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COMPLETION OF WORK REPORT

Second Unilateral Administrative Order for Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

April 2005

Prepared for

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EXECUTIVE SUMMARY

On March 26, 2001, the United States Environmental Protection Agency (EPA) New England Region (Region 1) issued an Administrative Order for Removal Action pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (Docket No. CERCLA-1-2001-0032). The Order was issued to the Centredale Manor Performing Parties Group for a Removal Action to be conducted at the Centredale Manor Restoration Project Superfund Site located in North Providence, Rhode Island. The Centredale Manor Performing Parties Group has completed the Removal Action in accordance with the Order.

The Removal Action consisted of a Non-Time-Critical Removal Action, and in general included the restoration of Allendale Dam and the excavation of dioxin-impacted recreational and residential-use soils and floodplain sediments. This Completion of Work Report documents the activities completed by the Group. As provided in this report, the performance criteria of the Non-Time Critical Removal Action have been attained by restoring Allendale Dam and by excavating dioxin-impacted soils and sediments.

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LIST OF ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CWM	Chemical Waste Management
CWR	Completion of Work Report
EDR	Environmental Data Services, Inc.
EIA	Competitive Enzyme Immunoassay
EPA	United States Environmental Protection Agency
ERS	Environmental Remediation Services, LLC
FSP	Field Sampling Plan
GEI	GEI Consultants, Inc.
HASP	Health and Safety Plan
HDPE	High-Density Polyethylene
ICP	Institutional Controls Plan
IWP	Implementation Work Plan
LEA	Loureiro Engineering Associates, Inc.
LCI	LEA-Cianci, Inc.
NCP	National Contingency Plan
NGVD	National Geodetic Vertical Datum
NTCRA	Non-Time-Critical Removal Action
O&M	Operation and Maintenance Manual
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
POP	Project Operations Plan

PRSCP	Post-Removal Site Control Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RIDEM	Rhode Island Department of Environmental Management
SAP	Sampling and Analysis Plan
SMP	Site Management Plan
SOW	Statement of Work
STL	Severn Trent Laboratories, Inc.
SVOCs	Semivolatile Organic Compounds
TCDD	tetrachlorodibenzo-p-dioxin
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalent
TPH	Total Petroleum Hydrocarbons
USACE	United States Army Corps of Engineers
VOCs	Volatile Organic Compounds

LIST OF UNITS

gpm	gallons per minute
µ	micron
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
NTUs	Nephelometric turbidity units
ppb	parts per billion
lb	pound

1. INTRODUCTION

1.1 Terms of Reference

On March 26, 2001, the United States Environmental Protection Agency (EPA) New England Region (Region 1) issued a Unilateral Administrative Order for Removal Action (Order) pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (CERCLA Docket No. CERCLA-1-2001-0032). The Order was issued to the Centredale Manor Performing Parties Group (Group) for a Removal Action to be conducted at the Centredale Manor Restoration Project Superfund Site located in North Providence, Rhode Island, hereinafter referenced as the "Site." This Order was subsequently amended by EPA to clarify milestones identified for the Removal Action. This First Amendment to the Order was issued by EPA on September 6, 2001. A Second Amendment to the Order was issued by EPA on September 23, 2002 to provide changes to the Removal Action schedule. The Group has completed the Removal Action in accordance with the Order and subsequent amendments.

The Removal Action consisted of a Non-Time-Critical Removal Action (NTCRA), and in general included the restoration of Allendale Dam and the excavation of impacted recreational and residential-use soils and floodplain sediments. This Completion of Work Report (CWR) documents the NTCRA completed by the Group. This CWR has been prepared pursuant to Paragraph VI.A.4 of the Statement of Work (SOW) included as Attachment A to the Order. This report satisfies the requirements of the Order, Section 300.165 of the National Contingency Plan (NCP) entitled *OSC Reports*, and the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.3-03 entitled *Removal Response Reporting*.

1.2 Background

1.2.1 Site Description

As defined by EPA, the Site consists of two parcels, 2072 and 2074 Smith Street (Route 44), encompassing approximately 9.7 acres, as well as sediments and floodplain areas of the Woonasquatucket River from Smith Street southerly to Lymansville Dam. The location of the Site is illustrated in Figure 1-1. The 2072 Smith Street parcel is occupied by Brook Village Apartments. This parcel is registered as Plat 14, Lot 200 in the Land Evidence Records of North Providence, Rhode Island. Brook Village Apartments consists of an eleven-story apartment building that houses approximately 135 elderly residents. A series of three paved parking lots extend to the south of this building. The area of the parcel surrounding the building and parking

lots includes landscaped areas and a paved driveway accessing Smith Street and located along the eastern property line. The parcel also includes an interim soil cap located adjacent to the Woonasquatucket River. The parcel is bordered to the north by Smith Street, to the west by the Woonasquatucket River, to the east by a drainage ditch (former tailrace), and to the south by the 2074 Smith Street parcel.

Centredale Manor Apartments occupies the 2074 Smith Street parcel and consists of an eight-story apartment building that houses approximately 130 elderly residents. This parcel is registered as Plat 14, Lot 250 in the Land Evidence Records of North Providence, Rhode Island. Two paved parking lots are located on this parcel to the north and west of the building. The parking lots and building are located on the northern end of the parcel. The remaining area of the parcel includes landscaped areas. The parcel also includes an interim soil cap on the southern end of the parcel, which is bordered by the Woonasquatucket River to the west and south. The parcel is bordered to the east by the former tailrace. The property is bordered to the north by the Brook Village Apartments property.

1.2.2 Site History

Dioxin, primarily 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), as well as other chemical constituents have been identified at elevated levels in sediments and soils at the Site. EPA has identified twelve "Action Areas" (Action Area 1 through Action Area 12) to address the impacted sediments and soils at the Site. The Action Areas are areas of the Site at specific locations along the eastern shore of Allendale Pond, Lymansville Pond and the interconnecting reaches of the Woonasquatucket River, including the area surrounding Allendale Dam. The Action Areas also include the area of the former tailrace east of the Centredale Manor Apartments.

EPA identified the Action Areas as those areas where dioxin concentrations in soils and sediments were believed to exceed the removal action level. The removal action level established by EPA is one part per billion (ppb) of the toxicity equivalent (TEQ) of 2,3,7,8-TCDD. EPA generally defined the Action Areas as:

- Floodplain sediments in Allendale Pond between elevations of 92.5 and 93.5 feet above mean sea level, referenced to the National Geodetic Vertical Datum (NGVD);
- Floodplain sediments in Lymansville Pond between the existing shoreline and into the pond to a depth of one foot of water;
- Residential and recreational-use soils between elevation 93.5 feet above mean sea level and the ten-year flood elevation along the eastern shoreline of Allendale Pond and the Allendale reach of the Woonasquatucket River;

- Residential and recreational-use soils along the eastern shoreline of Lymansville Pond and the Lymansville reach of the Woonasquatucket River; and
- Floodplain and aquatic sediments in areas adjacent to and immediately upgradient and downgradient of Allendale dam that are disturbed during dam restoration activities.

The Action Areas defined by EPA are illustrated in Drawings 1-1, 1-2, 1-3, and 1-4.

1.3 Purpose and Objectives

As defined in the SOW, the objectives of the NTCRA are to: (i) prevent migration of dioxin-impacted sediments to downstream areas; (ii) eliminate or reduce the risk of human exposure to sediments and soils containing concentrations of dioxin in excess of the removal action level (1 ppb of 2,3,7,8-TCDD (TEQ)); and (iii) properly dispose the waste materials generated during implementation of the NTCRA. The restoration of Allendale Dam, which had partially breached in November 1991 and more recently again in 2001, was identified by EPA as the component of the NTCRA to prevent migration of impacted sediments to downstream areas. EPA identified the excavation of impacted sediments and soils as the component of the NTCRA to eliminate or reduce the risk of human exposure to sediments and soils containing concentrations of dioxin in excess of removal action level.

The purpose of this CWR is to provide a summary description of the methods and procedures that were used in implementing the NTCRA. Also, this CWR has been prepared to document the results obtained during the implementation of the NTCRA. In addition, the purpose of this CWR is to demonstrate achievement of the performance standards defined in the SOW.

1.4 Organization of the Report

As organized, this CWR provides a chronology of the methods and procedures used to restore Allendale Dam and to excavate potentially impacted soils and sediments. The report includes a description of the methods used to manage all solids and liquids during construction and excavation activities. Records, including copies of all signed waste manifests, are provided to document the off-Site disposal of materials generated during the NTCRA. In addition, this report includes all quality assurance/quality control (QA/QC) construction documentation generated during the implementation of the NTCRA. This report also includes a tabulation of all laboratory analytical data obtained during the implementation of the NTCRA. Figures are included to demonstrate the limits of excavation performed at the Site. A photodocumentation log is provided to document the sequence of events in restoring Allendale Dam. This log also includes photographs that document the excavation of impacted soils and sediments.

The Allendale Dam Restoration Drawings that specify the as-built condition of the restored Allendale Dam were submitted to EPA under correspondence dated May 29, 2003. A copy of this correspondence is included in Appendix A. The as-built drawings submitted under this correspondence are considered to be part of this CWR. Similarly, the data validation summary reports submitted to EPA under correspondence dated October 4, 2002, November 8, 2002, and November 22, 2002 are also considered to comprise part of this CWR. Copies of the correspondence under which the data validation reports were submitted are also included in Appendix A.

The organization of the remainder of this CWR is as follows:

- A description of the NTCRA performance standards is provided in Section 2;
- A summary of the design documents that were prepared in fulfillment of the SOW to allow the implementation of NTCRA field activities is provided in Section 3.
- A summary of the methods and materials used to restore Allendale Dam is provided in Section 4;
- A summary of the methods and procedures used to define the limits of excavation and to excavate impacted soils and sediments is provided in Section 5.
- A general description of access restrictions and institutional controls developed for the Site is provided in Section 6;
- A general description of the Post-Removal Site Control Plan (PRSCP) developed to protect the measures taken pursuant to the NTCRA SOW is provided in Section 7;
- A detailed breakdown of the cost to implement the NTCRA activities is provided in Section 8; and
- A statement certifying that the information provided in this CWR is true, accurate, and complete is provided in Section 9.

SECTION 2

2. NTCRA PERFORMANCE STANDARDS

In general, the performance standards specified in the SOW include the requirement to perform the NTCRA activities in compliance with all applicable or relevant and appropriate requirements (ARARs). A summary of the ARARs is provided in Table 1. Table 1 also includes a summary of the corresponding action taken in achieving each ARAR.

Specifically, the SOW stipulates that the NTCRA be designed and implemented to meet the following performance standards:

- Remove soil and adjacent sediment from residential and recreational-use properties that contain dioxin in excess of the removal action level;
- In restoring the Site, replace excavated soil and sediment with like clean fill materials to match the surrounding grade;
- Destroy excavated soil and sediment containing concentrations of dioxin in excess of 1 ppb (TEQ) through controlled incineration at a licensed off-site location; and
- Restore Allendale Dam with provisions for water level controls and return Allendale Pond to its original elevation by completing the spillway to an elevation of 93.5 feet above mean sea level, NGVD.

As demonstrated in the remaining sections of this CWR, the Group has achieved these performance standards by implementing the NTCRA activities in compliance with all ARARs and the requirements specified in the design documents prepared in fulfillment of the SOW.

SECTION 3

3. DESIGN DOCUMENTS AND IMPLEMENTATION WORK PLAN

3.1 Introduction

The design-phase deliverables included securing access required to perform the NTCRA. These deliverables also included the preparation of performance and operational specifications for the restoration of Allendale Dam and the excavation of impacted soils and sediments. In addition, the design-phase deliverables included the preparation and submittal of an Institutional Controls Plan. The implementation-phase deliverables included the preparation of an Implementation Work Plan (IWP). A description of each of these deliverables is provided in the sections that follow.

3.2 Off-Site Access Agreements

Completion of the NTCRA field activities necessitated that consent to access private properties be obtained from a number of property owners. Private properties to which access was critical in implementing the NTCRA field activities included a number of properties east of the former tailrace, Allendale Pond, Lymansville Pond, and the Woonasquatucket River. Obtaining consent to access one property west of Allendale Pond, The Town Asphalt Company property (now Johnston Asphalt Company property) located at 100 Allendale Way in Johnston, Rhode Island, was also critical to implementing the NTCRA activities.

Consent to access The Town Asphalt Company property was granted to allow the implementation of the NTCRA. Consent to access all but one private property east of the former tailrace, Allendale Pond, Lymansville Pond, and the Woonasquatucket River was also granted. The only property to which access could not be obtained is the property owned by Mr. and Mrs. James R. Scott. The Scott property is located at 2 Mill Street in North Providence, Rhode Island. This property is designated as Plat 14/Lot 268 in the Land Evidence Records of North Providence, Rhode Island. The western extent of this property abuts the former tailrace in the vicinity of Action Area 1, as shown in Drawing 1-1. Access agreements that were obtained were previously submitted to the EPA in accordance with the SOW. EPA authorized the NTCRA activities to proceed while continuing attempts were made to secure access to the Scott property. In September 2003, EPA and ten responsible parties signed an Administrative Order on Consent that provides for capping in and near the potentially impacted area of the Scott property.

3.3 Design Schedule and Design Work Plan

A Design Schedule, dated April 23, 2001, and a Design Work Plan, dated May 9, 2001, were prepared by Loureiro Engineering Associates, Inc. (LEA) on behalf of the Group and were submitted to EPA for review and approval. The work plan provides a description of the design documents to be submitted pursuant to the schedule in complying with the requirements of the Order. The design documents identified in this plan include a 100% Design, a Project Operations Plan (POP) and an IWP. The Design Schedule and the Design Work Plan were approved by EPA.

3.4 Institutional Controls Plan

An Institutional Controls Plan (ICP) was included as part of the IWP. This plan outlines the approach to establish and maintain the necessary access restrictions and institutional controls to ensure non-interference with the functional integrity and performance of the NTCRA. In accordance with the requirements of the SOW, the ICP specifies that a negative easement restricting the alteration of Allendale Dam be established. The ICP also specifies that Allendale Dam shall be maintained by assuring that the spillway does not become obstructed with debris causing the height of Allendale Pond to be raised, or potentially causing the restored dam to fail. A description of the access restrictions and institutional controls taken in implementing the ICP is presented in Section 6, and a description of the post-removal controls required to be implemented at the Site is provided in Section 7.

3.5 Implementation Work Plan

An IWP, dated August 6, 2001, was prepared by LEA on behalf of the Group and was submitted to EPA for review and approval. This plan incorporates a response, provided as Amendment 01, to EPA comments to a draft version of the plan, dated July 9, 2001, previously submitted to and conditionally approved by EPA. The August 6, 2001 IWP includes the 100% Design and the POP identified in the Design Work Plan. The 100% Design incorporates LEA's modifications to the preliminary design and sequence of construction for the restoration of Allendale Dam that was completed by the United States Army Corps of Engineers (USACE). The POP consists of a Site Management Plan (SMP); a Sampling and Analysis Plan (SAP) consisting of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP); a Site-specific Health and Safety Plan (HASP); and a Community Relations Support Plan.

The August 6, 2001 IWP was subsequently amended to address additional comments to the plan provided by EPA and USACE on August 10, 2001. The additional comments were addressed in an interim amendment and in Amendment 02. The interim amendment was submitted to EPA on

August 17, 2001 and provides design modifications for a concrete containment pad to be constructed to temporarily store excavated soils and sediments generated during the implementation of the NTCRA. Amendment 02, was submitted to EPA on August 31, 2001 and addresses the additional comments provided by EPA and USACE on August 10, 2001. The IWP, which incorporates Amendment 01, the interim amendment, and Amendment 02, was approved by EPA. As discussed in Section 5 of this CWR, the EPA-approved IWP was subsequently amended with Amendment 03 and Amendment 04.

4. ALLENDALE DAM RESTORATION

4.1 Overview

LEA, through its wholly-owned subsidiary LEA-Cianci, Inc. (LCI), performed the construction activities to restore Allendale Dam. The area of Allendale Dam lies within Action Area 8, as defined by EPA (Drawing 1-2). The sequence and scheme of construction in restoring Allendale Dam is depicted in the photographs presented in Appendix B. A description of the construction techniques and procedures employed in restoring Allendale Dam is presented in this section.

The construction of Allendale Dam was provided through the technical assistance and design provided by GEI Consultants, Inc. (GEI). To ensure that construction activities did not cause damage to features that have remained after restoration, the sequence and scheme of construction was implemented in a safe and workmanlike manner. Furthermore, the construction techniques and procedures were employed to minimize disturbance and impacts to the surrounding residential and recreational-use properties.

As a first step in restoring Allendale Dam, the design and sequence of construction activities previously completed by the USACE in 1997 were evaluated and modified. The design provided by GEI included measures to minimize the downstream migration of sediment during construction. The design also included modifications to the USACE's design of the dam gate structure. The design modifications provided for a mechanically-operated sluice gate. The design prepared by GEI is included in the EPA-approved IWP. The activities performed in restoring Allendale Dam pursuant to this design and that resulted in the restoration of Allendale Pond to its elevation prior to the initial breach in 1991 are described in sections that follow.

4.2 Photographic Survey

The photographs presented in Appendix B provide a photographic survey of the Site. These photographs include a survey of Action Area 8 prior to, during, and after the construction of Allendale Dam. The photographs of Action Area 8 also provide a record of the major construction phases and components of Allendale Dam. Specifically, the photographs document the sequence of construction activities including: cutting and clearing trees; forming the concrete extension of the gate structure wingwall; placing cofferdams for water control and diversion; removing debris; rock coring and rock bolt testing; forming and pouring the concrete footing; and forming and pouring the concrete wall. In addition, the photographs also document the ancillary activities performed in support of the Allendale Dam restoration effort, including the plugging of the raceway wall and the construction of the temporary containment pad. The post-

construction photographs document the as-built condition of Allendale Dam. Reference to the photographs presented in Appendix B is made at this time to facilitate an understanding of the Allendale Dam restoration activities performed, as presented in the following sections.

4.3 Site Security

The measures taken to ensure Site security during the restoration of Allendale Dam included the maintenance of the existing chain-link fence along Allendale Way. This fence restricts access to the dam. These measures also included posting additional warning signs along the fence and around Allendale Dam. Additional security measures included the installation of a gate within the section of chain-link fence adjacent to the Town Asphalt Company, Inc. property to provide access to the dam from the west embankment. Further security measures within the area of the Site included erecting a temporary chain-link fence around the containment pad, erecting a temporary construction fence around roll-off containers deployed on this property, and posting additional warning signs.

4.4 Clearing Activities

The restoration of Allendale Dam required limited clearing within Action Area 8. Small trees and shrubs were cleared from the west embankment of the Town Asphalt Company property. These trees and shrubs were cleared so that a temporary access road leading to the area of the dam could be constructed. Clearing along this embankment also enabled LCI to construct a temporary cofferdam downstream of the work area. Along the east embankment, small trees and shrubs were cleared in the area surrounding the existing gate structure of the dam.

The clearing activities within Action Area 8 included removing shrubs and cutting a limited number of trees. Trees were cut to the ground surface and were chipped on-Site. The cleared vegetation and wood chips were recycled off-Site at Smithfield Peat, a local recycling facility.

Clearing activities also included the removal of a limited number of tree stumps from the embankment on the northeast side of the existing gate structure. After these stumps were grubbed (removed), the stumps and associated root structures were physically shaken to remove as much soil from the roots as possible. Because it was impracticable to remove all of the soil from the stumps and root structures, a composite sample of the soil representative of the soil affixed to the stumps and roots was sampled and analyzed to characterize the quality of the soil prior to transporting the material for off-Site recycling. The sampling procedure included the collection of one soil sample in accordance with the general procedures for soil sampling

outlined in the FSP. The sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) 8 metals, total petroleum hydrocarbons (TPH), pH, and dioxins. The laboratory analytical results of this sample, identified as "CMS-RTS-001", are summarized in Table 2. The results were submitted to the USACE for review and approval as part of Construction Submittal 011. A copy of this submittal, approved by USACE, is provided in Appendix C. Based on the laboratory analytical results and the approval provided by the USACE, the tree stumps and associated root structures were transported off-Site for recycling at Smithfield Peat.

Additional clearing activities included cutting and removing trees within the area of Allendale Pond below an elevation of 93.5 feet. The trees were cut and removed from this area prior to establishing the historic elevation of the pond. Upon removal from this area of the Site, the trees were chipped for recycling off-Site at Smithfield Peat.

4.5 Temporary Containment Pad

A temporary containment pad was constructed on the property formerly owned by the Town Asphalt Company and located north of the bridge connecting Allendale Way and Allendale Avenue. The containment pad was designed and constructed to temporarily store excavated material prior to off-Site disposal. This pad was constructed of concrete in accordance with the details illustrated in Figure 4-1. The placement of an epoxy sealant on the concrete pad, the installation of a 40-mil high-density polyethylene (HDPE) liner, and the placement of a filler material (mastic) between the block walls and concrete pad were included as part of the construction.

Once the temporary containment pad was constructed, a background soil sample was obtained from the area immediately adjacent to the northeast corner of the pad. This soil sample was collected to document the quality of the soil in this area of the Site prior to the use of the pad. The sampling procedure included the collection of one soil sample in accordance with the general procedures for soil sampling outlined in the FSP. The sample was analyzed for VOCs, SVOCs, PCBs, RCRA-8 metals, TPH, pH, and dioxins. The laboratory analytical results of this sample, identified as "CMS-CPAD-001", are summarized in Table 3.

Once the containment pad was no longer needed for the temporary storage of excavated material, the pad was dismantled. Dismantling operations included the demolition of the concrete pad and disposal of the concrete rubble at Pond View Concrete, a local recycling facility. Following the

removal of the concrete containment pad, a soil sample was obtained from the area immediately adjacent to the location from which sample "CMS-CPAD-001" was obtained. The sampling procedure included the collection of one soil sample in accordance with the general procedures for soil sampling outlined in the FSP. This sample was analyzed for VOCs, SVOCs, PCBs, RCRA-8 metals, TPH, pH, and dioxins to document that the soil surrounding the pad was not impacted as a result of containment pad operations. The laboratory analytical results of this sample, identified as "CMS-CPAD-001R", are summarized in Table 4.

The dioxin results reported for the sample obtained after the removal of the containment pad were validated by Environmental Data Services, Inc. located in Concord, New Hampshire (EDR). A copy of EDR's laboratory data validation report is presented in Appendix D. As provided in this report, the dioxin results reported for this sample are valid.

A comparison of the constituents detected in the soil samples obtained prior to and after the use of the containment pad is presented in Table 5. As shown in this table, the results reported for the sample obtained following the removal of the containment pad are consistent with those reported for the sample prior to the use of the pad. Based on the validated results for sample "CMS-CPAD-001R", and on the comparison of the laboratory analytical results reported for the two soil samples, the area of the temporary containment pad has not been impacted as a result of the containment pad operations.

4.6 Temporary Access Road

A temporary access road was constructed on the west embankment of the Town Asphalt Company property. This temporary road provided access from the top of the embankment to the downstream side of the dam. Imported fill, consisting of gravel, compacted to sustain heavy vehicle traffic, was used to construct this access road. The results of a sieve analysis performed on the gravel by the material supplier were submitted to the design engineer, GEI, and to the USACE for review and approval as Construction Submittal 002. A copy of this submittal is provided in Appendix C. Based on the results of the sieve analysis, GEI and the USACE approved the use of the gravel material at the Site. Upon the completion of the construction of Allendale Dam, the temporary access road was removed and placed as fill on the upstream side of Allendale Dam.

