the corrective action and any required follow-up measures, inspections, or monitoring. A copy of the report shall also be submitted to the MassDEP and to the Lead Administrative Trustee.

Such a program was in place during the 2006 and 2007 maintenance and monitoring activities in the 1½-Mile Reach. The program was performed during the growing season, late June through August.

During the maintenance and monitoring in 2006 and 2007, it was observed that herbicide treatment apparently impacted some planted trees and shrubs. Larger trees that were impacted by herbicides may have taken up herbicides from soils or herbicides may have entered through recent pruning cuts. Also, some plant species that were targeted included native species such as staghorn sumac (*Rhus hirta*) and common horsetail (*Equisetum arvense*). Other species that were targeted are considered invasive in Massachusetts (i.e., cypress spurge, smooth bedstraw [*Galium mollugo*], common mullein, and spotted knotweed), but typically require full sunlight and may not be a problem once the tree canopy closes in. Although the presence of invasive species is not desirable within restoration planting areas, some modification of the previous herbicide treatment regime is advisable due to the observed losses of planted stock and herbaceous cover.

EPA recommends that GE implement appropriate precautions during herbicide application and, to the extent practical, minimize the spraying of herbicides on native tree or shrub species. It is also recommended that the list of targeted invasive species by herbicides be limited to Japanese knotweed, purple loosestrife, common reed (*Phragmites australis*), oriental bittersweet, and invasive woody species including Norway maple, black locust, common buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Frangula alnus*), Morrow's honeysuckle (*Lonicera morrowii*), border privet (*Ligustrum obtusifolium*), and multiflora rose. Herbicide spray shall not be applied under windy conditions which may contribute to mortality of desirable species by spray drift. Personnel performing the invasive species control shall be licensed in the State of Massachusetts and shall be familiar with the PRSC Plan and project goals.

## **3.7 ENVIRONMENTAL MONITORING**

### **3.7.1 Sediment Sampling**

Sediment samples will be collected to document the PCB concentrations in sediment over time. Every five years, sediment samples will be collected at 200-foot intervals (every fourth transect) along the entire 1½-Mile Reach, from the center of the channel and right and left sides. These sampling locations should be as close to those from which samples were collected prior to the removal action as is feasible. A total of 37 transects will be sampled, from Transect 66 (Lyman Street) to Transect 210 (confluence of East and West Branches). (See Figure 3-1 for the sediment sampling locations.)

Ideally two sediment samples will be collected at each sampling point, one from the 0- to 6-inch surface interval and 6-inch to riprap (refusal). Based on this frequency, 222 samples may be obtained. Sediment samples should be representative of fine grain sediment (i.e., sands or silts and not gravel). If 6 inches of sediment is not present overlying the riprap, then 1) a nearby area (within 10 feet) with adequate sediment depth will be sampled, or failing the location of such an area; 2) an adequate volume to meet analytical requirements will be collected from the area of the original sampling location, if possible. If a sufficient volume of sediment can not be obtained, no sample will be collected and this will be documented. Average sediment depth at each sample location will be noted and reported.

Sediment samples will be analyzed in accordance with methods approved in the *GE Field Sampling Plan/Quality Assurance Project Plan (QAPP)* for total PCBs and total organic carbon.

### **3.7.2 Surface Water Sampling**

Surface water sampling is not required at Lyman Street and Pomeroy Avenue (adjacent to Fred Garner Park) pursuant to this PRSC Plan; provided that GE continues with its ongoing monthly water sampling at Lyman Street and Pomeroy Avenue and reports the results in the PRSC Annual Report. If GE discontinues its current monthly water column sampling, EPA reserves

the right to require GE to perform water column monitoring as part of these 1½-Mile PRSC activities.

### **3.8 AQUATIC BIOLOGICAL MONITORING**

The aquatic invertebrate sampling will be performed every five years to obtain information on PCB concentrations and the community composition of the aquatic invertebrate communities that have re-established themselves in the 1½-Mile Reach since the completion of remediation activities. This requirement does not preclude the future need for assessment of the fish community. It is anticipated that such activities will be specified by EPA as part of the Rest of River decision making process.

Analyses of the macroinvertebrate community structure (i.e., species and numbers) shall be conducted using the procedures and established methods used to assess single habitat types (Barbour *et al.*, 1999) which are described in the Aquatic Habitat Assessment (Woodlot, 2000) and summarized below.

The samples shall be collected from one representative riffle or run within each subreach (that is, Lyman to Elm, Elm to Dawes and Dawes to the confluence) of the 1½-Mile Removal area during low flow. Aquatic macroinvertebrate samples will be collected from areas previously sampled in 2000 for the pre-remediation Aquatic Habitat Assessment and in the 2007 monitoring activities. Samples will be collected from the following three transects T070, T134, and T170. See Figure 4-1 for the three sampling transects. If insufficient biomass is present at the sampling location, the sampling location may be moved within a reasonable distance (to be determined in the field) to increase the opportunity for collection of organisms. At each of the three sampling transects, macroinvertebrate samples will be collected for community composition as well as PCB concentrations.

#### **Community Composition Samples**

At each sample transect, 12 samples will be collected using a 9-inch by 18-inch rectangular kick-net with a 900-micron net. The net will be placed on the bed substrate and the substrate will

be “kicked” for approximately two minutes during each sample collection. Due to the potential existence of riprap with minimal substrate that can not be “kicked” using standard methods, modified techniques for removal of epi- and in-fauna can be used with EPA approval. The 12 sample locations for each transect will be equally spaced (approximately five to ten feet apart) and will transverse the channel width in an upstream zigzag pattern. A 1-meter square grid will be employed upstream of the net to define the sampling area at each sample location. Upon completion of the two minute sampling, the net will be removed from the water column, drained of free water, and carefully inspected to determine the presence of aquatic macroinvertebrates. All samples will be individually packaged and preserved, in the field, in small glass jars, and then will be shipped to an EPA-approved lab for taxonomic identification. Sample collection steps will be repeated in an upstream direction until adequate samples are obtained. Habitat characteristics, including water depth, stream characteristics (e.g., pool, run, and riffle), and substrate type, will be recorded on the field sampling data sheet (Appendix K).

### **Macroinvertebrate PCB Sampling**

At each transect, a minimum of one 10-gram sample of the total macroinvertebrate biomass will be collected to characterize tissue PCB concentrations. In addition, one quality assurance (QA) sample will be collected. The location of the QA sample will be determined in the field based on sample availability. The amount of biomass necessary for the QA sample will be three times that of one sample, that is 30 grams. If this is not feasible, the laboratory will perform a lab spiked blank and spiked blank duplicate. These samples will be collected using a kick-net by walking along the transect, just upstream of areas sampled for taxonomy. The predominant taxa used for the PCB tissue analysis will be determined in the field at each transect during the collection of the macroinvertebrate community characterization samples. Samples will be placed in pre-cleaned 4-ounce glass jars with river water during collection and placed on wet ice for return to the processing area. At the processing area, samples will be drained, weighed, and preserved by freezing at approximately 0°F. Samples will then be shipped frozen to a laboratory. The samples will be analyzed for PCB Aroclors, Congeners and homologs and % Lipids using the analytical methods approved in the GE QAPP.

### **3.9 ENVIRONMENTAL RESTRICTIONS AND EASEMENTS AND CONDITIONAL SOLUTIONS INSPECTIONS AND REPORTING**

In addition to the monitoring programs and inspections related to the restoration and re-vegetation activities performed for the 1½-Mile Reach, additional inspection activities are required by the Consent Decree for non-residential, non-GE-owned and non-state-owned properties with Environmental Restrictions and Easements (ERE) and properties at which Conditional Solutions have been implemented. EREs will be imposed on the following properties: the GE-owned properties (namely, Parcels I8-24-101, I6-1-103, I6-1-104, and I6-1-106); the City of Pittsfield-owned properties (namely, Parcels I8-4-8, I8-4-7, I7-21-5, I7-1-101, I8-10-3, I8-10-2, City Layout for High Street-abutting High Street formerly lot I8-10-1, I7-20-101, I7-20-2 and I7-20-1); and the State of Massachusetts-owned property (Parcel I6-1-62).

For the following non-residential properties, GE will be requesting EREs only on the riverbank portion of the properties: Parcels I8-23-4, I8-23-103 (formerly Parcels I8-23-3 and I8-23-2), I8-24-1, I7-21-1, I7-21-2 and I7-21-103 (formerly Parcel I7-21-3). If the owners of the non-residential properties referenced above decline EREs, Conditional Solutions will be implemented for the riverbank portion of the properties. (In addition, permanent maintenance easements, which are different from EREs, have been obtained over the following properties: Parcels: I9-4-201, I9-4-203, I9-4-25, I9-4-19, and I9-4-14.)

Conditional Solutions will apply to the riverbank portion of the following properties: I9-4-201, I9-4-203, I9-4-25, I9-4-14, I9-4-19, I8-23-6, and I7-1-5. GE has sent notification letters to the property owners of such properties that a Conditional Solution will apply to the riverbank and non-riverbank portions of the properties.

Lastly, EPA sent notification letters and as-built drawings to owners of properties I8-10-4 and I8-10-5. This letter advises the property owners not to interfere with or modify the anchored retaining walls located on their properties. EREs and therefore Conditional Solutions are not required on the riverbank portion of those properties because there are no accessible riverbanks. GE shall perform an annual search regarding the ownership of Parcels I8-10-4 and I8-10-5. If

there is a change in ownership, GE will resend a copy of the original EPA notice letter to the new owners.

### **3.9.1 Annual Environmental Restrictions and Easements Inspections**

Paragraph 57 of the CD requires annual inspections at non-GE-owned and non-state owned properties at which EREs have been recorded or registered to assess compliance with the applicable EREs during the preceding year. The information related to the EREs at these properties will be provided in the final completion report. The annual ERE inspections of these properties will be conducted in accordance with the requirements set forth in Appendix Q of the CD and will include a document review and visual site inspection as further described below. If an ERE applies only to the riverbank portion of a property, then the ERE inspection of such property will only apply to the riverbank portion.

For each such property, prior to the visual site inspection, the documents pertinent to the ERE and the use of the property will be reviewed. These documents will include the ERE, the Plan of Restricted Area (as revised if appropriate), the Final Completion Report, the As-Built Survey Drawings, (and any alternative, more recent plan that GE proposes to use for evaluating surface grade changes), any conditional exceptions approved under the ERE (if known), any recorded amendments to and/or releases from the ERE, and any other documents in GE's possession relevant to the ERE or the use of the property. In addition, the most recent topographic map of the property that is available to GE, as well as any Post-Work Notification Forms (Exhibit E to the ERE) that have been submitted by the Grantor under the ERE and of which GE has a copy, will be reviewed for background information and reference. Except for documents created by GE, GE will not be responsible for verifying the accuracy or completeness of any aspect of or information in the foregoing documents, either as of the time they were prepared or as compared to conditions at the time of the inspection.

After reviewing these documents, a visual on-site inspection of the property will be performed to determine whether there is evidence that any of the following have occurred since the last annual inspection:

- Activities at or uses that are potentially contrary to the restrictions stated in the ERE.
- Utility work or any building construction, modification, addition, and/or demolition.
- Soil excavations that involved more than 10 cy of soil.
- Significant soil erosion.
- Significant pavement construction, disturbance, and/or removal/excavation.

If the inspection indicates that any of the above conditions has altered the surface grade of the property since the prior inspection, the new surface grade(s) will be compared to the As-Built Survey Drawings in the Final Completion Report, unless GE proposes, and EPA approves, the use of an alternative plan showing more recent conditions. The approximate area/location of any such surface grade change will be identified on a plan.

GE will conduct the annual ERE inspections in accordance with the procedures specified above. The inspections will begin the year after recordation of the EREs. After all observations have been made, the ERE Annual Inspection Check List provided in Appendix L will be completed. Within 30 days of completion of the inspection, a summary ERE inspection report will be submitted to EPA and Massachusetts Department of Environmental Protection (MassDEP). This report will include a summary of the findings of the inspection, a description and the basis for the identification (based on the visual inspection in conjunction with the document review) of any instances of potential non-compliance with the ERE, and a copy of the completed ERE Annual Inspection Check List. Any determination of whether activities and uses that have occurred are in fact contrary to the restrictions stated in the ERE will be made by EPA and/or MassDEP.

### **3.9.2 Annual Conditional Solution Inspections**

In addition to the ERE inspections, GE will perform annual inspections of the properties subject to Conditional Solutions (identified above) using the procedures outlined in Paragraphs 36 and 38 and Appendix Q of the CD, with modifications on which GE and EPA have agreed in this plan for such inspections. These activities will include a document review and a visual site inspection as described below. For properties where a Conditional Solution applies only to the riverbank portion of the property, the inspection requirements contained in this section apply only to the riverbank portion of the property. For properties where a Conditional Solution

applies to entire property (that is, Parcels I9-4-201, I9-4-203 & I9-4-25, I9-4-14 & I9-4-19, I8-23-6, and I7-1-5), the inspection requirements in this PRSC Plan apply only to the riverbank portion of property. For such properties, GE shall conduct the Conditional Solution inspections for the riverbanks in conjunction with the Conditional Solution inspection of the non-riverbank portions required pursuant to the Post-Removal Site Control Plans for the Lyman Street Area, Oxbow Areas A and C, or the 1½-Mile Non-Residential Floodplain Properties (as applicable).

Prior to the first inspection, GE shall send the property owners subject to a Conditional Solution a notice letter regarding the Conditional Solution. Such a letter shall be similar to the Conditional Solution letters GE has sent to property owners at other Removal Action Areas and shall be approved by EPA. The letter shall detail GE's obligations if further work (such as soil excavation) is required or if the property use changes.

Prior to the visual site inspection, GE will review the most recent property records at the Pittsfield Tax Assessor's Office and the property deeds at the Berkshire Middle District Registry of Deeds to determine if there has been a change in ownership of any of these parcels. If there has been a change in ownership, GE will provide notice to the new owner of the Conditional Solution implemented at the property. In addition, GE will review the Final Completion Report, including the As-Built Survey Drawings, which depict current site features and topography (and any alternative, more recent plan that GE proposes to use for evaluating surface grade changes), and any subsequent work plan(s) approved and implemented pursuant to Paragraph 35 of the CD.

GE will then conduct a visual site inspection of each property (to the extent possible given any access limitations) to evaluate whether there is evidence that any of the following have occurred since the prior inspection:

- Any change in activities or uses of the property that would be potentially inconsistent with the land use for which the Conditional Solution was implemented (i.e., recreational use).
- Installation of a new utility or repair or replacement of an existing utility that involved disturbance of soil.

- Any excavations, construction, or other activities or conditions that resulted in the disturbance of 10 cy of soil or greater, regardless of depth.
- If any of the activities in the two preceding bullets are noted, any alteration of the surface grade, compared to that shown in the As-Built Survey Drawings (or anymore recent plan that GE proposes and EPA approves).

After all observations have been made, GE will complete, for each property, the Conditional Solution Annual Inspection Checklist provided in Appendix M, and will prepare and submit a written inspection report to EPA and MassDEP, as described further below.

GE will conduct annual inspections of the properties at which Conditional Solutions have been implemented. The inspections are anticipated to begin in 2009. These inspection activities will be performed in accordance with the procedures specified above and will utilize the Conditional Solution Annual Inspection Checklist provided in Appendix M. A report will be prepared and submitted to EPA and MassDEP within 30 days of completion of each such future inspection. That report will include a description of the current ownership of each property, a summary of the findings for each property (including a description and the basis for the identification, based on visual inspection in conjunction with the document review, of any known or suspected changes in the activities or uses that would involve any of the activities or uses listed above), and copies of the completed Annual Inspection Checklists indicating that the inspections included all required criteria. Any determination of whether changes in activities and uses that have occurred at a property would in fact be inconsistent with the land uses for which the Conditional Solution was implemented or would involve unacceptable exposure conditions will be made by EPA and/or MassDEP.

In addition, the Conservation Commission of the City of Pittsfield is establishing a registry of parcels to provide notice to the Commission if an applicant proposes work in the river or the riverbanks of the 1½-Mile Reach. Annually, GE shall send a letter to the Conservation Commission summarizing the work that occurred during the 1½-Mile Reach Removal Action, and recommending that any work in the 1½-Mile Reach be coordinated with EPA, and asking the Commission to maintain the registry of parcels along the 1½-Mile Reach.

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**SECTION 4**

**FREQUENCY OF MONITORING AND REPORTING REQUIREMENTS**

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## **4. FREQUENCY OF MONITORING AND REPORTING REQUIREMENTS**

### **4.1 MONITORING FREQUENCY**

Table 4-1 summarizes the PRSC Plan, including the types of monitoring to be conducted, monitoring frequencies and long-term durations, ideal monitoring time frames, Maintenance Standards and the monitoring locations. All monitoring programs are to be initiated in year 2008, except for the ERE and Conditional Solution inspections and the sediment and aquatic macroinvertebrate sampling. Because EPA conducted the sediment and macroinvertebrate sampling in 2007, and the program calls for the sampling to be conducted every five years, the next round of those two sampling programs shall be conducted in 2012, concurrent with the ½-Mile Reach surficial sediment sampling program.

Table 4-1 indicates the duration of each monitoring program. As indicated on Table 4-1, for some programs at the end of the five-year or fifteen-year period, GE shall propose to EPA an appropriate long-term monitoring frequency. GE will implement that modified long-term monitoring program upon approval by EPA.

GE may request modifications to this PRSC Plan. Any changes to the PRSC Plan, including monitoring methods, frequencies, and/or locations shall be approved by EPA in writing prior to implementation. Upon notice to GE, EPA may make modifications to this PRSC Plan.

### **4.2 FIELDWORK NOTIFICATIONS**

GE shall notify EPA of all the scheduled monitoring, inspection and maintenance activities, except for surface water sampling, 14 days in advance to allow for arrangements of oversight.

### **4.3 CORRECTIVE ACTION APPROVAL AND IMPLEMENTATION**

Whenever corrective action (including without limitation, planting) is required under this PRSC Plan, GE shall submit a corrective action plan and an implementation schedule to EPA for approval. GE shall submit such a plan within 30 days of the applicable monitoring or inspection

or according to a schedule approved by EPA. A copy of the proposed plan shall also be submitted to the MassDEP and to the Lead Administrative Trustee. Except in the case of emergencies, or where there is a high potential for significant erosion of contaminated soils into the river, GE shall only perform corrective actions after obtaining approval of EPA. In the case of emergencies, or where there is a high potential for significant erosion of contaminated soils into the river, GE may conduct appropriate corrective actions without advance EPA approval, but GE shall notify EPA of the emergency or the potential soil erosion as soon as possible, but no more than two (2) hours after having learned of such emergency or potential soil erosion. (Notwithstanding the above, GE may conduct the corrective actions required by Section 3.6.1 regarding invasive species without advance EPA approval; provided GE provides EPA, MassDEP and the Lead Administrative Trustee with advance notice of such corrective actions.) Within 30 days of implementing any corrective action, GE shall submit to EPA for approval a report describing the corrective action and any required follow up measures, inspections, or monitoring. A copy of the report shall also be submitted to the MassDEP and to the Lead Administrative Trustee.

#### **4.4 REPORTING REQUIREMENTS**

GE is required to prepare the following reports following the monitoring programs:

- Riverbank Soil Restoration, Riprap, Aquatic Habitat Enhancement Structures and Ancillary Items Inspections. The four programs listed are to be summarized in one report to be submitted within 30 days after monitoring is completed. (An additional report is to be prepared and submitted within 30 days after a high flow event inspection of 3,500 cfs.)
- The re-vegetation monitoring will require two reports, one after each monitoring event. The spring re-vegetation monitoring report will address riverbank plantings, non-riverbank plantings, and tree and cage maintenance. The summer re-vegetation monitoring report will address riverbank plantings, non-riverbank plantings, tree and cage maintenance, herbaceous vegetation cover and invasive species. The two reports are to be submitted within 30 days after monitoring is completed.
- Separate independent reports are required for the post-removal sediment sampling and macroinvertebrate sampling. Those reports will include validated data. The

**FREQUENCY OF MONITORING AND REPORTING REQUIREMENTS**

sediment report is to be submitted within 60 days of the completion of sampling and the macroinvertebrate report within 90 days of sampling.

- Reports are required for the Annual ERE Inspections and Annual Conditional Solution Inspections. The reports are to be submitted within 30 days of the inspection.
- Surface water sampling results shall be submitted in the annual report.
- All monitoring activities performed throughout the year are required to be summarized in an Annual Report. The annual report will include a summary of all monitoring and any corrective actions that were performed. The annual report will also include a summary of the monthly water column sampling and the associated analytical data. The annual reports are to be submitted by January 31st of the following year.

All reports will include, at a minimum, the following information:

- Introduction.
- Staff performing the monitoring activities.
- Scope and nature of the monitoring, including a brief summary of the Maintenance Standards.
- Results of the monitoring.
- Discussion of the monitoring results and compliance with the Maintenance Standards.
- List of areas of noncompliance of the Maintenance Standards.
- Corrective actions performed.
- Proposed changes to the PRSC Plan, if any.
- Scope and nature of future monitoring.

All reports shall be submitted to EPA with a copy to MassDEP and to the Lead Administrative Trustee, with the exception of the reports for the Annual ERE and Conditional Solution Inspections. The ERE reports shall be submitted to MassDEP with a copy to EPA, and the Conditional Solution reports shall be submitted to EPA with a copy to MassDEP.

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**SECTION 5**

**REFERENCES**

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## 5. REFERENCES

Barbour, M.T, J. Gerritsen, B.D.Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.*

GE QAPP. 2007. *Field Sampling Plan/Quality Assurance Project Plan*. Originally submitted September 2000 Revised March 2007. Prepared by Arcadis/BBL for General Electric Company Pittsfield, MA.

Weatherbee, P., Somers, P., and Simmons, T. 1998. *A Guide to Invasive Plants in Massachusetts*. Prepared by The Massachusetts Biodiversity Initiative, Prepared for the Massachusetts Division of Fisheries and Wildlife.

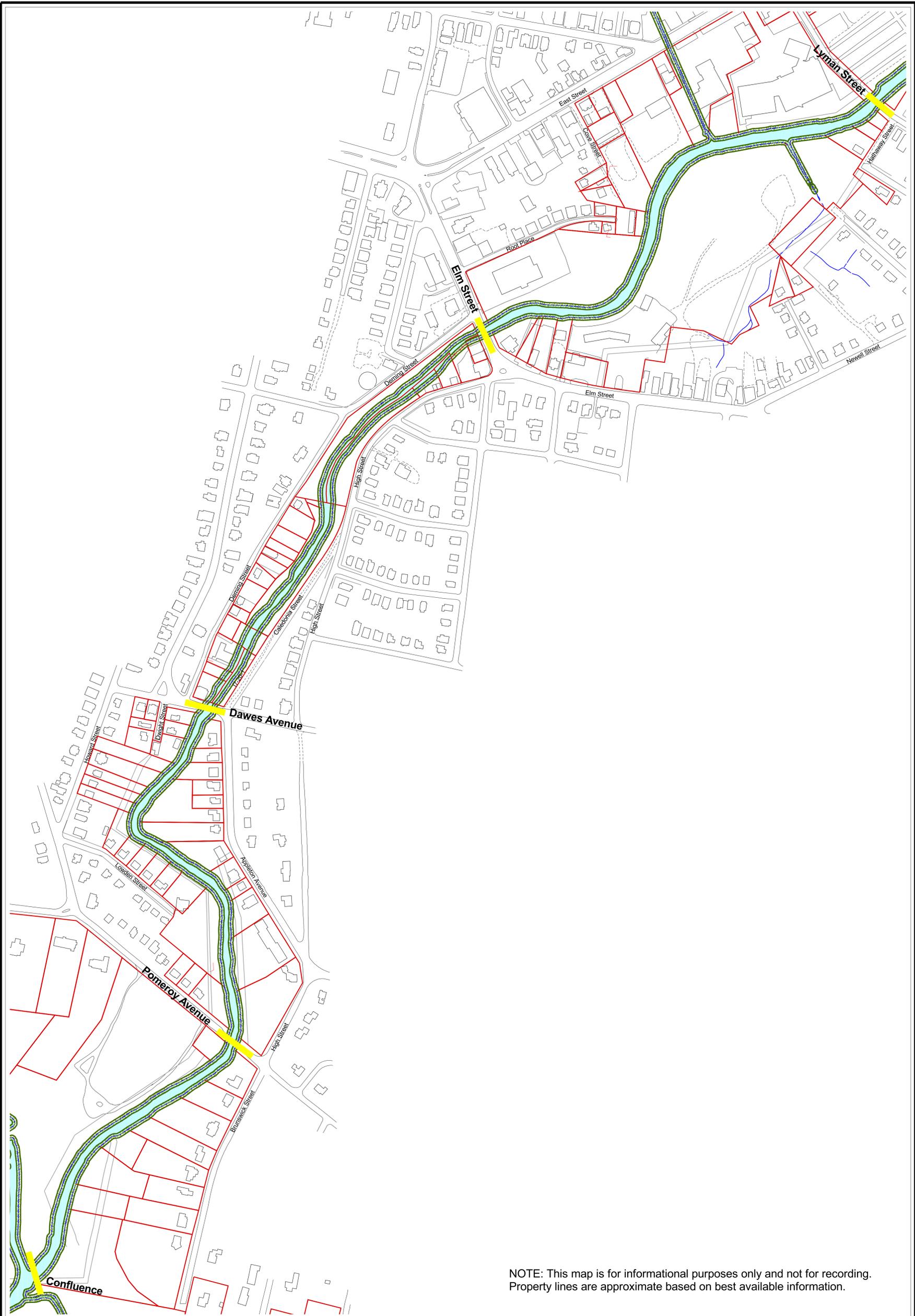
Woodlot Alternatives, Inc. (Woodlot). 2000. *AquaticHabitat Assessment, 1½-Mile Reach-GE-Pittsfield/Housatonic River Site*. Prepared by Woodlot for Weston Solutions, Inc., 1 Wall Street, Manchester, NH 03101

Woodlot. 2004. *1½ Mile Reach Restoration Monitoring Plan, GE-Housatonic River Site, Pittsfield, MA*. Prepared by Woodlot for Weston Solutions, Inc., 1 Wall Street, Manchester, NH 03101.

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## FIGURES

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NOTE: This map is for informational purposes only and not for recording. Property lines are approximate based on best available information.

**LEGEND:**

- Approximate Property Lines
- Roads
- Housatonic River
- 18-4-7 Parcel ID



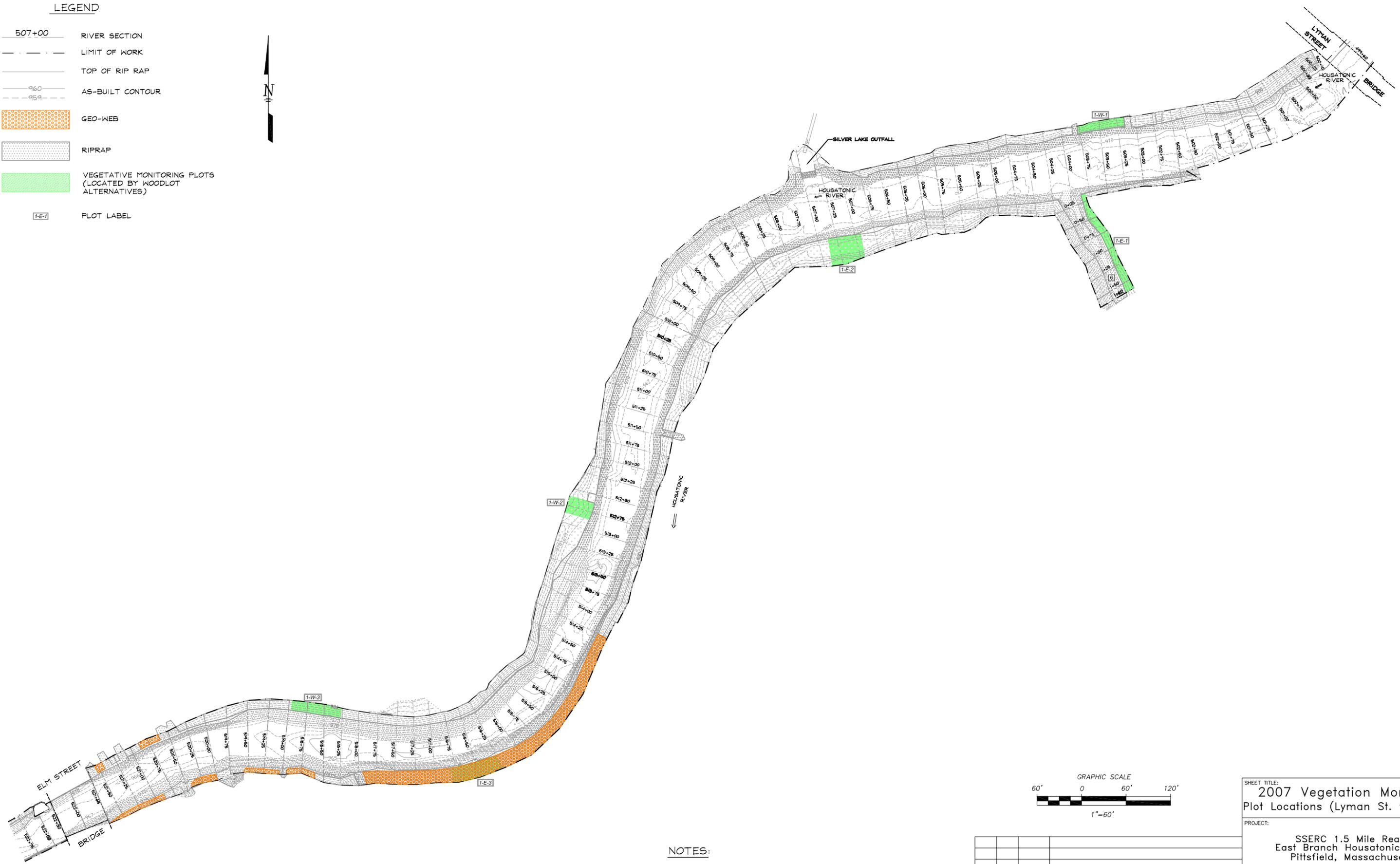
Housatonic River Project  
Pittsfield, Massachusetts

**FIGURE 1-1**  
**Lyman Street to the Confluence**  
**1.5 Mile Reach Removal Action**

January 2007

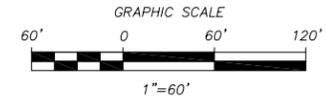
**LEGEND**

- 507+00 RIVER SECTION
- LIMIT OF WORK
- TOP OF RIP RAP
- 960 AS-BUILT CONTOUR
- 959
- GEO-WEB
- RIPRAP
- VEGETATIVE MONITORING PLOTS (LOCATED BY WOODLOT ALTERNATIVES)
- 1-E-1 PLOT LABEL



**NOTES:**

1. AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC. BETWEEN SEPTEMBER 2002 (PHASE #1) AND APRIL 2006 (END PHASE #3).
2. GEO-WEB LOCATIONS ARE BASED ON PLANS PROVIDED BY WESTON SOLUTIONS, INC. AND WERE NOT LOCATED IN THE FIELD (WITH AN INSTRUMENT) BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.



REV.	BY	DATE	STATUS

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**2007 Vegetation Monitoring Plot Locations (Lyman St. to Elm St.)**

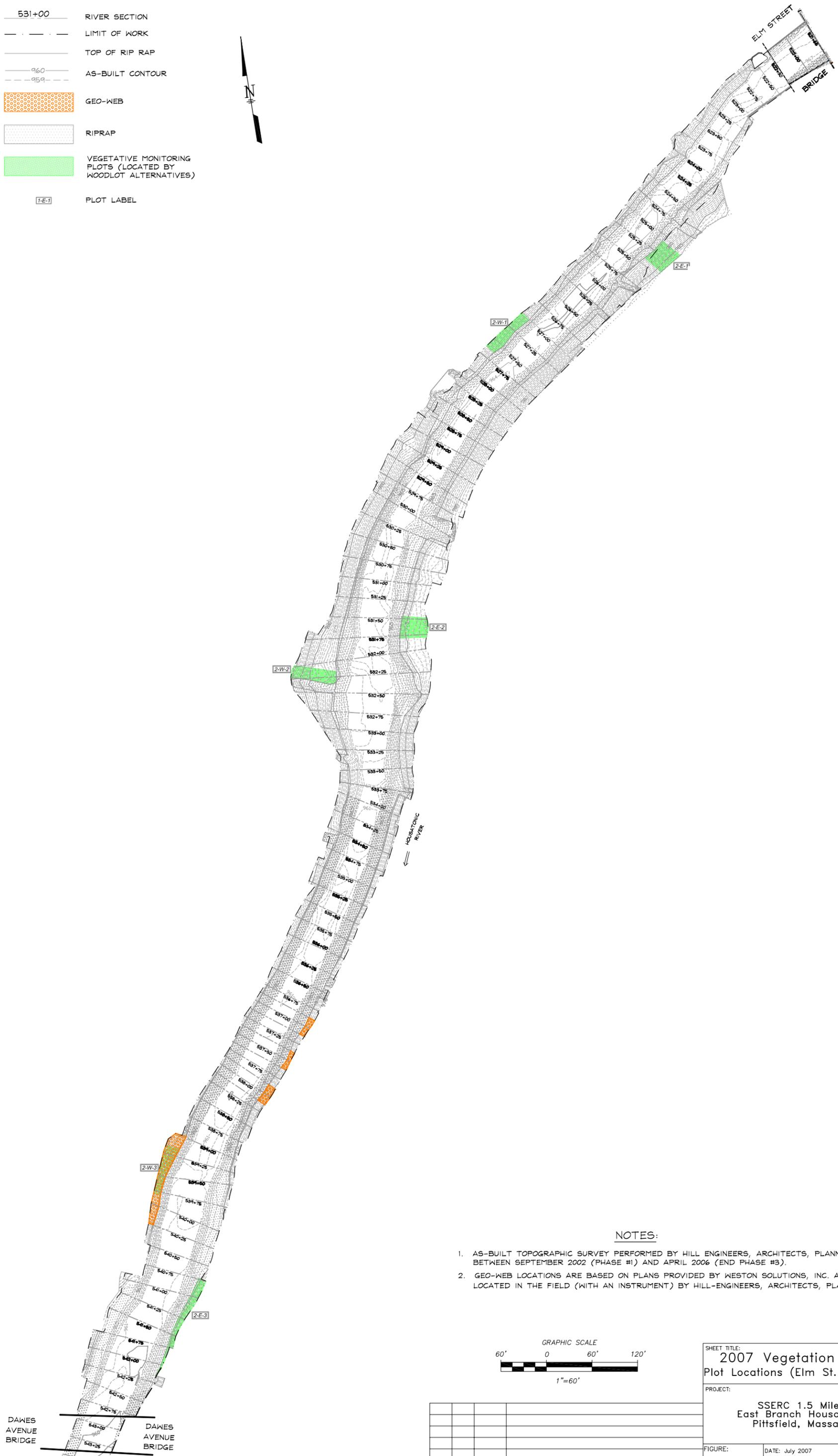
PROJECT:  
SSERC 1.5 Mile Reach  
East Branch Housatonic River  
Pittsfield, Massachusetts

FIGURE:  
**2-1**

DATE: July 2007  
SCALE: 1"=60'  
PROJ. NO.: 104141.03

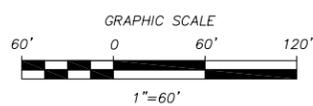
**LEGEND**

- 531+00 RIVER SECTION
- LIMIT OF WORK
- TOP OF RIP RAP
- 960 AS-BUILT CONTOUR
- 959
- GEO-WEB
- RIPRAP
- VEGETATIVE MONITORING PLOTS (LOCATED BY WOODLOT ALTERNATIVES)
- 7-E-1 PLOT LABEL



**NOTES:**

1. AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC. BETWEEN SEPTEMBER 2002 (PHASE #1) AND APRIL 2006 (END PHASE #3).
2. GEO-WEB LOCATIONS ARE BASED ON PLANS PROVIDED BY WESTON SOLUTIONS, INC. AND WERE NOT LOCATED IN THE FIELD (WITH AN INSTRUMENT) BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.



REV.	BY	DATE	STATUS

SHEET TITLE:  
**2007 Vegetation Monitoring Plot Locations (Elm St. to Dawes Ave.)**

PROJECT:  
 SSERC 1.5 Mile Reach  
 East Branch Housatonic River  
 Pittsfield, Massachusetts

FIGURE:  
**2-2**

DATE: July 2007  
 SCALE: 1"=60'  
 PROJ. NO.: 104141.03

DAWES AVENUE BRIDGE

2-W-3

2-E-3

2-W-1

2-E-1

HOUSATONIC RIVER

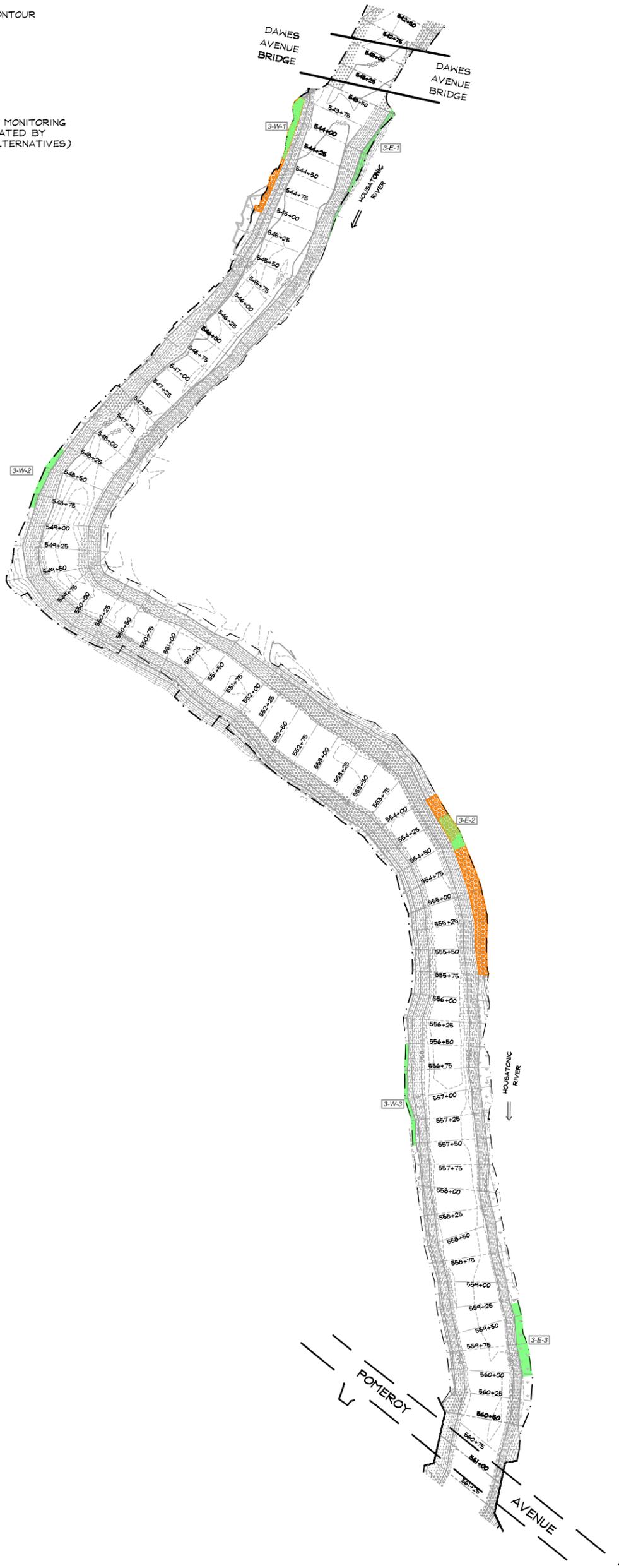
2-W-2

2-E-2

ELY STREET BRIDGE

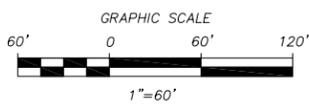
LEGEND

- 531+00 RIVER SECTION
- LIMIT OF WORK
- TOP OF RIP RAP
- 960 AS-BUILT CONTOUR
- 959
- GEO-WEB
- RIPRAP
- VEGETATIVE MONITORING PLOTS (LOCATED BY WOODLOT ALTERNATIVES)
- 1-E-1 PLOT LABEL



NOTES:

1. AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC. BETWEEN SEPTEMBER 2002 (PHASE #1) AND APRIL 2006 (END PHASE #3).
2. GEO-WEB LOCATIONS ARE BASED ON PLANS PROVIDED BY WESTON SOLUTIONS, INC. AND WERE NOT LOCATED IN THE FIELD (WITH AN INSTRUMENT) BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.



REV.	BY	DATE	STATUS

SHEET TITLE:  
2007 Vegetation Monitoring  
Plot Locations (Dawes Ave. to Pomeroy Ave.)

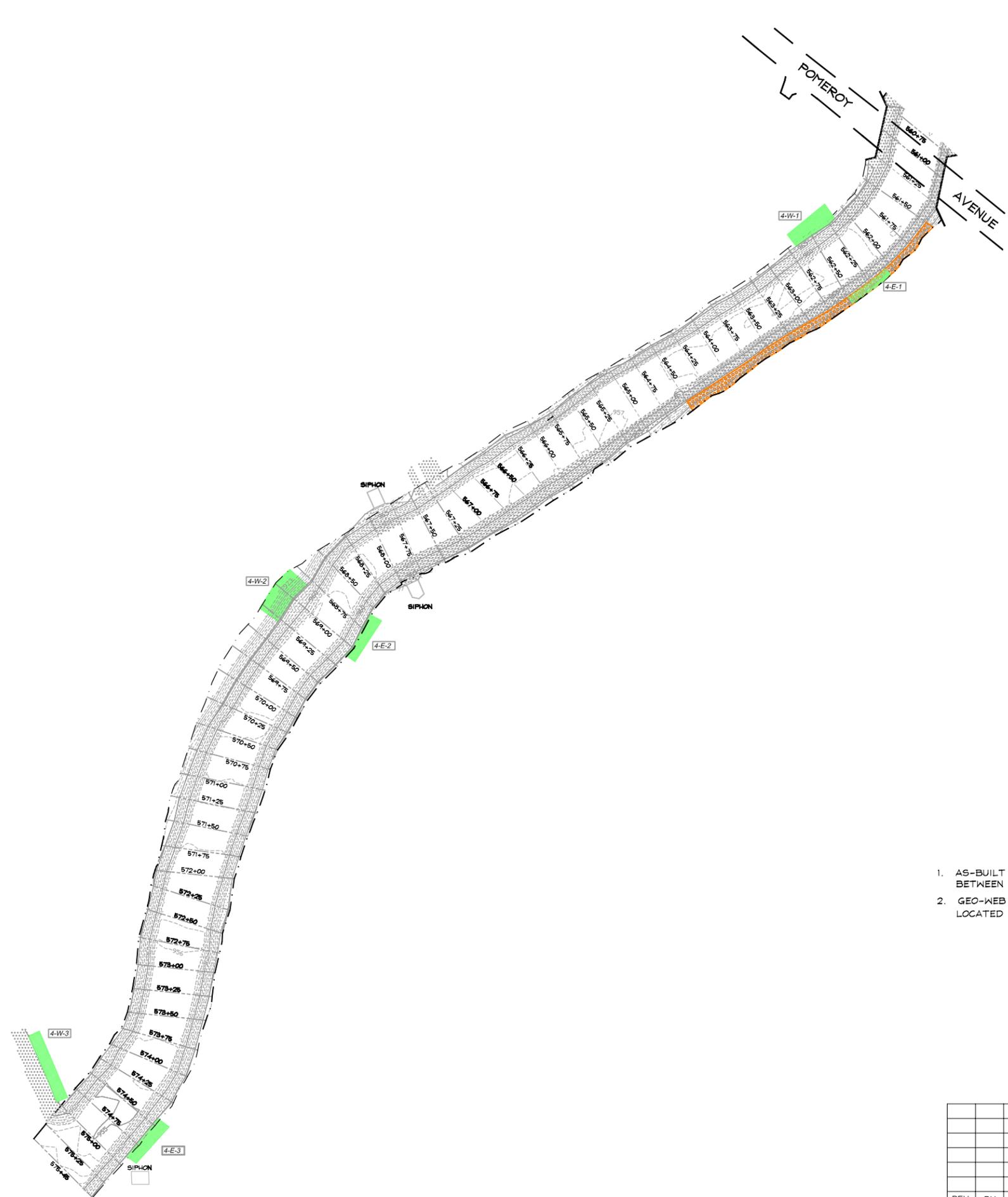
PROJECT:  
SSERC 1.5 Mile Reach  
East Branch Housatonic River  
Pittsfield, Massachusetts

FIGURE:  
2-3

DATE: July 2007  
SCALE: 1"=60'  
PROJ. NO.: 104141.03

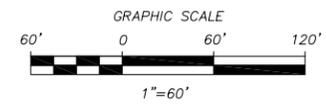
**LEGEND**

- 562+00 RIVER SECTION
- LIMIT OF WORK
- TOP OF RIP RAP
- 960 AS-BUILT CONTOUR
- 959
-  GEO-WEB
-  RIPRAP
-  VEGETATIVE MONITORING PLOTS (LOCATED BY WOODLOT ALTERNATIVES)
-  PLOT LABEL



**NOTES:**

1. AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC. BETWEEN SEPTEMBER 2002 (PHASE #1) AND APRIL 2006 (END PHASE #3).
2. GEO-WEB LOCATIONS ARE BASED ON PLANS PROVIDED BY WESTON SOLUTIONS, INC. AND WERE NOT LOCATED IN THE FIELD (WITH AN INSTRUMENT) BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.