4.7 Gate Structure Modifications

At the onset of construction activities, the gate structure included a broken stop log mechanism that had been plugged with debris and sediment. The concrete, however, was in acceptable condition, requiring only minor refurbishment. As a first step in restoring Allendale Dam, LCI refurbished the gate structure to protect temporary cofferdams to be installed in controlling and diverting water during construction activities.

A temporary berm comprised of concrete blocks, clear polyethylene sheeting, and sand bags was installed to prevent water from flowing into the gate structure. Once this berm was in place, allowing the gate structure to be dewatered, the existing gate mechanism was removed along with material, debris, and sediment. The material that was removed was temporarily placed on the containment pad until it could be transported off-Site.

Modifications to the concrete gate structure were then made by LCI. These modifications included the extension of the existing wingwall on the downstream side of the gate structure. The concrete structure was also modified by installing a mechanically-operated gate mechanism. Modifications to the gate structure also included mounting steel frames on the concrete structure as part of a stop log system to be installed. The stop log system represents a change to the design, not identified in the Dam Reconstruction Specifications included in the IWP. The stop log system is comprised of eight pressure treated 4" x 8" oak logs affixed with lag bots and lifting hooks. The sluice gate mechanism and stop log system modifications allow for the adjustment of the water level in Allendale Pond. Additional modifications to the gate structure included placing riprap in front of the gate structure, and applying a finish mortar to the concrete surface of the gate structure.

Prior to pouring the concrete wingwall, the concrete mix design was provided to the USACE for review and approval as Construction Submittal 003. A copy this submittal is provided in Appendix C. Based on this mix design, the USACE approved the use of the concrete provided that test data on the reactivity of the aggregates to be used in the concrete mix are submitted. The reactive aggregate test data were submitted to the USACE for review and approval as Construction Submittal 006. A copy of this submittal is provided in Appendix C. Based on the test data, the USACE approved the use of the concrete mix.

During the concrete pour, Briggs Engineering & Testing obtained grout cube cylinders to test the strength of the concrete. The grout cube cylinders were broken at seven days to test the strength of the concrete. The test results were submitted to the USACE for review and approval as

Construction Submittal 007. A copy of this submittal is provided in Appendix C. Based on these test results, the USACE approved the concrete

The Dam Reconstruction Specifications included in the IWP required the submittal of the manufacturer's product data and specifications for the gate mechanism and associated sluice gate. Accordingly, the product data and specifications were submitted to the design engineer and the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 004, is provided in Appendix C. Upon review of the product data, GEI recommended that the gate size be reduced from 60" x 96" to 60" x 48". Based on this recommendation, the sluice gate manufacturer, Rodney Hunt Company, provided design drawings specifying a 60" x 48" gate. These drawings were submitted to the design engineer and to the USACE for review and approval. This submittal included an affidavit of compliance issued by the manufacturer, and the manufacturer's Operation & Maintenance (O&M) Manual. A copy of this submittal, identified as Construction Submittal 009, is provided in Appendix C. Upon review of the sluice gate design drawings and the accompanying information, the sluice gate and accompanying gate mechanism were approved for installation. A figure illustrating the detailed specifications of the modified sluice gate is provided as Figure 4-2.

4.8 Water Control and Diversion

After LCI extended the wingwall and mounted the steel frames on the gate structure, the temporary concrete block berm was adjusted to divert water through the gate structure. A gravel and concrete block cofferdam was then placed upstream and downstream of the proposed dam location. The temporary cofferdams were installed to prevent water from entering the construction area during reconstruction activities. The cofferdams were installed sufficiently upstream and downstream to allow for material within the proposed dam location to be safely excavated and to allow for equipment movement within the work area.

Prior to delivery and placement of the gravel used to construct the cofferdams at the Site, a sample of the gravel was obtained. This sample was analyzed for VOCs, SVOCs, PCBs, RCRA-8 metals, TPH, and pH. The laboratory analytical results were submitted to the USACE for review and approval. Following an initial review of this submittal, the laboratory analytical results were resubmitted to provide the method of sample preparation and analysis for each test and to provide a more formal, final report of the results for the metals analysis, as requested by the USACE. A copy of the revised submittal, identified as Construction Submittal 005, is provided in Appendix C. Based on the laboratory analytical results presented in the revised submittal, the USACE approved the use of the gravel material to construct the cofferdams.

Water control and diversion measures also included plugging the raceway structure located east of Allendale Dam. This was accomplished by forming and pouring concrete plugs to seal the openings in the raceway structure. This measure resulted in the diversion of water flowing from Allendale Pond away from the raceway and through the gate structure. Plugging the raceway represents an addition to the Dam Reconstruction Specifications presented in the IWP.

4.9 Dewatering

The placement of the temporary cofferdams upstream and downstream of the proposed location of Allendale Dam diverted the flow of water away from the work area. However, a limited quantity of water continued to seep into the work area below the cofferdams. Thus, dewatering measures were taken to remove water seeping in below the two cofferdams.

Dewatering measures included the placement of sandbags along the cofferdams to seal the areas in which water was entering. These measures also included pumping water from the area below the existing dam structure. Water was pumped from a temporary sump created upstream of the work area as well as a temporary sump created downstream of the work area.

Prior to discharging pumped water back into the Woonasquatucket River downstream of the work area, the water was treated to remove suspended sediment as required by the USACE and the Rhode Island Department of Environmental Management (RIDEM). As required, pumped water was treated to meet a discharge limit equal to ten Nephelometric turbidity units (NTUs) above background conditions. In establishing background conditions, surface water samples were obtained from six areas of the Woonasquatucket River at the Site, and were measured for turbidity. The discharge limit was then established as the turbidity level equal to ten NTUs above the average of the turbidity levels that were measured and recorded. The discharge limit was established at 12.45 NTUs. The treatment system was then designed to meet this limit.

As designed, the treatment system consisted of two settling (frac) tanks; 50-micron (μ), 25 μ, and 10 μ sediment filters; and a 1,000-pound (lb) (50 gallons per minute (gpm)) and two 2,000-lb (100 gpm) carbon vessels, placed in series. A schematic of the treatment system, and the turbidity data upon which the treatment system was based, was submitted to the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 008, is provided in Appendix C. Upon the USACE's approval of this submittal, LCI initiated water treatment activities.

Water treatment activities were initiated by pumping water at a combined rate of approximately 250 gpm through the treatment system. Due to plugging of the sediment filters, the treatment system was subsequently modified. As modified, water seeping into the work area was pumped to the frac tanks and through a sand (4,500 lbs) and gravel (2,000 lbs) filter.

Dewatering activities continued until the concrete wall of the new dam was formed and poured. Upon the completion of the dewatering activities, the frac tanks were cleaned and emptied by pumping the water and residual sediment from the frac tanks through the sand and gravel filter. The sediment that was mechanically filtered from the water was placed in lined roll-off containers with the carbon, sand, and gravel used as part of the treatment systems. This material was temporarily stored in the roll-off containers until the material could be transported off-Site.

4.10 Removal of Debris and Sediment

Restoring the existing dam included the removal of sediment, metal, wood, trash, and other dry debris that had been deposited behind the dam. Once this material was removed and the temporary cofferdams were constructed to dewater the work area, material in the proposed location of the new dam was removed. This material included timbers set within the river bed at the base of the existing dam and the underlying sediment. The timbers at the base of the existing timber-frame structure were excavated, cut, and placed on the containment pad. The wood timbers were subsequently chipped and placed in lined roll-off containers along with sediment that was later excavated from below the existing dam. The timber frame located on the upstream side of the proposed location of the new dam remained in place, as any attempt to remove this structure would have jeopardized the safety of the dam reconstruction activities.

In removing sediment from below the existing dam, the sediment was first stockpiled at the base of the west embankment to allow the material to free drain. The sediment was then placed in lined roll-off containers within which sawdust had been placed to adsorb any remaining free liquids. The roll-off containers were temporarily staged on the former Town Asphalt Company property until they could be transported off-Site.

As per the Dam Reconstruction Specifications provided in the IWP, all of the sediment was to be excavated to expose the underlying bedrock surface. Based on the USACE's initial design, upon which GEI's design was based, the surface of the bedrock was inferred to be between one foot to two feet below the timber frame. However, the bedrock surface was discovered to be as much as ten feet below this elevation. This finding was initially made in setting the temporary sumps to dewater the work area. The depth of the bedrock surface below the timbers was confirmed

during the advancement of borings/rock cores by Guild Drilling Company, Inc. (Guild). Guild advanced three borings/rock cores, LEA-1, LEA-2, and LEA-3, in assessing the competency of the bedrock. Also at this time, a trench was excavated in the proposed area of the new dam. The boring reports provided by Guild were submitted to the USACE for review and approval as Construction Submittal 010. A copy of this submittal is provided in Appendix C. Based on the findings summarized in the boring reports and on the findings of the excavated trench, it was confirmed that the bedrock surface exists approximately five to ten feet below the timber frame. Necessary modifications made to the design resulted in the excavation of less sediment than was contemplated.

4.11 Off-Site Destruction of Debris and Sediment

The debris and sediment removed from the area of the dam were placed in lined roll-off containers covered with a bed of sawdust to adsorb any free liquids released from the material. Once the debris and sediment were placed, a bowed tarpaulin cover was secured over each container. The roll-off containers were temporarily staged on the former Town Asphalt Company property, pending transportation off-Site.

Approximately 340 tons of debris and sediment were removed from the area of the dam and placed in the roll-off containers. The debris and sediment were then transported in the containers for off-Site disposal. Approximately 315 tons of the debris and sediment were transported to Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility in Saint-Ambroise, Quebec, Canada for destruction through incineration. A copy of the annual report submitted to EPA summarizing the export of this material is provided in Appendix E, along with the corresponding copies of the transportation manifests and Certificates of Destruction. Following EPA approval pursuant to the Off-Site Rule set forth in the NCP, the remaining material (sediment, metal, wood, trash, and other dry debris) was transported to the Chemical Waste Management (CWM) - Chemical Services, L.L.C. Subtitle C facility located in Model City, NY for disposal. Copies of the transportation manifests and Certificates of Disposal provided by CWM are included in Appendix F.

4.12 Design Modifications and Dam Construction

Based on the depth of bedrock below the dam, GEI assessed whether the new dam could be built on the till material that exists above the rock. After concluding that the size of the footing for the proposed dam was adequate; the material above the bedrock was suitable to carry the loads of the dam and water; the rock anchors, as initially specified and designed, would still be effective; and

the flow under the dam could be controlled with a toe drain system and grouted riprap spill pad, GEI modified the design. The modified design specified that the new dam be seated on undisturbed till immediately below the timber of the old dam.

The construction of Allendale Dam in accordance with the modified design incorporated the placement of a layer of 3/8" crushed gravel at the base of the dam. This layer, approximately eighteen inches thick, provides a toe drain for the new dam. A copy of the gradation analysis of the 3/8" crushed gravel was submitted to the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 012, is provided in Appendix C. Upon the USACE's approval of this submittal, LCI initiated the placement and compaction of the toe drain material. In constructing the toe drain, LCI placed the 3/8" crushed gravel in stages so that the toe drain could be extended beyond the gate structure.

The design of the new dam was also modified to incorporate the existing granite wall abutment along the west embankment. During the excavation of the timber dam and surrounding sediment, the existing granite wall was observed to extend below the dam footing elevation. Thus, the design of the new dam was modified to keep the granite wall in place. The design modification proposed by GEI and approved by the USACE included adjusting the concrete dam so that it extends into the west embankment immediately downstream of the existing wall, providing approximately eight feet of overlap with the existing granite wall abutment.

The concrete dam was adjusted approximately nine inches over 105 feet to extend into the embankment immediately downstream of the granite wall. A detailed design of this modification provided by GEI is provided in Appendix G. This design modification incorporates the placement of a waterstop concrete accessory required and approved by the USACE. The specifications of the concrete waterstop, identified as Construction Submittal 013 are provided in Appendix C.

Upon the USACE's approval of this design modification, LCI excavated material from the west embankment immediately downstream of the existing granite wall abutment. LCI then "chinked" and stabilized the existing wall by applying mortar to the granite wall abutment in preparation of placing the concrete dam footing. Prior to forming and pouring the concrete footing, a reinforcing steel bar (rebar) bending diagram and the specifications for the concrete joint filler and joint sealant were submitted to the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 015, is provided in Appendix C. Once approved by the USACE, the dam footing was poured by Horton Construction Company, Inc.

During the concrete pour, Briggs Engineering & Testing inspected the rebar and obtained grout cube cylinders to test the strength of the concrete. Copies of the inspection reports are provided in Appendix H. The grout cube cylinders were broken at seven and 28 days to test the strength of the concrete. The test results were submitted to the USACE for review and approval as Construction Submittals 014 and 014a. Copies of these submittals are provided in Appendix C. Based on these test results and the results of the inspections performed by Briggs Engineering & Testing, the USACE approved the concrete.

In preparation of forming and pouring the concrete wall, specifications for the concrete form liner were submitted to the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 016, is provided in Appendix C. Upon approval from the USACE, the concrete wall was formed and poured. As specified, an elastomeric textured concrete form liner was used to provide an Ashlar Stone Texture concrete pattern on the exposed face of the concrete dam wall. Once set in place, granite cap stones were affixed to the top of the dam wall.

After the concrete dam was constructed, a grouted riprap pad was placed over the top of the toe drain material to serve as a scour pool to protect the toe drain from damage due to water falling over the spillway. The grouted rip rap pad was designed and constructed to be approximately three feet thick. This pad extends fifteen feet downstream from and over the length of the dam (approximately 100 feet). The design specifications for the toe drain and grouted riprap pad, as approved by the USACE, are provided in Appendix I. Loose riprap was placed over the grouted rip rap pad.

To seal off the pea gravel layer below the dam, a loose lean concrete flowable fill was placed just upstream of the dam, between the new dam wall and the portion of the old dam that was left in place. The flowable fill mix design and specifications were submitted to the USACE for review and approval. A copy of this submittal, identified as Construction Submittal 017, is provided in Appendix C. Once approved by the USACE, the flowable fill was placed as specified. After the flowable fill was set in place, the lower cofferdam was removed and the cofferdam material was placed on top of the flowable fill material.

Seating the new dam on the dense, undisturbed till required that additional modifications to the design be implemented. The additional design modifications included modifications to the methods for rock drilling and anchor bolt installation. The rock anchor bolt specifications approved by the USACE are provided as Submittal 001 as part of Appendix C. The revised design required the installation of the rock anchor bolts through a four to ten foot thick layer of dense till. The specific rock anchor bolt installation procedure that was used is provided in

Appendix J. This procedure included the requirement that the anchor lock-off load be revised from 150 kips to 100 kips. Upon the USACE's approval of this revised procedure, Terra Drilling Company, Inc. (Terra), installed the rock anchors. Once installed, Terra tested the lock-off loads on each rock anchor. Based on the tests performed by Terra, all of the rock anchors were satisfactorily installed. The rock anchor test results approved by the USACE are included as Construction Submittal 018 in Appendix C.

4.13 Restoration

Restoration activities included the placement of topsoil along the east and west embankments of Action Area 8. Approximately four inches of topsoil were placed in accordance with the specifications provided in the IWP. Hydroseed was then applied to the topsoil in accordance with the specifications provided in the IWP. The hydroseed was applied in re-establishing a suitable stand of growth in the areas that had been disturbed during the reconstruction of Allendale Dam.

4.14 Dam Inspection

Following the completion of construction activities associated with the restoration of Allendale Dam, a pre-final dam inspection was performed by EPA, the USACE, RIDEM, and LCI personnel on April 3, 2002. Based on this inspection, a "punch-list" of final tasks needed to be completed was developed. The remaining "punch-list" of tasks included the following items:

- Remove the temporary electrical drop from the former field office trailer location;
- Remove the pile of weeds and brush generated when the trailer location was prepared;
- Transport and dispose of the remaining debris requiring off-Site disposal as part of the dam reconstruction activities;
- Install the remaining piece of the sluice gate opener; and
- Install a steel plate over the existing hole in the gate structure above the location of the new sluice gate.

Documentation summarizing the pre-final dam inspection is provided in Appendix K.

Subsequent to completing these tasks, a final inspection of the Allendale Dam restoration activities was performed by EPA, USACE, RIDEM, and LCI. This inspection was performed on June 17, 2002, at which time the "punch-list" of tasks were reviewed. During the inspection, it was noted that the electrical power drop was removed; the weed pile created when the trailer was mobilized to the Site was removed; the areas along the embankments were seeded and grass was

established; all remaining debris stockpiled on the containment pad was transported off-Site for proper disposal; the remaining piece of the gate opener was installed; and all equipment was removed from the Site. Based on this final inspection, EPA acknowledged that the construction activities associated with the restoration of Allendale Dam were complete. Documentation summarizing the final dam inspection is provided in Appendix K.

Subsequent to performing the inspections of Allendale Dam, seepage was observed to be flowing from the stone wall of the east embankment located adjacent to outlet of the sluice gate structure. To secure the embankment, LCI placed grouted rip rap over the soil located downstream of the sluice gate structure. Also, additional grouting activities were performed to fill the potential voids beneath the sluice gate structure and to mitigate the observed seepage. The grouting activities were conducted by Jeans Waterproofing, Inc. of Auburn, Maine on October 21, 2004. Representatives of GEI and the USACE were on-site to observe the grouting activities. Approximately 100 gallons of Aqua-Tite grout were pumped below the sluice gate structure to fill the existing voids. A dye test was performed at the conclusion of the grouting activities and was used to confirm that the observed seepage had been mitigated. A summary of the grouting activities is provided in the memorandum included in Appendix K.

5. SOIL AND SEDIMENT EXCAVATION

5.1 Overview

A summary of the methods and procedures used to define the limits of excavation is provided in this section. A summary of the methods and procedures used to excavate the areas containing potentially dioxin-impacted soil and sediment is also provided. As discussed below, potentially impacted soil and sediment were removed from the Action Areas generally defined by EPA. The vicinity of the Action Areas defined by EPA are illustrated in Drawings 1-1, 1-2, 1-3, and 1-4. These areas are characterized as areas containing:

- Flood plain sediments in Allendale Pond between elevations of 92.5 and 93.5 feet above mean sea level, referenced to the NGVD;
- Flood plain sediments in Lymansville Pond between the existing shoreline and into the pond to a depth of one foot of water;
- Residential and recreational-use soils between elevation 93.5 feet above mean sea level and the ten-year flood elevation along the eastern shoreline of Allendale Pond and the Allendale reach of the Woonasquatucket River; and
- Residential and recreational-use soils along the eastern shoreline of Lymansville Pond and the Lymansville reach of the Woonasquatucket River.

A topographic survey was first performed to field locate these areas as well as the sampling locations, as specified in the IWP. Soil and sediment samples were then obtained and analyzed in defining the limits of excavation within each Action Area. Sampling was conducted in Action Area 1 pursuant to the IWP. However, EPA excluded excavation in Action Area 1 from the NTCRA so that this area could be addressed at a later date. In September 2003, EPA and ten responsible parties signed an Administrative Order on Consent that provides for capping in and near Action Area 1.

Once defined, the impacted soil and sediment were excavated and the areas of excavation were restored. Excavation techniques and procedures were employed to minimize disturbance and impacts to the surrounding residential and recreational-use properties. A detailed description of the activities performed in removing impacted soil and sediment is provided in the following sections.

5.2 Surveys

5.2.1 Photographic Survey

The photographs presented in Appendix B include a photographic survey of the activities completed at the Site in the Action Areas defined by EPA. In general, these photographs document the conditions of each Action Area from which soil and/or sediment were removed. The photographs depict the conditions prior to, during, and after the completion of the excavation and restoration activities. The photographs also provide a record of the material handling and storage operations associated with the excavated soil and sediment. Reference to the photographs presented in Appendix B is made at this time to facilitate an understanding of the methods and procedures implemented during the soil and sediment excavation component of the NTCRA.

5.2.2 Topographic Survey

A topographic survey was performed by Guerriere & Halnon, Inc, a Rhode Island licensed professional land surveyor, to field locate the 92.5-foot and 93.5 foot elevation, the ten-year flood elevation, and sampling locations within each Action Area along the eastern shoreline of Allendale Pond and the Allendale reach of the Woonasquatucket River. The elevation of the crest of Lymansville Dam was also surveyed to identify the elevation of Lymansville Pond and to field locate the horizontal limits of the Action Areas that are below at least one foot of water along the eastern shoreline of Lymansville Pond and the Lymansville reach of the Woonasquatucket River. The elevation of Lymansville Pond was surveyed at approximately 77 feet above mean sea level. The sampling locations within each Action Area along the eastern shoreline of Lymansville Pond and the Lymansville reach of the Woonasquatucket River were also field located.

5.3 Sampling and Analytical Approach

Although each Action Area was established in general by the EPA, previously obtained data were insufficient to adequately define the limits of excavation within each Action Area. To define the limits of excavation and as required by the Order, LEA implemented a sampling and analysis (immunoassay screening) program. In accordance with this program, soil and sediment samples were obtained from within Action Areas 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12. Impacted sediments within Action Area 8 were addressed during the construction activities associated with restoring Allendale Dam.

The soil and sediment samples were obtained from the locations staked by the surveyor in accordance with the FSP. These sample locations were centered on previous sample locations characterized by EPA as containing concentrations of dioxin that exceed 1 ppb. In accordance with the FSP, a grid-based sampling approach was implemented to define the limits of soil and sediment containing concentrations of dioxin that exceed 1 ppb. Generally, three samples were obtained from each residential-use or recreational-use soil sample location. The samples were obtained from three discrete depth intervals identified as 0-6", 6-12", and 12-24" below grade. Two samples were obtained from each floodplain sediment sample location at depths of 0-6" and 6-12" below grade.

In accordance with the FSP, the soil and sediment samples were obtained using clean stainless steel bucket augers, trowels, spades, or macro-core sampling tubes. Each sample was thoroughly mixed and homogenized. If standing water was observed to be present on the sample, an attempt was made to dry the sample by placing the sample on an absorbent pad to wick water away from the sample. Each sample was examined and a general description of the soil or sediment was recorded on a geologic boring log.

Following homogenization, each sample was placed directly into a Teflon®-lined, four-ounce glass jar. The sample jars were then placed on ice in a cooler in preparation for transporting the samples to LEA's laboratory. The samples were delivered to LEA's laboratory by ground courier under proper Chain-of-Custody documentation.

The soil and sediment samples were screened for 2,3,7,8-TCDD using a Competitive Enzyme Immunoassay (EIA) methodology at LEA's laboratory. The EIA methodology was used to provide a relatively rapid indication of the presence of dioxin at concentrations that likely exceed 1 ppb. The EIA screening results were intended to provide "real-time" data in assessing the need to refine the limits of dioxin-impacted soil and sediment. As such, the results were used to guide characterization efforts by means of an adaptive sampling strategy, in which the screening results were used to readily direct the collection of the next round of samples. The screening results were used to provide a general indication of the limits of excavation; the specific limits of excavation were based on laboratory analytical results for the samples analyzed in accordance with EPA Method 8290.

5.4 Revised Sampling and Analytical Approach

5.4.1 Overview

Based on initial EIA screening results, elevated levels of dioxin appeared to extend beyond the limits of the Action Areas defined by EPA. To better understand the possible extent of dioxin-impacted soil and sediment at the Site, LEA implemented a revised sampling and analytical program. This revised program was implemented to assess the extent of elevated levels of dioxin beyond the limits of the EPA-identified Action Areas. The revised sampling approach is described in Amendment 03 to the IWP, which was approved by EPA. A summary of the procedures used in implementing the revised sampling and analytical approach are discussed below.