REV.	BY	DATE	STATUS

SHEET TITLE: <b>2007 Vegetation Monitoring</b> Plot Locations (Pomeroy Ave. to Confluence)	
PROJECT: SSERC 1.5 Mile Reach East Branch Housatonic River Pittsfield, Massachusetts	
FIGURE: <b>2-4</b>	DATE: July 2007 SCALE: 1"=60' PROJ. NO.: 104141.03
	



**WESTON SOLUTIONS, INC.**

10 LYMAN STREET  
PITTSFIELD, MA

PROJECT DESCRIPTION

DRAWING TITLE

**EAST BRANCH  
HOUSATONIC RIVER**

**SEDIMENT SAMPLING  
LOCATIONS**

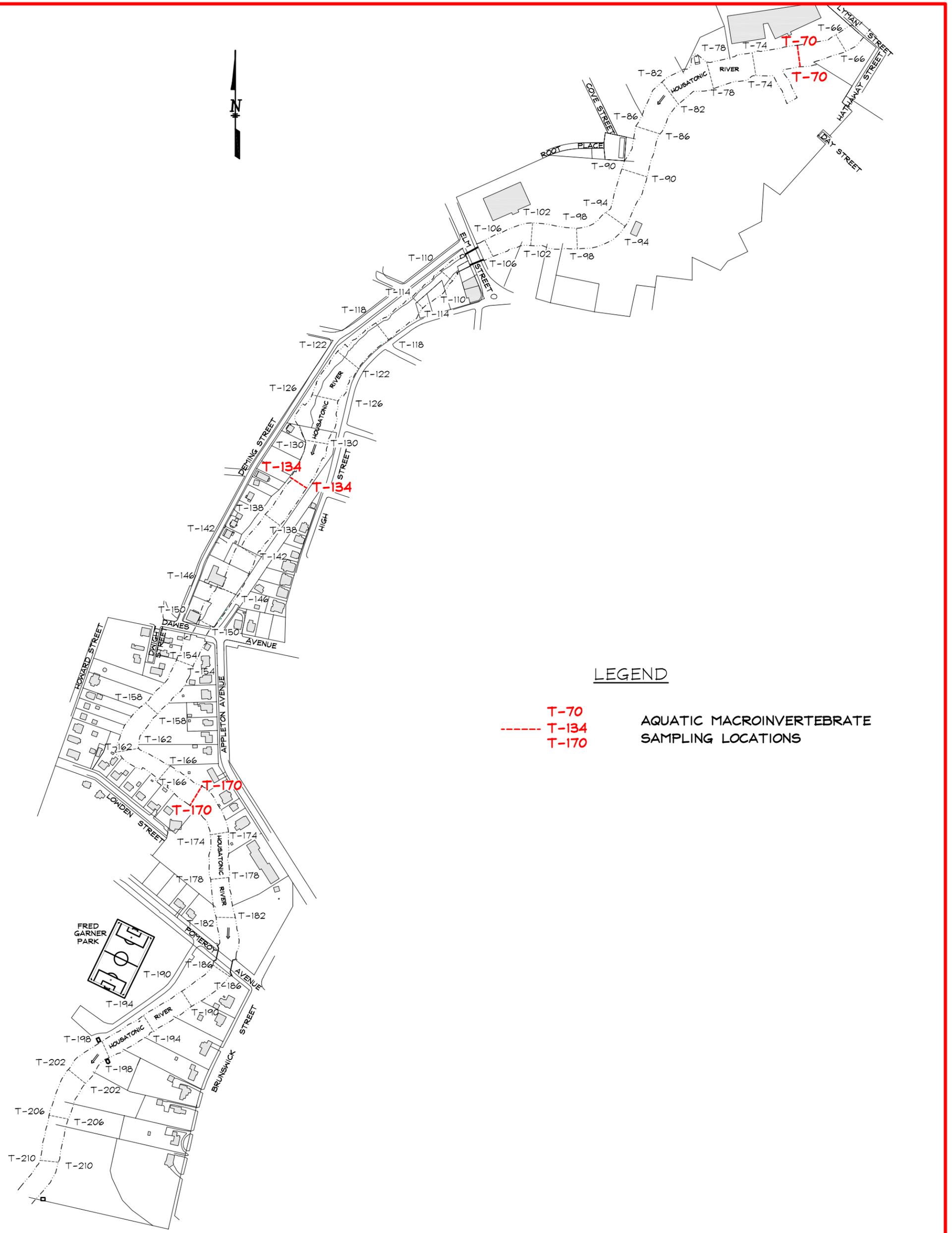
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A	ISSUED FOR COMMENT	JR	5-17-07
B	ADDED PROPERTY LINES	JR	5-18-07



50 Depot Street  
Dalton, MA 01226  
(413) 684-0925  
www.hillengineers.com



DRAWN BY	JR
DATE DRAWN	5-17-07
SCALE	1"=400'
APP'D. BY	
CAD CODE:	TRANSECT9SKI.DWG
FIGURE	3-1
REV.	B



**LEGEND**

- T-70
  - T-134
  - T-170
- AQUATIC MACROINVERTEBRATE SAMPLING LOCATIONS**

**WESTON SOLUTIONS, INC.**

10 LYMAN STREET  
PITTSFIELD, MA

PROJECT DESCRIPTION

DRAWING TITLE

**EAST BRANCH  
HOUSATONIC RIVER**

**AQUATIC  
MACROINVERTEBRATE  
SAMPLING LOCATIONS**

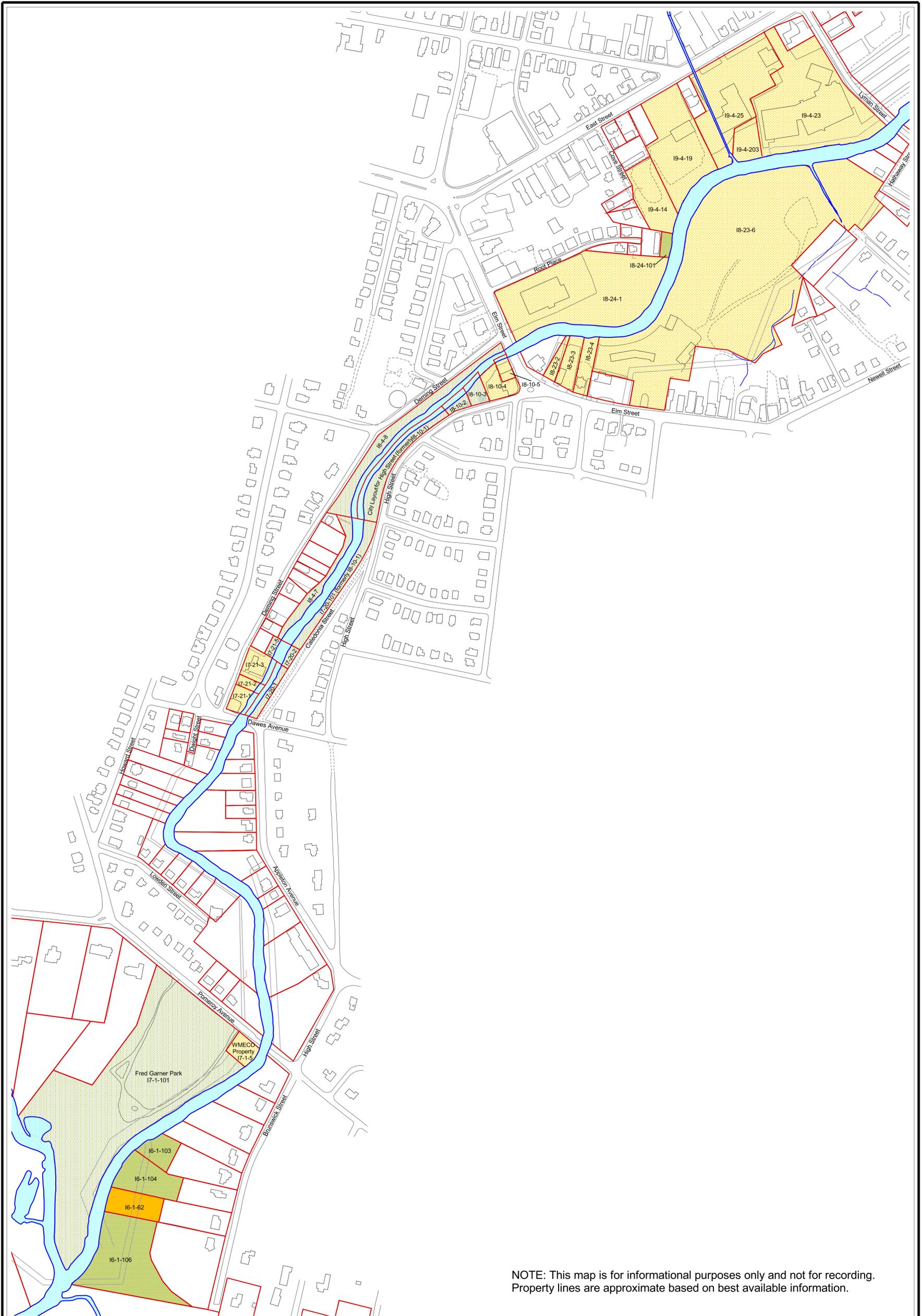
REV.	DESCRIPTION	DR'N CK'D.	DATE
A	ISSUED FOR COMMENT	JR	6-19-07



50 Depot Street  
Dolton, MA 01226  
(413) 684-0925  
www.hillengineers.com



DRAWN BY	JR
DATE DRAWN	6-19-07
SCALE	1"=400'
APV'D. BY	
CAD CODE:	TRANSCTSSK3.DWG
FIGURE	4-1
REV.	A



NOTE: This map is for informational purposes only and not for recording. Property lines are approximate based on best available information.

**LEGEND:**

- Approximate Property Lines
- City Owned Properties (ERE)
- Commercial Properties (CS)
- Commonwealth of MA Fish & Wildlife Property (ERE)
- GE Owned Property (ERE)
- Roads
- Housatonic River
- 18-4-7 Parcel ID

N

70      0      70      140 Feet

Housatonic River Project  
Pittsfield, Massachusetts

**FIGURE 5-1**  
**Environmental Restrictions Easement (ERE) and**  
**Conditional Solutions Properties**  
**Lyman Street to the Confluence**  
**1.5 Mile Reach Removal Action**  
January 2007

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## TABLES

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**TABLE 3-1  
Riverbank Re-vegetation Monitoring Plot Summary  
GE-Pittsfield/Housatonic River, 1.5 Mile Reach**

**Monitoring Plot Details**  
1.5 Mile Reach, Housatonic River, Pittsfield, MA

Date:  
By:  
Checked By:

Monitoring Plot/Area	Bank	Plot No.	Type	Date	Dimensions					Trees						Shrubs					Total Plants							
					L (ft)	Slope W (ft)	Height (ft) <sup>1</sup>	W (ft)	Area (ft <sup>2</sup> )	BW	SM	EC	BE	Total Trees	Tree Density	ROD	SD	WH	CC	NA	Total Shrubs	Total Plants						
Lyman-Elm	West	1-W-1	Regular		61	10	3	9.5	582																			
Lyman-Elm	West	1-W-2	Regular		32	31	4.5	30.7	981																			
Lyman-Elm	West	1-W-3	Regular		67	22	5	21.4	1435																			
Monitoring Area Average																												
Lyman-Elm	East	1-E-1	Regular		139	12	2	11.8	1645																			
Lyman-Elm	East	1-E-2	Regular		45	34.5	2	34.4	1550																			
Lyman-Elm	East	1-E-3	Geoweb		70	22	13	17.7	1242																			
Monitoring Area Average																												
Elm-Dawes	West	2-W-1	Regular		63	18	6.5	16.8	1057																			
Elm-Dawes	West	2-W-2	Regular		17	57	19	53.7	914																			
Elm-Dawes	West	2-W-3	Geoweb		66	14	11	8.7	572																			
Monitoring Area Average																												
Elm-Dawes	East	2-E-1	Regular		33	31	15	27.1	895																			
Elm-Dawes	East	2-E-2	Regular		27	35	9	33.8	913																			
Elm-Dawes	East	2-E-3	Regular		141	11	5	9.8	1382																			
Monitoring Area Average																												
Dawes-Pomeroy	West	3-W-1	Geoweb		212	7	1	6.0	1272																			
Dawes-Pomeroy	West	3-W-2	Regular		67	14	0	14.0	938																			
Dawes-Pomeroy	West	3-W-3	Regular		105	13	0	13.0	1365																			
Monitoring Area Average																												
Dawes-Pomeroy	East	3-E-1	Regular		145	10	4	10.0	1450																			
Dawes-Pomeroy	East	3-E-2	Geoweb		38	12	7	9.7	370																			
Dawes-Pomeroy	East	3-E-3	Regular		77	10	0	10.0	770																			
Monitoring Area Average																												
Pomeroy-Confluence	West	4-W-1	Regular		50	18	0	18.0	900																			
Pomeroy-Confluence	West	4-W-2	Regular		50	25	0	25.0	1250																			
Pomeroy-Confluence	West	4-W-3	Regular		74	12	0	12.0	888																			
Monitoring Area Average																												
Pomeroy-Confluence	East	4-E-1	Geoweb		50	8	0	8.0	400																			
Pomeroy-Confluence	East	4-E-2	Regular		50	10	0	10.0	500																			
Pomeroy-Confluence	East	4-E-3	Regular		50	10	0	10.0	500																			
Monitoring Area Average																												

**Notes:**

- 1: From As-Built CAD Drawing
- 2: 3-W-1 Height based on field observation
- 3: 3-E-1 Height based on field observation

Species Legend

BW = black willow  
SM = silver maple  
EC = eastern cottonwood  
BE = box elder

SD = silky dogwood  
ROD = red-osier dogwood  
NA = northern arrow-wood  
WH = winterberry holly  
CC = chokecherry

**TABLE 3-1  
Riverbank Re-vegetation Monitoring Plot Summary  
GE-Pittsfield/Housatonic River, 1.5 Mile Reach**

**Monitoring Plot Details  
1.5 Mile Reach, Housatonic River, Pittsfield**

Monitoring Plot/Area	Bank	Plot No.	Type	Plot Characterization	Shrub Clumps							Trees			Monitoring Standard Summary		
					Length (ft)	Width (ft)	Shrub No.	Area (ft^2)	Shrub D (shrubs/acre)	Target Density (shrubs/acre)	% Target D	Area	Tree Density (tree/acre)	Target Density (tree/acre)	% Target Density	Shrubs	Trees
Lyman-Elm	West	1-W-1	Regular	no shrubs clumps or RO band, shrub clump immediately upstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	582		700			
Lyman-Elm	West	1-W-2	Regular	shrub clump immediately upstream, RO band incomplete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	981		700			
Lyman-Elm	West	1-W-3	Regular	shrub clump approx. 24ftx14ft at South edge of plot, (ellipse)				264*				1435		700			
Monitoring Area Average													Monitoring Area Average				
Lyman-Elm	East	1-E-1	Regular	shrub clump approx. 77ftx8ft in center of plot, RO band 77 ft in length (ellipse)				484*				1645		700			
Lyman-Elm	East	1-E-2	Regular	shrub clump immediately upstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1550		700			
Lyman-Elm	East	1-E-3	Geoweb	all shrubs with interspersed trees, shrubs 4-10ft OC, avg 7 ft OC	70	17.7		1242				1242		210**			
Monitoring Area Average													Monitoring Area Average				
Elm-Dawes	West	2-W-1	Regular	shrub clump immediately upstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1057		700			
Elm-Dawes	West	2-W-2	Regular	RO band unevenly spaced, shrub clump immediately upstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	914		700			
Elm-Dawes	West	2-W-3	Geoweb	shrubs distributed evenly with trees	66	8.7		572				572		500			
Monitoring Area Average													Monitoring Area Average				
Elm-Dawes	East	2-E-1	Regular	shrub clump approx. 1/2 of plot extending upstream (triangle)				316*				895		700			
Elm-Dawes	East	2-E-2	Regular	no shrub clumps, shrub clump approx. 200 ft upstream & downstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	913		700			
Elm-Dawes	East	2-E-3	Regular	no shrub clumps, shrub clump approx. 300 ft upstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1382		700			
Monitoring Area Average													Monitoring Area Average				
Dawes-Pomeroy	West	3-W-1	Geoweb	shrubs distributed evenly with trees	212	6		1272				1272		411**			
Dawes-Pomeroy	West	3-W-2	Regular	shrubs distributed evenly with trees	66	14		938				938		418**			
Dawes-Pomeroy	West	3-W-3	Regular	shrubs distributed evenly, some area void	105	13		1365				1365		383**			
Monitoring Area Average													Monitoring Area Average				
Dawes-Pomeroy	East	3-E-1	Regular	shrub clump approx. 16ftx6ft w/ some interspersed trees	145	10		1450				1450		391**			
Dawes-Pomeroy	East	3-E-2	Geoweb	no shrub clumps, shrub clump approx. 120 ft downstream	N/A	N/A	N/A	N/A	N/A	N/A	N/A	370		500			
Dawes-Pomeroy	East	3-E-3	Regular	shrubs distributed evenly with trees	77	10		770				770		679**			
Monitoring Area Average													Monitoring Area Average				
Pomeroy-Confluence	West	4-W-1	Regular	no shrubs clumps, Shrubs in adjacent WMECO ROW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	900		700			
Pomeroy-Confluence	West	4-W-2	Regular	no shrubs clumps, Shrubs in adjacent WMECO ROW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1250		700			
Pomeroy-Confluence	West	4-W-3	Regular	Shrub clump approximately 1/2 of plot	40	10		400				888		700			
Monitoring Area Average													Monitoring Area Average				
Pomeroy-Confluence	East	4-E-1	Geoweb	Shrub clump adjacent to plot	N/A	N/A	N/A	N/A	N/A	N/A	N/A	400		500			
Pomeroy-Confluence	East	4-E-2	Regular	shrubs distributed evenly with trees	50	10		500				500		700			
Pomeroy-Confluence	East	4-E-3	Regular	shrubs distributed evenly with trees	50	10		500				500		700			
Monitoring Area Average													Monitoring Area Average				

**Notes:**

Target Planting Densities

	Normal	Geoweb	
Trees:	700	500	per acre
Shrubs:	730	730	per acre
Total:	1430	1230	per acre

N/A - Not Applicable

\* - Irregularly shaped shrub clump

Calculations of "as-built" shrub densities are based on the presence or absence of shrub clumps. If shrubs were evenly distributed within the monitoring area, shrub density should have been 730 shrubs/acre in non-GeoWeb® plots and 730 shrubs/acre in areas with GeoWeb® plots. If a defined shrub clump was observed, the area of the shrub clump was delineated and resulting shrub density within the clump should have been 2,723 shrubs/acre if shrubs were planted 4-foot on center. The density of 2,723 shrubs per acre was established by utilizing the shrub clump planting design of shrubs installed 4-foot on center. One shrub occupies 16 square feet (sf) 43,560 ft (1 acre) divided by 16 sf results in a target density of 2,722.5 shrubs per acre within shrub clumps. As described above for the trees, in certain areas, the actual number of shrubs planted was used to calculate existing shrub densities.

\*\* - denotes plots where survivorship criterion is based on actual number of trees planted. There are some areas where planting densities were different from the design 700 trees/acre in non-GeoWeb® riverbanks and the design 500 trees/acre in the GeoWeb® riverbanks due to the needs or requests of residential property owners or physical conditions of the riverbanks.

Assessment of sample area (plot) based on original number of trees planted

Plot #: (1-E-3) - Six trees originally planted within plot

Plot #: (3-W-1) - Thirteen trees originally planted within plot

Plot #: (3-W-2) - Nine trees originally planted within plot

Plot #: (3-W-3) - Twelve trees originally planted within plot

Plot #: (3-E-1) - Fourteen trees originally planted within plot

Plot #: (3-E-3) - Twelve trees originally planted within plot

Plot #: (4-E-2) - Five trees originally planted within plot

**TABLE 3-2**  
**Non-Riverbank Monitoring Area Summary**  
**GE-Pittsfield/Housatonic River Project, 1.5 Mile Reach**

Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock	Comments	Monitoring Requirements
Lyman St. Bridge to Elm St. Bridge	18-24-1	6	<i>Betula nigra</i>	River Birch Clump	8-10 ft.		2008
		12	<i>Acer rubrum</i>	Red Maple	1.75"-2" cal		2008
		6	<i>Quercus alba</i>	White Oak	1.75"-2" cal		2008
		11	<i>Acer saccharum</i>	Sugar Maple	1.75"-2" cal		2008
		8	<i>Fraxinus americana</i>	White Ash	1.75"-2" cal		2008
		6	<i>Fraxinus pennsylvanica</i>	Green Ash	1.75"-2" cal		2008
		6	<i>Quercus palustris</i>	Pin Oak	1.75"-2" cal		2008
		7	<i>Pinus strobus</i>	White Pine	5-6 ft.		2008
		7	<i>Abies fraseri</i>	Fraser Fir	5-6 ft.		2008
	6	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	5-6 ft.		2008	
	18-23-6	80	<i>Thuja occidentalis</i>	Dark American Arborvitae	12-15 ft.		Complete
		2	<i>Acer rubrum</i>	Red Maple	2" cal		Complete
19-5-13	13	<i>Thuja occidentalis</i>	Dark American Arborvitae	12 ft.		2008	
	12	<i>Thuja occidentalis</i>	Dark American Arborvitae	4 ft.		2008	
Elm St. Bridge To Dawes Ave. Bridge	18-4-6	3	<i>Pinus strobus</i>	White Pine	6 ft.		Complete
	18-4-101	1	<i>Acer saccharinum</i>	Silver Maple	n/a		Complete
	18-4-7	1	<i>Salix nigra</i>	Black Willow	n/a		Complete
		1	<i>Prunus serotina</i>	Black Cherry	n/a		Complete
		5	<i>Abies balsamea</i>	Balsam Fir	n/a		Complete
	2	<i>Syringa vulgaris</i>	Lilacs	n/a		Complete	
	17-21-6 and 17-21-4	5	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	5 ft.		Complete
		1	<i>Acer platanoides</i>	Crimson King Maple	n/a		Complete
	18-10-4	37	<i>Thuja occidentalis</i>	Dark American Arborvitae	4-5 ft.		Complete
	17-20-1	3	<i>Fraxinus pennsylvanica</i>	Green Ash	n/a		Complete
2		<i>Acer rubrum 'red sunset'</i>	Sunset Maple	n/a		Complete	
Dawes Ave. Bridge to Pomeroy Ave. Bridge	17-3-12	3	<i>Picea pungens</i>	Blue Spruce	10 ft.		Complete
		2	<i>Acer saccharum</i>	Sugar Maple	2" cal		Complete
		1	<i>Acer saccharinum</i>	Silver Maple	2" cal		Complete
	17-3-4	1	<i>Betula papyrifera</i>	White Birch	n/a		Complete
		1	<i>Forsythia sp.</i>	Forsythia	n/a		Complete
		1	<i>Rosa sp.</i>	Knockout Rose	n/a		Complete
	17-2-21	3	<i>Syringa vulgaris</i>	Lilacs	n/a		Complete
	17-2-22	5	<i>Thuja occidentalis</i>	Dark American Arborvitae	n/a		Complete
		1	<i>Rhododendron sp.</i>	Rhododendron	n/a		Complete
	17-2-24	2	<i>Acer rubrum</i>	Red Maple	10-12 ft.		Complete
	17-2-25	2	<i>Acer rubrum</i>	Red Maple	10-12 ft.		Complete
		1	<i>Picea pungens</i>	Blue Spruce	6 ft.		Complete
		9	<i>Funkiaceae</i>	Hostas	n/a		Complete
1		<i>Rhododendron sp.</i>	Rhododendron	n/a		Complete	
Pomeroy Ave. Bridge to Confluence	17-1-5	8	<i>Thuja occidentalis</i>	Dark American Arborvitae	6-8 ft.	WMECO	Complete
	17-1-101	8	<i>Acer rubrum</i>	Red Maple	2" cal	Soccer Field Area	2008 to 2011
		6	<i>Betula nigra</i>	River Birch Clump	8-10 ft.	Soccer Field Area	2008 to 2011
		16	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	8-10 ft.	Top of bank along walk path	2008 to 2011
		5	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area A	2008 to 2011
		10	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area A	2008 to 2011
		10	<i>Quercus rubra</i>	Red Oak	1.5"-2" cal	Area A	2008 to 2011
		5	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area A	2008 to 2011
		4	<i>Acer saccharinum</i>	Silver Maple	1.5"-2" cal	Area A	2008 to 2011
	17-1-101	13	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area B	2008 to 2011
		16	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area B	2008 to 2011
		15	<i>Quercus rubra</i>	Red Oak	1.5"-2" cal	Area B	2008 to 2011
		10	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area B	2008 to 2011
		23	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area B	2008 to 2011
		23	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area B	2008 to 2011
		23	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area B	2008 to 2011
		23	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area B	2008 to 2011
	17-1-101	14	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area C ^	2008 to 2011
		13	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area C ^	2008 to 2011
		13	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area C ^	2008 to 2011
13		<i>Prunus virginiana</i>	Chokecherry	1-gal	Area C ^	2008 to 2011	