5.4.2 Evaluating the Distribution of Dioxin-Impacted Soil and Sediment

To ascertain whether dioxin-impacted soils and sediments exist beyond the EPA-defined Action Areas, samples were obtained during April 2002 from twenty boring locations adjacent to Allendale Pond. The sample locations are illustrated in Figures 5-1 through 5-10. The sample locations illustrated in these figures were assigned an alphanumeric code that identifies locations from where the samples were obtained (adjacent to Allendale Pond (AP)), the type of sample (delineation), and the sequential sample number (01 through 20). According to this sampling nomenclature, the delineation samples obtained to assess the extent of dioxin beyond the EPA-defined Action Areas were identified as AP-DEL-01 through AP-DEL-20.

As a first step in obtaining samples from these locations, the survey subcontractor staked the sampling locations in the field. Two samples were obtained from each staked location. The samples were obtained using a stainless steel bucket-auger, macro-core drive tube, or hand trowel, as Site conditions dictated from a depth of 0–12 inches and 12–24 inches below the ground surface. Thus, a total of 40 samples were obtained.

The samples were analyzed by Severn Trent Laboratories, Inc. (STL) located in Sacramento, California using EPA Method 8290. The laboratory analytical results were validated by EDR in accordance with the Region I Data Validation Functional Guidelines for Evaluating Environmental Analyses. The data validation summary report for this sampling event was submitted to EPA under correspondence dated October 4, 2002 (Appendix A).

The validated results were evaluated relative to the 1.0 ppb criterion. A summary of the laboratory analytical results is provided in Table 6. The results for each sample location are also

shown in Figures 5-1 through 5-10. As shown in Table 6, one sample, AP-DEL-04, was reported to contain a concentration of dioxin above 1 ppb. All of the remaining samples were reported to contain concentrations of dioxin below 1 ppb. Based on these results, and in accordance with Amendment 03 to the IWP, a modified, grid-based sampling approach was used to obtain additional samples in delineating the specific limits of dioxin at the Site. The delineation of the specific limits of dioxin included sampling soil around sample location AP-DEL-04, defined as Action Area 03/04.

5.4.3 Defining the Specific Limits of Dioxin-Impacted Soil and Sediment

To define the specific limits of dioxin-impacted soil and sediment, a modified, grid-based sampling approach, approved by EPA, was adopted. In general, the grid-based approach was based on EPA sample locations that were reported to contain dioxin concentrations greater than 1.0 ppb and that were used by EPA to define the Action Areas. The EPA sample locations are noted in Drawings 1-1 through 1-4.

For each EPA sample location reported to contain dioxin concentrations greater than 1.0 ppb, a triangular-grid (five-foot grid) was staked in the field. The grid was centered on the EPA sample location. At each node of the grid, a composite sample comprised of three grab samples collected within approximately one foot of the node was obtained. The grab samples were obtained from a depth of 0-24 inches below the ground surface, or from the ground surface to the water table for those areas where the water table was clearly identified and present above a depth of 24 inches. The locations, sampled during July 2002, are illustrated in Figures 5-11 through 5-22.

For the Action Areas defined by EPA results of sediment samples obtained below the elevation of the pond(s) (e.g., Action Areas 5, 6, and 11), three soil borings were advanced to a depth 24 inches (or to the water table), upslope and east of the EPA sediment sample locations. The locations of these soil borings are shown in Figures 5-16, 5-17, and 5-21. These soil borings were spaced approximately five feet apart. A composite sample comprised of the soil obtained from these three locations was prepared. A similar sampling approach was used to define the specific limits of dioxin-impacted soil surrounding sample location AP-DEL-04 (Action Area 03/04), as shown in Figure 5-14.

In obtaining the samples used to define the specific limits of dioxin, the surveyor staked the sampling locations in the field. The samples were obtained from each staked location, as planned, using a stainless steel bucket-auger, macro-core drive tube, or hand trowel, depending

upon Site conditions. Each sample was examined and a general description of the soil or sediment was recorded on a geologic boring log. Copies of the geologic boring logs are provided in Appendix L.

Each sample was assigned a unique sample location identification number consisting of an alphanumeric code that identifies that the samples were obtained within a specific "Action Area" (01), the type of sample (delineation), and a sequential sample number. According to this sampling nomenclature, the delineation samples obtained to assess the extent of dioxin within the Action Areas were identified, for example, as "01-DEL-100".

The samples were analyzed by STL using EPA Method 8290. The laboratory analytical results were validated by EDS in accordance with the Region I Data Validation Functional Guidelines for Evaluating Environmental Analyses. The data validation summary report for this sampling event was submitted to EPA under correspondence dated October 4, 2002 (Appendix A).

The validated results were evaluated relative to the 1.0 ppb criterion. A summary of the laboratory analytical results is provided in Table 7. The results for each sample location are also shown in Figures 5-11 through 5-22. As shown in Figure 5-11, the limits of dioxin-impacted soil and sediment are not defined by the laboratory analytical results for the samples obtained. Concentrations of dioxin reported to be present in these samples exceed 1.0 ppb. Upon further evaluation of the information provided for this Action Area, EPA excluded Action Area 1 from the NTCRA so that this area could be adequately addressed at a later time. As shown in the remaining figures, with the exception of Action Area 03/04 and Action Area 10, the limits of impacted soil and sediment are defined by the laboratory analytical results of the samples obtained.

As shown in Figure 5-14, the limits of dioxin are not defined by the samples obtained. Samples obtained from location 03/04-DEL-101 and from location 03/04-DEL-103 were reported to contain concentrations of dioxin that exceed 1.0 ppb. Accordingly, the sampling grid was expanded as approved by EPA to obtain additional samples from sample locations 03/04-DEL-104 and 03/04-DEL-105. These additional samples were obtained and analyzed on September 10, 2002 in accordance with the above-referenced protocol. Also, as shown in Figure 5-20, the sample obtained from location 10-DEL-303 was reported to contain a concentration of dioxin that exceeds 1.0 ppb. Thus, on September 10, 2002 a sample from location 10-DEL-304 was obtained and analyzed in accordance with EPA approval and the above-referenced protocol. The laboratory analytical results for the samples obtained on September 10, 2002 were validated by EDS in accordance with the Region I Data Validation Functional Guidelines for Evaluating

Environmental Analyses. The data validation summary report for this sampling event was submitted to EPA under correspondence dated November 8, 2002 (Appendix A). The validated results were evaluated relative to the 1.0 ppb criterion. A summary of the laboratory analytical results is provided in Table 8. The results for these additional sample locations are also shown in Figure 5-14 and Figure 5-20. Based on these results, the limits of dioxin were defined within these Action Areas.

5.5 Soil and Sediment Removal

Based on the laboratory analytical results used to define the specific limits of dioxin-impacted soil and sediment, Amendment 04 to the IWP was prepared and later approved by EPA. This amendment describes modified procedures to be used in removing the impacted soil and sediment. The impacted soil and sediment were excavated during October – December 2002. A summary of the procedures used in removing the soil and sediment, in accordance with Amendment 04 is provided in this section.

Prior to excavating soil and sediment from Action Areas 2, 3, 03/04, 4, 5, 6, and 7, the elevation of Allendale Pond was lowered by removing stop logs and raising the associated sluice gate at Allendale Dam. Prior to excavating soil and sediment from Action Areas 9, 10, 11, and 12 adjacent to Lymansville Pond, a temporary cofferdam was placed sufficiently beyond the proposed excavation limits of each area to minimize the amount of water in the excavation area. The temporary cofferdams were constructed of staked hay bales placed in front of a water-filled portable barrier (Aqua Dam®). As presented in Amendment 04 to the IWP, water was pumped from these areas over the cofferdams and back into Lymansville Pond in dewatering the areas of sediment removal.

The limits of excavation within each Action Area were identified by survey and were staked in the field. These limits are illustrated in Figures 5-12 through 5-22. Soil and sediment were excavated from within the marked excavation boundaries using a vacuum truck system, light construction equipment, and hand tools. The vacuum truck system, operated by Environmental Remediation Services, LLC (ERS), was comprised of a vacuum and hose system, capable of excavating soil and sediment over great distances. Using this technique, soil and sediment were excavated and vacuumed directly into the body of the vacuum truck. The use of the vacuum truck system minimized the disturbance to the residential properties.

Within each of the areas of excavation, the soil and sediment were excavated to a depth of two feet below ground surface. The depth of each excavation was measured in the field using a

batter board to assure uniformity of the excavation and to verify that the proposed two feet of soil and sediment had been excavated.

The excavated soil and sediment were transported in the vacuum truck from each area of excavation to the containment pad. The amount of material excavated from within each Action Area was recorded on a Bill of Lading, a copy of which was maintained by ERS in transporting each load of excavated material to the containment pad. The Bill of Lading documentation is provided in Appendix M. Approximately 100 cubic yards of soil and sediment were excavated.

Free liquids that were removed with soil and sediment were readily adsorbed by sawdust placed in the body of the vacuum truck prior to the excavation process. Any remaining free liquids were removed from the body of the vehicle to the extent practicable prior to placing the soil and sediment on the containment pad. The free liquids were treated using a bag filter and carbon polish treatment train prior to being discharged to the Woonasquatucket River at the base of Allendale Dam. Once the treatment process was complete, the carbon used to treat the liquids was placed on the containment pad along with the excavated material until it could be transported for off-Site disposal.

After transporting the material to the containment pad, sawdust was thoroughly mixed within the soil and sediment to adsorb any remaining free liquids. Once thoroughly mixed, the stockpiled material was leveled-off to a uniform height of approximately five feet, and encompassing an approximate area of 15 feet by 40 feet. The material placed on the containment pad was covered with polyethylene sheeting, and the containment pad was secured pending transportation to an off-site disposal facility.

Upon completing the removal of soil and sediment from each Action Area, the elevation of Allendale Pond was restored by closing the sluice gate and resetting the stop logs at Allendale Dam. The temporary cofferdams placed in the Action Areas adjacent to Lymansville Pond were removed. In addition, the material stockpiled on the containment pad were properly disposed and the Site was restored as described in the sections that follow.

5.6 Characterization of Excavated Material

The material excavated from each Action Area and stockpiled on the containment pad was sampled to characterize the material for off-Site disposal. The samples were obtained in accordance with the EPA-approved protocol outlined in Appendix N. The samples were

obtained to identify the dioxin concentration in the soil and sediment, and to identify whether the soil and sediment exhibit hazardous characteristics.

In accordance with the prescribed sampling protocol, LEA obtained samples from the stockpiled material. Four separate composite samples were obtained: COMP-C1, COMP-D1, COMP-D2, and COMP-D3. As illustrated in the schematic provided in Appendix N, sample COMP-C1 was obtained by dividing the entire stockpile into two layers: each containing eight grid nodes. The layers were located at 1/3 depth (1.7 feet) and 2/3 depth (3.3 feet) of the stockpile. Six sample locations were then randomly selected from the 16 numbered grid nodes. Using a stainless steel auger bucket, one grab sample was obtained from each of the six sample locations. Grab samples were obtained from node locations 3, 4, and 7 at 1/3 depth of the stockpile; and from node locations 10, 11, and 12 at 2/3 depth of the stockpile.

Each grab sample was screened for the presence of VOCs using a photoionization detector (PID). Based on this field screening, a portion of the sample exhibiting the highest VOC reading was submitted to STL in Connecticut for the analysis of VOCs. This sample was obtained from Node-3. The remainder of this sample was composited with the five remaining grab samples. This composite sample was vigorously homogenized and was submitted to STL-Connecticut for the analysis of SVOCs, TPH, PCBs, RCRA-8 metals (mass), pesticides and herbicides, reactivity, ignitability, and pH. The results of the analyses were used to assess whether or not the soil and sediment is characteristically hazardous.

Three additional composite samples, COMP-D1, COMP-D2, and COMP-D3, were obtained to assess the concentration of dioxin in the soil and sediment. First, the stockpile was divided into three equal sections, as shown in the schematic provided in Appendix N. Each section was divided into two layers; each containing eight grid nodes. The layers were located at 1/3 depth (1.7 feet) and 2/3 depth (3.3 feet) of the stockpile. Six sample locations were then randomly selected from the 16 numbered grid nodes within each section. Using a stainless steel auger bucket, one grab sample was then obtained from each of the six sample locations within each section. The sampled node locations are illustrated in the schematic provided in Appendix N. The grab samples obtained within each section were combined to form one composite sample for each section. Each composite sample was vigorously homogenized. The three composite samples were submitted to STL-Sacramento, California for the analysis of dioxin.

The results of the grab sample obtained from Node-3, and the composite sample, COMP-C1, analyzed by STL in Shelton, Connecticut are summarized in Table 9. As presented in Table 9, the concentration of lead detected in the composite sample was 149 milligrams per kilogram

(mg/kg). To assess whether the soil/sediment was characteristically hazardous for lead (>5.0 milligrams per liter (mg/l)), a toxicity characteristic leachate procedure (TCLP) was performed on the composite sample. As presented in Table 9, a reported TCLP result of 0.153 mg/l demonstrates that the material was not characteristically hazardous for lead. Based on this result and the other waste characterization results, the soil and sediment was characterized as non-hazardous.

The results of composite samples COMP-D1, COMP-D2, and COMP-D3 analyzed by STL-Sacramento are summarized in Table 10. As shown in Table 10, the total TEQ concentration calculated for two of the samples (COMP-D1 and COMP-D3) is 0 ppb. The total TEQ concentration for the third sample is 0.63 ppb. Thus, the dioxin concentration within the stockpiled material was below the human health risk-based criterion of 1.0 ppb (TEQ).

5.7 Disposal of Excavated Material

Based on the characterization results obtained for the stockpiled material, EPA authorized the disposal of the material at an off-Site disposal facility, pending approval of the facility in accordance with the Off-Site Rule set forth in the NCP. Arrangements were made to dispose of the material at the CWM Subtitle C facility located in Model City, New York. Upon receipt of confirmation from EPA that the CWM Model City, New York facility is operating in compliance with the applicable Off-Site Rule requirements, the stockpiled material was transported to this facility. Copies of the Non-Hazardous Waste Manifests documenting the proper transportation of the material to this facility are provided in Appendix O. Approximately 125 tons of material were transported to and disposed at this facility. Copies of the Certificates of Disposal for the non-hazardous material are provided in Appendix P.

5.8 Site Restoration

Site restoration activities performed during the soil and sediment excavation component of the NTCRA included backfilling soil borings advanced through soil located on residential-use and recreational-use properties. Upon completing each boring, the soil borings were backfilled with topsoil. As provided in the IWP, the borings advanced through floodplain sediment were not backfilled.

The Site restoration activities also included backfilling areas excavated for the removal of soil and sediment. Upon the removal of the soil and sediment from the limits of each excavation, these areas were backfilled with clean bank run gravel. The gravel was placed to an elevation of

approximately four inches below the pre-disturbed elevation in landscaped areas, and to the pre-disturbed grade in all other areas. For the landscaped areas, the areas of excavation were restored to the pre-disturbed grade by placing approximately four inches of clean topsoil. Once the topsoil was placed, these areas were seeded in re-establishing a proper stand of vegetation.

Restoration activities completed at the Site also included the removal of the temporary fence surrounding the concrete containment pad and demolition and removal of the pad. Prior to the demolition of the containment pad, the polyethylene liner covering the pad was removed for off-Site disposal with the excavated material. The concrete blocks were then removed from the pad, and the pad was demolished. The resulting concrete rubble was transported to Pond View Concrete, a concrete recycling facility. After removing all of the concrete rubble, the area of the pad was graded to pre-disturbed elevations.

5.9 Site Inspection

Following the completion of soil and sediment excavation activities, a pre-final inspection was performed by EPA, the USACE, RIDEM, and LEA personnel. This inspection was performed on September 9, 2003 to identify final actions that may be necessary in closing out the field work performed pursuant to the Order. The inspection included an inspection of each Action Area from which soils and sediments were removed. The Site inspection also included an inspection of the area where excavated soils and sediments were temporarily staged on the concrete containment pad. In addition, the inspection included an inspection of the earthen embankment adjacent to Allendale Dam. The embankment was inspected to assess the adequacy of the vegetative cover on the embankment soils.

Based on this inspection, a "punch-list" of final tasks needed to be completed was developed. This "punch-list" of tasks included the following items:

- Action Area 2: Properly secure the chain-link fence surrounding the Grenier residence property.
- Action Area 9: Provide loam and seed to a limited portion of exposed gravel within this Action Area.
- Concrete Containment Pad Area: Remove several "Hazardous Materials" warning signs that were posted on the chain-link fence in this area.
- Allendale Dam Earthen Embankment: Remove a small (approximately two-inch diameter) tree present adjacent to the sluiceway gate structure.

Based on the inspection performed, no other actions were required. Documentation summarizing the pre-final inspection is provided in Appendix K.

Subsequent to completing these tasks, a final inspection of the areas affected by the soil and sediment removal activities was conducted by EPA, RIDEM, and LCI. This inspection was conducted on October 7, 2003, at which time the "punch-list" deficiencies identified during the September 9, 2003 pre-final inspection were reviewed. Specifically, the inspection was performed to verify that the "punch-list" deficiencies have been corrected and that the NTCRA performance standards have been met.

During the final inspection it was noted that: the chain-link fence surrounding the Grenier residence property had been secured by affixing several pieces of appropriately-gauged wire to the fence; loam had been placed over the limited portion of exposed gravel within Action Area 9 and growth had been re-established in this area through proper seeding; the "Hazardous Materials" warning signs posted on the chain-link fence in the area of the concrete containment pad were removed; and the tree present adjacent to the sluiceway gate structure was cut at its base and removed, and that the remaining stump was sealed with a prune sealer to prevent the re-growth of any offshoots.

Based on this final inspection, EPA acknowledged that the field work required pursuant to the Order was complete and that the performance criteria of the NTCRA had been attained. Documentation summarizing the final inspection is provided in Appendix K.

SECTION 6

6. ACCESS RESTRICTIONS AND INSTITUTIONAL CONTROLS

In accordance with the ICP and the Order, a Declaration of Covenants and Environmental Protection/Conservation Easement (easement) was prepared that restricts alteration of Allendale Dam in any way until such time as the dam is no longer considered by EPA to be necessary for meeting the response action objectives at the Site, and that grants to RIDEM a right of access to the dam. The easement runs with the land and is binding on all successors and assigns of the current owner of Allendale Dam: THE MILL AT ALLENDALE CONDOMINIUM (Mill at Allendale). The easement was submitted to the Mill at Allendale and to EPA for review. Upon receiving the necessary approvals from EPA, the document was presented to the Mill at Allendale for execution. The easement was executed on October 24, 2002 and was recorded in the Land Evidence Records of the Town of North Providence and the Town of Johnston on March 11, 2004. A certified copy of the recorded document is provided in Appendix Q. The recorded document ensures the functional integrity of Allendale Dam.

Because none of the property where access and/or land/water use restrictions that are needed to implement the Order is owned or controlled by any of the Respondents, no easement or other institutional controls are required with respect to property owned by the Respondents.

SECTION 7

7. POST-REMOVAL SITE CONTROL PLAN

In accordance with Paragraph 5 of the implementation phase of the SOW, a PRSCP was prepared and submitted to EPA on January 6, 2003. In general, the PRSCP specifies that Allendale Dam shall be maintained to assure the proper function of the dam. Specifically, this plan provides a schedule for inspection, continued maintenance, and repair of Allendale Dam. Specific provisions of the PRSCP also include provisions for fulfilling documentation and reporting requirements.

SECTION 8

8. COSTS FOR THE NON-TIME CRITICAL REMOVAL ACTION

8.1 Overview

As of April, 2005, the total cost for the activities performed by LEA in satisfying the performance criteria of the NTCRA is approximately $2,257,745. This cost includes the cost to prepare this document. A final total cost for the completion of the activities performed will not be available until this CWR has been approved by EPA.

Following a presentation of the costs for the engineering design, including the preparation of design documents and specifications, the costs for the dam reconstruction component of the NTCRA is provided in this section. The costs for the soil and sediment removal component of the NTCRA is also provided. This section is also used to present the costs associated with waste disposal.

8.2 Engineering Design

The engineering design associated with the implementation of the NTCRA SOW included several deliverables. As presented in Section 3, these deliverables included securing authorization to access properties not owned by the Respondents. These deliverables also included the preparation of the Design Work Plan and associated design documents, the preparation of the ICP, and the preparation of the IWP and associated documents. The total cost for obtaining access and preparing the engineering design deliverables is approximately $157,245.

8.3 Construction of Allendale Dam

The costs to restore Allendale Dam include costs for mobilization/demobilization and costs for implementing administrative and Site controls. In general, these costs also include costs for sediment excavation, dewatering and wastewater treatment. Costs for Site restoration and additional grouting activities are also included. The total cost associated with these items is $828,400.

8.4 Removal of Soil and Sediment

The costs to remove soil and sediment include costs for delineating the limits of excavation, including costs associated with field sampling and laboratory analysis. These costs also include costs for excavating soil and sediment, managing excavated material, and restoring the Site. In general, these costs also include coordinating and attending project meetings, performing

community relations support activities, preparing reports, and preparing the PRSCP. The total cost associated with these items is approximately $1,034,000.

8.5 Transportation and Off-Site Disposal of Waste

The total cost for the transportation and off-Site disposal of waste is approximately $238,100. This cost includes the costs associated with the materials removed during the restoration of Allendale Dam that were subsequently transported to and incinerated at Bennett's facility in Saint-Ambroise, Quebec, Canada, and that were transported to and disposed at the CWM facility in Model City, New York. This cost is approximately $209,500. The cost for the transportation and off-Site disposal of waste also includes the costs associated with the materials removed during the excavation of soil and sediment that were subsequently transported to and disposed at CWM's facility in Model City, New York. This cost is approximately $28,600.

8.6 Summary

In summary, the costs incurred in satisfying the performance criteria of the NTCRA include costs for engineering design, restoring Allendale Dam, and removing soil and sediment. These costs also include costs for the transportation and off-Site disposal of wastes. The total cost of implementing the NTCRA is approximately $2,257,745. An itemization of this cost is summarized as follows:

NTCRA Activity	Cost
Engineering Design	$157,245
Restoring Allendale Dam	$828,400
Removal of Soil and Sediment	$1,034,000
Transportation and Off-Site Disposal of Wastes	$238,100
Total:	$2,257,745

9. CERTIFICATION STATEMENT

To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submittal is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Jeffrey. J. Loureiro, P.E., LEP
Project Coordinator

TABLES

TABLES

TABLE 1
SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO ATTAIN ARAR
Federal Regulatory Requirement	Protection of Wetlands (Executive Order 11990), 40 CFR 6.302(a) and Statement of Procedures on Floodplain Management and Wetlands Protection (40 CFR 6, App. A)	Applicable	Federal agencies are required to avoid undertaking or providing assistance for new construction located in wetlands unless there is no practicable alternative and the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.	LEA provided soil erosion and sediment controls in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook and as identified in the design documents to minimize any potential erosion that may impact the wetlands. In implementing the NTCRA, LEA minimized to the extent practicable the disturbance to the area within the wetland and associated buffer. Also LEA restored disturbed areas as soon as practicably possible.
Federal Regulatory Requirement	Floodplain Management (Ex Order 11988-40 CFR 6.302(b) and Statement of Procedures on Floodplain Management and Wetlands Protection (40 CFR 6, App. A)	Applicable	Federal agencies are required to avoid impacts associated with the occupancy and modification of a floodplain and avoid support of floodplain development wherever there is a practicable alternative.	In implementing the NTCRA, LEA minimized to the extent practicable the disturbance to the floodplain. Also LEA restored disturbed areas as soon as practicably possible.

TABLE 1 (continued)
SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO ATTAIN ARAR
Federal Regulatory Requirement	Rivers and Harbors Act (33 U.S.C. Section 403): Section 10	Applicable	These regulations set forth criteria from the United States Army Corps of Engineers for placing dams/structures in navigable waters of the United States	LEA restored Allendale Dam in accordance with a modification of the United States Army Corps of Engineers design that incorporates these requirements.
Federal Regulatory Requirement	Clean Water Act – Section 404(b) Guidelines for specification of disposal sites for dredged or fill material (40 CFR 230)	Applicable	These guidelines outline requirements for the discharge of dredged or fill materials into surface waters, including wetlands. Under these requirements, no activity that adversely impacts a wetland shall be permitted if a practicable alternative that would have less adverse impact exists. If there is no practicable alternative, impacts must be mitigated.	LEA placed clean fill in areas that are inundated with surface water. Placement of the fill was performed to minimize the impacts to the surface water by maintaining a low water level in Allendale Pond during the removal activities and maintaining a barrier between the excavation and the surface waters associated with Lymansville Pond during backfilling operations.
Federal Regulatory Requirement	(40 CFR 264.170–78-Subpart I – Use and Management of Containers	Applicable	These regulations identify the requirements for the use and management of containers containing hazardous waste.	Soil and sediment were loaded into roll-off containers provided with six-mil plastic liners and bowed tarpaulins that completely covered each container, thereby preventing precipitation from accumulating on or in the container. Each roll-off container was properly labeled.

TABLE 1 (continued)
SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO ATTAIN ARAR
Federal Regulatory Requirement	40 CFR 265.1087 – Subpart CC – Air Emission Standards for Tanks, Surface Impoundments, and Containers	Applicable	This Subpart establishes controls on airborne emissions from tanks, surface impoundments, and containers.	Except when waste was being loaded, each container remained in a closed and covered status.
Federal Regulatory Requirement	40 CFR 262 – Subpart E – Export of Hazardous Waste	Applicable	This Subpart provides the procedures required to properly export waste for disposal including the proper notification to the EPA and Canadian Ministry, the special manifesting requirements, the reporting requirements and record keeping.	The proper notification, special manifesting, and reporting requirements have been fulfilled. Certificates of Destruction provide confirmation that the soil and sediment have been properly disposed. Records will be kept as provided for in this Subpart.
State Regulatory Requirement	Hazardous Waste Management Act (RI General Laws 23-19.1-6, 23-19.1-7, and 23-19.1-10): Section 5, Generators	Applicable	These regulations apply to all generators of hazardous waste. They include requirements for identifying, storing, shipping, and labeling waste.	Wastes generated during the implementation of the NTCRA were managed in accordance with these regulations by properly identifying, storing, shipping, and labeling the waste.

TABLE 1 (continued)
SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TAKEN TO ATTAIN ARAR
State Regulatory Requirement	Remediation Regulations DEM-DSR-01-93 Section 8.01, A to D	Relevant and Appropriate	This section regulates impacted media at contaminated sites.	Areas defined by soil and sediment containing concentrations of dioxin exceeding 1 ppb were excavated and were transported for off-Site disposal.
State Regulatory Requirement	Rhode Island Air Pollution Control Regulation #5, Fugitive Dust	Applicable	Regulations designed to control release of airborne particulate in the State of Rhode Island, including those caused by earth moving activities.	Prior to exiting the Site, soil and sediment were removed from personnel and vehicles in accordance with the Site plans.
State Regulatory Requirement	Freshwater Wetlands Act (RI General Laws 201018 through 2-1-24); Rule #10, Protection of Wetlands Functions and Values	Applicable	Any activity which alters a wetland must avoid all probable impact to freshwater wetlands to the maximum extent possible. If impacts cannot be avoided, they must be reduced to the maximum extent possible.	LEA provided soil erosion and sediment controls in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook and as identified in the design documents to minimize any potential erosion that may impact the wetlands. In implementing the NTCRA, LEA minimized to the extent practicable the disturbance to the area within the wetland and associated buffer. Also LEA restored disturbed areas as soon as practicably possible.

TABLE 2
SUMMARY OF LABORATORY ANALYTICAL RESULTS
ROOT-BALL SAMPLE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: September 27, 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Concentration	
VOCs (ug/Kg)		
Methylene Chloride	16B	14B
Acetone	30B	16B
1,1,1-Trichloroethane	.9J	<5.0
Ethylbenzene	<5.0	1J
Xylene (Total)	<5.0	10

Note: VOCs were determined by purge and trap GC/MS using guidance provided in Method5035A/8260B. Sample 2004285 was analyzed twice due to results exhibiting suppression of internal standard areas and surrogate recoveries out of criteria. Both analyses were reported because matrix interference was proven. The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control sample.

SVOCs (ug/Kg)	
1,4-Dichlorobenzene	8J
2-Methylnaphthalene	15J
4-Methylphenol	40J
2,4-Dimethylphenol	16J
Benzoic acid	170J
Naphthalene	190J
2-Methylnaphthalene	140J
Acenaphthylene	190J
Acenaphthene	220J
Dibenzofuran	160J
Fluorene	220J
Phenanthrene	2400
Anthracene	580
Carbazole	260J
Fluoranthene	2400
Pyrene	2400
Butylbenzylphthalate	22J
Benzo (a) anthracene	1600
Chrysene	1700
bis(2-Ethylhexyl)phthalate	46J
Benzo (b) fluoranthene	1800
Benzo (k) fluoranthene	1700
Benzo (a) pyrene	1100
Indeno (1,2,3-cd) pyrene	86J
Dibenzo (a, h) anthracene	32J
Benzo (g, h, i) perylene	59J

TABLE 2 (continued)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
ROOT-BALL SAMPLE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: September 27, 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Concentration
PCBs (ug/Kg)	
Aroclor-1254	38
Aroclor-1260	70
Metals (mg/Kg)	
Arsenic	7.9
Barium	40.2
Chromium	10
Lead	228
Mercury	0.13
Selenium	2.0
Petroleum Hydrocarbons (mg/Kg)	112
pH	4.77

Notes:
mg/Kg = Milligrams per kilogram.
ug/Kg = Micrograms per kilogram.
J = Estimated concentration.

TABLE 2 (continued)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
ROOT-BALL SAMPLE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: September 27, 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Result	TEF Factor	TEQ Concentration
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	120	1.000	120.000
Total TCDD	140		
Total PeCDD	5.5		
1,2,3,6,7,8-HxCDD	3.7J	0.100	0.370
1,2,3,7,8,9-HxCDD	4.7J	0.100	0.470
Total HxCDD	33		
1,2,3,4,6,7,8-HpCDD	48	0.010	0.480
Total HpCDD	92		
OCDD	290	0.001	0.290
2,3,7,8-TCDF	4.8CON	0.100	0.480
Total TCDF	51		
2,3,4,7,8-PeCDF	3.2J	0.500	1.600
Total PeCDF	37		
1,2,3,6,7,8-HxCDF	2.9J	0.100	0.290
2,3,4,6,7,8-HxCDF	3.3J	0.100	0.330
Total HxCDF	37		
1,2,3,4,6,7,8-HpCDF	16	0.010	0.160
Total HpCDF	27		
OCDF	20	0.001	0.020
Total TEQ Concentration			124

Notes:
Sample analyzed and reported in accordance with USEPA Method 8290.
pg/g = Picogram per gram.
J = Estimated Result. Result is less than the reporting limit.
CON = Confirmation analysis.
Total TEQ concentration reported to the nearest pg/g.

TABLE 3
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLE - PRE-CONSTRUCTION
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: September 27, 2001

Sample ID	**2004284**
Location ID	CMS-CPAD-001
Time	900
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained adjacent to northeast corner of containment pad.

Analyte	Concentration
VOCs (ug/Kg)	
Methylene Chloride	7B
Acetone	10JB
SVOCs (ug/Kg)	
4-Methylphenol	15J
Benzoic Acid	190J
2-Methylnaphthalene	4J
Acenaphthylene	34J
Phenanthrene	110J
Anthracene	39J
Fluoranthene	200J
Pyrene	220J
Benzo (a) anthracene	100J
Chrysene	150J
Benzo (b) fluoranthene	170J
Benzo (k) fluoranthene	140J
Benzo (a) pyrene	120J
Indeno (1,2,3-cd) pyrene	11J
Benzo (g,h,i) perylene	9J
PCBs (ug/Kg)	
Aroclor-1260	7.7J
Metals (mg/Kg)	
Arsenic	2.9
Barium	47.9
Chromium	12.0
Lead	34.9
Mercury	0.070
Petroleum Hydrocarbons (mg/Kg)	635
pH	6.27

Notes:

mg/Kg = Milligrams per kilogram. **ug/Kg = Micrograms per kilogram.**

J = Estimated concentration. **B = Analyte detected in the laboratory method blank.**

TABLE 3 (continued)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLE - PRE-CONSTRUCTION
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: September 27, 2001

Sample ID	**2004284**
Location ID	CMS-CPAD-001
Time	900
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained adjacent to northeast corner of containment pad.

Analyte	Result	TEF Factor	TEQ Concentration
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	0.64J	1.000	0.640
Total TCDD	0.64		
Total HxCDD	3.9		
1,2,3,4,6,7,8-HpCDD	37	0.010	0.370
Total HpCDD	65		
OCDD	250	0.001	0.250
Total TCDF	2.6		
Total HxCDF	7.4		
1,2,3,4,6,7,8-HpCDF	11	0.010	0.110
Total HpCDF	24		
OCDF	18	0.001	0.018
Total TEQ Concentration			1

Notes:
Sample analyzed and reported in accordance with USEPA Method 8290.
pg/g = Picogram per gram.
J = Estimated Result. Result is less than the reporting limit.
TEQ = Toxic Equivalents.
Total TEQ concentration reported to the nearest pg/g.

TABLE 4
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLE - POST-CONSTRUCTION
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: July 23, 2003

Sample ID	**1028887**
Location ID	CMS-CPAD-001R
Time	12:25
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained from the area immediately adjacent to the location from which the "Background Containment Pad Sample" (Pre-Construction) was obtained.

Analyte	Concentration
SVOCs (ug/Kg)	
Phenanthrene	160J
Fluoranthene	250J
Pyrene	350J
Benzo (a) anthracene	140J
Chrysene	190J
Benzo (a) pyrene	140J
Benzo (g,h,i) perylene	110J
PCBs (ug/Kg)	
Aroclor-1248	6.2J
Aroclor-1254	19J
Aroclor-1260	5.6JM
Metals (mg/Kg)	
Arsenic	3.2B
Barium	41.8N
Chromium	8.4
Lead	42.5
Mercury	
Petroleum Hydrocarbons (mg/Kg)	371
pH	6.86

Notes:
mg/Kg = milligrams per kilogram / ug/Kg = micrograms per kilogram.
J = Estimated Result. Result is less than the reporting limit.
B = Result is less than the reporting limit, but greater than or equal to the method detection limit.
M = Manually integrated compound
N = Matrix spike (MS) and matrix spike duplicate (MSD): spike recovery exceeds the upper or lower control limits.

TABLE 4 (continued)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLE - POST-CONSTRUCTION
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

SAMPLE DATE: July 23, 2003

Sample ID	**1028887**
Location ID	CMS-CPAD-001R
Time	12:25
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained from the area immediately adjacent to the location from which the "Background Containment Pad Sample" (Pre-Construction) was obtained.

Analyte	Concentration	TEF Factor	TEQ Concentration
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	24	1.000	24.000
Total TCDD	25		
Total HxCDD	<2.8		
1,2,3,4,6,7,8-HpCDD	19	0.010	0.19
Total HpCDD	33		
OCDD	140	0.0001	0.014
Total TCDF	7.9		
Total PeCDF	7.8		
Total HxCDF	10		
1,2,3,4,6,7,8-HpCDF	15	0.010	0.150
Total HpCDF	26		
OCDF	16	0.0001	0.002
Total TEQ Concentration			24

Notes:
Dioxin analysis performed and reported in accordance with USEPA Method 8290.
pg/g = picogram per gram.
TEQ = Toxic Equivalents.
Total TEQ concentration reported to the nearest pg/g.

TABLE 5
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLES
COMPARISON OF PRE-CONSTRUCTION AND POST-CONSTRUCTION SAMPLES
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Sample ID	2004284	1028887
Location ID	CMS-CPAD-001	CMS-CPAD-001R
Date	9/27/2001	7/23/2003
Time	900	12:25
Sample Type	Soil (Grab)	Soil (Grab)
Depth	0-6"	0-6"
Analyte	**Concentration**	**Concentration**
VOCs (ug/Kg)		
Methylene Chloride	7B	<7B
Acetone	10JB	<2B
SVOCs (ug/Kg)		
4-Methylphenol	15J	<89
Benzoic Acid	190J	<3300
2-Methylnaphthalene	4J	<140
Acenaphthylene	34J	<54
Phenanthrene	110J	160J
Anthracene	39J	<59M
Fluoranthene	200J	250J
Pyrene	220J	350J
Benzo (a) anthracene	100J	140J
Chrysene	150J	190J
Benzo (b) fluoranthene	170J	<190
Benzo (k) fluoranthene	140J	<190
Benzo (a) pyrene	120J	140J
Indeno (1,2,3-cd) pyrene	11J	<89
Benzo (g,h,i) perylene	9J	110J
PCBs (ug/Kg)		
Aroclor-1248	<33	6.2J
Aroclor-1254	<33	19
Aroclor-1260	7.7J	5.6J
Metals (mg/Kg)		
Arsenic	2.9	3.2B
Barium	47.9	41.8
Chromium	12.0	8.4
Lead	34.9	42.5
Mercury	0.070	<0.052
Petroleum Hydrocarbons (mg/Kg)	635	371
pH	6.27	6.86

TABLE 5 (continued)
SUMMARY OF LABORATORY ANALYTICAL RESULTS
BACKGROUND CONTAINMENT PAD SAMPLES
COMPARISON OF PRE-CONSTRUCTION AND POST-CONSTRUCTION SAMPLES
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Sample ID	**2004284**			**1028887**		
Location ID	CMS-CPAD-001			CMS-CPAD-001R		
Date	9/27/2001			7/23/2003		
Time	900			12:25		
Sample Type	Soil (Grab)			Soil (Grab)		
Depth	0-6"			0-6"		
Analyte	**Result**	**TEF Factor**	**TEQ Concentration**	**Result**	**TEF Factor**	**TEQ Concentration**
Dioxins/Furans (pg/g)						
2,3,7,8-TCDD	0.64J	1.000	0.640	24	1.000	24.000
Total TCDD	0.64			25		
Total HxCDD	3.9			<2.8		
1,2,3,4,6,7,8-HpCDD	37	0.010	0.370	19	0.010	0.19
Total HpCDD	65			33		
OCDD	250	0.001	0.250	140	0.0001	0.014
Total TCDF	2.6			7.9		
Total PeCDF	<2.4			7.8		
Total HxCDF	7.4			10		
1,2,3,4,6,7,8-HpCDF	11	0.010	0.110	15	0.010	0.150
Total HpCDF	24			26		
OCDF	18	0.001	0.018	16	0.0001	0.002
Total TEQ Concentration			1			24

Notes:
mg/Kg = Milligrams per kilogram.
ug/Kg = Micrograms per kilogram.
pg/g = picogram per gram.
Dioxin analysis performed and reported in accordance with USEPA Method 8290.
J = Estimated concentration.
B = Analyte detected in the laboratory method blank.
M = Manually integrated compound.
TEQ = Toxic Equivalents.
Total TEQ concentration reported to the nearest pg/g.

TABLE 6
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Location ID		AP-DEL-20		AP-DEL-20		AP-DEL-19		AP-DEL-19		AP-DEL-18	
Sample ID		2102205		2102206		2102207		2102208		2102209	
Sample Date		4/10/2002		4/10/2002		4/10/2002		4/10/2002		4/10/2002	
Sample Time		1025		1027		1045		1047		1110	
Sample Depth		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'	
Laboratory		STL		STL		STL		STL		STL	
Lot Number		G2D130156		G2D130156		G2D130156		G2D130156		G2D130156	
Lab. Number		#001		#002		#003		#004		#005	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**1.2 J**	**1.2**	**1.8 *J***	**1.8**	**1.2 J**	**1.2**	**1.1 J**	**1.1**	**230**	**230.0**
Total TCDD	-	**1.2**	-	**2.7**	-	**2.9**	-	**4.4**	-	**240**	-
1,2,3,7,8-PeCDD	1.000	<0.24	0	<0.47 *UJ*	0	<0.37	0	<0.23	0	**9.7**	**9.7**
Total PeCDD	-	<2.2	-	<1.6	-	<3.2	-	<3.2	-	**20**	-
1,2,3,4,7,8-HxCDD	0.100	<0.32	0	<0.21	0	<0.41	0	<0.83	0	**20**	**2.0**
1,2,3,6,7,8-HxCDD	0.100	<0.79	0	<0.42 *UJ*	0	<2.4	0	**3.6 J**	**0.36**	**54**	**5.4**
1,2,3,7,8,9-HxCDD	0.100	<0.64	0	<0.42	0	<1.1	0	<2.0	0	**49**	**4.9**
Total HxCDD	-	<2.1	-	<2.1	-	**11**	-	**25**	-	**360**	-
1,2,3,4,6,7,8-HpCDD	0.010	**22**	**0.22**	**28**	**0.28**	**25**	**0.25**	**71**	**0.71**	**1600**	**16.0**
Total HpCDD	-	**47**	-	**63**	-	**56**	-	**240**	-	**2700**	-
OCDD	0.0001	**2400**	**0.24**	**5100 E *J***	**0.51**	**240**	**0.024**	**700**	**0.07**	**9600 E *J***	**0.96**
2,3,7,8-TCDF	0.100	<0.57 CON	0	**0.80 J, CON**	**0.08**	**1.4 CON**	**0.14**	**1.0 J, CON**	**0.1**	**6.0 CON**	**0.6**
Total TCDF	-	**9.1 *UJ***	-	**13 *UJ***	-	**15 *UJ***	-	**23 *UJ***	-	**79**	-
1,2,3,7,8-PeCDF	0.050	<0.43	0	<0.26	0	<0.64	0	<0.75	0	<2.9	0
2,3,4,7,8-PeCDF	0.500	<0.49	0	<0.34	0	<0.92	0	<1.3	0	**7.4**	**3.7**
Total PeCDF	-	**9.0**	-	**13**	-	**17**	-	**24**	-	**100**	-
1,2,3,4,7,8-HxCDF	0.100	<1.0	0	<0.39	0	<2.4	0	<2.5	0	**16**	**1.6**
1,2,3,6,7,8-HxCDF	0.100	<0.62	0	<0.55	0	<1.2	0	<1.6	0	**12**	**1.2**
2,3,4,6,7,8-HxCDF	0.100	<0.74	0	<0.16	0	<1.3	0	<1.3	0	**8.1**	**0.81**
1,2,3,7,8,9-HxCDF	0.100	<0.098	0	<0.12	0	<0.45	0	<0.17	0	<0.19	0
Total HxCDF	-	**3.8**	-	<3.0	-	**16**	-	**18**	-	**230**	-
1,2,3,4,6,7,8-HpCDF	0.010	**4.7 J**	**0.047**	<2.5	0	**8.0**	**0.08**	**11**	**0.11**	**180**	**1.8**
1,2,3,4,7,8,9-HpCDF	0.010	<0.32	0	<0.20	0	<0.63	0	<1.1	0	**12**	**0.12**
Total HpCDF	-	**10**	-	<2.5	-	**18**	-	**29**	-	**420**	-
OCDF	0.0001	**9.8**	**0.00098**	<3.8	0	**18**	**0.0018**	**32**	**0.0032**	**340**	**0.034**
Total TEQ Concentration	-	-	2	-	**3**	-	**2**	-	**2**		**279**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-18		AP-DEL-17		AP-DEL-16		AP-DEL-16		AP-DEL-15	
	Sample ID	2102210		2102211		2102212		2102213		2102214	
	Sample Date	4/10/2002		4/10/2002		4/10/2002		4/10/2002		4/10/2002	
	Sample Time	1112		1140		1205		1207		1350	
	Sample Depth	1.0-2.0'		0.0-1.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130156		G2D130156		G2D130156		G2D130156		G2D130156	
	Lab. Number	#006		#007		#008		#009		#010	
Constituent											
Date Dioxins/Furans Analyz	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**730 E *J***	**730.0**	**840 E *J***	**840.0**	**2.4**	**2.4**	<0.39	0	**110**	**110.0**
Total TCDD	-	**770**	-	**920**	-	**5.1**	-	<0.44	-	**120**	-
1,2,3,7,8-PeCDD	1.000	<1.2	0	**7.2 J**	**7.2**	<0.24	0	<0.83	0	<1.6	0
Total PeCDD	-	**18**	-	**44**	-	<1.9	-	<0.83	-	<3.1	-
1,2,3,4,7,8-HxCDD	0.100	**30**	**3.0**	**7.9 J**	**0.79**	<0.28	0	<0.36	0	<2.0	0
1,2,3,6,7,8-HxCDD	0.100	**77**	**7.7**	**21**	**2.1**	<0.39	0	<0.39	0	**4.2 J**	**0.42**
1,2,3,7,8,9-HxCDD	0.100	**68**	**6.8**	**16**	**1.6**	<0.51	0	<0.34	0	**5.8 J**	**0.58**
Total HxCDD	-	**510**	-	**180**	-	<1.9	-	<0.82	-	**32**	-
1,2,3,4,6,7,8-HpCDD	0.010	**1900**	**19.0**	**330**	**3.3**	**5.2 J**	**0.052**	<1.0	0	**90**	**0.9**
Total HpCDD	-	**3400**	-	**610**	-	**10**	-	<1.2	-	**210**	-
OCDD	0.0001	**12000 E *J***	**1.2**	**1600**	**0.16**	**35 *J***	**0.0035**	**14**	**0.0014**	**1100**	**0.11**
2,3,7,8-TCDF	0.100	**17 CON *J***	**1.7**	**29 CON**	**2.9**	**2.1 CON**	**0.21**	<0.44 CON	0	**2.0 CON**	**0.2**
Total TCDF	-	**380**	-	**400**	-	**31 *UJ***	-	**4.4**	-	**23**	-
1,2,3,7,8-PeCDF	0.050	**4.9 J**	**0.24**	**13**	**0.65**	<0.95	0	<0.42	0	<0.90	0
2,3,4,7,8-PeCDF	0.500	**7.9 J**	**3.9**	**19**	**9.5**	<0.94	0	<0.42	0	<1.4	0
Total PeCDF	-	**260**	-	**370**	-	**9.7**	-	<1.2	-	**22**	-
1,2,3,4,7,8-HxCDF	0.100	**16**	**1.6**	**18**	**1.8**	<1.8	0	<0.73	0	<2.8	0
1,2,3,6,7,8-HxCDF	0.100	**13**	**1.3**	**15**	**1.5**	<0.93	0	<0.34	0	<1.4	0
2,3,4,6,7,8-HxCDF	0.100	**4.9 J**	**0.49**	**12**	**1.2**	<0.48	0	<0.43	0	<1.2	0
1,2,3,7,8,9-HxCDF	0.100	<0.17	0	<0.64	0	<0.12	0	<0.39	0	<0.37	0
Total HxCDF	-	**320**	-	**260**	-	<3.0	-	<0.73	-	**27**	-
1,2,3,4,6,7,8-HpCDF	0.010	**130**	**1.3**	**85**	**0.85**	**4.0 J**	**0.04**	<1.4	0	**11**	**0.11**
1,2,3,4,7,8,9-HpCDF	0.010	**7.5 J**	**0.075**	**5.5 J**	**0.055**	<0.33	0	<0.28	0	<0.61	0
Total HpCDF	-	**290**	-	**150**	-	**4.0**	-	<1.4	0	**20**	-
OCDF	0.0001	**230**	**0.023**	**91**	**0.0091**	<6.6	0	<1.2	0	**18**	**0.0018**
Total TEQ Concentration	-	-	778	-	874	-	3	-	0	-	112