**TABLE 3-2**  
**Non-Riverbank Monitoring Area Summary**  
**GE-Pittsfield/Housatonic River Project, 1.5 Mile Reach**

Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock	Comments	Monitoring Requirements	
Pomeroy Ave. Bridge to Confluence	17-1-101	2	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area D	2008 to 2011	
		2	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area D	2008 to 2011	
		2	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area D	2008 to 2011	
		3	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area D	2008 to 2011	
		3	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area D	2008 to 2011	
		3	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area D	2008 to 2011	
		3	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area D	2008 to 2011	
	17-1-101	5	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area E	2008 to 2011	
		3	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area E	2008 to 2011	
		40	<i>Acer saccharinum</i>	Silver Maple	1.5"-2" cal	Area E	2008 to 2011	
		30	<i>Acer rubrum</i>	Red Maple	1.5"-2" cal	Area E	2008 to 2011	
		7	<i>Salix nigra</i>	Black Willow	1-gal	Area E	2008 to 2011	
		16	<i>Populus deltoides</i>	Eastern Cottonwood	1-gal	Area E	2008 to 2011	
		8	<i>Acer negundo</i>	Box Elder	1-gal	Area E	2008 to 2011	
		37	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area E	2008 to 2011	
		38	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area E	2008 to 2011	
		38	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area E	2008 to 2011	
		38	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area E	2008 to 2011	
		16-1-69	5	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	4-5 ft.		Complete
			4		Various Shrubs	3-gal		Complete
	16-1-68	16	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	4-5 ft.		Complete	
		14	<i>Sorbaria sorbifolia</i>	Spirea	3-gal		Complete	
	16-1-67	3	<i>Amelanchier sp.</i>	Serviceberry (shadbush)	6-8 ft.		2008	
		2	<i>Fraxinus pennsylvanica</i>	Green Ash	6-8 ft.		2008	
		3	<i>Betula papyrifera</i>	White Birch	6-8 ft.		2008	
		7	<i>Pinus strobus</i>	White Pine	5-6 ft.		2008	
		2	<i>Quercus rubra</i>	Red Oak	6-8 ft.		2008	
		2	<i>Abies balsamea</i>	Balsam Fir	5-6 ft.		2008	
		2	<i>Acer rubrum</i>	Red Maple	6-8 ft.		2008	
		13	<i>Vaccinium macrocarpon</i>	American Cranberry	3-4 ft.		2008	
		14	<i>Viburnum dentatum</i>	Northern Arrowwood	3-4 ft.		2008	
		2	<i>Cornus sericea</i>	Red Osier Dogwood	1-gal		2008	
		2	<i>Cornus amomum</i>	Silky Dogwood	1-gal		2008	
		4	<i>Ilex verticillata</i>	Winterberry Holly	1-gal		2008	
		4	<i>Prunus virginiana</i>	Chokecherry	1-gal		2008	
		5	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal		2008	
		16-1-66	7	<i>Amelanchier sp.</i>	Serviceberry (shadbush)	6-8 ft.		2008
	6		<i>Fraxinus pennsylvanica</i>	Green Ash	6-8 ft.		2008	
	4		<i>Betula papyrifera</i>	White Birch	6-8 ft.		2008	
	8		<i>Pinus strobus</i>	White Pine	5-6 ft.		2008	
	9		<i>Quercus rubra</i>	Red Oak	6-8 ft.		2008	
	4		<i>Abies balsamea</i>	Balsam Fir	5-6 ft.		2008	
	12		<i>Acer rubrum</i>	Red Maple	6-8 ft.		2008	
	8		<i>Vaccinium macrocarpon</i>	American Cranberry	3-4 ft.		2008	
	7		<i>Viburnum dentatum</i>	Northern Arrowwood	3-4 ft.		2008	
	6		<i>Cornus amomum</i>	Silky Dogwood	1-gal		2008	
	5		<i>Ilex verticillata</i>	Winterberry Holly	1-gal		2008	
	5		<i>Prunus virginiana</i>	Chokecherry	1-gal		2008	
	6		<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal		2008	

n/a - Not Available

^ - Planting Areas located on Western Mass Electric Company (WMECO) Right of Way (ROW). WMECO requirements do not allow tree planting in ROW areas, therefore only shrubs were planted.

\* - Different Areas are displayed on the non-riverbank planting as-builts

**TABLE 4-1  
Monitoring Activities Summary \*  
GE-Pittsfield/Housatonic River Project, 1.5 Mile Reach**

Monitoring Program	Frequency	Duration	Ideal Monitoring Time frame	Maintenance Standard Summary	Locations
<b>Habitat and non-Habitat Based Monitoring</b>					
Riverbank Soil Restoration	Once a Year and High Flow	5 Years + Proposal	During low flow (typically July or August) and after any flow event over 3,500 cfs**	No significant erosion (e.g., ruts, gullies, washouts, or sloughing)	Entire 1.5 Mile
Riprap in the River Channel, Riverbank or Swales and ACB	Once a Year and High Flow	5 Years + Proposal	During low flow (typically July or August) and after any flow event over 3,500 cfs**	No significant movement or reduction in thickness that threatens the stability of the riverbanks or river channel or results in erosion of underlying soils or sediments. Also, for swales, no movement of riprap that results in the exposure of the underlying geotextile fabric. For ACB, no significant damage to the ACB, and to the shotcrete which is tying in the ACB to the base of the adjacent retaining wall on Parcel I8-10-5 and the shotcrete at the transition between the ACB and the adjacent riprap at the downstream end of the ACB.	Entire 1.5 Mile
Aquatic Habitat Enhancement Structures	Once a Year and High Flow	5 Years	During low flow (typically July or August) and after any flow event over 3,500 cfs**	No significant movement of riprap and no significant riverbank erosion.	Entire 1.5 Mile
Ancillary Items-Critical	Once a Year	5 Years + Proposal	During low flow (typically July or August)	No substantial variation from As-Built condition.	Retaining walls, designated guardrails and fences, see section 3.4 of this report
Ancillary Items- NON-Critical	Once a Year	2 Years from Installation	During low flow (typically July or August)	No substantial variation from As-Built condition.	Fences, guardrails, pavement, and other items, see section 3.4 of this report
Riverbank Plantings	Twice a Year	5 Years	May and July	80% Survivability	Entire 1.5 Mile
Non-Riverbank Plantings	Twice a Year	Varies see Table 3	May and July	100% Survivability and 80% Survivability on the Fred Garner Park trees (except the 8 red maples and 6 river birches on the soccer field and 16 hemlocks along walking path, which have 100% survivability )	See Table 3 and non-riverbank As-built drawings
Tree and Cage Maintenance	Twice a Year	5 Years	May and July	N/A	Entire 1.5 Mile
Herbaceous Vegetation Cover	Once a year	5 Years	July	>95%	24 Plots, Meander Survey and Parcels I8-24-1, I6-1-66, I6-1-67 and FGP (Parcel I7-1-101)
Invasive Species	Once a year	5 Years	July	<5%	24 Plots, Meander Survey and Parcels I8-24-1, I6-1-66, I6-1-67 and FGP (Parcel I7-1-101)
<b>Environmental Monitoring</b>					
Sediment Sampling	Every 5 years for 15 years	15 Years +Proposal	Low Flow conditions Late June or early July is recommended	N/A	Transect 66 (Lyman Street) to Transect 210 (confluence of East and West Branches) 200-foot intervals (every fourth transect)
Surface Water Sampling^	see note	see note	see note	see note	see note
Macroinvertebrate Sampling	Every 5 years for 15 years	15 Years+ Proposal	Low Flow conditions Late June or early July is recommended	N/A	Transects T070, T134 and T170
<b>ERE and Conditional Solutions Inspections</b>					
ERE Inspections	Once a Year	In Perpetuity	May	N/A	non-GE-owned and non-state owned Parcels with EREs
Conditional Solutions Inspections	Once a Year	In Perpetuity	May	N/A	Parcels with Conditional Solutions

**Notes:**

\* - This is a summary only. In case of conflict, the text of the PRSC Plan shall control.

\*\* - 3,500 (cfs) cubic-feet-per-second as measured at the United States Geological Survey (USGS) Coltsville stream gauging station (USGS No. 01197000).

^ - Surface water sampling will not be conducted at Lyman Street and Pomeroy Avenue (adjacent to Fred Garner Park) subject to the following conditions: A) GE continues with its ongoing monthly water sampling at Lyman Street and Pomeroy Avenue and reports the results in the PRSC Annual Report; and B) If GE discontinues its current monthly water column sampling, EPA reserves the right to require GE to perform water column monitoring as part of the 1½-Mile PRSC activities

N/A - Not Applicable

---

**APPENDIX A**

**LIST OF INVASIVE PLANT SPECIES**

---

## INVASIVE PLANT LIST

COMMON NAME	SCIENTIFIC NAME
Amur honeysuckle	<i>Lonicera maackii</i>
Autumn olive	<i>Elaeagnus umbellata</i>
Barnyard grass	<i>Echinochloa crusgalli</i>
Black locust	<i>Robinia pseudoacacia</i>
Black swallow-wort	<i>Cynanchum louiseae</i>
Bittersweet nightshade	<i>Solanum dulcamara</i>
Bushy Rock-cress	<i>Cardamine impatiens</i>
Canada bluegrass	<i>Poa compressa</i>
Chervil	<i>Anthriscus sylvestris</i>
Coltsfoot	<i>Tussilago farfara</i>
Common barberry	<i>Berberis vulgaris</i>
Common buckthorn	<i>Rhamnus cathartica</i>
Common / hedge privet	<i>Ligustrum vulgare</i>
Common mullein	<i>Verbascum thapsus</i>
Creeping buttercup	<i>Ranunculus repens</i>
Curly pondweed	<i>Potamogeton crispus</i>
Cypress spurge	<i>Euphorbia cyparissias</i>
Dame's rocket	<i>Hesperis matronalis</i>
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>
Fanwort	<i>Cabomba caroliniana</i>
Garlic mustard	<i>Alliaria petiolata</i>
Giant waterweed	<i>Egeria densa</i>
Glossy buckthorn	<i>Rhamnus frangula</i>
Goutweed or	<i>Aegopodium podagraria</i>
Hair fescue	<i>Festuca filiformis</i>
Hairy willow-herb	<i>Epilobium hirsutum</i>
Japanese barberry	<i>Berberis thunbergii</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Japanese hops	<i>Humulus japonicus</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>
Japanese privet	<i>Ligustrum obtusifolium</i>
Japanese rose	<i>Rosa rugosa</i>
Kiwi vine	<i>Actinidia arguta</i>
Kudzu	<i>Pueraria montana</i>
Lesser naiad	<i>Najas minor</i>
Live-forever or Orpine	<i>Sedum telephium</i>
Money wort	<i>Lysimachia nummularia</i>
Morrow's honeysuckle	<i>Lonicera morrowii</i>
Morrow's X Tatarian	<i>Lonicera xbella</i>
Multiflora rose	<i>Rosa multiflora</i>
Norway maple	<i>Acer platanoides</i>
Oriental bittersweet	<i>Celastrus orbiculata</i>
Phragmites, Reed grass	<i>Phragmites australis</i>

## INVASIVE PLANT LIST

COMMON NAME	SCIENTIFIC NAME
Porcelain berry	<i>Ampelopsis brevipedunculata</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Reed canary-grass	<i>Phalaris arundinacea</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Sea- or horned poppy	<i>Glaucium flavum</i>
Sheep fescue	<i>Festuca ovina</i>
Sheep-sorrel	<i>Rumex acetosella</i>
Silver lace-vine	<i>Polygonum aubertii</i>
Silver poplar	<i>Populus alba</i>
Spotted knapweed	<i>Centaurea biebersteinii</i>
Sweet reedgrass	<i>Glyceria maxima</i>
Sycamore maple	<i>Acer pseudoplatanus</i>
Tartarian honeysuckle	<i>Lonicera tartarica</i>
Tree-of-heaven	<i>Ailanthus altissima</i>
True forget-me-not	<i>Myosotis scorpioides</i>
Water-chestnut	<i>Trapa natans</i>
Watercress	<i>Rorippa nasturtium-aquaticum</i>
Wetsern catalpa	<i>Catalpa speciosa</i>
White mulberry	<i>Morus alba</i>
Wild thyme	<i>Thymus pulegioides</i>
Winged euonymus	<i>Euonymus alata</i>
Variable water-milfoil	<i>Myriophyllum heterophyllum</i>
Yellow floating heart	<i>Nymphoides peltata</i>
Yellow iris	<i>Iris pseudacorus</i>

### Reference:

Weatherbee, P.B., P. Somers, T. Simmons. 1998. A Guide to Invasive Plants in Massachusetts. The Massachusetts Biodiversity Initiative. MassWildlife.

---

**APPENDIX B**

**RIPRAP, SOIL, SWALE AND ACB MONITORING FIELD FORM**

---

## RIVERBANK SOIL, RIPRAP AND SWALE, AND ARTICULATED CONCRETE BLOCKS (ACB) MONITORING FIELD FORM

**Date:** \_\_\_\_\_

**Lead Monitor:** \_\_\_\_\_

Monitoring Area	Monitoring Program	Comments / Recommendations and Brief Description of Specific Location
Lyman St Bridge to Elm Street Bridge	Soil:	
	Riprap:	
	Enhancement Structures:	
Elm Street Bridge to Dawes Ave Bridge	Soil:	
	Riprap:	
	Enhancement Structures:	
	ACB:	
Dawes Ave Bridge to Pomeroy Ave Bridge	Soil:	
	Riprap:	
	Enhancement Structures:	
Pomeroy Ave to the Confluence	Soil:	
	Riprap:	
	Enhancement Structures:	
	ACB:	

---

**APPENDIX C**

**CONSTRUCTION AS-BUILTS (IN-RIVER)**

---

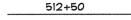
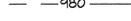
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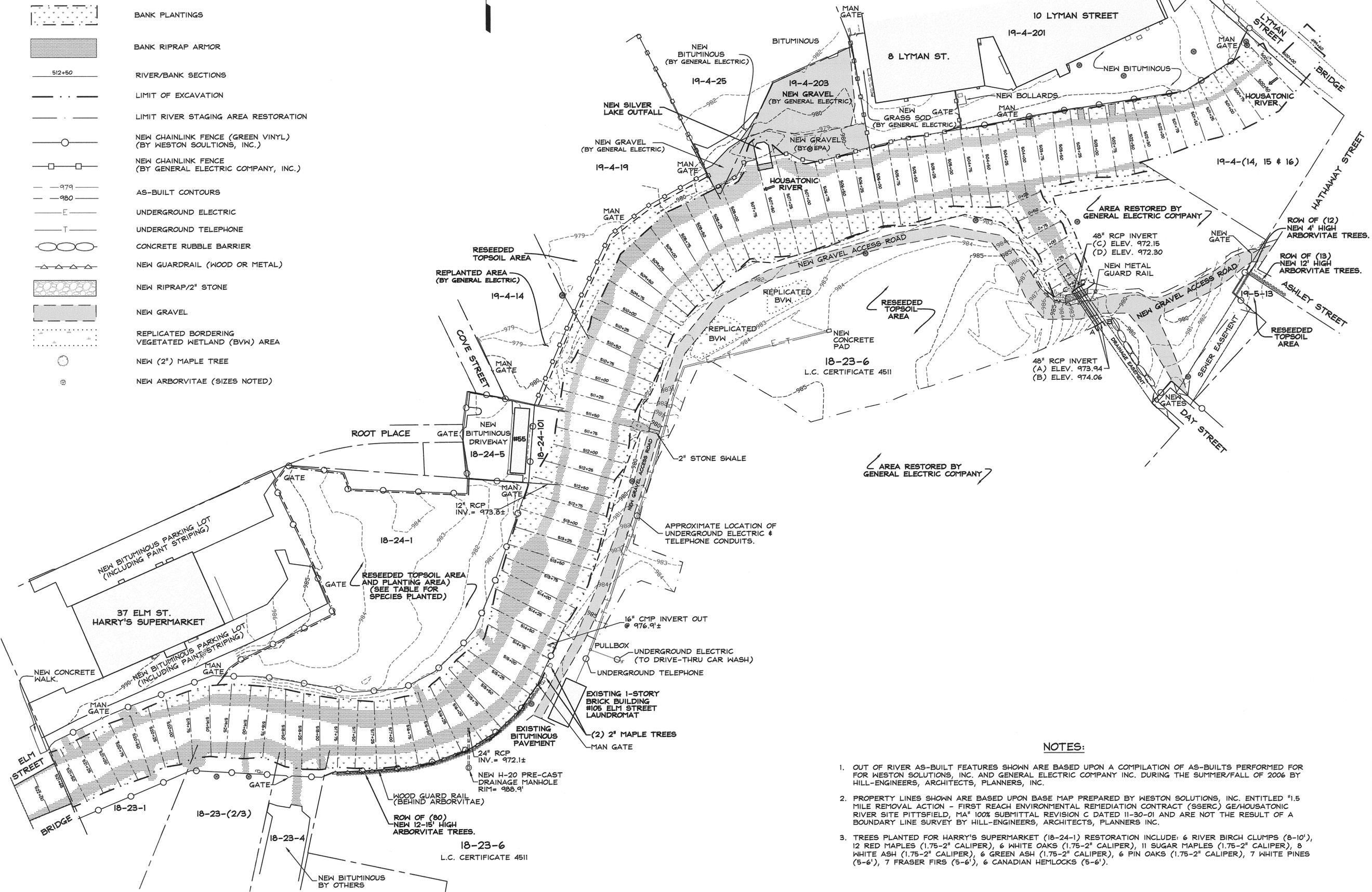
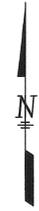
**APPENDIX D**

**CONSTRUCTION AS-BUILTS (OUT-OF-RIVER)**

---

**LEGEND**

-  UTILITY POLE
-  DRAIN MANHOLE
-  MONITORING WELL
-  BANK PLANTINGS
-  BANK RIPRAP ARMOR
-  RIVER/BANK SECTIONS
-  LIMIT OF EXCAVATION
-  LIMIT RIVER STAGING AREA RESTORATION
-  NEW CHAINLINK FENCE (GREEN VINYL)  
(BY WESTON SOLUTIONS, INC.)
-  NEW CHAINLINK FENCE  
(BY GENERAL ELECTRIC COMPANY, INC.)
-  AS-BUILT CONTOURS
-  UNDERGROUND ELECTRIC
-  UNDERGROUND TELEPHONE
-  CONCRETE RUBBLE BARRIER
-  NEW GUARDRAIL (WOOD OR METAL)
-  NEW RIPRAP/2" STONE
-  NEW GRAVEL
-  REPLICATED BORDERING  
VEGETATED WETLAND (BVW) AREA
-  NEW (2" MAPLE TREE
-  NEW ARBORVITAE (SIZES NOTED)



**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. PROPERTY LINES SHOWN ARE BASED UPON BASE MAP PREPARED BY WESTON SOLUTIONS, INC. ENTITLED "1.5 MILE REMOVAL ACTION - FIRST REACH ENVIRONMENTAL REMEDIATION CONTRACT (SSERC) GE/HOUSATONIC RIVER SITE PITTSFIELD, MA" 100% SUBMITTAL REVISION C DATED 11-30-01 AND ARE NOT THE RESULT OF A BOUNDARY LINE SURVEY BY HILL-ENGINEERS, ARCHITECTS, PLANNERS INC.
3. TREES PLANTED FOR HARRY'S SUPERMARKET (18-24-1) RESTORATION INCLUDE: 6 RIVER BIRCH CLUMPS (8'-10'), 12 RED MAPLES (1.75-2" CALIPER), 6 WHITE OAKS (1.75-2" CALIPER), 11 SUGAR MAPLES (1.75-2" CALIPER), 8 WHITE ASH (1.75-2" CALIPER), 6 GREEN ASH (1.75-2" CALIPER), 6 PIN OAKS (1.75-2" CALIPER), 7 WHITE PINES (5'-6'), 7 FRASER FIRS (5'-6'), 6 CANADIAN HEMLOCKS (5'-6').

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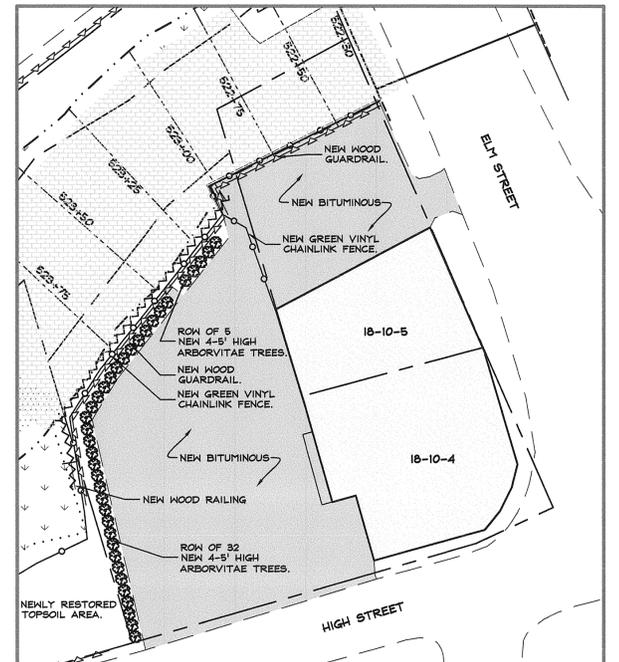
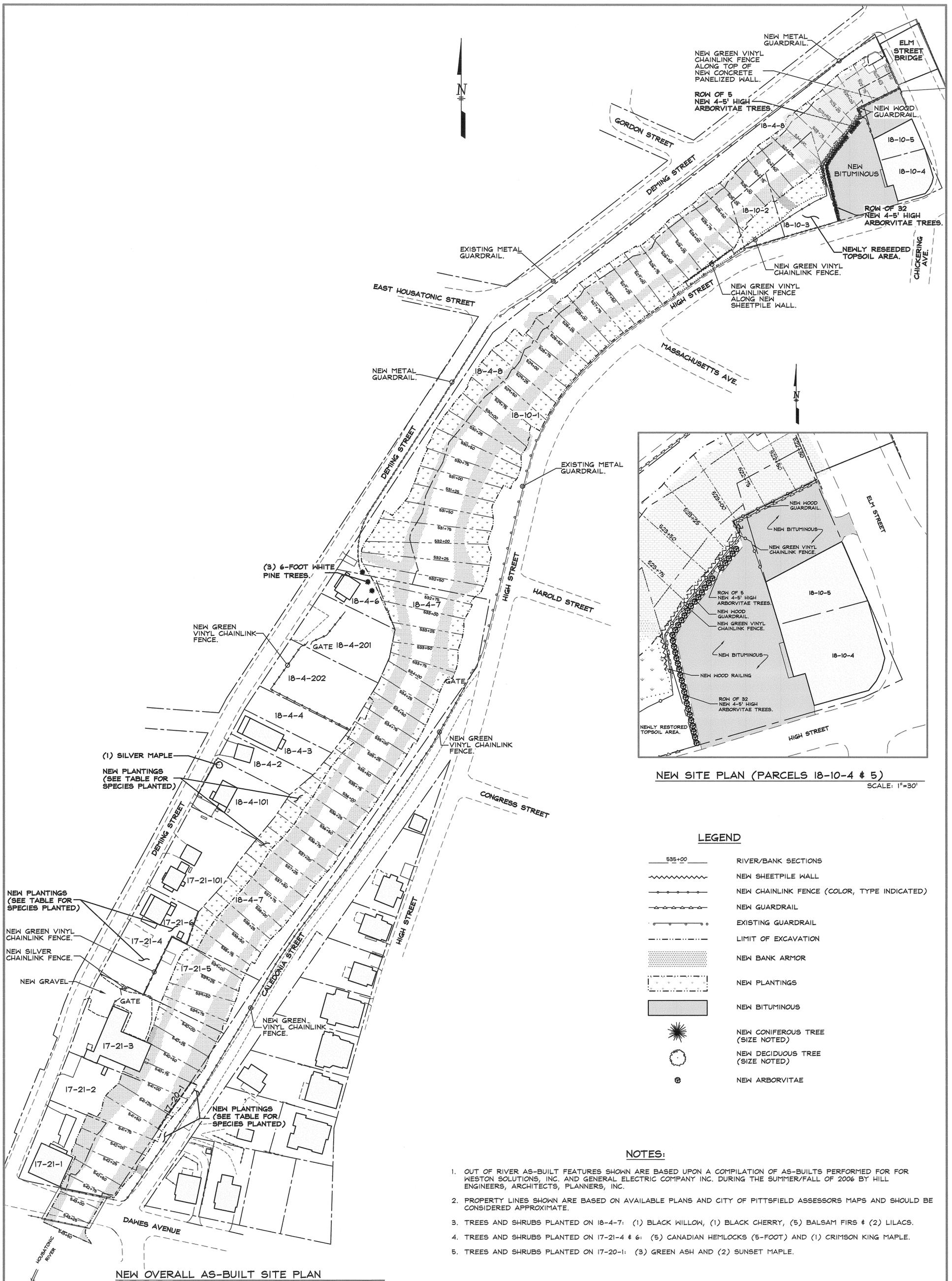
REV.	ISSUED FOR COMMENT	DESCRIPTION	DATE
A			7-26-07