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-15		AP-DEL-14		AP-DEL-14		AP-DEL-13		AP-DEL-13	
	Sample ID	2102215		2102216		2102217		2102218		2102219	
	Sample Date	4/10/2002		4/10/2002		4/10/2002		4/10/2002		4/10/2002	
	Sample Time	1353		1405		1407		1445		1446	
	Sample Depth	1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130156		G2D130156		G2D130156		G2D130156		G2D130156	
	Lab. Number	#011		#012		#013		#014		#015	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**3.0**	**3.0**	**42**	**42.0**	**52**	**52.000000**	**130**	**130.0**	**2.4**	**2.4**
Total TCDD	-	**3.0**	-	**650**	-	**1800**	-	**140**	-	**2.4**	-
1,2,3,7,8-PeCDD	1.000	<0.33 *UJ*	0	**41**	**41.0**	**73**	**73.000000**	**3.7 J**	**3.7**	<0.24	0
Total PeCDD	-	<0.49	-	**490**	-	**1200**	-	**19**	-	<0.32	-
1,2,3,4,7,8-HxCDD	0.100	<0.14	0	**29**	**2.9**	**50**	**5.000000**	**3.8 J**	**0.38**	<0.11	0
1,2,3,6,7,8-HxCDD	0.100	<0.14	0	**81**	**8.1**	**130**	**13.000000**	**14**	**1.4**	<0.44	0
1,2,3,7,8,9-HxCDD	0.100	<0.13	0	**53**	**5.3**	**86**	**8.600000**	**13**	**1.3**	<0.54	0
Total HxCDD	-	<0.46	-	**840**	-	**1800**	-	**110**	-	<1.7	-
1,2,3,4,6,7,8-HpCDD	0.010	<2.3	0	**1200**	**12.0**	**1500**	**15.000000**	**230**	**2.3**	**16**	**0.16**
Total HpCDD	-	<2.3	-	**2300**	-	**2700**	-	**410**	-	**29**	-
OCDD	0.0001	**14 *J***	**0.0014**	**6100**	**0.61**	**5900**	**0.590000**	**1800**	**0.18**	**1500**	**0.15**
2,3,7,8-TCDF	0.100	<0.38 *UJ*	0	**310 CON**	**31.0**	**400 CON**	**40.000000**	**5.9 CON**	**0.59**	<0.44 *UJ*	0
Total TCDF	-	<0.51	-	**4800**	-	**8200**	-	**110**	-	<1.9	-
1,2,3,7,8-PeCDF	0.050	<0.13	0	**150**	**7.5**	**260**	**13.000000**	**3.2 J**	**0.16**	<0.10	0
2,3,4,7,8-PeCDF	0.500	<0.12	0	**190**	**95.0**	**370**	**180.000000**	**5.0 J**	**2.50**	<0.10	0
Total PeCDF	-	<2.3	-	**2200**	-	**4300**	-	**140**	-	<2.8	-
1,2,3,4,7,8-HxCDF	0.100	<0.19	0	**150**	**15.0**	**290**	**29.000000**	**7.1**	**0.71**	<0.46	0
1,2,3,6,7,8-HxCDF	0.100	<0.12	0	**140**	**14.0**	**270**	**27.000000**	**6.9**	**0.69**	<0.28	0
2,3,4,6,7,8-HxCDF	0.100	<0.053	0	**160**	**16.0**	**300**	**30.000000**	**5.8 J**	**0.58**	<0.20	0
1,2,3,7,8,9-HxCDF	0.100	<0.065	0	**8.6 J**	**0.86**	**15**	**1.500000**	<0.22	0	<0.13	0
Total HxCDF	-	<0.98	-	**1400**	-	**2600**	-	**140**	-	<1.9	-
1,2,3,4,6,7,8-HpCDF	0.010	<0.89	0	**650**	**6.5**	**950**	**9.500000**	**97**	**0.97**	**3.4 J**	**0.034**
1,2,3,4,7,8,9-HpCDF	0.010	<0.17	0	**52**	**0.52**	**90**	**0.900000**	**3.5 J**	**0.035**	<0.34	0
Total HpCDF	-	<0.89	-	**1100**	-	**1600**	-	**180**	-	**3.4**	-
OCDF	0.0001	<0.50	0	**340**	**0.034**	**400**	**0.040000**	**72**	**0.0072**	<4.6	0
Total TEQ Concentration	-	-	**3**	-	**298**	-	**498**	-	**146**	-	**3**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-12		AP-DEL-12		AP-DEL-11		AP-DEL-11		AP-DEL-10	
	Sample ID	2102220		2102221		2102222		2102223		2102224	
	Sample Date	4/10/2002		4/10/2002		4/10/2002		4/10/2002		4/10/2002	
	Sample Time	1510		1512		1525		1528		1540	
	Sample Depth	0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130156		G2D130156		G2D130156		G2D130156		G2D130156	
	Lab. Number	#016		#017		#018		#019		#020	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**49**	**49.0**	**47**	**47.0**	**18**	**18.0**	**4.4**	**4.4**	**1.4 J**	**1.4**
Total TCDD	-	**57**	-	**50**	-	**19**	-	**4.4**	-	**1.4**	-
1,2,3,7,8-PeCDD	1.000	<1.3	0	<0.60	0	<1.3	0	<0.67	0	<0.49	0
Total PeCDD	-	**6.1**	-	<1.7	-	<3.7	-	<2.6	-	<1.1	-
1,2,3,4,7,8-HxCDD	0.100	<0.94	0	<0.58	0	<2.0	0	<0.49	0	<0.65	0
1,2,3,6,7,8-HxCDD	0.100	<2.1	0	<1.8	0	**11**	**1.1**	<2.2	0	<1.8	0
1,2,3,7,8,9-HxCDD	0.100	<2.3	0	<1.6	0	**6.2 J**	**0.62**	<1.4	0	<1.6	0
Total HxCDD	-	**15**	-	**9.4**	-	**83**	-	**14**	-	**11**	-
1,2,3,4,6,7,8-HpCDD	0.010	**24**	**0.24**	**25**	**0.25**	**170**	**1.7**	**11**	**0.11**	**53**	**0.53**
Total HpCDD	-	**45**	-	**51**	-	**570**	-	**27**	-	**140**	-
OCDD	0.0001	**99**	**0.0099**	**160**	**0.016**	**1600**	**0.016**	**53**	**0.0053**	**520**	**0.052**
2,3,7,8-TCDF	0.100	**1.2 CON**	**0.12**	**1.2 J, CON**	**0.12**	**2.6 CON**	**0.26**	**1.0 J, CON**	**0.1**	<0.46 CON	0
Total TCDF	-	**33 *UJ***	-	**15 *UJ***	-	**29 *UJ***	-	**11 *UJ***	-	**6.6 *UJ***	-
1,2,3,7,8-PeCDF	0.050	<0.66	0	<0.49	0	<1.4	0	<0.55	0	<0.38	0
2,3,4,7,8-PeCDF	0.500	<0.91	0	<1.0	0	<2.1	0	<0.74	0	<0.41	0
Total PeCDF	-	**11**	-	**13**	-	**46**	-	**13**	-	**5.6**	-
1,2,3,4,7,8-HxCDF	0.100	<1.8	0	<1.7	0	**6.0 J**	**0.6**	<1.8	0	<1.7	0
1,2,3,6,7,8-HxCDF	0.100	<0.85	0	<0.76	0	<3.1	0	<0.90	0	<1.1	0
2,3,4,6,7,8-HxCDF	0.100	<1.1	0	<1.0	0	<2.0	0	<0.73	0	<0.88	0
1,2,3,7,8,9-HxCDF	0.100	<0.080	0	<0.090	0	<1.2	0	<0.55	0	<0.24	0
Total HxCDF	-	<2.7	-	**16**	-	**110**	-	**10**	-	**12**	-
1,2,3,4,6,7,8-HpCDF	0.010	**3.4 J**	**0.034**	**6.9**	**0.069**	**100**	**1.0**	**4.5 J**	**0.045**	**11**	**0.11**
1,2,3,4,7,8,9-HpCDF	0.010	<0.32	0	<0.41	0	<2.7	0	<0.53	0	<0.90	0
Total HpCDF	-	**3.4**	-	**14**	-	**240**	-	**9.3**	-	**32**	-
OCDF	0.0001	<0.28	0	**11 J**	**0.0011**	**120**	**0.012**	<0.45	0	**33**	**0.0033**
Total TEQ Concentration	-	-	**49**	-	**47**	-	**23**	-	**5**	-	**2**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-10		AP-DEL-09		AP-DEL-09		AP-DEL-08		AP-DEL-08	
	Sample ID	2102225		2102226		2102227		2102228		2102229	
	Sample Date	4/10/2002		4/10/2002		4/10/2002		4/11/2002		4/11/2002	
	Sample Time	1545		1605		1607		930		932	
	Sample Depth	1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130156		G2D130156		G2D130156		G2D130158		G2D130158	
	Lab. Number	#021		#022		#023		#001		#002	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**0.92 J**	**0.92**	<0.40	0	**8.2**	**8.2**	**91**	**91.0**	**6.5 *J***	**6.5**
Total TCDD	-	**0.92**	-	<0.40	-	**18**	-	**120**	-	**7.8**	-
1,2,3,7,8-PeCDD	1.000	<0.86	0	<0.62	0	<1.4	0	<3.1	0	<2.1	0
Total PeCDD	-	<0.86	-	<0.62	-	**5.0**	-	**27**	-	<2.1	-
1,2,3,4,7,8-HxCDD	0.100	<0.62	0	<0.44	0	<0.93	0	<2.0	0	<1.3	0
1,2,3,6,7,8-HxCDD	0.100	<1.1	0	<0.47	0	**10**	**1.0**	**5.8 J**	**0.58**	<1.3	0
1,2,3,7,8,9-HxCDD	0.100	<0.59	0	<0.41	0	**6.1 J**	**0.61**	<4.6	0	<1.2	0
Total HxCDD	-	**3.9**	-	<0.47	-	**70**	-	**49**	-	<2.1	-
1,2,3,4,6,7,8-HpCDD	0.010	**32**	**0.32**	<1.9	0	**86**	**0.86**	**50**	**0.5**	**5.9 J**	**0.059**
Total HpCDD	-	**56**	-	<1.9	-	**150**	-	**100**	-	**11**	-
OCDD	0.0001	**270**	**0.027**	**11**	**0.0011**	**520**	**0.052**	**280**	**0.028**	**41**	**0.0041**
2,3,7,8-TCDF	0.100	<0.41 CON	0	<0.31	0	**5.4 CON**	**0.54**	**17 CON**	**1.7**	**2.6 CON**	**0.26**
Total TCDF	-	<0.41	-	<0.33	-	**130**	-	**250**	-	**32**	-
1,2,3,7,8-PeCDF	0.050	<0.58	0	<0.44	0	<2.8	0	**7.3 J**	**0.36**	<1.3	0
2,3,4,7,8-PeCDF	0.500	<0.57	0	<0.44	0	**7.5 J**	**3.7**	**13**	**6.5**	<1.6	0
Total PeCDF	-	<2.2	-	<0.61	-	**230**	-	**380**	-	**21**	-
1,2,3,4,7,8-HxCDF	0.100	<0.57	0	<0.42	0	**9.3**	**0.93**	**12**	**1.2**	<3.2	0
1,2,3,6,7,8-HxCDF	0.100	<0.52	0	<0.39	0	**7.8**	**0.78**	**12**	**1.2**	<1.6	0
2,3,4,6,7,8-HxCDF	0.100	<0.58	0	<0.43	0	**7.2 J**	**0.72**	**12**	**1.2**	<1.6	0
1,2,3,7,8,9-HxCDF	0.100	<0.63	0	<0.45	0	<0.57	0	<1.5	0	<1.2	0
Total HxCDF	-	<2.3	-	<0.45	-	**140**	-	**240**	-	**14**	-
1,2,3,4,6,7,8-HpCDF	0.010	**5.2 J**	**0.052**	<0.53	0	**62**	**0.62**	**34**	**0.34**	<5.1	0
1,2,3,4,7,8,9-HpCDF	0.010	<0.49	0	<0.40	0	<2.8	0	<3.4	0	<0.78	0
Total HpCDF	-	**12**	-	<0.53	-	**110**	-	**57**	-	<5.1	-
OCDF	0.0001	**9.3 J**	**0.00093**	<0.67	0	**33**	**0.0033**	**23**	**0.0023**	<4.5	0
Total TEQ Concentration	-		**1**	-	**0**	-	**18**	-	**105**	-	7

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-08		AP-DEL-07		AP-DEL-07		AP-DEL-06		AP-DEL-06	
	Sample ID	2102230		2102231		2102232		2102233		2102234	
	Sample Date	4/11/2002		4/11/2002		4/11/2002		4/11/2002		4/11/2002	
	Sample Time	933 (DUP)		1005		1007		1110		1112	
	Sample Depth	1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130158		G2D130158		G2D130158		G2D130158		G2D130158	
	Lab. Number	#003		#004		#005		#006		#007	
	Date Dioxins/Furans Analyzed										
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**14 *J***	**14.0**	**97**	**97.0**	**120**	**120.0**	**0.99 J**	**0.99**	**5.3**	**5.3**
Total TCDD	-	**19**	-	**120**	-	**140**	-	**0.99**	-	**7.5**	-
1,2,3,7,8-PeCDD	1.000	<2.3	0	**10**	**10.0**	**3.7 J**	**3.7**	<0.67	0	<0.89	0
Total PeCDD	-	<3.0	-	**64**	-	**35**	-	<0.88	-	<2.4	-
1,2,3,4,7,8-HxCDD	0.100	<1.2	0	**6.5 J**	**0.65**	**4.7 J**	**0.47**	<0.83	0	<0.56	0
1,2,3,6,7,8-HxCDD	0.100	<1.3	0	**85**	**8.5**	**18**	**1.8**	<2.3	0	<1.9	0
1,2,3,7,8,9-HxCDD	0.100	<1.1	0	**21**	**2.1**	**11**	**1.1**	<2.4	0	<2.1	0
Total HxCDD	-	<2.9	-	**380**	-	**150**	-	**9.3**	-	**15**	-
1,2,3,4,6,7,8-HpCDD	0.010	**7.4 J**	**0.074**	**870**	**8.7**	**440**	**4.4**	**45**	**0.45**	**33**	**0.33**
Total HpCDD	-	**15**	-	**1700**	-	**840**	-	**85**	-	**62**	-
OCDD	0.0001	**59**	**0.0059**	**6500 E *J***	**0.65**	**4000**	**0.4**	**340**	**0.034**	**200**	**0.02**
2,3,7,8-TCDF	0.100	**3.3 CON**	**0.33**	**9.9 CON**	**0.99**	**12 CON**	**1.2**	**0.69 J, CON**	**0.069**	**4.6 CON**	**0.46**
Total TCDF	-	**37**	-	**110**	-	**210**	-	**2.4**	-	**38**	-
1,2,3,7,8-PeCDF	0.050	<1.4	0	**6.1 J**	**0.3**	**4.7 J**	**0.24**	<0.40	0	<1.8	0
2,3,4,7,8-PeCDF	0.500	<2.1	0	**9.4**	**4.7**	**12**	**6.0**	<0.52	0	<2.8	0
Total PeCDF	-	**22**	-	**230**	-	**420**	-	**7.9**	-	**27**	-
1,2,3,4,7,8-HxCDF	0.100	<3.4	0	**14**	**1.4**	**12**	**1.2**	<0.74	0	**4.2 J**	**0.42**
1,2,3,6,7,8-HxCDF	0.100	<1.8	0	**18**	**1.8**	**11**	**1.1**	<0.57	0	<1.2	0
2,3,4,6,7,8-HxCDF	0.100	<2.0	0	**14**	**1.4**	**11**	**1.1**	<0.76	0	<1.5	0
1,2,3,7,8,9-HxCDF	0.100	<1.0	0	<0.93	0	<0.60	0	<0.37	0	<0.51	0
Total HxCDF	-	**17**	-	**450**	-	**310**	-	**5.0**	-	**19**	-
1,2,3,4,6,7,8-HpCDF	0.010	**6.3 J**	**0.063**	**270**	**2.7**	**120**	**1.2**	**7.0**	**0.07**	**10**	**0.1**
1,2,3,4,7,8,9-HpCDF	0.010	<0.84	0	**12**	**0.12**	**7.7**	**0.077**	<0.40	0	<2.3	0
Total HpCDF	-	**6.3**	-	**820**	-	**370**	-	**14**	-	**23**	-
OCDF	0.0001	<4.5	0	**650**	**0.065**	**260**	**0.026**	**11 J**	**0.0011**	**17**	**0.0017**
Total TEQ Concentration	-	-	**14**	-	**141**	-	**144**	-	**2**	-	**7**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Location ID		AP-DEL-05		AP-DEL-05		AP-DEL-04		AP-DEL-04		AP-DEL-03	
Sample ID		2102235		2102236		2102237		2102238		2102239	
Sample Date		4/11/2002		4/11/2002		4/11/2002		4/11/2002		4/11/2002	
Sample Time		1135		1137		1250		1252		1310	
Sample Depth		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'	
Laboratory		STL		STL		STL		STL		STL	
Lot Number		G2D130158		G2D130158		G2D130158		G2D130158		G2D130158	
Lab. Number		#008		#009		#010		#011		#012	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**440**	**440.0**	**5.9**	**5.9**	**120**	**120.0**	**1500 E *J***	**1500.0**	**14**	**14.0**
Total TCDD	-	**460**	-	**60**	-	**130**	-	**1500**	-	**23**	-
1,2,3,7,8-PeCDD	1.000	**7.7**	**7.7**	<2.2	0	<2.4	0	<3.4	0	<0.93	0
Total PeCDD	-	**50**	-	**28**		<5.5	-	**32**	-	**9.4**	-
1,2,3,4,7,8-HxCDD	0.100	**14**	**1.4**	<1.5	0	<3.3	0	**5.5 J**	**0.55**	<0.83	0
1,2,3,6,7,8-HxCDD	0.100	**47**	**4.7**	**5.3 J**	**0.53**	**10**	**1.0**	**17**	**1.7**	**11**	**1.10**
1,2,3,7,8,9-HxCDD	0.100	**34**	**3.4**	**5.0 J**	**0.50**	**8.6**	**0.86**	**13**	**1.3**	**5.8 J**	**0.58**
Total HxCDD	-	**260**	-	**51**	-	**66**	-	**130**	-	**65**	-
1,2,3,4,6,7,8-HpCDD	0.010	**1200**	**12.0**	**58**	**0.58**	**200**	**2.0**	**390**	**3.9**	**38**	**0.38**
Total HpCDD	-	**2400**	-	**120**	-	**380**	-	**680**	-	**74**	-
OCDD	0.0001	**8400 E *J***	**0.84**	**350**	**0.035**	**1600**	**0.16**	**2600**	**0.26**	**210**	**0.021**
2,3,7,8-TCDF	0.100	**6.8 CON**	**0.68**	**11 CON**	**1.1**	**5.0 CON**	**0.5**	**19 CON**	**1.9**	**9.0 CON**	**0.90**
Total TCDF	-	**120**	-	**220**	-	**110**	-	**200**	-	**71**	-
1,2,3,7,8-PeCDF	0.050	**4.6 J**	**0.23**	**5.0 J**	**0.25**	<2.4	0	**4.9 J**	**0.24**	**3.3 J**	**0.17**
2,3,4,7,8-PeCDF	0.500	**7.6**	**3.8**	**9.5**	**4.7**	**5.9 J**	**3.0**	**10**	**5.0**	**4.9 J**	**2.50**
Total PeCDF	-	**200**	-	**360**	-	**200**	-	**250**	-	**76**	-
1,2,3,4,7,8-HxCDF	0.100	**13**	**1.3**	**9.4**	**0.94**	**7.6 J**	**0.76**	**11**	**1.1**	**4.8 J**	**0.48**
1,2,3,6,7,8-HxCDF	0.100	**12**	**1.2**	**8.3**	**0.83**	**6.1 J**	**0.61**	**8.9**	**0.89**	**4.1 J**	**0.41**
2,3,4,6,7,8-HxCDF	0.100	**9.5**	**0.95**	**8.9**	**0.89**	**6.3 J**	**0.63**	**8.5 J**	**0.85**	**4.4 J**	**0.44**
1,2,3,7,8,9-HxCDF	0.100	<0.53	0	<0.85	0	<1.6	0	<1.4	0	<0.33	0
Total HxCDF	-	**290**	-	**200**	-	**140**	-	**200**	-	**120**	-
1,2,3,4,6,7,8-HpCDF	0.010	**180 *J***	**1.8**	**37**	**0.37**	**44**	**0.44**	**55**	**0.55**	**160**	**1.6**
1,2,3,4,7,8,9-HpCDF	0.010	**13**	**0.13**	**3.1 J**	**0.031**	<2.7	0	<3.9	0	<2.0	0
Total HpCDF	-	**490**	-	**67**	-	**97**	-	**130**	-	**280**	-
OCDF	0.0001	**470 *J***	**0.047**	**43**	**0.0043**	**77**	**0.0077**	**82**	**0.0082**	**84**	**0.0084**
Total TEQ Concentration	-	-	**480**	-	**17**	-	**130**	-	**1518**	-	**23**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-03		AP-DEL-02		AP-DEL-02		AP-DEL-01		AP-DEL-01	
	Sample ID	2102240		2102241		2102242		2102243		2102244	
	Sample Date	4/11/2002		4/11/2002		4/11/2002		4/11/2002		4/11/2002	
	Sample Time	1312		1335		1337		1350		1352	
	Sample Depth	1.0-2.0'		0.0-1.0'		1.0-2.0'		0.0-1.0'		1.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2D130158		G2D130158		G2D130158		G2D130158		G2D130158	
	Lab. Number	#013		#014		#015		#016		#017	
Date Dioxins/Furans Analyzed											
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**1.7**	**1.7**	**150**	**150.0**	<0.89	0	**49**	**49.0**	**76**	**76.0**
Total TCDD	-	**5.8**	-	**170**	-	<0.89	-	**53**	-	**82**	-
1,2,3,7,8-PeCDD	1.000	<0.67	0	<2.0	0	<3.8	0	<2.3	0	<2.1	0
Total PeCDD	-	**46**	-	**27**	-	<3.8	-	<2.3	-	<3.5	-
1,2,3,4,7,8-HxCDD	0.100	<0.84	0	<1.0	0	<2.0	0	<1.4	0	<1.1	0
1,2,3,6,7,8-HxCDD	0.100	**170**	**17.0**	<2.8	0	<2.1	0	**3.5 J**	**0.35**	<2.7	0
1,2,3,7,8,9-HxCDD	0.100	**55**	**5.5**	<2.7	0	<1.9	0	<3.0	0	<2.0	0
Total HxCDD	-	**1000**	-	**37**	-	<2.1	-	**24**	-	**19**	-
1,2,3,4,6,7,8-HpCDD	0.010	**310**	**3.1**	**43**	**0.43**	<1.5	0	**61**	**0.610**	**30**	**0.30**
Total HpCDD	-	**510**	-	**81**	-	<1.5	-	**220**	-	**66**	-
OCDD	0.0001	**76**	**0.0076**	**280**	**0.028**	<5.3	0	**570**	**0.057**	**220**	**0.022**
2,3,7,8-TCDF	0.100	**5.5 CON**	**0.55**	**10 CON**	**1.0**	<1.4	0	**2.0 CON**	**0.2**	**4.1 CON *J***	**0.41**
Total TCDF	-	**25**	-	**100**	-	<1.4	-	**18**	-	**54**	-
1,2,3,7,8-PeCDF	0.050	**3.3 J**	**0.17**	**3.7 J**	**0.18**	<2.3	0	<1.2	0	<1.6	0
2,3,4,7,8-PeCDF	0.500	**6.6**	**3.3**	**4.9 J**	**2.5**	<2.3	0	<1.6	0	**2.9**	**1.4**
Total PeCDF	-	**95**	-	**68**	-	<2.3	-	**18**	-	**87**	-
1,2,3,4,7,8-HxCDF	0.100	**28**	**2.8**	**3.8 J**	**0.38**	<2.3	0	<2.4	0	**3.8 J**	**0.38**
1,2,3,6,7,8-HxCDF	0.100	**10**	**1.0**	**3.3 J**	**0.33**	<2.1	0	<1.5	0	<2.1	0
2,3,4,6,7,8-HxCDF	0.100	**9.7**	**0.97**	<2.7	0	<2.4	0	<2.0	0	<2.7	0
1,2,3,7,8,9-HxCDF	0.100	<1.5	0	<0.58	0	<2.5	0	<1.4	0	<1.4	0
Total HxCDF	-	**1700**	-	**54**	-	<2.5	-	**24**	-	**84**	-
1,2,3,4,6,7,8-HpCDF	0.010	**4100 E *J***	**41.0**	**19**	**0.19**	<0.83	0	**14**	**0.14**	**13**	**0.13**
1,2,3,4,7,8,9-HpCDF	0.010	**14**	**0.14**	<1.1	0	<0.97	0	<0.98	0	<0.74	0
Total HpCDF	-	**7200**	-	**31**	-	<0.97	-	**31**	-	**27**	-
OCDF	0.0001	**1200**	**0.12**	**15**	**0.0015**	<2.0	0	**25**	**0.0025**	**22**	**0.0022**
Total TEQ Concentration	-	-	**77**	-	**155**	-	**0**	-	**50**	-	**79**

TABLE 6 (continued)
SUMMARY OF CONSTITUENTS
EVALUATION OF THE DISTRIBUTION OF DIOXIN
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	AP-DEL-01	
	Sample ID	2102245	
	Sample Date	4/11/2002	
	Sample Time	1353 (DUP)	
	Sample Depth	1.0-2.0'	
	Laboratory	STL	
	Lot Number	G2D130158	
	Lab. Number	#018	
Date Dioxins/Furans Analyzed			
Constituent	TEF	Result	TEQ
2,3,7,8-TCDD	1.000	**56**	**56.0**
Total TCDD	-	**64**	-
1,2,3,7,8-PeCDD	1.000	<1.2	0
Total PeCDD	-	<5.1	-
1,2,3,4,7,8-HxCDD	0.100	<0.74	0
1,2,3,6,7,8-HxCDD	0.100	<2.1	0
1,2,3,7,8,9-HxCDD	0.100	<1.7	0
Total HxCDD	-	**19**	-
1,2,3,4,6,7,8-HpCDD	0.010	**32**	**0.32**
Total HpCDD	-	**64**	-
OCDD	0.0001	**230**	**0.023**
2,3,7,8-TCDF	0.100	**7.2 CON *J***	**0.72**
Total TCDF	-	**92**	-
1,2,3,7,8-PeCDF	0.050	<2.3	0
2,3,4,7,8-PeCDF	0.500	**3.5 J**	**1.7**
Total PeCDF	-	**93**	-
1,2,3,4,7,8-HxCDF	0.100	**4.0 J**	**0.4**
1,2,3,6,7,8-HxCDF	0.100	<2.5	0
2,3,4,6,7,8-HxCDF	0.100	<2.4	0
1,2,3,7,8,9-HxCDF	0.100	<1.0	0
Total HxCDF	-	**81**	-
1,2,3,4,6,7,8-HpCDF	0.010	**12**	**0.12**
1,2,3,4,7,8,9-HpCDF	0.010	<1.0	0
Total HpCDF	-	**27**	-
OCDF	0.0001	**23**	**0.0023**
Total TEQ Concentration	-	-	**59**

Notes to Table 6

Results have been adjusted for dry weight
pg/g = picograms per gram = parts per trillion (ppt)
TEF = Toxic Equivalency Factor provided by World Health Organization (WHO) (7/23/99).
TEQ = Toxic Equivalents
Total TEQ concentration reported to the nearest pg/g
J = Estimated result; result is less than the reporting limit
CON = Confirmation analysis
D = Result was obtained from the analysis of a dilution
E = Estimated result; result concentration exceeds the calibration range
Data Validation Qualifiers presented in Italics:
UJ = The compound was analyzed for, but not detected. The associated numerical value is the estimated sample quantitation limit.
J = The associated numerical value is an estimated quantity.
STL = Severn Trent Laboratories, Inc. - Sacramento

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TABLE 7
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	01-DEL-201		01-DEL-202		01-DEL-203		02-DEL-201		02-DEL-202	
	Sample ID	2108336		2108340		2108339		2108332		2108330	
	Sample Date	7/22/2002		7/22/2002		7/22/2002		7/22/2002		7/22/2002	
	Sample Time	1640		1820		1805		1420		1335	
	Sample Depth	0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2G240279		G2G240279		G2G240279		G2G240279		G2G240279	
	Lab. Number	014		018		017		010		008	
	Date Dioxins/Furans Analyzed	8/11/2002		8/11/2002		8/11/2002		8/11/2002		8/8/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**9500 D**	**9500.0**	**800**	**800.0**	**8600 ~~ED~~ *J***	**8600.0**	**43 D**	**43**	**29**	**29**
Total TCDD	-	**9600**	-	**910**	-	**8800**	-	**43**	-	**33**	-
1,2,3,7,8-PeCDD	1.000	**22**	**22.0**	**24**	**24.0**	**21**	**21.0**	<4.4 D	0	<0.29	0
Total PeCDD	-	**170**	-	**180**	-	**110**	-	<4.4 D	-	<1.7	-
1,2,3,4,7,8-HxCDD	0.100	**26**	**2.6**	**35**	**3.5**	**23**	**2.3**	<1.1	0	<0.31	0
1,2,3,6,7,8-HxCDD	0.100	**85**	**8.5**	**110**	**11.0**	**72**	**7.2**	<0.90	0	<0.72	0
1,2,3,7,8,9-HxCDD	0.100	**77**	**7.7**	**62**	**6.2**	**66**	**6.6**	<2.2	0	<0.75	0
Total HxCDD	-	**780**	-	**1000**	-	**650**	-	**8.4**	-	<2.5	-
1,2,3,4,6,7,8-HpCDD	0.010	**1600**	**16.0**	**3200**	**32.0**	**1300**	**13.0**	**12**	**0.12**	**9.3**	**0.093**
Total HpCDD	-	**3000**	-	**6300**	-	**2300**	-	**27**	-	**19**	-
OCDD	0.0001	**15000 D**	**1.5**	**35000 D**	**3.5**	**11000 D**	**1.1**	**72**	**0.0072**	**64**	**0.0064**
2,3,7,8-TCDF	0.100	**38 CON**	**3.8**	**59 CON**	**5.9**	**36 CON**	**3.6**	**3.3 CON**	**0.33**	**3.5 CON**	**0.35**
Total TCDF	-	**400**	-	**340**	-	**730**	-	**18**	-	**18**	-
1,2,3,7,8-PeCDF	0.050	**23**	**1.2**	**25**	**1.2**	**20**	**1.0**	<1.1	0	<1.2	0
2,3,4,7,8-PeCDF	0.500	**46**	**23.0**	**48**	**24.0**	**51**	**26.0**	**3.8 J**	**1.9**	<1.2	0
Total PeCDF	-	**750**	-	**720**	-	**1000**	-	**12**	-	**5.3**	-
1,2,3,4,7,8-HxCDF	0.100	**79**	**7.9**	**120**	**12.0**	**77**	**7.7**	<2.2	0	<1.8	0
1,2,3,6,7,8-HxCDF	0.100	**71**	**7.1**	**100**	**10.0**	**51**	**5.1**	<0.84	0	<0.82	0
2,3,4,6,7,8-HxCDF	0.100	**57**	**5.7**	**53**	**5.3**	**28**	**2.8**	<0.84	0	<0.75	0
1,2,3,7,8,9-HxCDF	0.100	<2.2	0	<2.4	0.0	<1.3	0	<0.22	0	<0.078	0
Total HxCDF	-	**1200**	-	**1200**	-	**1300**	-	**10**	-	**6.8**	-
1,2,3,4,6,7,8-HpCDF	0.010	**460 *J***	**4.6**	**460**	**4.6**	**180**	**1.8**	**5.1 J**	**0.051**	**3.7 J**	**0.037**
1,2,3,4,7,8,9-HpCDF	0.010	**25**	**0.25**	**46**	**0.46**	**22**	**0.22**	<0.74	0	<0.33	0
Total HpCDF	-	**1000**	-	**1300**	-	**450**	-	**8.2**	-	**3.7**	-
OCDF	0.0001	**910 ~~D~~ *J***	**0.091**	**1300 D**	**0.13**	**430 D**	**0.04**	<5.5	0	<4.2	0
Total TEQ Concentration	-	-	**9612**	-	**944**	-	**8699**	-	**45**	-	**29**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Location ID		02-DEL-203		03-DEL-101		03-DEL-102		03-DEL-103		03-DEL-201	
Sample ID		2108331		2108328		2108327		2108329		2108324	
Sample Date		7/22/2002		7/22/2002		7/22/2002		7/22/2002		7/22/2002	
Sample Time		1410		1030		1010		1045		1105	
Sample Depth		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
Laboratory		STL		STL		STL		STL		STL	
Lot Number		G2G240279		G2G240279		G2G240279		G2G240279		G2G240279	
Lab. Number		009		002		001		003		004	
Date Dioxins/Furans Analyzed		8/8/2002		8/8/2002		8/8/2002		8/8/2002		8/8/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**41**	**41**	**120**	**120.0**	**4.4**	**4.4**	**630 E J**	**630.0**	**370**	**370.0**
Total TCDD	-	**44**	-	**140**	-	**6.3**	-	**640**	-	**390**	-
1,2,3,7,8-PeCDD	1.000	<0.36	0	<2.6	0	<0.41	0	**5.1 J**	**5.1**	**4.1 J**	**4.1**
Total PeCDD	-	<1.0	-	**13**	-	<1.0	-	**22**	-	**11**	-
1,2,3,4,7,8-HxCDD	0.100	<0.30	0	<1.8	0	<0.24	0	**4.1 J**	**0.41**	**4.1 J**	**0.41**
1,2,3,6,7,8-HxCDD	0.100	<0.77	0	**4.1 J**	**0.41**	<0.46	0	**9.8**	**0.98**	**13**	**1.3**
1,2,3,7,8,9-HxCDD	0.100	<0.88	0	<2.8	0	<0.44	0	**12**	**1.2**	**12**	**1.2**
Total HxCDD	-	<2.5	-	**42**	-	<2.4	-	**110**	-	**98**	-
1,2,3,4,6,7,8-HpCDD	0.010	**13**	**0.13**	**40**	**0.4**	**5.3 J**	**0.053**	**320**	**3.2**	**250**	**2.5**
Total HpCDD	-	**25**	-	**77**	-	**10**	-	**520**	-	**460**	-
OCDD	0.0001	**220**	**0.022**	**220**	**0.022**	**33**	**0.0033**	**2200**	**0.22**	**1500**	**0.15**
2,3,7,8-TCDF	0.100	**2.5 CON**	**0.25**	**10 CON**	**1.0**	**1.0 CON J**	**0.1**	**5.7 CON**	**0.57**	**5.8 CON**	**0.58**
Total TCDF	-	**14**	-	**100**	-	**9.3**	-	**54**	-	**49**	-
1,2,3,7,8-PeCDF	0.050	<0.83	0	**6.0 J**	**0.3**	<0.66	0	<2.4	0	<2.5	0
2,3,4,7,8-PeCDF	0.500	<1.0	0	**12**	**6.0**	<0.89	0	**4.2 J**	**2.1**	**4.5 J**	**2.2**
Total PeCDF	-	**4.1**	-	**160**	-	**8.2**	-	**35**	-	**55**	-
1,2,3,4,7,8-HxCDF	0.100	<1.4	0	**9.5**	**0.95**	<1.4	0	**5.8 J**	**0.58**	**6.4**	**0.64**
1,2,3,6,7,8-HxCDF	0.100	<0.72	0	**9.2**	**0.92**	<0.90	0	**3.9 J**	**0.39**	**5.3 J**	**0.53**
2,3,4,6,7,8-HxCDF	0.100	<0.76	0	**11**	**1.1**	<0.74	0	**4.2 J**	**0.42**	**4.3 J**	**0.43**
1,2,3,7,8,9-HxCDF	0.100	<0.055	0	<0.51	0	<0.14	0	<0.21	0	<0.18	0
Total HxCDF	-	**7.1**	-	**130**	-	**3.8**	-	**71**	-	**140**	-
1,2,3,4,6,7,8-HpCDF	0.010	**3.9 J**	**0.039**	**32**	**0.32**	<2.9	0	**21**	**0.21**	**39**	**0.39**
1,2,3,4,7,8,9-HpCDF	0.010	<0.34	0	<3.0	0	<0.61	0	<1.7	0	<2.6	0
Total HpCDF	-	**4.0**	-	**48**	-	<2.9	-	**37**	-	**86**	-
OCDF	0.0001	<4.8	0	**21**	**0.0021**	<2.8	0	**24**	**0.0024**	**74**	**0.0074**
Total TEQ Concentration	-	-	**41**	-	**131**	-	**5**	-	**645**	-	**384**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	03-DEL-202		03-DEL-203		03/04-DEL-101		03/04-DEL-102		03/04-DEL-102	
	Sample ID	2108325		2108326		2108320		2108321		2108322 (Duplicate)	
	Sample Date	7/22/2002		7/22/2002		7/19/2002		7/19/2002		7/19/2002	
	Sample Time	1115		1130		1510		1520		1520	
	Sample Depth	0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2G240279		G2G240279		G2G230229		G2G230229		G2G230229	
	Lab. Number	005		006		018		019		020	
	Date Dioxins/Furans Analyzed	8/8/2002		8/8/2002		8/7/2002		8/7/2002		8/9/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**15**	**15.0**	**4.3**	**4.3**	**1200 E *EB***	**1200.0**	**280 *EB***	**280.0**	**130 EB**	**130.0**
Total TCDD	-	**19**	-	**4.3**	-	**1300 *EB***	-	**290 *EB***	-	**130 *EB***	-
1,2,3,7,8-PeCDD	1.000	<1.2	0	<0.37	0	**11 J**	**11.0**	<2.9	0	<2.3	0
Total PeCDD	-	<2.6	-	<0.45	-	**28**	-	**4.8**	-	<2.3	0
1,2,3,4,7,8-HxCDD	0.100	<2.2	0	<0.38	0	**19**	**1.9**	<3.1	0	<2.6	0
1,2,3,6,7,8-HxCDD	0.100	**12**	**1.2**	<2.7	0	**57**	**5.7**	**12**	**1.2**	**9.2**	**0.92**
1,2,3,7,8,9-HxCDD	0.100	**6.0**	**0.6**	<1.6	0	**47**	**4.7**	**11**	**1.1**	**7.1 J**	**0.71**
Total HxCDD	-	**60**	-	**5.1**	-	**310**	-	**77**	-	**57**	-
1,2,3,4,6,7,8-HpCDD	0.010	**450**	**4.5**	**48**	**0.48**	**1400**	**14.0**	**240**	**2.4**	**200**	**2.0**
Total HpCDD	-	**820**	-	**88**	-	**2600**	-	**440**	-	**350**	-
OCDD	0.0001	**3700**	**0.37**	**290**	**0.029**	**11000 E *J***	**1.1**	**1800**	**0.18**	**1600**	**0.16**
2,3,7,8-TCDF	0.100	**3.4 CON**	**0.34**	<0.44 CON	0	**6.2 CON**	**0.62**	**5.3 CON**	**0.53**	**4.4 CON**	**0.44**
Total TCDF	-	**27**	-	**3.0**	-	**130**	-	**43**	-	**27**	-
1,2,3,7,8-PeCDF	0.050	<1.6	0	<0.35	0	<4.5	0	<3.6	0	<2.2	0
2,3,4,7,8-PeCDF	0.500	<2.3	0	<0.73	0	**8.1 J**	**4.0**	**4.9 J**	**2.5**	<3.6	0
Total PeCDF	-	**45**	-	**15**	-	**260**	-	**55**	-	**41**	-
1,2,3,4,7,8-HxCDF	0.100	**3.1 J**	**0.31**	<1.2 *UJ*	0	**21**	**2.1**	**7.6 J**	**0.76**	**4.5 J**	**0.45**
1,2,3,6,7,8-HxCDF	0.100	**3.5 J**	**0.35**	<1.2	0	**18**	**1.8**	**6.7 J**	**0.67**	**4.9 J**	**0.49**
2,3,4,6,7,8-HxCDF	0.100	**3.7 J**	**0.37**	<1.4	0	**12**	**1.2**	**6.6 J**	**0.66**	**5.4 J**	**0.54**
1,2,3,7,8,9-HxCDF	0.100	<0.13	0	<0.14	0	<0.70	0	<0.39	0	<0.32	0
Total HxCDF	-	**90**	-	**17**	-	**340**	-	**100**	-	**80**	-
1,2,3,4,6,7,8-HpCDF	0.010	**62**	**0.62**	**6.6**	**0.066**	**210**	**2.1**	**47**	**0.47**	**50**	**0.50**
1,2,3,4,7,8,9-HpCDF	0.010	**3.1 J**	**0.031**	<0.53	0	**16**	**0.16**	**4.2 J**	**0.042**	<3.2	0
Total HpCDF	-	**200**	-	**16**	-	**600**	-	**120**	-	**1110**	-
OCDF	0.0001	**180**	**0.018**	**7.2 J**	**0.00072**	**790**	**0.079**	**97**	**0.0097**	**92**	**0.0092**
Total TEQ Concentration	-	-	**24**	-	**5**	-	**1250**	-	**291**	-	**136**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Location ID		03/04-DEL-103		04-DEL-201		04-DEL-202		04-DEL-203		05-DEL-100	
Sample ID		2108319		2108316		2108315		2108313		2108311	
Sample Date		7/19/2002		7/19/2002		7/19/2002		7/19/2002		7/19/2002	
Sample Time		1455		1355		1345		1320		1250	
Sample Depth		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
Laboratory		STL		STL		STL		STL		STL	
Lot Number		G2G230229		G2G230229		G2G230229		G2G230229		G2G230229	
Lab. Number		017		014		013		011		009	
Date Dioxins/Furans Analyzed		8/7/2002		8/7/2002		8/7/2002		8/7/2002		8/7/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**1900 ~~E~~ *EB***	**1900.0**	**140 *EB***	**140.0**	**57 *EB***	**57.0**	**310 *EB***	**310.0**	**46 *EB***	**46.0**
Total TCDD	-	**1900 *EB***	-	**140 *EB***	-	**59 *EB***	-	**320 *EB***	-	**49 *EB***	-
1,2,3,7,8-PeCDD	1.000	**9.9**	**9.9**	<0.80	0	<0.59	0	<1.2	0	<1.3	0
Total PeCDD	-	**27**	-	<0.80	-	<1.1	-	<1.9	-	<2.6	-
1,2,3,4,7,8-HxCDD	0.100	**10**	**1.0**	<0.94	0	<0.49	0	<1.2	0	<2.4	0
1,2,3,6,7,8-HxCDD	0.100	**28**	**2.8**	<2.5	0	<0.96	0	<3.8	0	**45**	**4.5**
1,2,3,7,8,9-HxCDD	0.100	**34**	**3.4**	<2.6	0	<1.3	0	<3.4	0	**9.1**	**0.91**
Total HxCDD	-	**200**	-	**10**	-	**3.1**	-	**17**	-	**180**	-
1,2,3,4,6,7,8-HpCDD	0.010	**730**	**7.3**	**41**	**0.41**	**18**	**0.18**	**81**	**0.81**	**4300 D**	**43.0**
Total HpCDD	-	**1200**	-	**77**	-	**35**	-	**150**	-	**9500**	-
OCDD	0.0001	**4800**	**0.48**	**210**	**0.021**	**110**	**0.011**	**480**	**0.048**	**84000 ~~DE~~ *J***	**8.4**
2,3,7,8-TCDF	0.100	**12 CON**	**1.2**	**0.76 CON J**	**0.076**	**0.88 CON J**	**0.088**	**1.4 J CON**	**0.14**	**1.4 CON**	**0.14**
Total TCDF	-	**130**	-	**2.9**	-	**4.5**	-	**6.9**	-	**15**	-
1,2,3,7,8-PeCDF	0.050	**5.9 J**	**0.29**	<0.50	0	<0.52	0	<0.81	0	<0.98	0
2,3,4,7,8-PeCDF	0.500	**15**	**7.5**	<0.60	0	<0.63	0	<0.96	0	<2.1	0
Total PeCDF	-	**240**	-	<1.8	-	<2.3	-	**4.9**	-	**29**	-
1,2,3,4,7,8-HxCDF	0.100	**20**	**2.0**	<1.4	0	<0.86	0	<1.3	0	**3.5 J**	**0.35**
1,2,3,6,7,8-HxCDF	0.100	**14**	**1.4**	<0.73	0	<0.51	0	<1.2	0	<2.8	0
2,3,4,6,7,8-HxCDF	0.100	**15**	**1.5**	<0.82	0	<0.49	0	<1.2	0	<3.0	0
1,2,3,7,8,9-HxCDF	0.100	<0.66	0	<0.17	0	<0.21	0	<0.33	0	<0.35	0
Total HxCDF	-	**310**	-	**4.7**	-	<2.1	-	**15**	-	**130**	-
1,2,3,4,6,7,8-HpCDF	0.010	**61**	**0.61**	**5.4 J**	**0.054**	**3.4 J**	**0.034**	**10**	**0.10**	**130**	**1.3**
1,2,3,4,7,8,9-HpCDF	0.010	**6.0 J**	**0.06**	<0.46	0	<0.29	0	<0.83	0	**5.8 J**	**0.058**
Total HpCDF	-	**140**	-	**11**	-	**3.4**	-	**22**	-	**700**	-
OCDF	0.0001	**110**	**0.011**	**10 J**	**0.001**	<4.9	0	**19**	**0.001900**	**440 D**	**0.044**
Total TEQ Concentration	-	-	**1939**	-	**141**	-	**57**	-	**311**	-	**105**