**WESTON SOLUTIONS, INC**  
EAST BRANCH HOUSATONIC RIVER, PHASE 1  
BELOW LYMAN STREET BRIDGE,  
PITTSFIELD MA

**PHASE 1**  
AS-BUILT DRAWING

**AS-BUILT SITE PLAN**  
OUTSIDE RIVER REMEDIATION  
LIMITS

DRAWN BY	JR
DATE DRAWN	1-16-07
SCALE	1"=60'
AP'D BY	
CAD CODE:	PHASE 1 OVERALLAB.DWG
GRAPHIC SCALE:	0 60 120
PROJECT NUMBER:	SRV-758-62
DRAWING NUMBER	C-101
REV.	A



**NEW SITE PLAN (PARCELS 18-10-4 & 5)**  
SCALE: 1"=30'

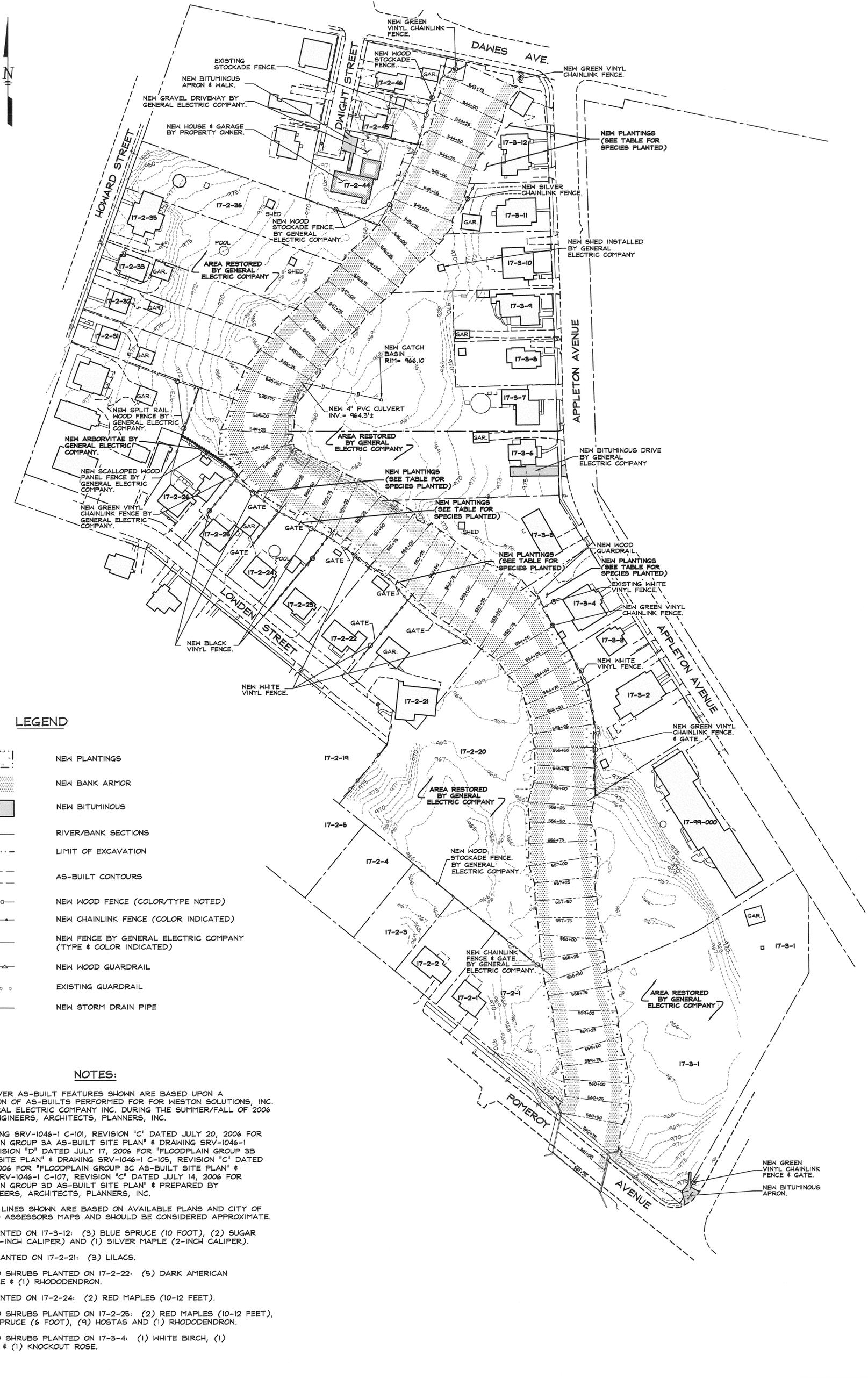
**LEGEND**

- 535+00 RIVER/BANK SECTIONS
- NEW SHEETPILE WALL
- NEW CHAINLINK FENCE (COLOR, TYPE INDICATED)
- NEW GUARDRAIL
- EXISTING GUARDRAIL
- LIMIT OF EXCAVATION
- NEW BANK ARMOR
- NEW PLANTINGS
- NEW BITUMINOUS
- NEW CONIFEROUS TREE (SIZE NOTED)
- NEW DECIDUOUS TREE (SIZE NOTED)
- NEW ARBORVITAE

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.
3. TREES AND SHRUBS PLANTED ON 18-4-7: (1) BLACK WILLOW, (1) BLACK CHERRY, (5) BALSAM FIRS & (2) LILACS.
4. TREES AND SHRUBS PLANTED ON 17-21-4 & 6: (5) CANADIAN HEMLOCKS (5-FOOT) AND (1) CRIMSON KING MAPLE.
5. TREES AND SHRUBS PLANTED ON 17-20-1: (3) GREEN ASH AND (2) SUNSET MAPLE.

C-102 A	PROJECT NUMBER: <b>SRV-758-62</b> DRAWING NUMBER: A	CAD CODE: <b>PHASE2 OUT/RIVER/AB.DWG</b>	DRAWN BY: JR DATE DRAWN: 2-07-07 SCALE: AS-SHOWN	<b>WESTON SOLUTIONS, INC</b> EAST BRANCH HOUSATONIC RIVER, PHASE 2 BELOW ELM STREET BRIDGE, PITTSFIELD MA PROJECT DESCRIPTION: <b>PHASE 2 AS-BUILT DRAWING</b> DRAWING TITLE: <b>AS-BUILT SITE PLAN OUTSIDE RIVER REMEDIATION LIMITS</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>DR'N</th> <th>CK'D.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>ISSUED FOR COMMENT</td> <td>JR</td> <td></td> <td>2-8-07</td> </tr> </tbody> </table>	REV.	DESCRIPTION	DR'N	CK'D.	DATE	A	ISSUED FOR COMMENT	JR		2-8-07	41 Park Street 7400rs, MA 01220 (413) 743-0010 www.hillengineers.com
REV.	DESCRIPTION	DR'N	CK'D.	DATE												
A	ISSUED FOR COMMENT	JR		2-8-07												



**LEGEND**

- NEW PLANTINGS
- NEW BANK ARMOR
- NEW BITUMINOUS
- RIVER/BANK SECTIONS
- LIMIT OF EXCAVATION
- AS-BUILT CONTOURS
- NEW WOOD FENCE (COLOR/TYPE NOTED)
- NEW CHAINLINK FENCE (COLOR INDICATED)
- NEW FENCE BY GENERAL ELECTRIC COMPANY (TYPE & COLOR INDICATED)
- NEW WOOD GUARDRAIL
- EXISTING GUARDRAIL
- NEW STORM DRAIN PIPE

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. SEE DRAWING SRV-1046-1 C-101, REVISION "C" DATED JULY 20, 2006 FOR "FLOODPLAIN GROUP 3A AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-103, REVISION "D" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3B AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-105, REVISION "C" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3C AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-107, REVISION "C" DATED JULY 14, 2006 FOR "FLOODPLAIN GROUP 3D AS-BUILT SITE PLAN" & PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
3. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.
4. TREES PLANTED ON 17-3-12: (3) BLUE SPRUCE (10 FOOT), (2) SUGAR MAPLES (2-INCH CALIPER) AND (1) SILVER MAPLE (2-INCH CALIPER).
5. SHRUBS PLANTED ON 17-2-21: (3) LILACS.
6. TREES AND SHRUBS PLANTED ON 17-2-22: (5) DARK AMERICAN ARBORVITAE & (1) RHODODENDRON.
7. TREES PLANTED ON 17-2-24: (2) RED MAPLES (10-12 FEET).
8. TREES AND SHRUBS PLANTED ON 17-2-25: (2) RED MAPLES (10-12 FEET), (1) BLUE SPRUCE (6 FOOT), (9) HOSTAS AND (1) RHODODENDRON.
9. TREES AND SHRUBS PLANTED ON 17-3-4: (1) WHITE BIRCH, (1) FORSYTHIA & (1) KNOCKOUT ROSE.

**WESTON SOLUTIONS, INC**

EAST BRANCH HOUSATONIC RIVER, PHASE 3  
PITTSFIELD MA

PROJECT DESCRIPTION	DRAWING TITLE
PHASE 3A & 3B AS-BUILT DRAWING	AS-BUILT SITE PLAN OUTSIDE RIVER REMEDIATION LIMITS

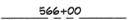
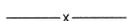
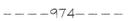
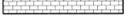
REV.	DESCRIPTION	DR'N	CK'D.	DATE
A	ISSUED FOR COMMENT	JR		2-8-07

50 Depot Street  
 Pittsfield, MA 01226  
 (413) 684-0925  
 www.hillengineers.com  
 41 Park Street  
 Adams, MA 01220  
 (413) 743-0019

DRAWN BY: JR  
 DATE DRAWN: 2-07-07  
 SCALE: 1"=60'  
 APP'D BY: \_\_\_\_\_  
 CAD CODE: \_\_\_\_\_  
 PHASE: O/UTRIVER/AB/DWG  
 PROJECT NUMBER: SRV-758-62  
 DRAWING NUMBER: C-103  
 REV: A

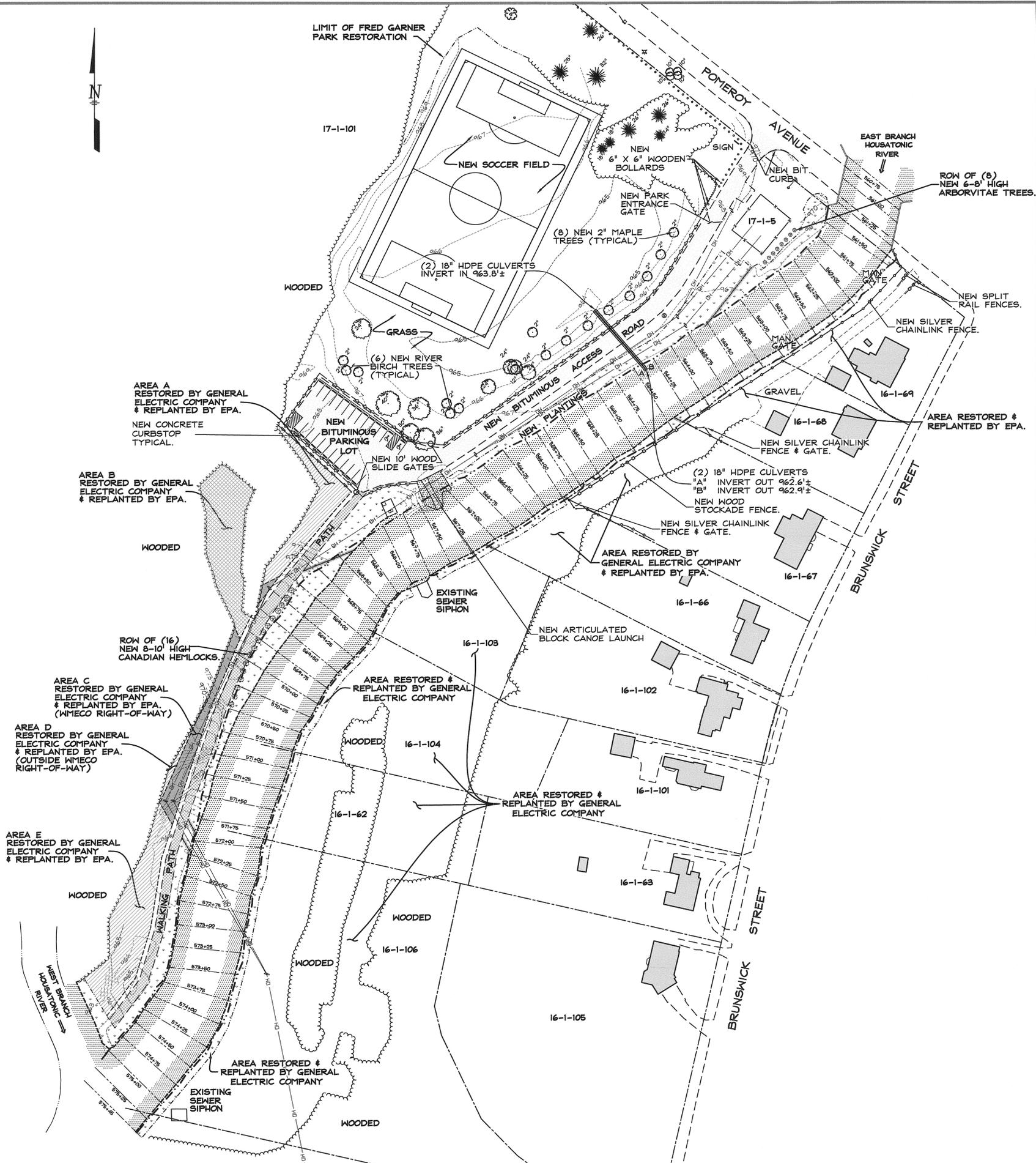
A COPY OF THE DATA IN THIS DRAWING FILE IS MAINTAINED AT THE OFFICES OF HILL ENGINEERS ARCHITECTS, PLANNERS, INC. THE INTERPRETATION, APPLICATION AND REVISION OF THIS DATA IS THE SOLE RESPONSIBILITY OF THE USER.

**LEGEND**

-  NEW SIGN
-  EXISTING UTILITY POLE & GUY WIRE
-  EXISTING SANITARY SEWER MANHOLE
-  HYDRANT
-  ROW OF WOODEN BOLLARDS
-  RIVER/BANK SECTIONS
-  EXISTING FENCE
-  NEW WOOD STOCKADE FENCE
-  NEW CHAIN LINK FENCE
-  NEW GUARDRAIL
-  OVERHEAD WIRES
-  AS-BUILT CONTOUR
-  LIMIT OF EXCAVATION
-  APPROXIMATE EDGE OF WATER
-  LIMIT OF RESTORATION
-  TREELINE
-  NEW BANK ARMOR
-  NEW ARTICULATED BLOCK
-  NEW PLANTINGS
-  NEW BITUMINOUS ROAD
-  NEW WALKING PATH
-  SHRUB/BUSH
-  DECIDUOUS TREE (SIZE)
-  CONIFEROUS TREE (SIZE)

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. SEE DRAWING SRV-758-58 CX101, REVISION "A" DATED OCTOBER 6, 2006 FOR FRED GARNER PARK AS-BUILT TOPOGRAPHIC SURVEY PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
3. SEE DRAWING SRV-1165-4A C-101, REVISION "B" DATED DECEMBER 22, 2006 FOR "FLOODPLAIN 4A AS-BUILT SITE PLAN" & DRAWING SRV-1165-4B C-103, REVISION "A" DATED OCTOBER 23, 2006 FOR "FLOODPLAIN 4B AS-BUILT SITE PLAN" & DRAWING SRV-1165-4C C-104, REVISION "B" DATED DECEMBER 22, 2006 FOR "FLOODPLAIN 4C AS-BUILT SITE PLAN" PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
4. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.
5. SEE PLANTING AS-BUILTS FOR QUANTITY AND TYPES OF TREES AND SHRUBS PLANTED.



REV.	DESCRIPTION	DATE
A	ISSUED FOR REVIEW & COMMENT	2-7-07

WESTON SOLUTIONS, INC. 10 LYMAN STREET PITTSFIELD, MA	DRAWING TITLE AS-BUILT SITE PLAN OUTSIDE RIVER REMEDIATION LIMITS
PROJECT DESCRIPTION PHASE 3C AS-BUILT DRAWING	

DRAWN BY	JR
DATE DRAWN	2-7-07
SCALE	1"=60'
AP'D BY	
CAD CODE:	SRV-758-59 (phase 3c as-built).dwg
GRAPHIC SCALE:	0 60 120
PROJECT NUMBER:	SRV-758-62
DRAWING NUMBER	REV.
C-104	A

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**APPENDIX E**

**RETAINING WALL INSPECTION CHECK LIST**

---

## NON-CRITICAL RESTORATION ITEMS INSPECTION FIELD FORM

Restoration Items (Installed or Restored in 2006)	Inspection	Corrective Action	Comments
Restored Areas including fencing and pavement I9-4-201	YES _____ NO _____	YES _____ NO _____	
Restored Areas including pavement and a portion of fencing adjacent to parking lot on Parcel I8-24-1	YES _____ NO _____	YES _____ NO _____	
Pavement, fencing and gates on Parcel I8-24-5	YES _____ NO _____	YES _____ NO _____	
Restored Areas including pavement on Hathaway Street	YES _____ NO _____	YES _____ NO _____	
Restored Areas including fencing, gates and guard rail on Parcel I8-23-6	YES _____ NO _____	YES _____ NO _____	
Black stone mix parking lot on Parcels I9-4-25 and I9-4-203	YES _____ NO _____	YES _____ NO _____	
Restored Areas including fencing and guardrail on Parcels I8-10-2 and I8-10-3	YES _____ NO _____	YES _____ NO _____	
Restored Areas including fencing and gate along the parking lot on Parcel I8-4-201/202	YES _____ NO _____	YES _____ NO _____	
Restored Areas including fencing and gates on Parcels I6-1-67 and I6-1-68 and I6-1-69	YES _____ NO _____	YES _____ NO _____	
Restored Areas including pavement, guardrail and gate at Fred Garner Park (Parcel I7-1-101)	YES _____ NO _____	YES _____ NO _____	
Backflow prevention valves at Fred Garner Park (including the need to clean out and flush out the valves).	YES _____ NO _____	YES _____ NO _____	





# THE RETAINING WALLS LOCATED AT PARCELS I8-23-6 AND I8-24-1 INSPECTION FIELD FORM

Date: \_\_\_\_\_

Lead Monitor: \_\_\_\_\_

Retaining wall Parcel I8-23-6 OR Parcel I8-24-1  
(circle one)

Wall Deflection Indicators:	Comments
<p>1. GENERAL CONDITION</p> <p>GOOD _____ FAIR _____ POOR _____</p> <p>Good interlocking of riprap Protection YES _____ NO _____</p> <p>Scour of riprap @ Toe Occurring YES _____ NO _____ (Length _____ Width _____ Depth _____)</p> <p>Loss of section of riprap or Soil (Length _____ Width _____ Depth _____)</p>	
<p>2. SLOPES</p> <p>General Condition GOOD _____ FAIR _____ POOR _____</p> <p>Displacement of riprap or soil YES _____ NO _____</p> <p>Settlement YES _____ NO _____</p> <p>Sloughing/Slumping YES _____ NO _____</p> <p>Exposed Underlayer YES _____ NO _____</p>	
<p>3. TOP OF RIVERBANK</p> <p>General Condition GOOD _____ FAIR _____ POOR _____</p> <p>Displacement of soil YES _____ NO _____</p> <p>Settlement YES _____ NO _____</p> <p>Sloughing/Slumping YES _____ NO _____</p> <p>Exposed Underlayer YES _____ NO _____</p>	
<p>4. OTHER</p> <p>Cracks in vegetative areas YES _____ NO _____</p> <p>Visible bulge on the riverbank slope YES _____ NO _____</p>	
<p>5. AREA 20-feet BEYOND THE TOP OF RIVERBANK</p> <p>Cracks in vegetative areas YES _____ NO _____</p> <p>Cracks in pavement parallel to top of bank YES _____ NO _____</p> <p>Pronounced drop in ground surface elevation YES _____ NO _____</p> <p>Excessively leaning trees, utility poles or fences YES _____ NO _____</p>	

**PHOTOGRAPHS:** YES \_\_\_\_\_ NO \_\_\_\_\_

**RECOMMENDATIONS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

---

**APPENDIX F**

**RE-VEGETATION MONITORING FIELD FORMS**

---

## RIVERBANK, RE-VEGETATION MONITORING FIELD FORM

1.5 Mile Reach, GE/Housatonic River Site, Pittsfield, MA

Page \_\_\_ of \_\_\_\_

Observer(s): \_\_\_\_\_ Date: \_\_\_\_\_

Phase: \_\_\_\_\_ Flow @ Coltsville (cfs) \_\_\_\_\_ Weather: \_\_\_\_\_

Planting Area Location: \_\_\_\_\_

Riverbank Length (ft): \_\_\_\_\_ Avg width (ft): \_\_\_\_\_

Planting Area (sf): \_\_\_\_\_ 10-20% Area (sf): \_\_\_\_\_

Comments: \_\_\_\_\_

Random Sample Location Number: \_\_\_\_\_ Riverbank length (ft): \_\_\_\_\_ Width (ft): \_\_\_\_\_

Slope length (ft): \_\_\_\_\_ Sample Area (sf): \_\_\_\_\_

**Plant Survivorship:**

<i>Trees</i>	<i>Quantity (live)</i>	<i>Total</i>	<i>Shrubs</i>	<i>Quantity (live)</i>	<i>Total</i>
Black Willow			Red-osier Dogwood		
Silver Maple			Silky Dogwood		
Eastern Cottonwood			Winterberry Holly		
Box Elder			Chokecherry		
			Northern Arrowwood		

**Total Live Trees:** \_\_\_\_\_ **Total Live Shrubs:** \_\_\_\_\_

**Herbaceous Cover (%):** \_\_\_\_\_

**Invasive Plant Cover (%):** \_\_\_\_\_

*Meander Survey Comments (Use Additional Sheets As Necessary):*

**NON-RIVERBANK RE-VEGETATION MONITORING FIELD FORM**

DATE: \_\_\_\_\_

Reach	Parcel ID	Quantity of Plants Planted	Plant Type and Species	Common Name	Size/Stock	Comments	Monitoring Requirements	Maintenance Standard	Number of live trees	% Survivability	Meets Maintenance Standard (YES/NO)
Lyman St. Bridge to Elm St. Bridge	18-24-1	6	<i>Betula nigra</i>	River Birch Clump	8-10 ft.		2008	100%			
		12	<i>Acer rubrum</i>	Red Maple	1.75"-2" cal		2008	100%			
		6	<i>Quercus alba</i>	White Oak	1.75"-2" cal		2008	100%			
		11	<i>Acer saccharum</i>	Sugar Maple	1.75"-2" cal		2008	100%			
		8	<i>Fraxinus americana</i>	White Ash	1.75"-2" cal		2008	100%			
		6	<i>Fraxinus pennsylvanica</i>	Green Ash	1.75"-2" cal		2008	100%			
		6	<i>Quercus palustris</i>	Pin Oak	1.75"-2" cal		2008	100%			
		7	<i>Pinus strobus</i>	White Pine	5-6 ft.		2008	100%			
		7	<i>Abies fraseri</i>	Fraser Fir	5-6 ft.		2008	100%			
	6	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	5-6 ft.		2008	100%				
19-5-13	13	<i>Thuja occidentalis</i>	Dark American Arborvitae	12 ft.		2008	100%				
	12	<i>Thuja occidentalis</i>	Dark American Arborvitae	4 ft.		2008	100%				
Pomeroy Ave. Bridge to Confluence	17-1-101	8	<i>Acer rubrum</i>	Red Maple	2" cal	Soccer Field Area	2008 to 2011	100%			
		6	<i>Betula nigra</i>	River Birch Clump	8-10 ft.	Soccer Field Area	2008 to 2011	100%			
		16	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	8-10 ft.	Top of bank along walk path	2008 to 2011	100%			
	17-1-101	5	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area A*	2008 to 2011				
		10	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area A*	2008 to 2011				
		10	<i>Quercus rubra</i>	Red Oak	1.5"-2" cal	Area A*	2008 to 2011				
		5	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area A*	2008 to 2011				
		4	<i>Acer saccharinum</i>	Silver Maple	1.5"-2" cal	Area A*	2008 to 2011				
	<b>Total</b>	<b>34</b>	<b>Area A* TOTAL Trees</b>					<b>80%</b>			
	17-1-101	13	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area B*	2008 to 2011				
		16	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area B*	2008 to 2011				
		15	<i>Quercus rubra</i>	Red Oak	1.5"-2" cal	Area B*	2008 to 2011				
		10	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area B*	2008 to 2011				
	<b>Total</b>	<b>54</b>	<b>Area B* TOTAL Trees</b>					<b>80%</b>			
	17-1-101	23	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area B*	2008 to 2011				
		23	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area B*	2008 to 2011				
		23	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area B*	2008 to 2011				
		23	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area B*	2008 to 2011				
	<b>Total</b>	<b>92</b>	<b>Area B* TOTAL Shrubs</b>					<b>80%</b>			
	17-1-101	14	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area C ^*	2008 to 2011				
		13	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area C ^*	2008 to 2011				
		13	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area C ^*	2008 to 2011				
		13	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area C ^*	2008 to 2011				
<b>Total</b>	<b>53</b>	<b>Area C* TOTAL Shrubs</b>					<b>80%</b>				
17-1-101	2	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area D*	2008 to 2011					
	2	<i>Acer saccharum</i>	Sugar Maple	1.5"-2" cal	Area D*	2008 to 2011					
	2	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area D*	2008 to 2011					
<b>Total</b>	<b>6</b>	<b>Area D* TOTAL Trees</b>					<b>80%</b>				
17-1-101	3	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area D*	2008 to 2011					
	3	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area D*	2008 to 2011					
	3	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area D*	2008 to 2011					
	3	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area D*	2008 to 2011					
<b>Total</b>	<b>12</b>	<b>Area D* TOTAL Shrubs</b>					<b>80%</b>				

**NON-RIVERBANK RE-VEGETATION MONITORING FIELD FORM**

DATE: \_\_\_\_\_

Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock	Comments	Monitoring Requirements	Maintenance Standard	Number of live trees	% Survivability	Meets Maintenance Standard (YES/NO)	
Pomeroy Ave. Bridge to Confluence	I7-1-101	5	<i>Pinus strobus</i>	White Pine	8-10 ft.	Area E*	2008 to 2011					
		3	<i>Betula papyrifera</i>	Paper Birch	8-10 ft.	Area E*	2008 to 2011					
		40	<i>Acer saccharinum</i>	Silver Maple	1.5"-2" cal	Area E*	2008 to 2011					
		30	<i>Acer rubrum</i>	Red Maple	1.5"-2" cal	Area E*	2008 to 2011					
	<b>Total</b>	<b>78</b>	<b>Area E* TOTAL Trees</b>						<b>80%</b>			
	I7-1-101	7	<i>Salix nigra</i>	Black Willow	1-gal	Area E*	2008 to 2011					
		16	<i>Populus deltoides</i>	Eastern Cottonwood	1-gal	Area E*	2008 to 2011					
		8	<i>Acer negundo</i>	Box Elder	1-gal	Area E*	2008 to 2011					
	<b>Total</b>	<b>31</b>	<b>Area E* TOTAL Trees</b>						<b>80%</b>			
	I7-1-101	37	<i>Cornus amomum</i>	Silky Dogwood	1-gal	Area E*	2008 to 2011					
		38	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	Area E*	2008 to 2011					
		38	<i>Ilex verticillata</i>	Winterberry Holly	1-gal	Area E*	2008 to 2011					
		38	<i>Prunus virginiana</i>	Chokecherry	1-gal	Area E*	2008 to 2011					
	<b>Total</b>	<b>151</b>	<b>Area E* TOTAL Shrubs</b>						<b>80%</b>			
	I6-1-67	3	<i>Amelanchier sp.</i>	Serviceberry (shadbush)	6-8 ft.		2008	100%				
		2	<i>Fraxinus pennsylvanica</i>	Green Ash	6-8 ft.		2008	100%				
		3	<i>Betula papyrifera</i>	White Birch	6-8 ft.		2008	100%				
		7	<i>Pinus strobus</i>	White Pine	5-6 ft.		2008	100%				
		2	<i>Quercus rubra</i>	Red Oak	6-8 ft.		2008	100%				
		2	<i>Abies balsamea</i>	Balsam Fir	5-6 ft.		2008	100%				
2		<i>Acer rubrum</i>	Red Maple	6-8 ft.		2008	100%					
13		<i>Vaccinium macrocarpon</i>	American Cranberry	3-4 ft.		2008	100%					
14		<i>Viburnum dentatum</i>	Northern Arrowwood	3-4 ft.		2008	100%					
2		<i>Cornus sericea</i>	Red Osier Dogwood	1-gal		2008	100%					
2		<i>Cornus amomum</i>	Silky Dogwood	1-gal		2008	100%					
4		<i>Ilex verticillata</i>	Winterberry Holly	1-gal		2008	100%					
4		<i>Prunus virginiana</i>	Chokecherry	1-gal		2008	100%					
I6-1-66	5	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal		2008	100%					
	7	<i>Amelanchier sp.</i>	Serviceberry (shadbush)	6-8 ft.		2008	100%					
	6	<i>Fraxinus pennsylvanica</i>	Green Ash	6-8 ft.		2008	100%					
	4	<i>Betula papyrifera</i>	White Birch	6-8 ft.		2008	100%					
	8	<i>Pinus strobus</i>	White Pine	5-6 ft.		2008	100%					
	9	<i>Quercus rubra</i>	Red Oak	6-8 ft.		2008	100%					
	4	<i>Abies balsamea</i>	Balsam Fir	5-6 ft.		2008	100%					
	12	<i>Acer rubrum</i>	Red Maple	6-8 ft.		2008	100%					
	8	<i>Vaccinium macrocarpon</i>	American Cranberry	3-4 ft.		2008	100%					
	7	<i>Viburnum dentatum</i>	Northern Arrowwood	3-4 ft.		2008	100%					
	6	<i>Cornus amomum</i>	Silky Dogwood	1-gal		2008	100%					
	5	<i>Ilex verticillata</i>	Winterberry Holly	1-gal		2008	100%					
	5	<i>Prunus virginiana</i>	Chokecherry	1-gal		2008	100%					
6	<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal		2008	100%						

n/a - not available

^ - Planting Areas located on Western Mass Electric Company (WMECO) Right of Way (ROW). WMECO requirements do not allow tree planting in ROW areas, therefore only shrubs were planted.

\* - Different Areas are displayed on the non-riverbank planting as-builts

ft. = feet

gal = gallon

"= inches

**NON-RIVERBANK RE-VEGETATION MONITORING FIELD FORM**

DATE: \_\_\_\_\_

**PERCENT HERBACEOUS COVER AND PERCENT INVASIVE PLANT SPECIES INSPECTION**

<b>Monitoring Area</b>	<b>Bank</b>	<b>Date Monitored</b>	<b>Plot</b>	<b>Herbaceous Cover (%)</b>	<b>Invasive Plant Cover (%)</b>	<b>Invasive Species</b>
Parcel I8-24-1	West		N/A			
Parcel I6-1-66	East		N/A			
Parcel I6-1-67	East		N/A			
FGP (Parcel I7-1- 101)	West		N/A			

Notes:

N/A – not applicable

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**APPENDIX G**

**LIST OF SPECIES DESIGNATED IN THE RESTORATION PLAN**

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**LIST OF SPECIES AND SPECIFICATIONS DESIGNATED IN THE RESTORATION PLAN AND  
TO BE USED FOR RE-PLANTING IF NEEDED**

<b>Plant Type and Species</b>	<b>Common Name</b>	<b>Stock</b>	<b>Size</b>
<b>Trees:</b>			
<i>Salix nigra</i>	Black willow	1-gal	4-foot minimum
<i>Acer negundo</i>	Box-elder	1-gal	4-foot minimum
<i>Acer saccharinum</i>	Silver maple	1-gal	4-foot minimum
<i>Populus deltoides</i>	Eastern cottonwood	1-gal	4-foot minimum
<b>Shrubs:</b>			
<i>Cornus amomum</i>	Silky dogwood	1-gal	2 -foot minimum
<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	2 -foot minimum
<i>Ilex verticillata</i>	Winterberry Holly	1-gal	2 -foot minimum
<i>Cornus sericea</i>	Red-osier dogwood	1-gal	2 -foot minimum
<i>Prunus virginiana</i>	Choke cherry	1-gal	2 -foot minimum

**Stock Specifications:**

- (1) All trees and shrubs shall be derived from New England/New York stock and be container grown.
- (2) All plant material shall be identified with attached, durable, waterproof labels and weather-resistant ink, stating the botanical (i.e., Latin) plant name and size.
- (3) Plant material shall be protected during delivery to prevent desiccation, heat stress, and damage to the branches, trunk, bark, root system, or earth ball. Exposed branches shall be covered during transport.
- (4) Plant materials shall be inspected upon delivery and checked for species, size, quantities, and unauthorized substitution. Grading of plant materials shall conform to ANSI Z60.1 *American Standard for Nursery Stock* as approved by ANSI and published by the American Association of Nurserymen, Inc.
- (5) Plant material shall be well-shaped; vigorous and healthy with a well-branched root system; and free from disease, harmful insects and insect eggs, sun-scald injury, dead or dry wood, broken terminal growth, disfigurement or abrasion. Plant material shall exhibit typical form of branch to height ratio and shall meet the height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Plant material shall show new fibrous roots, and the root mass shall contain its shape when removed from the container. Plant material with broken or cracked balls, or broken containers, shall be rejected.

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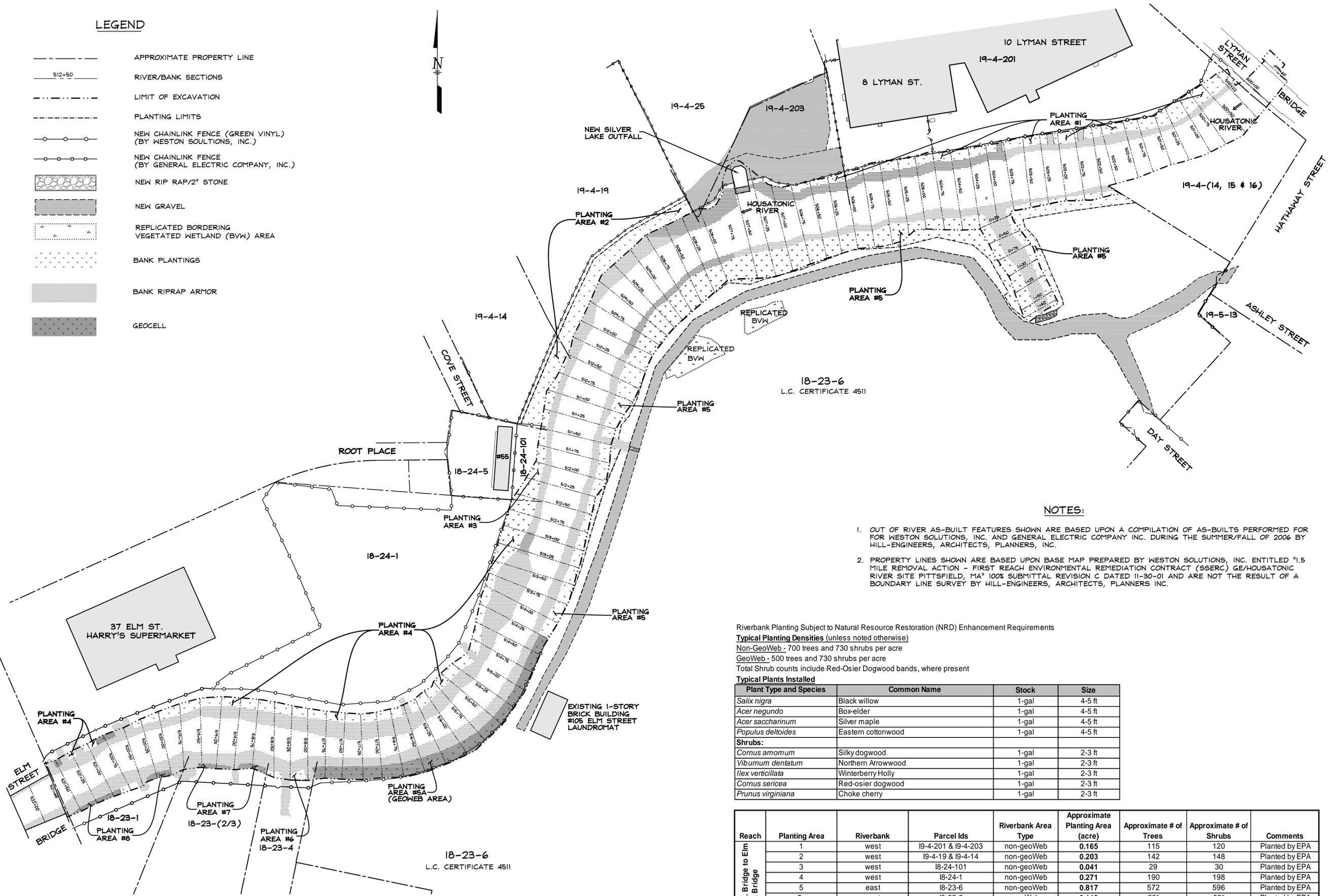
**APPENDIX H**

**RIVERBANK PLANTING AS-BUILTS  
(DRAWINGS 1 THROUGH 4)**

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**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  RIVER/BANK SECTIONS
-  LIMIT OF EXCAVATION
-  PLANTING LIMITS
-  NEW CHAINLINK FENCE (GREEN VINYL)  
(BY WESTON SOLUTIONS, INC.)
-  NEW CHAINLINK FENCE  
(BY GENERAL ELECTRIC COMPANY, INC.)
-  NEW RIP RAP/2" STONE
-  NEW GRAVEL
-  REPLICATED BORDERING  
VEGETATED WETLAND (BVW) AREA
-  BANK PLANTINGS
-  BANK RIPRAP ARMOR
-  GEOCELL



**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. PROPERTY LINES SHOWN ARE BASED UPON BASE MAP PREPARED BY WESTON SOLUTIONS, INC. ENTITLED "1.5 MILE REMOVAL ACTION - FIRST REACH ENVIRONMENTAL REMEDIATION CONTRACT (SSERC) GE/HOUSATONIC RIVER SITE PITTSFIELD, MA" 100% SUBMITTAL REVISION C DATED 11-30-01 AND ARE NOT THE RESULT OF A BOUNDARY LINE SURVEY BY HILL-ENGINEERS, ARCHITECTS, PLANNERS INC.

Riverbank Planting Subject to Natural Resource Restoration (NRD) Enhancement Requirements

**Typical Planting Densities** (unless noted otherwise)

Non-GeoWeb - 700 trees and 730 shrubs per acre

GeoWeb - 500 trees and 730 shrubs per acre

Total Shrub counts include Red-Osier Dogwood bands, where present

**Typical Plants Installed**

Plant Type and Species	Common Name	Stock	Size
<i>Salix nigra</i>	Black willow	1-gal	4-5 ft
<i>Acer negundo</i>	Box-elder	1-gal	4-5 ft
<i>Acer saccharinum</i>	Silver maple	1-gal	4-5 ft
<i>Populus deltoides</i>	Eastern cottonwood	1-gal	4-5 ft
<b>Shrubs:</b>			
<i>Cornus amomum</i>	Silky dogwood	1-gal	2-3 ft
<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	2-3 ft
<i>Ilex verticillata</i>	Winterberry Holly	1-gal	2-3 ft
<i>Cornus sericea</i>	Red-osier dogwood	1-gal	2-3 ft
<i>Prunus virginiana</i>	Choke cherry	1-gal	2-3 ft

Reach	Planting Area	Riverbank	Parcel Ids	Riverbank Area Type	Approximate Planting Area (acre)	Approximate # of Trees	Approximate # of Shrubs	Comments
Lyman St. Bridge to Elm St. Bridge	1	west	19-4-201 & 19-4-203	non-geoWeb	0.165	115	120	Planted by EPA
	2	west	19-4-19 & 19-4-14	non-geoWeb	0.203	142	148	Planted by EPA
	3	west	18-24-101	non-geoWeb	0.041	29	30	Planted by EPA
	4	west	18-24-1	non-geoWeb	0.271	190	198	Planted by EPA
	5	east	18-23-6	non-geoWeb	0.817	572	596	Planted by EPA
	5a	east	18-23-6	geoWeb	0.113	23*	82*	Planted by EPA
	6	east	18-23-4	non-geoWeb	0.008	6	6	Planted by EPA
	7	east	18-23-(2/3)	geoWeb	0.012	6	9	Planted by EPA
	8	east	18-23-1	geoWeb	0.021	10	15	Planted by EPA

\* - denotes area where planting densities were different from the standard NRD Enhancement Requirements due to needs or requests of residential property owners or the physical conditions of the riverbanks.

REV.	DESCRIPTION	DATE
A	ISSUED FOR COMMENT	9-17-07

**WESTON SOLUTIONS, INC**  
EAST BRANCH HOUSATONIC RIVER, PHASE 1  
PITTSFIELD MA

PROJECT DESCRIPTION: BELOW LYMAN STREET BRIDGE

DRAWING TITLE: AS-BUILT RIVERBANK PLANTING PLAN

PHASE 1 RESTORATION

DRAWN BY: JR

DATE DRAWN: 3-8-07

SCALE: 1"=60'

AP'D BY:

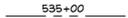
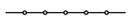
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GRAPHIC SCALE: 0 60 120

PROJECT NUMBER: SRV-758-62

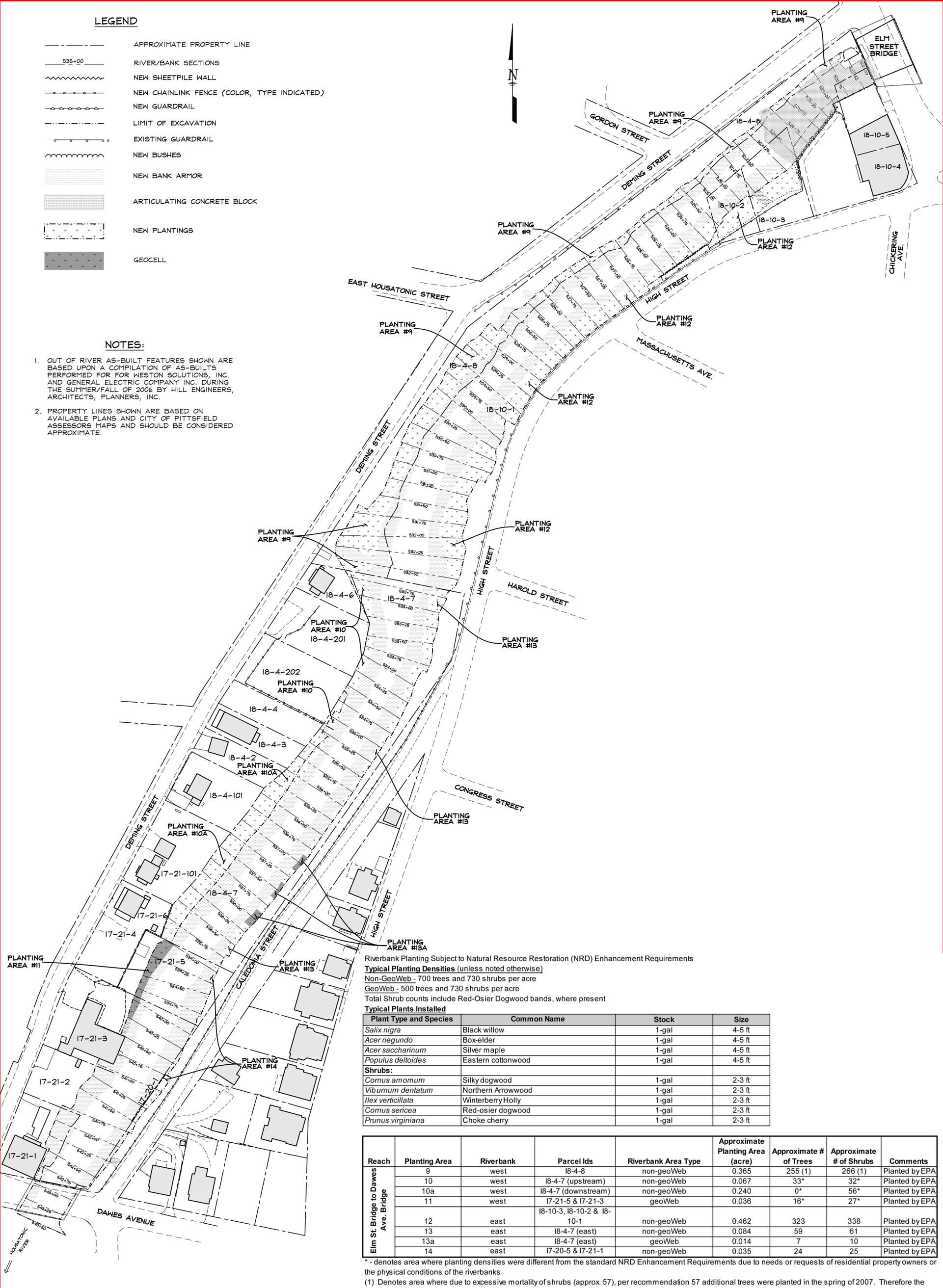
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C-105	A

**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  RIVER/BANK SECTIONS
-  NEW SHEETPILE WALL
-  NEW CHAINLINK FENCE (COLOR, TYPE INDICATED)
-  NEW GUARDRAIL
-  LIMIT OF EXCAVATION
-  EXISTING GUARDRAIL
-  NEW BUSHES
-  NEW BANK ARMOR
-  ARTICULATING CONCRETE BLOCK
-  NEW PLANTINGS
-  GEOCELL

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.