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TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	06-DEL-100		06-DEL-200		07-DEL-201		07-DEL-202		07-DEL-203	
	Sample ID	2108295		2108294		2108306		2108304		2108305	
	Sample Date	7/18/2002		7/18/2002		7/18/2002		7/19/2002		7/19/2002	
	Sample Time	1100		1045		1000		935		950	
	Sample Depth	0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2G220146		G2G220146		G2G230229		G2G230229		G2G230229	
	Lab. Number	002		001		004		002		003	
	Date Dioxins/Furans Analyzed	8/14/2002		8/14/2002		8/7/2002		8/7/2002		8/7/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**1.4 J**	**1.4**	<0.22	0	**370 *EB***	**370.0**	**61 *EB***	**61.0**	**340 *EB***	**340.0**
Total TCDD	-	**1.4**	-	<0.22	-	**440 *EB***	-	**160 *EB***	-	**470 *EB***	-
1,2,3,7,8-PeCDD	1.000	<0.69	0	<0.43	0	**6.8 J**	**6.8**	**7.0**	**7.0**	**14**	**14.0**
Total PeCDD	-	<0.69	-	<0.43	-	**61**	-	**75**	-	**150**	-
1,2,3,4,7,8-HxCDD	0.100	<0.32	0	<0.22	0	**9.4**	**0.94**	**5.8 J**	**0.58**	**11**	**1.1**
1,2,3,6,7,8-HxCDD	0.100	<0.49	0	<0.24	0	**23**	**2.3**	**23**	**2.3**	**43**	**4.3**
1,2,3,7,8,9-HxCDD	0.100	<0.39	0	<0.22	0	**14**	**1.4**	**15**	**1.5**	**30**	**3.0**
Total HxCDD	-	<0.92	-	<0.29	-	**210**	-	**220**	-	**390**	-
1,2,3,4,6,7,8-HpCDD	0.010	**7.0 J**	**0.07**	<1.2	0	**390**	**3.9**	**340**	**3.4**	**510**	**5.1**
Total HpCDD	-	**14**	-	<1.2	-	**740**	-	**600**	-	**890**	-
OCDD	0.0001	**110**	**0.011**	**9.3 J**	**0.000930**	**2000 *J***	**0.2**	**1400**	**0.14**	**2100**	**0.21**
2,3,7,8-TCDF	0.100	<0.52	0	<0.26	0	**22 CON**	**2.2**	**18 CON**	**1.8**	**39 CON**	**3.9**
Total TCDF	-	<0.52	-	<0.26	-	**410**	-	**360**	-	**540**	-
1,2,3,7,8-PeCDF	0.050	<0.54	0	<0.34	0	**19**	**0.95**	**15**	**0.75**	**28**	**1.4**
2,3,4,7,8-PeCDF	0.500	<0.52	0	<0.34	0	**39**	**20.0**	**22**	**11.0**	**40**	**20.0**
Total PeCDF	-	<0.85	-	<0.34	-	**480**	-	**360**	-	**550**	-
1,2,3,4,7,8-HxCDF	0.100	<0.28	0	<0.18	0	**74**	**7.4**	**25**	**2.5**	**39**	**3.9**
1,2,3,6,7,8-HxCDF	0.100	<0.35	0	<0.18	0	**53**	**5.3**	**23**	**2.3**	**38**	**3.8**
2,3,4,6,7,8-HxCDF	0.100	<0.28	0	<0.20	0	**62**	**6.2**	**21**	**2.1**	**37**	**3.7**
1,2,3,7,8,9-HxCDF	0.100	<0.29	0	<0.20	0	<2.4	0	<1.1	0	<2.0	0
Total HxCDF	-	<2.1	-	<0.20	-	**530**	-	**250**	-	**450**	-
1,2,3,4,6,7,8-HpCDF	0.010	**6.2 J**	**0.062**	<0.39	0	**380**	**3.8**	**110**	**1.1**	**150**	**1.5**
1,2,3,4,7,8,9-HpCDF	0.010	<0.31	0	<0.21	0	**43**	**0.43**	**7.7**	**0.077**	**12**	**0.12**
Total HpCDF	-	**15**	-	<0.39	-	**620**	-	**190**	-	**260**	-
OCDF	0.0001	**24**	**0.0024**	<0.38	0	**310**	**0.031**	**93**	**0.0093**	**110**	**0.011**
Total TEQ Concentration	-	-	**2**	-	**0**	-	**432**	-	**98**	-	**406**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	9-DEL-201		9-DEL-202		9-DEL-203		10-DEL-301		10-DEL-301	
	Sample ID	2108293		2108290		2108292		2108297		2108298 (Duplicate)	
	Sample Date	7/17/2002		7/17/2002		7/17/2002		7/18/2002		7/18/2002	
	Sample Time	1630		1545		1610		1255		1255	
	Sample Depth	0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2G190281		G2G190281		G2G190281		G2G220146		G2G220146	
	Lab. Number	012		009		011		004		005	
	Date Dioxins/Furans Analyzed	8/15/2002		8/15/2002		8/15/2002		8/14/2002		8/14/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**16**	**16**	**9.3**	**9.3**	**9.7**	**9.7**	**320**	**320.0**	**360**	**360.0**
Total TCDD	-	**21**	-	**13**	-	**51**	-	**360**	-	**410**	-
1,2,3,7,8-PeCDD	1.000	<0.82	0	<1.0	0	**6.8**	**6.8**	**4.5 J**	**4.5**	**5.2 J**	**5.2**
Total PeCDD	-	<2.2	-	<3.8	-	**47**	-	**13**	-	**23**	-
1,2,3,4,7,8-HxCDD	0.100	<0.68	0	<0.81	0	**5.0 J**	**0.5**	<2.9	0	<3.6	0
1,2,3,6,7,8-HxCDD	0.100	**3.2 J**	**0.32**	**3.1 J**	**0.31**	**15**	**1.5**	**8.2**	**0.82**	**11**	**1.1**
1,2,3,7,8,9-HxCDD	0.100	<1.3	0	**2.9 J**	**0.29**	**12**	**1.2**	**8.5**	**0.85**	**10**	**1.0**
Total HxCDD	-	**19**	-	**29**	-	**160**	-	**65**	-	**90**	-
1,2,3,4,6,7,8-HpCDD	0.010	**29**	**0.29**	**16**	**0.16**	**64**	**0.64**	**140**	**1.4**	**190**	**1.9**
Total HpCDD	-	**49**	-	**35**	-	**130**	-	**260**	-	**370**	-
OCDD	0.0001	**150**	**0.015**	**61**	**0.0061**	**220**	**0.022**	**910**	**0.091**	**1200**	**0.12**
2,3,7,8-TCDF	0.100	**1.7 CON**	**0.17**	**1.6 CON**	**0.16**	**15 CON**	**1.5**	**8.8 CON**	**0.88**	**9.8 CON**	**0.98**
Total TCDF	-	**57**	-	**91**	-	**450**	-	**83**	-	**150**	-
1,2,3,7,8-PeCDF	0.050	<1.4	0	<2.7	0	**18**	**0.9**	<2.8	0	<4.0	0
2,3,4,7,8-PeCDF	0.500	**4.5 J**	**2.2**	**7.9**	**3.9**	**40**	**20.0**	**5.6 J**	**2.8**	**5.1 J**	**2.5**
Total PeCDF	-	**98**	-	**280**	-	**1000**	-	**82**	-	**140**	-
1,2,3,4,7,8-HxCDF	0.100	**3.8 J**	**0.38**	**6.7**	**0.67**	**48**	**4.8**	**6.0 J**	**0.6**	**5.8 J**	**0.58**
1,2,3,6,7,8-HxCDF	0.100	**4.9 J**	**0.49**	**11**	**1.1**	**58**	**5.8**	**5.2 J**	**0.52**	**5.4 J**	**0.54**
2,3,4,6,7,8-HxCDF	0.100	**3.6 J**	**0.36**	**10**	**1.0**	**54**	**5.4**	<3.3	0	<3.6	0
1,2,3,7,8,9-HxCDF	0.100	<0.58	0	<0.35	0	<1.4	0	<0.39	0	<0.35	0
Total HxCDF	-	**88**	-	**220**	-	**990**	-	**74**	-	**83**	-
1,2,3,4,6,7,8-HpCDF	0.010	**25**	**0.25**	**24**	**0.24**	**150**	**1.5**	**43**	**0.43**	**49**	**0.49**
1,2,3,4,7,8,9-HpCDF	0.010	<2.2	0	<1.7	0	**10**	**0.1**	<2.5	0	<2.2	0
Total HpCDF	-	**63**	-	**42**	-	**260**	-	**82**	-	**94**	-
OCDF	0.0001	**47**	**0.0047**	**7.0 J**	**0.0007**	**40**	**0.004**	**44**	**0.0044**	**52**	**0.0052**
Total TEQ Concentration	-	-	**20**	-	**17**	-	**60**	-	**333**	-	**374**

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TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	10-DEL-302		10-DEL-303		11-DEL-100		12-DEL-101		12-DEL102	
	Sample ID	2108296		2108301		2108286		2108282		2108283	
	Sample Date	7/18/2002		7/18/2002		7/17/2002		7/17/2002		7/17/2002	
	Sample Time	1240		1330		1410		1245		1300	
	Sample Depth	0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-1.0'		0.0-2.0'	
	Laboratory	STL		STL		STL		STL		STL	
	Lot Number	G2G220146		G2G220146		G2G190281		G2G190281		G2G190281	
	Lab. Number	003		008		005		001		002	
Date Dioxins/Furans Analyzed		8/14/2002		8/14/2002		8/15/2002		8/15/2002		8/15/2002	
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**97**	**97.0**	**1200 D**	**1200.0**	**50**	**50.0**	**800**	**800.0**	**8.1**	**8.1**
Total TCDD	-	**110**	-	**1300**	-	**57**	-	**860**	-	**16**	-
1,2,3,7,8-PeCDD	1.000	<1.9	0	**15**	**15.0**	<1.0	0	**7.9 J**	**7.9**	<2.4	0
Total PeCDD	-	<4.1	-	**77**	-	<2.8	-	**16**	-	**3.3**	-
1,2,3,4,7,8-HxCDD	0.100	<0.69	0	**12**	**1.2**	<1.1	0	<5.8	0	<2.3 D	0
1,2,3,6,7,8-HxCDD	0.100	<2.6	0	**97**	**9.7**	<1.8	0	**16**	**1.6**	<3.3 D	0
1,2,3,7,8,9-HxCDD	0.100	<3.0	0	**33**	**3.3**	<2.2	0	**20**	**2.0**	<3.7 D	0
Total HxCDD	-	**18**	-	**390**	-	**9.8**	-	**110**	-	<11	-
1,2,3,4,6,7,8-HpCDD	0.010	**39**	**0.39**	**3300**	**33.0**	**19**	**0.19**	**210**	**2.1**	**27**	**0.27**
Total HpCDD	-	**76**	-	**5200**	-	**34**	-	**390**	-	**61**	-
OCDD	0.0001	**260**	**0.026**	**42000 D**	**4.2**	**120**	**0.012**	**1100**	**0.11**	**85**	**0.0085**
2,3,7,8-TCDF	0.100	**4.5 CON**	**0.45**	**27 CON**	**2.7**	**2.9 CON**	**0.29**	**10 CON**	**1.0**	**3.3 CON**	**0.33**
Total TCDF	-	**54**	-	**460**	-	**23**	-	**110**	-	**29**	-
1,2,3,7,8-PeCDF	0.050	<1.9	0	**8.7 J**	**0.43**	<1.8	0	<3.9	0	<2.3	0
2,3,4,7,8-PeCDF	0.500	<2.7	0	**16**	**8.0**	<2.1	0	**6.1 J**	**3.1**	<1.9	0
Total PeCDF	-	**25**	-	**300**	-	**6.3**	-	**62**	-	**5.7**	-
1,2,3,4,7,8-HxCDF	0.100	<2.7	0	**39**	**3.9**	<3.5	0	**6.5 J**	**0.65**	<2.0	0
1,2,3,6,7,8-HxCDF	0.100	<2.2	0	**15**	**1.5**	<1.6	0	**6.7 J**	**0.67**	<1.9	0
2,3,4,6,7,8-HxCDF	0.100	<1.7	0	**9.7**	**0.97**	<1.2	0	<3.9	0	<2.5	0
1,2,3,7,8,9-HxCDF	0.100	<0.37	0	<0.94	0	<1.3	0	<0.73	0	<0.41	0
Total HxCDF	-	**13**	-	**610**	-	**5.0**	-	**110**	-	**6.7**	-
1,2,3,4,6,7,8-HpCDF	0.010	**15**	**0.15**	**620**	**6.2**	**11**	**0.11**	**64**	**0.64**	**9.4**	**0.094**
1,2,3,4,7,8,9-HpCDF	0.010	<0.96	0	**70**	**0.7**	<1.2	0	<4.2	0	<1.6	0
Total HpCDF	-	**27**	-	**2700**	-	**18**	-	**120**	-	**18**	-
OCDF	0.0001	**17**	**0.0017**	**1800 D**	**0.18**	**11 J**	**0.0011**	**78**	**0.0078**	**8.7 J**	**0.00087**
Total TEQ Concentration	-	-	**98**	-	**1291**	-	**51**	-	**820**	-	**9**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

	Location ID	12-DEL-103	
	Sample ID	2108284	
	Sample Date	7/17/2002	
	Sample Time	1315	
	Sample Depth	0.0-1.0'	
	Laboratory	STL	
	Lot Number	G2G190281	
	Lab. Number	003	
Date Dioxins/Furans Analyzed		8/15/2002	
Constituent	TEF	Result	TEQ
2,3,7,8-TCDD	1.000	**530**	**530.0**
Total TCDD	-	**670**	-
1,2,3,7,8-PeCDD	1.000	**20**	**20.0**
Total PeCDD	-	**100**	-
1,2,3,4,7,8-HxCDD	0.100	**26**	**2.6**
1,2,3,6,7,8-HxCDD	0.100	**96**	**9.6**
1,2,3,7,8,9-HxCDD	0.100	**70**	**7.0**
Total HxCDD	-	**680**	-
1,2,3,4,6,7,8-HpCDD	0.010	**980**	**9.8**
Total HpCDD	-	**1700**	-
OCDD	0.0001	**3700**	**0.37**
2,3,7,8-TCDF	0.100	**28 CON**	**2.8**
Total TCDF	-	**320**	-
1,2,3,7,8-PeCDF	0.050	**23**	**1.2**
2,3,4,7,8-PeCDF	0.500	**31**	**16.0**
Total PeCDF	-	**350**	-
1,2,3,4,7,8-HxCDF	0.100	**53**	**5.3**
1,2,3,6,7,8-HxCDF	0.100	**41**	**4.1**
2,3,4,6,7,8-HxCDF	0.100	**29**	**2.9**
1,2,3,7,8,9-HxCDF	0.100	<2.4	0
Total HxCDF	-	**630**	-
1,2,3,4,6,7,8-HpCDF	0.010	**580**	**5.8**
1,2,3,4,7,8,9-HpCDF	0.010	**33**	**0.33**
Total HpCDF	-	**1200**	-
OCDF	0.0001	**400**	**0.04**
Total TEQ Concentration	-	-	**618**

TABLE 7 (continued)
SUMMARY OF CONSTITUENTS
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Notes to Table 7

Laboratory results of samples analyzed by STL using USEPA Method 8290; results have been adjusted for dry weight
pg/g = picograms per gram = parts per trillion (ppt)
TEQ = Toxic Equivalents
Total TEQ concentration reported to the nearest pg/g
TEF = Toxic Equivalency Factor provided by World Health Organization (WHO) (7/23/99)
Immuno-assay results of samples screened by LEA using USEPA Method 4025
J = Estimated result; result is less than the reporting limit
CON = Confirmation analysis
D = Result was obtained from the analysis of a dilution
E = Estimated result; result concentration exceeds the calibration range
LEA = Loureiro Engineering Associates, Inc.
STL = Severn Trent Laboratories, Inc. - Sacramento
Data Validation Qualifiers presented in Italics:
UJ = The compound was analyzed for, but not detected. The associated numerical value is the estimated sample quantitation limit.
J = The associated numerical value is an estimated quantity.
EB = The compound was detected in aqueous equipment blank associated soil samples.
~~E~~ = Analyte was flagged by the laboratory; the analyte was further qualified by the reviewer.

TABLE 8
SUMMARY OF CONSTITUENTS FOR ADDITIONAL SAMPLES
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Location ID		03 / 04-DEL-104		03 / 04-DEL-104		03 / 04-DEL-105		10-DEL-304	
Sample ID		2112412		2112416 (Duplicate)		2112413		2112410	
Sample Date		9/10/2002		9/10/2002		9/10/2002		9/10/2002	
Sample Time		1405		1405		1435		1135	
Sample Depth		0.0-2.0'		0.0-2.0'		0.0-2.0'		0.0-2.0'	
Laboratory		STL		STL		STL		STL	
Lot Number		G2I120184		G2I120184		G2I120184		G2I120184	
Lab. Number		003		007		004		001	
Date Dioxins/Furans Analyzed									
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	**18**	**18**	**11**	**11**	**19**	**19**	**64 *J***	**64**
Total TCDD	-	**18**	-	**11**	-	**39**	-	**79**	-
1,2,3,7,8-PeCDD	1.000	<0.20	0	<0.15	0	<0.24	0	<0.86	0
Total PeCDD	-	<0.82	-	<0.76	-	**8.2**	-	**6.7**	-
1,2,3,4,7,8-HxCDD	0.100	<0.42	0	<0.45	0	<1.4	0	<0.90	0
1,2,3,6,7,8-HxCDD	0.100	<0.99	0	<0.90	0	**5.2 J**	**0.52**	<3.3	0
1,2,3,7,8,9-HxCDD	0.100	<0.96	0	<1.0	0	**4.4 J**	**0.44**	<3.4	0
Total HxCDD	-	**2.9**	-	**3.2**	-	**44**	-	**15**	-
1,2,3,4,6,7,8-HpCDD	0.010	**21**	**0.21**	**24**	**0.24**	**150**	**1.5**	**66**	**0.66**
Total HpCDD	-	**38**	-	**44**	-	**270**	-	**130**	-
OCDD	0.0001	**140**	**0.014**	**160**	**0.016**	**1200**	**0.12**	**680**	**0.068**
2,3,7,8-TCDF	0.100	<0.42 CON	0	**0.82 J, CON**	**0.082**	**7.8 CON**	**0.78**	**5.2 CON**	**0.52**
Total TCDF	-	**7.5**	-	**8.1**	-	**90**	-	**61**	-
1,2,3,7,8-PeCDF	0.050	<0.27	0	<0.31	0	**3.6 J**	**0.18**	<1.8	0
2,3,4,7,8-PeCDF	0.500	<0.56	0	<0.61	0	**6.0**	**3.0**	<2.7	0
Total PeCDF	-	**18**	-	**8.1**	-	**130**	-	**70**	-
1,2,3,4,7,8-HxCDF	0.100	<0.77	0	<0.88	0	**5.2 J**	**0.52**	<2.1	0
1,2,3,6,7,8-HxCDF	0.100	<0.59	0	<0.71	0	**4.8 J**	**0.48**	<2.8	0
2,3,4,6,7,8-HxCDF	0.100	<0.63	0	<0.68	0	**4.7 J**	**0.47**	<2.3	0
1,2,3,7,8,9-HxCDF	0.100	<0.15	0	<0.097	0	<0.23	0	<0.14	0
Total HxCDF	-	**7.8**	-	**9.6**	-	**97**	-	**33**	-
1,2,3,4,6,7,8-HpCDF	0.010	**3.5 J**	**0.035**	**4.1 J**	**0.041**	**35**	**0.35**	**26**	**0.26**
1,2,3,4,7,8,9-HpCDF	0.010	<0.26	0	<0.34	0	<2.5	0	<1.3	0
Total HpCDF	-	**7.6**	-	**9.2**	-	**76**	-	**59**	-
OCDF	0.0001	**6.3 J**	**0.00063**	**7.3 J**	**0.00073**	**51**	**0.0051**	**46**	**0.0046**
Total TEQ Concentration	-	-	**18**	-	**11**	-	**27**	-	**66**

TABLE 8 (continued)
SUMMARY OF CONSTITUENTS FOR ADDITIONAL SAMPLES
DEFINING THE SPECIFIC LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Notes to Table 8
Laboratory results of samples analyzed by STL using USEPA Method 8290; results have been adjusted for dry weight
pg/g = picograms per gram = parts per trillion (ppt)
TEQ = Toxic Equivalents
Total TEQ concentration reported to the nearest pg/g
TEF = Toxic Equivalency Factor provided by World Health Organization (WHO) (7/23/99)
J = Estimated result; result is less than the reporting limit
CON = Confirmation analysis
STL = Severn Trent Laboratories, Inc. - Sacramento

Data Validation Qualifiers presented in Italics:
J = The associated numerical value is an estimated quantity.

TABLE 9
SUMMARY OF CONSTITUENTS DETECTED IN SOIL/SEDIMENT STOCKPILE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

	Location ID	COMP-C1
	Sample ID	2212130
	Sample Date	12/10/2002
	Sample Time	11:30
	Laboratory	STL-Connecticut
	Lab. Number	202698-1
Constituent	**Units**	Result
Polychlorinated Biphenyls (USEPA Method 8082)		
Aroclor 1016	ug/kg	<2.9
Aroclor 1221	ug/kg	<2.7
Aroclor 1232	ug/kg	<3.0
Aroclor 1242	ug/kg	95
Aroclor 1248	ug/kg	<2.1
Aroclor 1254	ug/kg	510
Aroclor 1260	ug/kg	65
Ignitability by USEPA Method 1030	Pos/Neg	Neg
Reactivity (cyanide) by USEPA Method 9014	ug/kg	<500
Reactivity (sulfide) by USEPA Method 9034)[4]	mg/kg	<6.6
Total Petroleum Hydrocarbons by USEPA Method 418.1	mg/kg	1650
Corrosivity (pH) by USEPA Method 9045C.	Yes/No	No
Metals (Mass)(USEPA Methods 6010/7471A)		
Arsenic	mg/kg	3.9
Barium	mg/kg	43.8
Cadmium	mg/kg	<2.0
Chromium	mg/kg	21.7
Lead	mg/kg	149
Mercury	mg/kg	0.21
Selenium	mg/kg	<3.1
Silver	mg/kg	<0.59
Metals (TCLP)		
Lead	mg/l	0.153

Notes:
Laboratory results of samples analyzed by Severn Trent Laboratories, Inc. - Connecticut (STL-CT) using SW-846 methods; results have been adjusted for dry weight.
TCLP = Toxicity Charachteristic Leachate Procedure
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram
mg/l = milligrams per liter

TABLE 9 (continued)
SUMMARY OF CONSTITUENTS DETECTED IN SOIL/SEDIMENT STOCKPILE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

	Location ID	COMP-C1
	Sample ID	2212130
	Sample Date	12/10/2002
	Sample Time	11:30
	Laboratory	STL-Connecticut
	Lab. Number	202698-1
Constituent	**Units**	**Result**
Semi-Volatile Organic Compounds (USEPA Method 8270C)		
4-Methylphenol	ug/kg	110 J
Naphthalene	ug/kg	400 J
2-Methylnaphthalene	ug/kg	1900
Acenaphthylene	ug/kg	170 J
Acenaphthene	ug/kg	810 J
Dibenzofuran	ug/kg	670 J
Fluorene	ug/kg	1400
Phenanthrene	ug/kg	7800
Anthracene	ug/kg	2100
Carbazole	ug/kg	990 J
Di-n-butyl phthalate	ug/kg	160 J
Fluoranthene	ug/kg	8500
Pyrene	ug/kg	7200
Benzo(a)anthracene	ug/kg	4400
Chrysene	ug/kg	4700
Bis (2-ethylhexyl)phthalate	ug/kg	300 J
Di-n-octyl phthalate	ug/kg	330 J
Benzo(b)fluoranthene	ug/kg	4100
Benzo(k)fluoranthene	ug/kg	4400
Benzo(a)pyrene	ug/kg	3400
Ideno(1,2,3-cd)pyrene	ug/kg	510 J
Dibenzo(a,h)anthracene	ug/kg	240 J
Benzo(ghi)perylene	ug/kg	420 J

Notes:

Laboratory results of samples analyzed by Severn Trent Laboratories, Inc. - Connecticut (STL-CT) using SW-846 methods; results have been adjusted for dry weight.

J = Estimated result; result is less than the reporting limit.

ug/kg = micrograms per kilogram

TABLE 9 (continued)
SUMMARY OF CONSTITUENTS DETECTED IN SOIL/SEDIMENT STOCKPILE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

Location ID		Node-3 (Grab)
Sample ID		2212131
Sample Date		12/10/2002
Sample Time		11:40
Laboratory		STL-Connecticut
Lab. Number		202698-1
Constituent	**Units**	Result
Volatile Organic Compounds (USEPA Method 8260B)		
Carbon Disulfide	ug/kg	3 J B
Acetone	ug/kg	16 J
Methylene Chloride	ug/kg	6 J B
cis-1,2-dichloroethene	ug/kg	2 J
Trichloroethene	ug/kg	8 J
Toluene	ug/kg	0.7 J
Tetrachloroethene	ug/kg	6 J
Chlorobenzene	ug/kg	2 J
Xylenes (total)	ug/kg	10

Notes:

Laboratory results of samples analyzed by Severn Trent Laboratories, Inc. - Connecticut (STL-CT) using SW-846 methods; results have been adjusted for dry weight.

ug/kg = micrograms per kilogram

J = Estimated result; result is less than the reporting limit.