Riverbank Planting Subject to Natural Resource Restoration (NRD) Enhancement Requirements

**Typical Planting Densities** (unless noted otherwise)

Non-GeoWeb - 700 trees and 730 shrubs per acre

GeoWeb - 500 trees and 730 shrubs per acre

Total Shrub counts include Red-Osier Dogwood bands, where present

**Typical Plants Installed**

Plant Type and Species	Common Name	Stock	Size
<i>Salix nigra</i>	Black willow	1-gal	4-5 ft
<i>Acer negundo</i>	Box-elder	1-gal	4-5 ft
<i>Acer saccharinum</i>	Silver maple	1-gal	4-5 ft
<i>Populus deltoides</i>	Eastern cottonwood	1-gal	4-5 ft
<b>Shrubs:</b>			
<i>Cornus amomum</i>	Silky dogwood	1-gal	2-3 ft
<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	2-3 ft
<i>Ilex verticillata</i>	Winterberry Holly	1-gal	2-3 ft
<i>Cornus sericea</i>	Red-osier dogwood	1-gal	2-3 ft
<i>Prunus virginiana</i>	Choke cherry	1-gal	2-3 ft

Reach	Planting Area	Riverbank	Parcel Ids	Riverbank Area Type	Approximate Planting Area (acre)	Approximate # of Trees	Approximate # of Shrubs	Comments
Elm St. Bridge to Dakes Ave. Bridge	9	west	18-4-8	non-geoWeb	0.365	255 (1)	266 (1)	Planted by EPA
	10	west	18-4-7 (upstream)	non-geoWeb	0.067	33*	32*	Planted by EPA
	10a	west	18-4-7 (downstream)	non-geoWeb	0.240	0*	56*	Planted by EPA
	11	west	17-21-5 & 17-21-3	geoWeb	0.036	16*	27*	Planted by EPA
	12	east	18-10-3, 18-10-2 & 18-10-1	non-geoWeb	0.462	323	338	Planted by EPA
	13	east	18-4-7 (east)	non-geoWeb	0.084	59	61	Planted by EPA
	13a	east	18-4-7 (east)	geoWeb	0.014	7	10	Planted by EPA
	14	east	17-20-5 & 17-21-1	non-geoWeb	0.035	24	25	Planted by EPA

\* - denotes area where planting densities were different from the standard NRD Enhancement Requirements due to needs or requests of residential property owners or the physical conditions of the riverbanks

(1) Denotes area where due to excessive mortality of shrubs (approx. 57), per recommendation 57 additional trees were planted in the spring of 2007. Therefore the approximate number of shrubs as of 2007 is estimated to be 209 and the number of trees is estimated to be 312.

**WESTON SOLUTIONS, INC**

EAST BRANCH HOUSATONIC RIVER, PHASE 2

BELOW ELM STREET BRIDGE, PITTSFIELD MA

PROJECT DESCRIPTION  
PHASE 2 RESTORATION

DRAWING TITLE  
AS-BUILT RIVERBANK PLANTING PLAN

REV.	DESCRIPTION	DR'N	CK'D.	DATE
A	ISSUED FOR COMMENT	JR		9-17-07

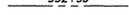
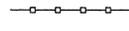
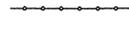
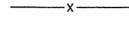
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41 Park Street  
Dartmouth, MA 01226  
(413) 684-0925  
www.hillengineers.com



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SCALE: 1"=60'  
DATE DRAWN: 3-8-07  
DRAWN BY: JR  
PROJECT NUMBER: SRV-758-62  
DRAWING NUMBER: C-106

**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  NEW PLANTINGS
-  NEW BANK ARMOR
-  GEOCELL
-  RIVER/BANK SECTIONS
-  NEW WOOD FENCE (COLOR/TYPE NOTED)
-  NEW CHAINLINK FENCE (COLOR INDICATED)
-  NEW FENCE BY GENERAL ELECTRIC COMPANY (TYPE & COLOR INDICATED)
-  PLANTING LIMITS

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. SEE DRAWING SRV-1046-1 C-101, REVISION "C" DATED JULY 20, 2006 FOR "FLOODPLAIN GROUP 3A AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-103, REVISION "D" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3B AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-105, REVISION "C" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3C AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-107, REVISION "C" DATED JULY 14, 2006 FOR "FLOODPLAIN GROUP 3D AS-BUILT SITE PLAN" & PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
3. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.

Riverbank Planting Subject to Natural Resource Restoration (NRD) Enhancement Requirements

**Typical Planting Densities (unless noted otherwise)**

Non-GeoWeb - 700 trees and 730 shrubs per acre

GeoWeb - 500 trees and 730 shrubs per acre

Total Shrub counts include Red-Osier Dogwood bands, where present

**Typical Plants Installed**

Plant Type and Species	Common Name	Stock	Size
<i>Salix nigra</i>	Black willow	1-gal	4-5 ft
<i>Acer negundo</i>	Box-elder	1-gal	4-5 ft
<i>Acer saccharinum</i>	Silver maple	1-gal	4-5 ft
<i>Populus deltoides</i>	Eastern cottonwood	1-gal	4-5 ft
<b>Shrubs:</b>			
<i>Cornus amomum</i>	Silky dogwood	1-gal	2-3 ft
<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	2-3 ft
<i>Ilex verticillata</i>	Winterberry Holly	1-gal	2-3 ft
<i>Cornus sericea</i>	Red-osier dogwood	1-gal	2-3 ft
<i>Prunus virginiana</i>	Choke cherry	1-gal	2-3 ft

Reach	Planting Area	Riverbank	Parcel Ids	Riverbank Area Type	Approximate Planting Area (acre)	Approximate # of Trees	Approximate # of Shrubs	Comments
Dawes Ave. Bridge To Pomeroy Ave. Bridge	15	west	17-2-46, 17-2-45 & 17-2-44	geoWeb & non-geoWeb	0.0238	13*	38*	Planted by EPA
	16	west	17-2-36 & 17-2-35	non-geoWeb	0.026	18*	36*	Planted by GE
	17	west	17-2-33	non-geoWeb	0.0083	6*	12*	Planted by GE
	18	west	17-2-32	non-geoWeb	0.0083	6*	12*	Planted by GE
	19	west	17-2-31	non-geoWeb	0.0083	6*	12*	Planted by GE
	20	west	17-2-26	non-geoWeb	0.011	13*	20*	Planted by EPA&GE
	21	west	17-2-25	non-geoWeb	0.013	9	9	Planted by EPA
	22	west	17-2-24	non-geoWeb	0.015	10	10	Planted by EPA
	23	west	17-2-23	non-geoWeb	0.012	8	9	Planted by EPA
	24	west	17-2-22	non-geoWeb	0.010	7	7	Planted by EPA
	25	west	17-2-21	non-geoWeb	0.017	12	12	Planted by EPA
	26	west	17-2-20	non-geoWeb	0.103	67*	82*	Planted by EPA&GE
	27	west	17-2-1	non-geoWeb	0.041	27*	41*	Planted by GE
	28	east	17-3-12	non-geoWeb	0.0283	11*	35*	Planted by EPA
	29	east	17-3-11	non-geoWeb	0.0077	0*	7*	Planted by EPA
	30	east	17-3-10	non-geoWeb	0.0184	2*	2*	Planted by GE
	31	east	17-3-7	non-geoWeb	0.041	29*	60*	Planted by GE
	32	east	17-3-6	non-geoWeb	0.030	21*	41*	Planted by GE
	33	east	17-3-5	non-geoWeb	0.044	30*	58*	Planted by GE
	34	east	17-3-4	non-geoWeb	0.011	8	8	Planted by EPA
	34a	east	17-3-4	geoWeb	0.006	3	4	Planted by EPA
	35	east	17-3-3	geoWeb	0.011	5	8	Planted by EPA
	36	east	17-3-2	non-geoWeb	0.023	16	17	Planted by EPA
	36a	east	17-3-2	geoWeb	0.006	3	4	Planted by EPA
	37	east	17-99-000	non-geoWeb	0.039	34*	47*	Planted by GE
	38	east	17-3-1	non-geoWeb	0.045	36*	55*	Planted by GE

\* - denotes area where planting densities were different from the standard NRD Enhancement Requirements due to needs or requests of residential property owners or the physical conditions of the riverbanks

**WESTON SOLUTIONS, INC**

EAST BRANCH HOUSATONIC RIVER, PHASE 3

BELOW DAWES AVENUE BRIDGE, PITTSFIELD MA

PROJECT DESCRIPTION: PHASE 3A & 3B RESTORATION  
DRAWING TITLE: AS-BUILT RIVERBANK PLANTING PLAN

REV.	DESCRIPTION	DR'N	CK'D.	DATE
A	ISSUED FOR COMMENT	JR		9-17-07

Hill  
engineers  
architects  
planners  
50 Depot Street  
Dorset, MA 01226  
(413) 684-0925  
41 Park Street  
Dorset, MA 01226  
(413) 684-0013  
www.hillengineers.com

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CAD CODE: PHASE3 OUTRIVERBANK.DWG  
SCALE: 1"=60'  
DATE DRAWN: 9-8-07  
DRAWN BY: JR  
CHECKED BY: JR  
PROJECT NUMBER: SRV-758-62  
DRAWING NUMBER: C-107  
REV: A

**LEGEND**

- APPROXIMATE PROPERTY LINE
- ==== PLANTING AREA BOUNDARY
- 566+00 RIVER/BANK SECTIONS
- x- EXISTING FENCE
- o-o- NEW WOOD FENCE
- o-o- NEW CHAIN LINK FENCE
- - - APPROXIMATE EDGE OF WATER
- - - LIMIT OF EXCAVATION
- ~~~~ TREELINE
- NEW BANK ARMOR
- NEW ARTICULATED BLOCK
- NEW PLANTINGS
- NEW BITUMINOUS
- GEOCELL

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. SEE DRAWING SRV-758-58 C-101, REVISION "A" DATED OCTOBER 6, 2006 FOR FRED GARNER PARK AS-BUILT TOPOGRAPHIC SURVEY PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
3. SEE DRAWING SRV-1165-4A C-101, REVISION "B" DATED DECEMBER 22, 2006 FOR "FLOODPLAIN 4A AS-BUILT SITE PLAN" & DRAWING SRV-1165-4B C-103, REVISION "A" DATED OCTOBER 23, 2006 FOR "FLOODPLAIN 4B AS-BUILT SITE PLAN" & DRAWING SRV-1165-4C C-104, REVISION "B" DATED DECEMBER 22, 2006 FOR "FLOODPLAIN 4C AS-BUILT SITE PLAN" PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
4. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.

Riverbank Planting Subject to Natural Resource Restoration (NRD) Enhancement Requirements

Typical Planting Densities (unless noted otherwise)

Non-GeoWeb - 700 trees and 730 shrubs per acre

GeoWeb - 500 trees and 730 shrubs per acre

Total Shrub counts include Red-Osier Dogwood bands, where present

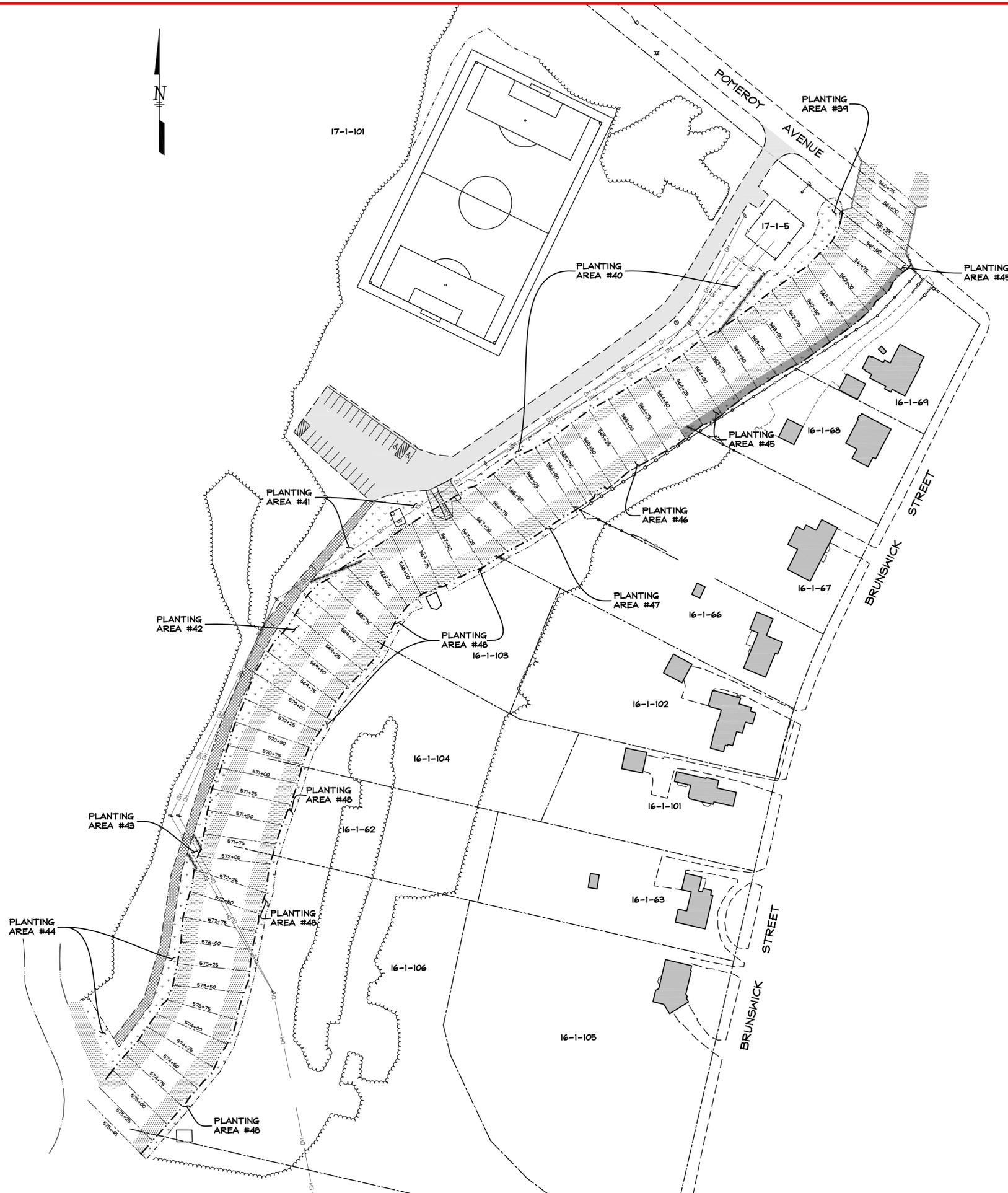
Typical Plants Installed

Plant Type and Species	Common Name	Stock	Size
<i>Salix nigra</i>	Black willow	1-gal	4-5 ft
<i>Acer negundo</i>	Box-elder	1-gal	4-5 ft
<i>Acer saccharinum</i>	Silver maple	1-gal	4-5 ft
<i>Populus deltoides</i>	Eastern cottonwood	1-gal	4-5 ft
<b>Shrubs:</b>			
<i>Cornus amomum</i>	Silky dogwood	1-gal	2-3 ft
<i>Viburnum dentatum</i>	Northern Arrowwood	1-gal	2-3 ft
<i>Ilex verticillata</i>	Winterberry Holly	1-gal	2-3 ft
<i>Cornus sericea</i>	Red-osier dogwood	1-gal	2-3 ft
<i>Prunus virginiana</i>	Choke cherry	1-gal	2-3 ft

Reach	Planting Area	Riverbank	Parcel Ids	Riverbank Area Type	Approximate Planting Area (acre)	Approximate # of Trees	Approximate # of Shrubs	Comments
Pomeroy Ave. Bridge to the Confluence	39	west	17-1-5 & 17-1-101	non-geoWeb	0.088	80*	85*	Planted by EPA
	40 ^	west	17-1-101	non-geoWeb	0.207	0*	187*	Planted by EPA
	41 ^	west	17-1-101	non-geoWeb	0.102	0*	53*	Planted by EPA
	42	west	17-1-101	non-geoWeb	0.147	110*	138*	Planted by EPA
	43 ^	west	17-1-101	non-geoWeb	0.008	0*	7*	Planted by EPA
	44	west	17-1-101	non-geoWeb	0.110	82*	88*	Planted by EPA
	45	east	16-1-69 & 16-1-68	geoWeb	0.065	32	47	Planted by EPA
	46	east	16-1-67	non-geoWeb	0.024	24*	29*	Planted by EPA
	47	east	16-1-66	non-geoWeb	0.023	14*	15*	Planted by EPA
	48	east	16-1-103; 16-1-104; 16-1-62 & 16-1-106	non-geoWeb	0.185	130*	237*	Planted by GE

\* - denotes area where planting densities were different from the standard NRD Enhancement Requirements due to needs or requests of residential property owners or the physical conditions of the riverbanks

^ - Planting Areas located on Western Mass Electric Company (WMECO) Right of Way (ROW). WMECO requirements do not allow tree planting in ROW areas, therefore only shrubs were planted.



WESTON SOLUTIONS, INC.  
10 LYMAN STREET  
PITTSFIELD, MA

AS-BUILT RIVERBANK  
PLANTING PLAN

PHASE 3C  
RESTORATION

DRAWN BY: JR  
DATE DRAWN: 3-8-07  
SCALE: 1"=60'  
APVD BY:

CAD CODE:  
SRV-758-58 (phase 3c as-built).dwg  
GRAPHIC SCALE: 0 60 120

PROJECT NUMBER:  
SRV-758-62

DRAWING NUMBER: C-108  
REV: A

REV	ISSUED FOR REVIEW & COMMENT	DESCRIPTION	DRY/CAD	DATE
A			JR	9-17-07

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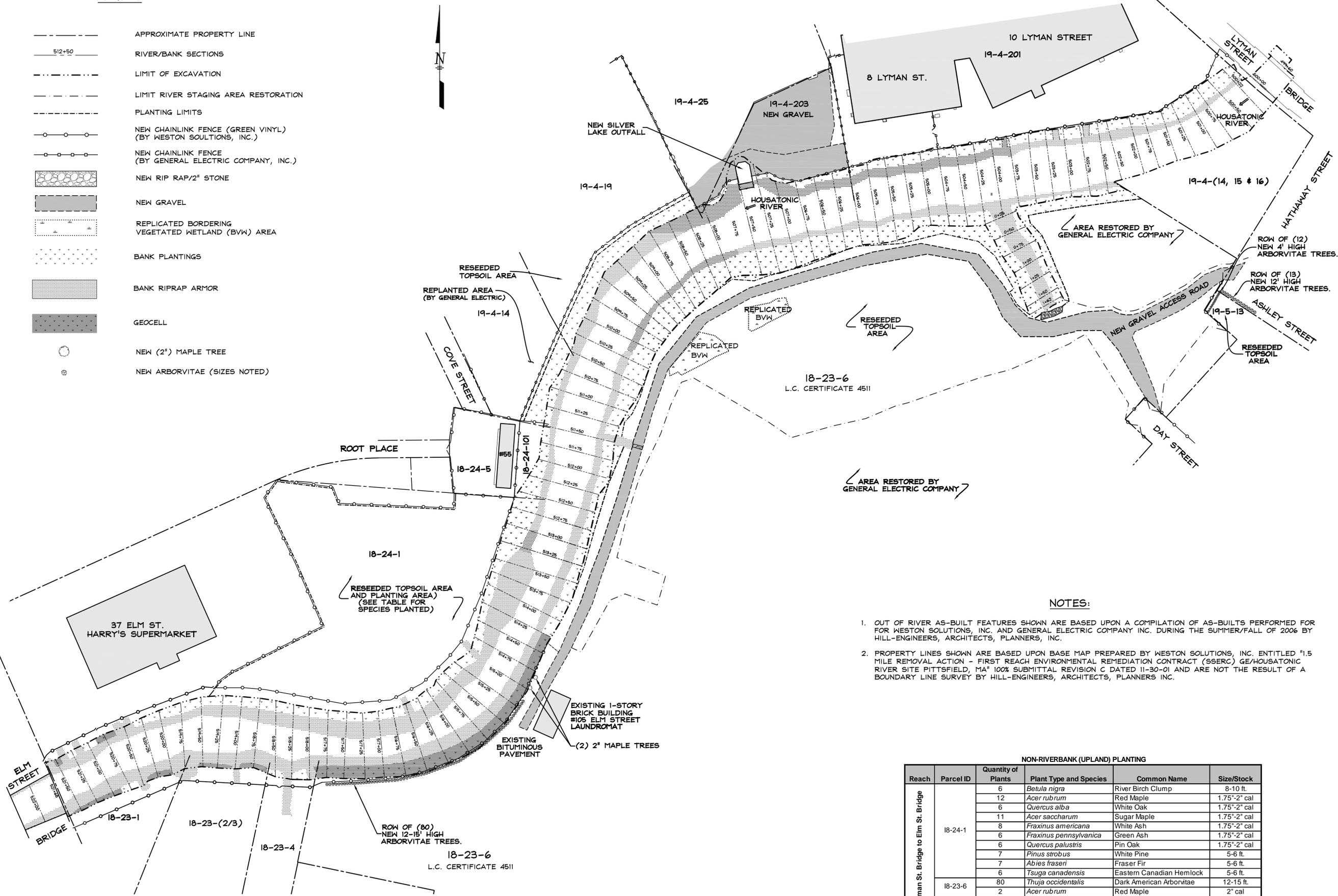
**APPENDIX I**

**NON-RIVERBANK (UPLAND) PLANTING AS-BUILTS  
(DRAWING 1 THROUGH 4)**

---

**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  RIVER/BANK SECTIONS
-  LIMIT OF EXCAVATION
-  LIMIT RIVER STAGING AREA RESTORATION
-  PLANTING LIMITS
-  NEW CHAINLINK FENCE (GREEN VINYL)  
(BY WESTON SOLUTIONS, INC.)
-  NEW CHAINLINK FENCE  
(BY GENERAL ELECTRIC COMPANY, INC.)
-  NEW RIP RAP/2" STONE
-  NEW GRAVEL
-  REPLICATED BORDERING  
VEGETATED WETLAND (BVW) AREA
-  BANK PLANTINGS
-  BANK RIPRAP ARMOR
-  GEOCELL
-  NEW (2") MAPLE TREE
-  NEW ARBORVITAE (SIZES NOTED)



- NOTES:**
- OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
  - PROPERTY LINES SHOWN ARE BASED UPON BASE MAP PREPARED BY WESTON SOLUTIONS, INC. ENTITLED "1.5 MILE REMOVAL ACTION - FIRST REACH ENVIRONMENTAL REMEDIATION CONTRACT (SSERC) GE/HOUSATONIC RIVER SITE PITTSFIELD, MA" 100% SUBMITTAL REVISION C DATED 11-30-01 AND ARE NOT THE RESULT OF A BOUNDARY LINE SURVEY BY HILL-ENGINEERS, ARCHITECTS, PLANNERS INC.

NON-RIVERBANK (UPLAND) PLANTING						
Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock	
Lyman St. Bridge to Elm St. Bridge	18-24-1	6	<i>Betula nigra</i>	River Birch Clump	8-10 ft.	
		12	<i>Acer rubrum</i>	Red Maple	1.75"-2" cal	
		6	<i>Quercus alba</i>	White Oak	1.75"-2" cal	
		11	<i>Acer saccharum</i>	Sugar Maple	1.75"-2" cal	
		8	<i>Fraxinus americana</i>	White Ash	1.75"-2" cal	
		6	<i>Fraxinus pennsylvanica</i>	Green Ash	1.75"-2" cal	
		6	<i>Quercus palustris</i>	Pin Oak	1.75"-2" cal	
		7	<i>Pinus strobus</i>	White Pine	5-6 ft.	
		7	<i>Abies fraseri</i>	Fraser Fir	5-6 ft.	
		6	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	5-6 ft.	
		18-23-6	80	<i>Thuja occidentalis</i>	Dark American Arborvitae	12-15 ft.
		19-5-13	2	<i>Acer rubrum</i>	Red Maple	2" cal
			13	<i>Thuja occidentalis</i>	Dark American Arborvitae	12 ft.
			12	<i>Thuja occidentalis</i>	Dark American Arborvitae	4 ft.

n/a - Not Available

**Hill**  
engineers  
architects  
planners

50 Depot Street  
Dalton, MA 01226  
(413) 684-0925

41 Park Street  
Adams, MA 01220  
(413) 743-0013  
www.hillengineers.com

REV.	DESCRIPTION	DATE
A <td>ISSUED FOR COMMENT <td>9-17-07 </td></td>	ISSUED FOR COMMENT <td>9-17-07 </td>	9-17-07

**WESTON SOLUTIONS, INC**  
EAST BRANCH HOUSATONIC RIVER, PHASE 1  
PITTSFIELD MA

PROJECT DESCRIPTION: BELOW LYMAN STREET BRIDGE, EAST BRANCH HOUSATONIC RIVER, PHASE 1

DRAWING TITLE: AS-BUILT NON-RIVERBANK (UPLAND) PLANTING PLAN

PHASE 1 RESTORATION

DRAWN BY: JR

DATE DRAWN: 3-8-07

SCALE: 1"=60'

APV'D BY:

CAD CODE: PHASE1 PLANTING PLAN.DWG

GRAPHIC SCALE: 0 60 120

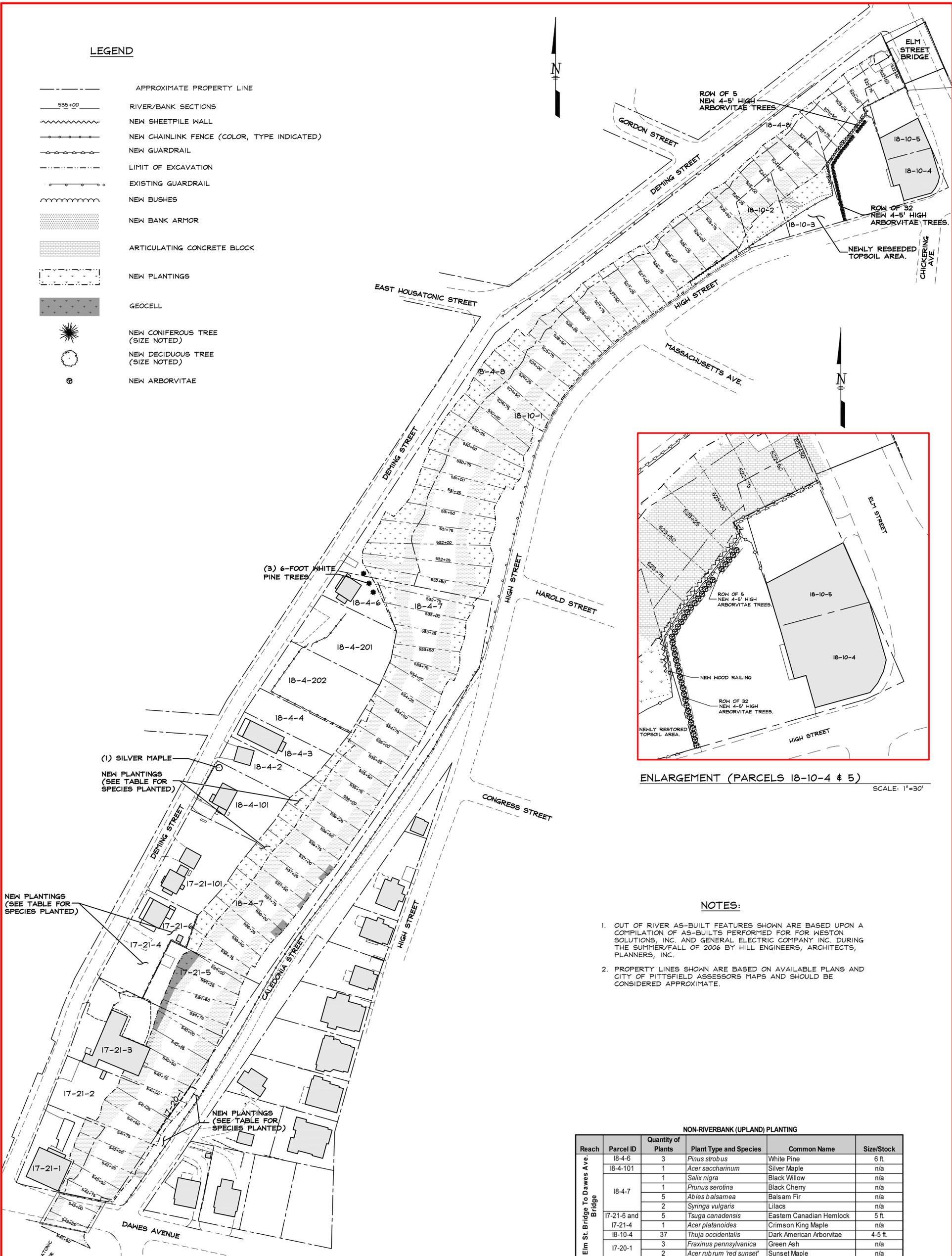
PROJECT NUMBER: SRV-758-62

DRAWING NUMBER: C-109

REV: A

**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  RIVER/BANK SECTIONS
-  NEW SHEETPILE WALL
-  NEW CHAINLINK FENCE (COLOR, TYPE INDICATED)
-  NEW GUARDRAIL
-  LIMIT OF EXCAVATION
-  EXISTING GUARDRAIL
-  NEW BUSHES
-  NEW BANK ARMOR
-  ARTICULATING CONCRETE BLOCK
-  NEW PLANTINGS
-  GEOCELL
-  NEW CONIFEROUS TREE (SIZE NOTED)
-  NEW DECIDUOUS TREE (SIZE NOTED)
-  NEW ARBORVITAE



**AS-BUILT NON-RIVERBANK (UPLAND) PLANTING PLAN**  
SCALE: 1"=60'

**ENLARGEMENT (PARCELS 18-10-4 & 5)**  
SCALE: 1"=30'

**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.

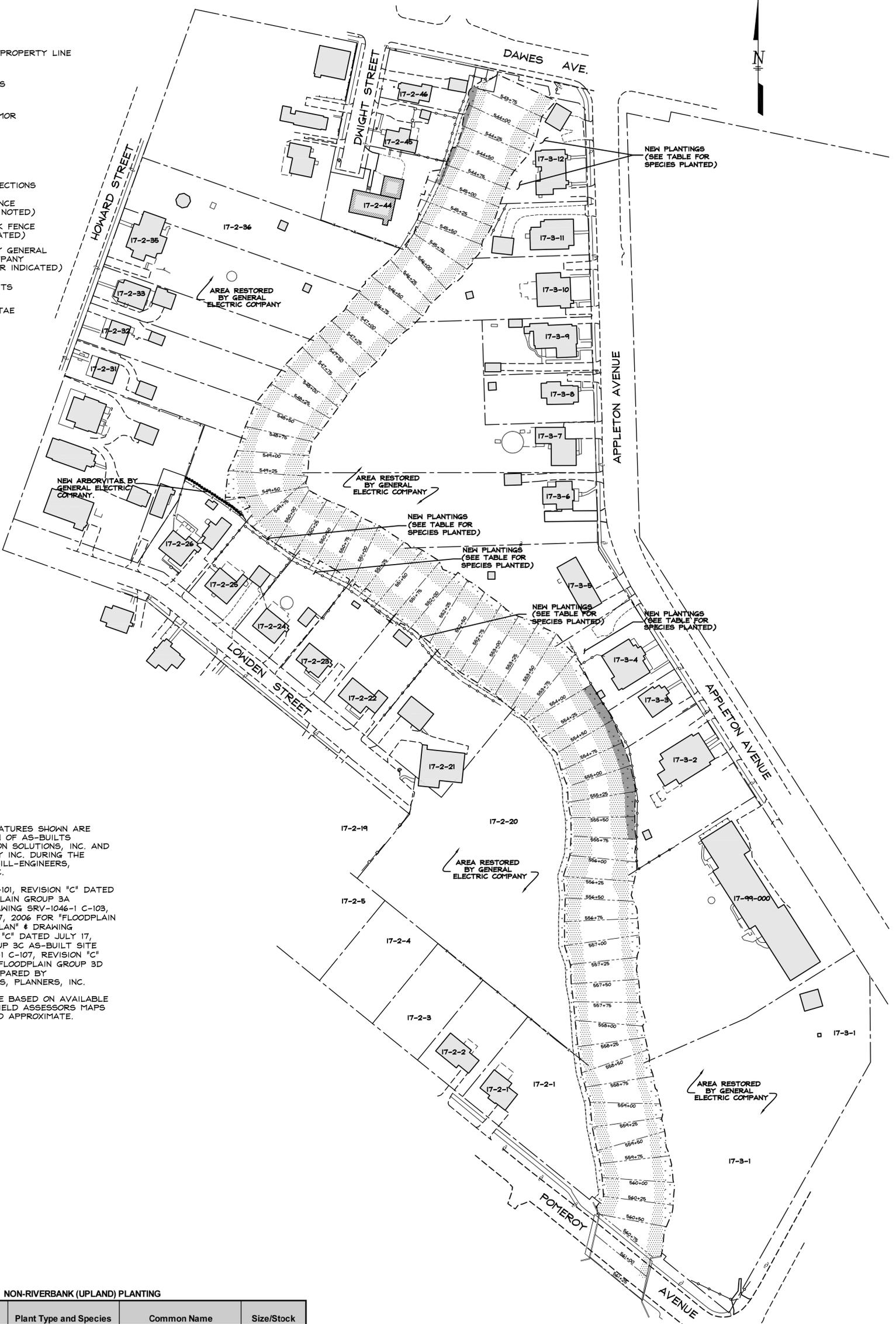
**NON-RIVERBANK (UPLAND) PLANTING**

Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock
Elm St. Bridge To Dawes Ave. Bridge	18-4-6	3	<i>Pinus strobus</i>	White Pine	6 ft.
	18-4-101	1	<i>Acer saccharinum</i>	Silver Maple	n/a
	18-4-7	1	<i>Salix nigra</i>	Black Willow	n/a
		1	<i>Prunus serotina</i>	Black Cherry	n/a
		5	<i>Abies balsamea</i>	Balsam Fir	n/a
	17-21-6 and 17-21-4	2	<i>Syringa vulgaris</i>	Lilacs	n/a
		5	<i>Tsuga canadensis</i>	Eastern Canadian Hemlock	5 ft.
	17-21-4	1	<i>Acer platanoides</i>	Crimson King Maple	n/a
	18-10-4	37	<i>Thuja occidentalis</i>	Dark American Arborvitae	4-5 ft.
	17-20-1	3	<i>Fraxinus pennsylvanica</i>	Green Ash	n/a
2		<i>Acer rubrum 'red sunset'</i>	Sunset Maple	n/a	

<p>CAD CODE: <b>PHASE2_OUTOFRIVERAB.DWG</b></p> <p>PROJECT NUMBER: <b>SRV-758-62</b></p> <p>DRAWING NUMBER: <b>C-110</b></p>	<p><b>WESTON SOLUTIONS, INC</b> EAST BRANCH HOUSATONIC RIVER, PHASE 2 PITTSFIELD MA</p>	<p>REV. DESCRIPTION DR'N CK'D. DATE</p> <p>A ISSUED FOR COMMENT JR 9-17-07</p>	<p>PROJECT DESCRIPTION: <b>PHASE 2 RESTORATION</b></p> <p>DRAWING TITLE: <b>AS-BUILT NON-RIVERBANK (UPLAND) PLANTING PLAN</b></p>
<p>DRAWN BY: JR</p> <p>DATE DRAWN: 3-8-07</p> <p>SCALE: AS-NOTED</p> <p>APP'D BY:</p>	<p>A COPY OF THE DATA IN THIS DRAWING FILE IS MAINTAINED AT THE OFFICES OF HILL ENGINEERS ARCHITECTS, PLANNERS, INC. THE INTERPRETATION, APPLICATION AND REVISION OF THIS DATA IS THE SOLE RESPONSIBILITY OF THE USER.</p>		
<p>50 Depot Street Dartmouth, MA 01226 (413) 684-0925</p> <p>41 Park Street Dartmouth, MA 01220 (413) 743-0013 www.hillengineers.com</p>			

**LEGEND**

-  APPROXIMATE PROPERTY LINE
-  NEW PLANTINGS
-  NEW BANK ARMOR
-  GEOCELL
-  RIVER/BANK SECTIONS
-  NEW WOOD FENCE (COLOR/TYPE NOTED)
-  NEW CHAINLINK FENCE (COLOR INDICATED)
-  NEW FENCE BY GENERAL ELECTRIC COMPANY (TYPE & COLOR INDICATED)
-  PLANTING LIMITS
-  NEW ARBORVITAE



**NOTES:**

1. OUT OF RIVER AS-BUILT FEATURES SHOWN ARE BASED UPON A COMPILATION OF AS-BUILTS PERFORMED FOR WESTON SOLUTIONS, INC. AND GENERAL ELECTRIC COMPANY INC. DURING THE SUMMER/FALL OF 2006 BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
2. SEE DRAWING SRV-1046-1 C-101, REVISION "C" DATED JULY 20, 2006 FOR "FLOODPLAIN GROUP 3A AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-103, REVISION "D" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3B AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-105, REVISION "C" DATED JULY 17, 2006 FOR "FLOODPLAIN GROUP 3C AS-BUILT SITE PLAN" & DRAWING SRV-1046-1 C-107, REVISION "C" DATED JULY 14, 2006 FOR "FLOODPLAIN GROUP 3D AS-BUILT SITE PLAN" & PREPARED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC.
3. PROPERTY LINES SHOWN ARE BASED ON AVAILABLE PLANS AND CITY OF PITTSFIELD ASSESSORS MAPS AND SHOULD BE CONSIDERED APPROXIMATE.

**NON-RIVERBANK (UPLAND) PLANTING**

Reach	Parcel ID	Quantity of Plants	Plant Type and Species	Common Name	Size/Stock
Dawes Ave. Bridge to Pomeroy Ave. Bridge	17-3-12	3	<i>Picea pungens</i>	Blue Spruce	10 ft.
		2	<i>Acer saccharum</i>	Sugar Maple	2" cal
		1	<i>Acer saccharinum</i>	Silver Maple	2" cal
	17-3-4	1	<i>Betula papyrifera</i>	White Birch	n/a
		1	<i>Forsythia sp.</i>	Forsythia	n/a
	17-2-21	1	<i>Rosa sp.</i>	Knockout Rose	n/a
		3	<i>Syringa vulgaris</i>	Lilacs	n/a
	17-2-22	5	<i>Thuja occidentalis</i>	Dark American Arborvitae	n/a
		1	<i>Rhododendron sp.</i>	Rhododendron	n/a
	17-2-24	2	<i>Acer rubrum</i>	Red Maple	10-12 ft.
		2	<i>Acer rubrum</i>	Red Maple	10-12 ft.
	17-2-25	1	<i>Picea pungens</i>	Blue Spruce	6 ft.
		9	<i>Funkiaceae</i>	Hostas	n/a
		1	<i>Rhododendron sp.</i>	Rhododendron	n/a

n/a - Not Available

**WESTON SOLUTIONS, INC**

EAST BRANCH HOUSATONIC RIVER, PHASE 3

BELOW DAWES AVENUE BRIDGE, PITTSFIELD MA

PHASE 3A & 3B RESTORATION

AS-BUILT NON-RIVERBANK (UPLAND) PLANTING PLAN

REV.	DESCRIPTION	DR'N	CK'D	DATE
A	ISSUED FOR COMMENT	JR		9-17-07

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50 Depot Street  
Dorset, MA 01226  
(413) 684-0925  
41 Park Street  
Amherst, MA 01002  
(413) 743-0013  
www.hillengineers.com



PROJECT NUMBER: SRV-758-62  
DRAWING NUMBER: C-111  
REV: A

DRAWN BY: JR  
DATE DRAWN: 3-8-07  
SCALE: 1"=60'

CAD CODE: PHASE3\_OUTRIVERBANK.DWG  
ORGANIC SCALE: 60  
120



---

**APPENDIX J**

**HERBACEOUS VEGETATION COVER AND INVASIVE SPECIES  
MONITORING SUMMARY TABLE**

---

## PERCENT HERBACEOUS COVER AND PERCENT INVASIVE PLANT SPECIES COVER SUMMARY SHEET

Monitoring Area	Bank	Date Monitored	Plot	Herbaceous Cover (%)	Invasive Plant Cover (%)	Invasive Species
Lyman-Elm	West		1-W-1			
Lyman-Elm	West		1-W-2			
Lyman-Elm	West		1-W-3			
Lyman-Elm	East		1-E-1			
Lyman-Elm	East		1-E-2			
Lyman-Elm	East		1-E-3			
Elm-Dawes	West		2-W-1			
Elm-Dawes	West		2-W-2			
Elm-Dawes	West		2-W-3			
Elm-Dawes	East		2-E-1			
Elm-Dawes	East		2-E-2			
Elm-Dawes	East		2-E-3			
Dawes-Pomeroy	West		3-W-1			
Dawes-Pomeroy	West		3-W-2			
Dawes-Pomeroy	West		3-W-3			
Dawes-Pomeroy	East		3-E-1			
Dawes-Pomeroy	East		3-E-2			
Dawes-Pomeroy	East		3-E-3			
Pomeroy-Confluence	West		4-W-1			
Pomeroy-Confluence	West		4-W-2			
Pomeroy-Confluence	West		4-W-3			
Pomeroy-Confluence	East		4-E-1			
Pomeroy-Confluence	East		4-E-2			
Pomeroy-Confluence	East		4-E-3			
Parcel I8-24-1	West		N/A			
Parcel I6-1-66	East		N/A			
Parcel I6-1-67	East		N/A			
FGP (Parcel I7-1- 101)	West		N/A			

Notes:

N/A – Not Applicable

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**APPENDIX K**

**MACROINVERTEBRATE TISSUE SAMPLING DATA SHEET**

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## AQUATIC MACROINVERTEBRATE TISSUE SAMPLING DATA SHEET

<b>General Information</b>			
Site : _____	Project: _____		
Location: _____	Sample Collection Start Date: _____		
Staff: _____	Sample Collection End Date: _____		
Sample Collection Start Time: _____	Sample Collection End Time: _____		
<b>Weather Observations</b>			
<b>Start of Sampling</b>		<b>End of Sampling</b>	
Sun/Clear: _____	Overcast/Rain: _____	Sun/Clear: _____	Overcast/Rain: _____
Wind Direction: _____	Ambient Temp.: _____	Wind Direction: _____	Ambient Temp.: _____
<b>Water Quality</b>			
Conductivity: _____	pH: _____	Dissolved O <sub>2</sub> : _____	Temperature: _____
<b>Sample Information</b>			
Matrix: _____	Sample ID: _____		
Sampling Method: _____	Sample Date: _____		
Sample Mass (grams): _____	Sample Time: _____		
Reference Photo IDs: _____	Species Reference Sample Collected: yes/no		
Collocated Samples: _____			
<b>Habitat Description/Comments/Site Sketch</b> (i.e., flow rate, substrate, water depth, in-stream structure)			

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**APPENDIX L**

**ENVIRONMENT RESTRICTIONS  
AND EASEMENTS ANNUAL INSPECTION CHECK LIST**

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**ERE ANNUAL INSPECTION CHECKLIST**

**PARCEL**

**DOCUMENT REVIEW**

Conducted By: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
Representing: \_\_\_\_\_ Review Start Date: \_\_\_\_\_

1.  Check here to confirm that the Grant of Environmental Restriction and Easement has been reviewed.
2.  Check here to confirm that the Plan of Restricted Area (as revised if appropriate) has been reviewed.
3.  Check here to confirm that the description of this property in the Final Completion Report and the as-built survey drawings provided in the Final Completion Report (and any alternative plan proposed by GE for the comparison described in Item 7 on next page) have been reviewed.
4. Are there any recorded amendments to or releases from the ERE, and/or any known conditional exceptions the ERE and of which the reviewing party has a copy, and/or any other documents in GE's possession relevant to the ERE or the use of the property?  
 No  
 Yes - If yes, review those items for background informational purposes and list them below (along with the book and page reference in the Registry of Deeds where applicable). (Note that the document reviewer has no obligation to verify the accuracy or completeness of any of these documents, either as of the time they were prepared or as compared to current conditions).

5. Review Completed: \_\_\_\_\_

**VISUAL ON-SITE INSPECTION**

Conducted By: \_\_\_\_\_ Representing: \_\_\_\_\_  
Inspection Start Date: \_\_\_\_\_

1. List other individuals and their company/agency that were present during the visual on-site inspection.

2. Is there any visual evidence of activities and uses of the property since the last inspection that are potentially contrary to the restrictions of the ERE?

- No  
 Yes - If yes, describe below.

**ERE ANNUAL INSPECTION CHECKLIST**

**PARCEL**

**DOCUMENT REVIEW**

Conducted By: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
Representing: \_\_\_\_\_ Review Start Date: \_\_\_\_\_

3. Is there any visual evidence of utility work or building construction, modification, addition, or demolition since the last inspection?

- No
- Yes - If yes, describe below and show the location(s) of such activity on a plan.

4. Is there any visual evidence of soil excavation that generated more than 10 cubic yards of soil since the last inspection?

- No
- Yes - describe below and show the location(s) of such activity on a plan.

5. Is there any visual evidence of significant soil erosion since the last inspection?

- No
- Yes - If yes, describe below and show the location(s) of such erosion on a plan.

6. Is there any visual evidence of significant pavement construction, disturbance, or excavations since the last inspection?

- No
- Yes - If yes, describe below and show the location(s) of such activity on a plan.

7. If any of the conditions listed in the responses to Questions 3 through 6 appears to have altered the surface grade of the property compared to the surface grade shown on the as-built survey drawings included in the Final Completion Report (or an alternative, more recent plan proposed by GE), identify the approximate area/location(s) of such grade change on a plan and compare the new surface grade in such area(s) to the surface grade on the above listed drawings and/or plan. (If GE proposes use of an alternative plan for this comparison, include a copy of that plan and describe the rationale for its proposed use.)

8. Inspection Completed: \_\_\_\_\_

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**APPENDIX M**

**CONDITIONAL SOLUTION INSPECTION CHECK LIST**

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**CONDITIONAL SOLUTION ANNUAL INSPECTION CHECKLIST**

**PARCEL NUMBER** \_\_\_\_\_

**DOCUMENT REVIEW**

Conducted By: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
Representing: \_\_\_\_\_ Review Start Date: \_\_\_\_\_

1.  Check here to confirm that the description of the Conditional Solution for this property in the Final Completion Report, and the as-built drawings included in the Final Completion Report (and any alternative plan proposed by GE for the comparison described in Item 5 on next page), and any subsequent work plan(s) approved and implemented pursuant to Paragraph 35 of the Consent Decree have been reviewed.
2.  Check here to confirm that the most recent property records from the Pittsfield Tax Assessor's Office and the property deed at the Berkshire Middle District Registry of Deeds for this property have been reviewed.
3. Has there been a change in ownership of this property?  
 No  
 Yes - If yes, list the new owner's name and mailing address below and indicate whether a notice of the Conditional Solution has been or will be sent to the new owner.

4. Review Completed: \_\_\_\_\_

**VISUAL ON-SITE INSPECTION**

Conducted By: \_\_\_\_\_ Representing: \_\_\_\_\_  
Inspection Start Date: \_\_\_\_\_

1. List other individuals and their company/agency that were present during the visual site inspection.
2. Is there any visual evidence of changes in activities and uses of the property since the last inspection that are potentially inconsistent with the land use for which the Conditional Solution was implemented?  
 No  
 Yes - If yes, describe below.
3. Is there any visual evidence of installation of a new utility or repair or replacement of an existing utility that involved disturbance of soil within the property since the last inspection?  
 No  
 Yes - If yes, describe below and show the location(s) of such activity on a plan.

**CONDITIONAL SOLUTION ANNUAL INSPECTION CHECKLIST**

4. Is there any visual evidence of excavations, construction, or other activities or conditions that resulted in the disturbance of 10 cubic yards of soil or greater, regardless of depth, within the property?

No

Yes - describe below and show the location(s) of such activity on a plan.

5. If any of the conditions listed in the responses to Questions 3 and 4 appears to have altered the surface grade of the property compared to the surface grade shown on the as-built survey drawings included in the Final Completion Report (or an alternative, more recent plan proposed by GE), identify the approximate area/location(s) of such grade change on a plan and compare the new surface grade in such area(s) to the surface grade in the above-listed drawings and/or plan. (If GE proposes use of an alternative plan for this comparison, include a copy of that plan and describe the rationale for its proposed use.)

6. Inspection Completed Date: \_\_\_\_\_