B = Analyte also detected in the laboratory method blank.

TABLE 10
SUMMARY OF DIOXINS DETECTED IN SOIL/SEDIMENT STOCKPILE
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

	Location ID	COMP-D1		COMP-D2		COMP-D3	
	Sample ID	2212132		2212133		2212134	
	Sample Date	12/10/2002		12/10/2002		12/10/2002	
	Sample Time	12:30		12:50		13:15	
	Laboratory	STL-Sacramento		STL-Sacramento		STL-Sacramento	
	Lot Number	G2L120246		G2L120246		G2L120246	
	Lab. Number	001		002		003	
Date Dioxins/Furans Analyzed							
Constituent	TEF	Result	TEQ	Result	TEQ	Result	TEQ
2,3,7,8-TCDD	1.000	<0.39	0	**0.63 J**	**0.63**	<0.28	0
Total TCDD	-	<0.39	-	**0.63**	**0.63**	<0.28	-
1,2,3,7,8-PeCDD	1.000	<0.19	0	<0.18	0	<0.18	0
Total PeCDD	-	<0.38	-	<0.23	-	<0.39	-
1,2,3,4,7,8-HxCDD	0.100	<0.13	0	<0.12	0	<0.071	0
1,2,3,6,7,8-HxCDD	0.100	<0.038	0	<0.11	0	<0.064	0
1,2,3,7,8,9-HxCDD	0.100	<0.13	0	<0.17	0	<0.13	0
Total HxCDD	-	<0.13	-	<0.17	-	<0.13	-
1,2,3,4,6,7,8-HpCDD	0.010	<0.24	0	<0.31	0	<0.33	0
Total HpCDD	-	<0.24	-	<0.31	-	<0.33	-
OCDD	0.0001	<1.9	0	**2.9 J**	**0.0003**	**2.9 J**	**0.0003**
2,3,7,8-TCDF	0.100	<0.062	0	<0.043	0	<0.051	0
Total TCDF	-	<0.23	-	<0.18	-	<0.11	-
1,2,3,7,8-PeCDF	0.050	0.048	0	<0.13	0	<0.047	0
2,3,4,7,8-PeCDF	0.500	<0.083	0	<0.061	0	<0.065	0
Total PeCDF	-	<0.33	-	<0.18	-	<0.16	-
1,2,3,4,7,8-HxCDF	0.100	<0.13	0	<0.080	0	<0.16	0
1,2,3,6,7,8-HxCDF	0.100	<0.11	0	<0.070	0	<0.12	0
2,3,4,6,7,8-HxCDF	0.100	<0.11	0	<0.064	0	<0.17	0
1,2,3,7,8,9-HxCDF	0.100	<0.13	0	<0.11	0	<0.22	0
Total HxCDF	-	<0.30	-	<0.22	-	<0.40	-
1,2,3,4,6,7,8-HpCDF	0.010	<0.27	0	<0.24	0.000	<0.41	0
1,2,3,4,7,8,9-HpCDF	0.010	<0.15	0	<0.24	0	<0.47	0
Total HpCDF	-	<0.37	-	<0.34	-	<0.71	-
OCDF	0.0001	<0.48	0	<0.37	0.00000	<1.7	0
Total TEQ Concentration	-	-	**0**	-	**0.630**	-	**0**

Notes:
Laboratory results of samples analyzed by Severn Trent Laboratories, Inc. - Sacramento (STL) using USEPA Method 8280A; results have been adjusted for dry weight
ng/g = nanograms per gram = parts per billion (ppb)
TEQ = Toxic Equivalents
TEF = Toxic Equivalency Factor provided by World Health Organization (WHO) (7/23/99)
J = Estimated result; result is less than the reporting limit

FIGURES

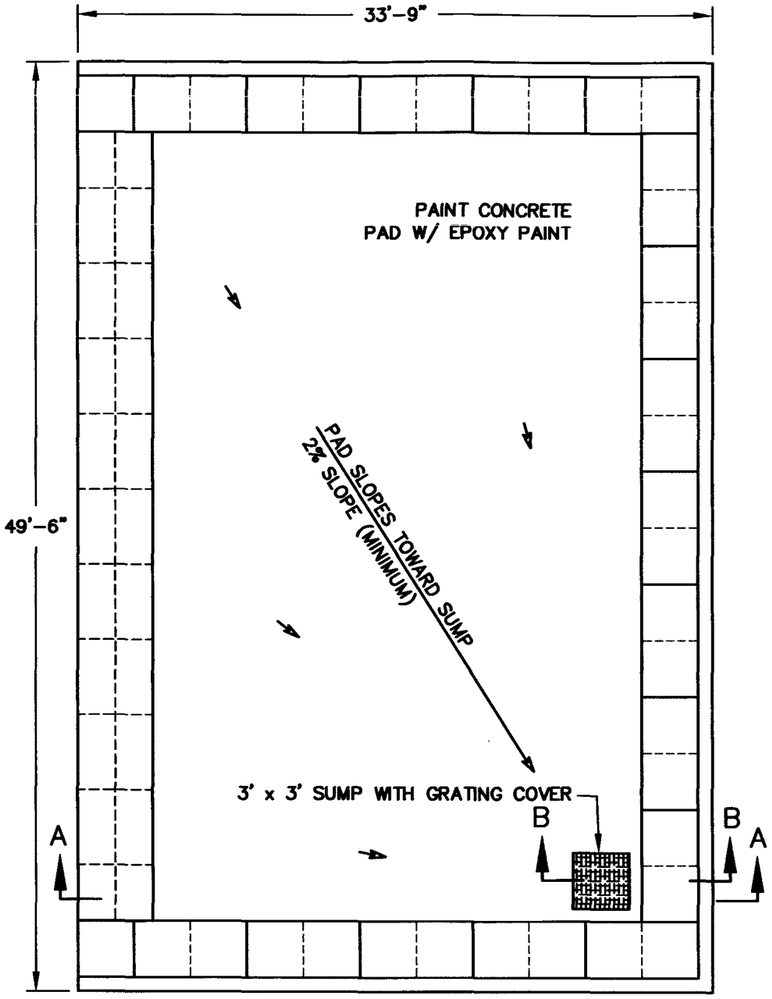
FIGURES

MAP REFERENCE:
USGS 7.5 MINUTE SERIES QUADRANGLES FOR PROVIDENCE, R.I.,
DATED 1957 AND REVISED 1975.

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

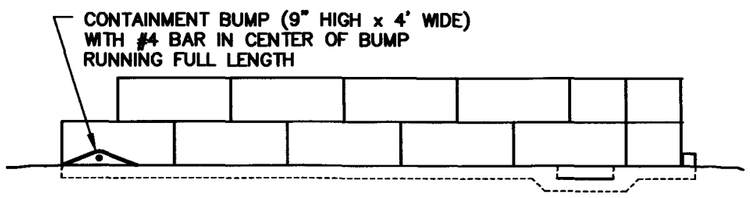
SITE LOCATION

Comm.No.	FIGURE 1-1	LEA
15RP102		



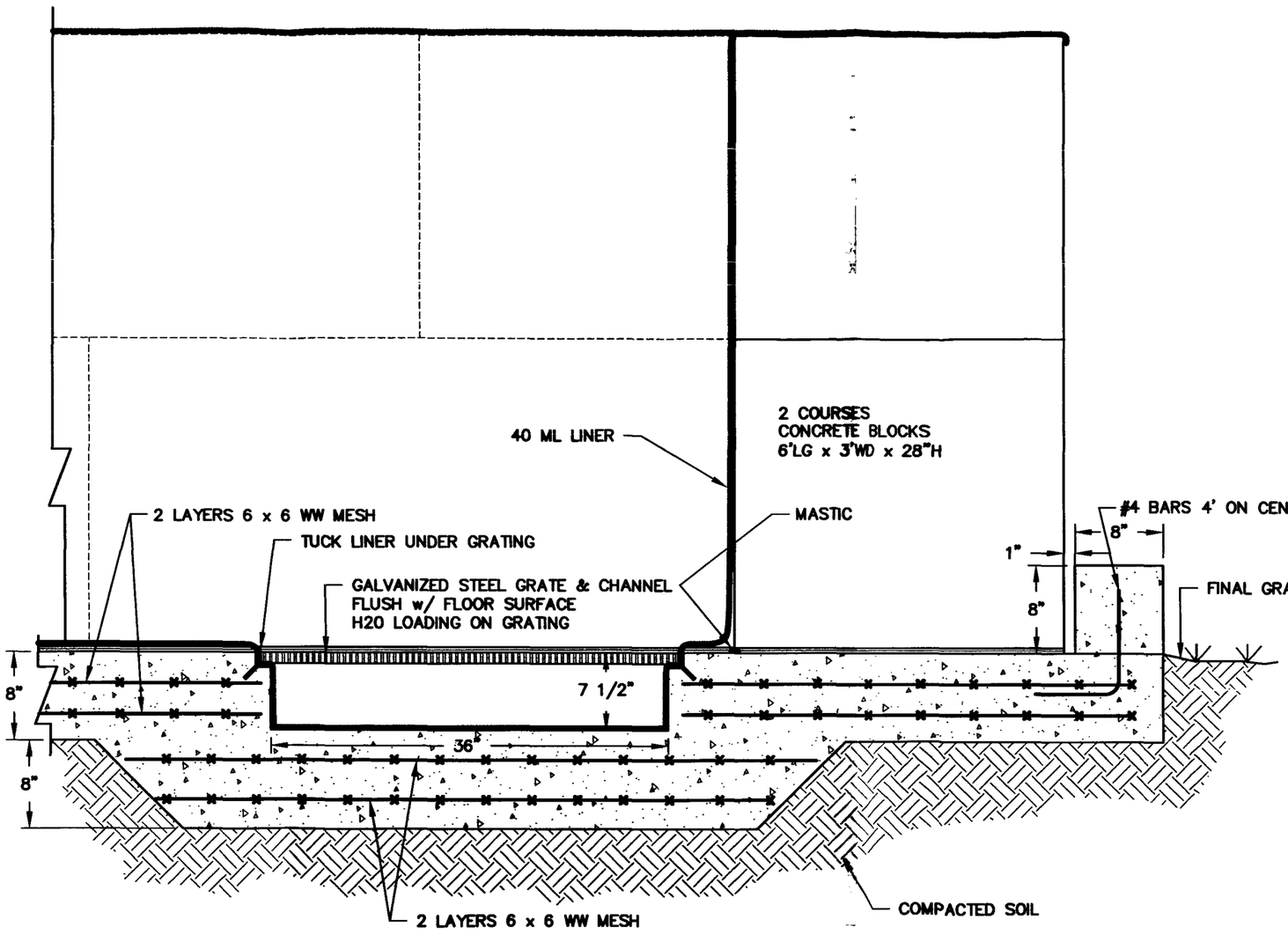
PLAN VIEW

SCALE ⅛" = 1'-0"



SECTION A-A

SCALE ⅛" = 1'-0"



SECTION B-B

SCALE 1" = 1'-0"

NOTES:

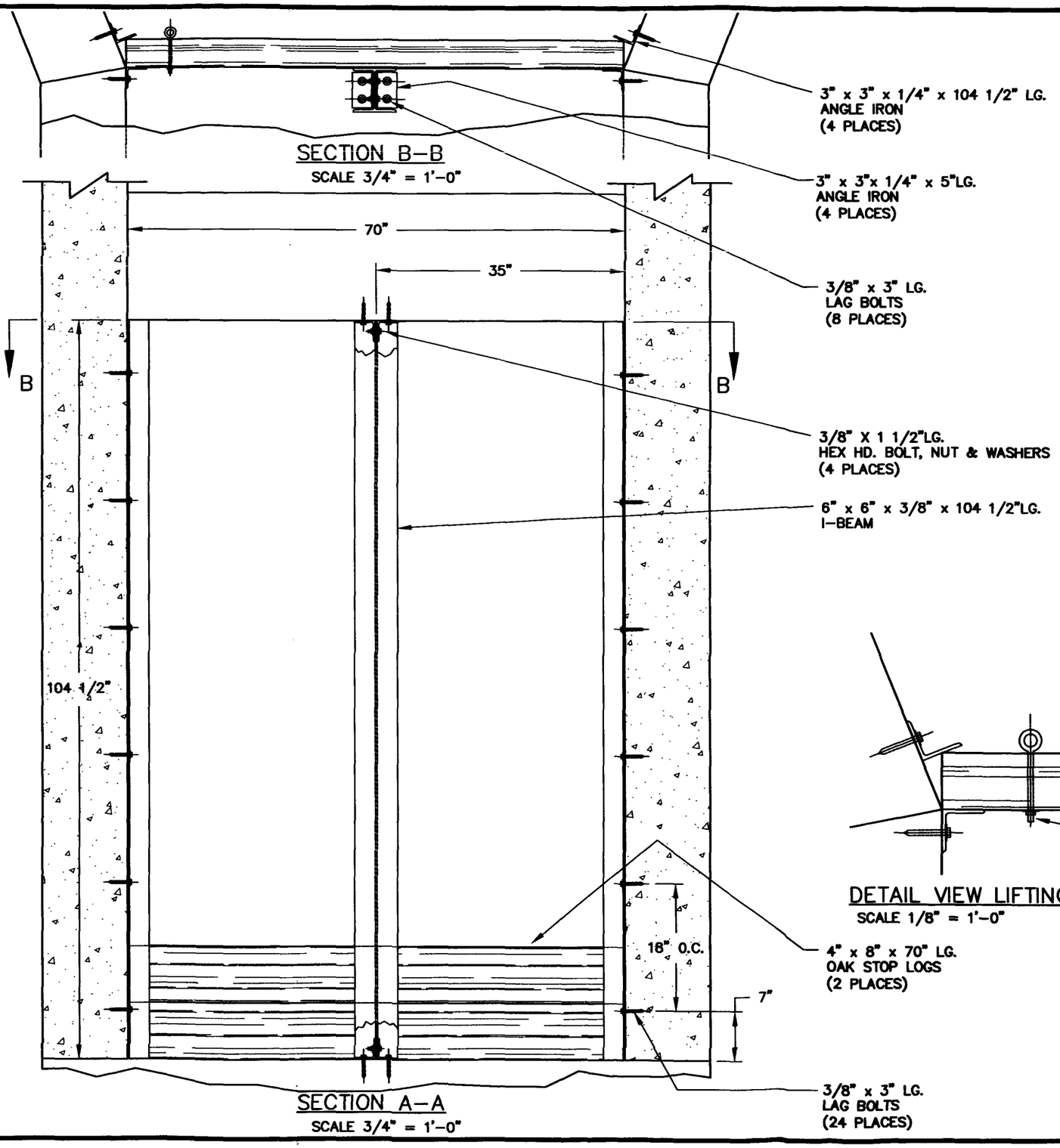
1. CONCRETE 4,000 PSI
2. MASTIC PLACED BETWEEN FLOOR & BOTTOM OF BLOCKS.

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

TEMPORARY CONTAINMENT PAD

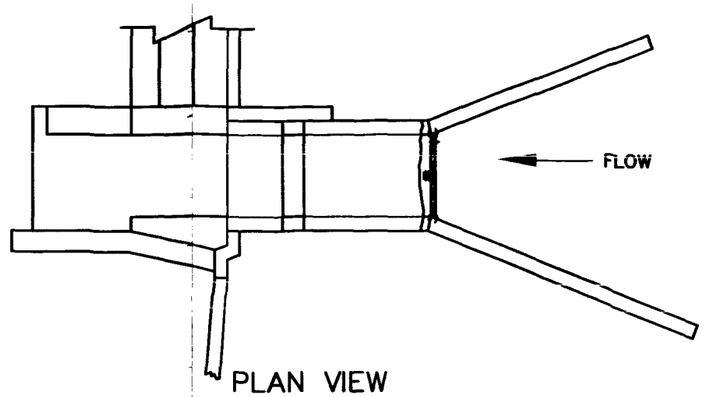
Comm.No.	FIGURE 4-1	LEA
15RP102		

G:\Autocad\PROJECTS\15RP102\COMPLETE\15RP102-F4-1.DWG, 12/9/2003 8:13:47

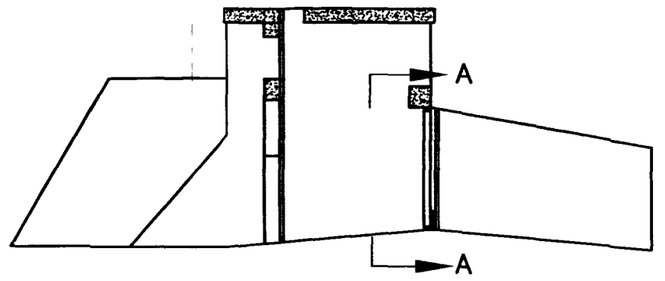


SECTION B–B
SCALE 3/4" = 1'–0"

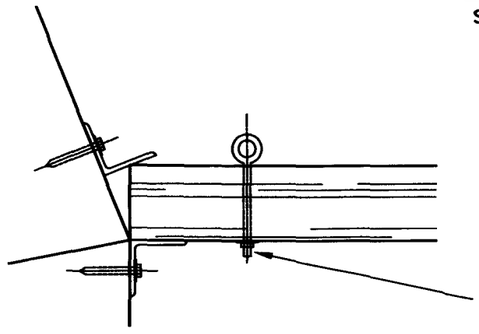
SECTION A–A
SCALE 3/4" = 1'–0"



PLAN VIEW



ELEVATION VIEW
CONCRETE SLUICE GATE STRUCTURE
SCALE 3/32" = 1'–0"



DETAIL VIEW LIFTING EYE BOLT
SCALE 1/8" = 1'–0"

NOTES:
1) ALL STEEL EPOXY PAINT COATED.

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

MODIFIED SLUICE GATE

Comm.No.	FIGURE 4–2
15RP102	

G:\Autocad\PROJECTS\15RP102\COMPLETE\15RP102-F4-2.DWG, 12/9/2003 8:16:19 A

C

N/F CENTERDALE MANOR ASSOCIATES
PLAT 14/LOT 250
BK 117 PG 414-419

N/F 2050 CENTREDALE VILLAGE, L.P.
PLAT 14/LOT 511
BK 328 PG 828

N/F 2050 CENTREDALE VILLAGE, L.P.
PLAT 14/LOT 270
BK 131 PG 016

N/F SCOTT
PLAT 14/LOT 268
BK 301 PG 740

N/F SERIO
PLAT 14/LOT 271
BK 110 PG 453

CLF

'CMS-422'
'CMS-445'
'CMS-078'
'CMS-079'
'CMS-424'
'CMS-084'
'CMS-085'
'CMS-456'
'CMW-SD-2018'
'CMS-427'
'CMS-426'
'CMS-090'
'CMS-091'
'CMS-508'
'CMS-431'
AP-DEL-01 (0.05/0.08)
'RES-14-271-01A'
'CMS-507'
'CMS-098'
'CMS-099'
'CMS-100'
'CMS-220'

N

10 0 10 20 30
SCALE IN FEET

RGURE 5-1

KEY PLAN

SCALE 1" = 20000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1 ppb
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
^MS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 (0.05/0.08) ▲	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND 1'-2* SAMPUNG INTERVAL IN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATION AP-DEL-01

Comm.No. 15RP102

FIGURE 5-1

LEA

'CMS-107'
'CMS-108'
STEERE AVENUE
'CMS-223'
'CMW-SD-2019'
N/F NABER
PLAT 14/LOT 272
BK 117 PG 186
A 'CMS-SOS'
AP-DEL-02 (0.15/0)
'CMS-503'
'CMS-504'
'CMS-114'
'CMS-115'
'CMS-116'
'CMS-502'
'CMS-123'
'CMS-121'
N/F GRENIER
PLAT 14/LOT 302
BK 105 PG 106
'CMS-501'
'CMS-222'
'CMS-128'
'CMW-SD-2020'
'CMS-130'
SHED
'CMS-226'
SD-30
'CMS-500'
GROVER
STREET

N

10 0 10 20 30

SCALE IN FEET

FIGURE 5-2

KEY PLAN

SCALE 1" = 20000'

LEGEND

CMS-422	EPA SOIL SAMPLE. DIOXIN < 1 ppb
CMS-456	EPA SOIL SAMPLE. DIOXIN > 1 ppb
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
Ap-DEL-01 (0.05/0.08) A	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND 1'-2* SAMPUNG INTERVAL IN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE. RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATION AP-DEL-02

Comm.No. 15RP102

FIGURE 5-2

LEA

AP-DEL-03 (0.02/0.08)
'RES-14-303-02'
'CMS-143'
'CMS-144'
"CMS-142'
'RES-14-303-01'
'CMS-225'
N/F ROTELLA
PLAT 14/LOT 303
BK 100 PG 1043
'CMW-SD-2021'
'RES-14-333-02'
N/F ROTELLA
PLAT 14/LOT 333
BK 100 PG 1043
'CMS-149'
'CMS-150'
'CMS-151'
93
92
95
97
96
'RES-14-333-01'
'RES-14-333-03'
•CMS-15T
'CMS-158'
'CMS-159'
REDFERN
STREET
'CMS-483'
'CMS-481'
•CMS-165'
'CMS-166'
'CMW-SD-2022'
CMS-167
N/F ROTELLA
PLAT 14/LOT 334
BK 100 PG 1043

N

10 0 10 20 30
SCALE IN FEET

RGURE 5-3

KEY PLAN

SCALE 1" = 20000'

LEGEND

CMS-422	EPA SOIL SAMPLE, DIOXIN < 1 ppb
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
Ap_DEL-01 ('0.05/0.08) A	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1" AND 1'-2' SAMPUNG INTERVAL IN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATION AP-DEL-03

Comm.No. 15RP102

FIGURE 5-3

LEA

N/F ROTELLA
PLAT 14/LOT 334
BK 100 PG 1043

N/F LUCAS
PLAT 14/LOT 365
BK 205 PG 1070

GEORGE STREET

N/F REHEL
PLAT 14/LOT 366
BK 240 PG 169

▲ AP-DEL-04 (0.13/1.52)

▲ AP-DEL-fcS (0W0.02)

▲ 'RES-14-366-03'

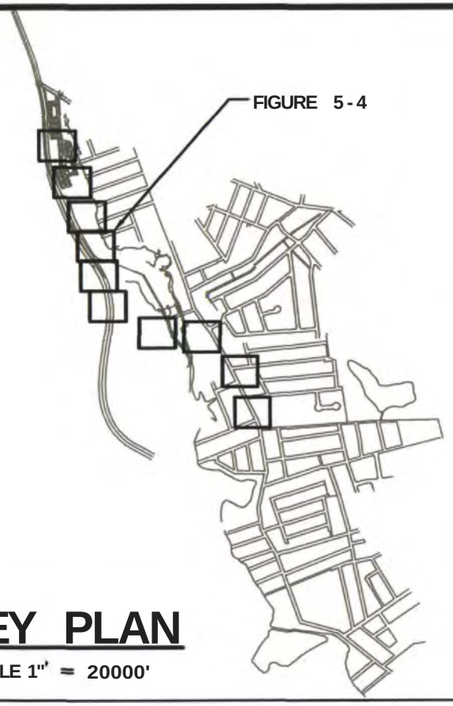
92 95 100 92 98 93 95 93 94 95

N

10 0 10 20 30

SCALE IN FEET

FIGURE 5-4



KEY PLAN

SCALE 1" = 20000'

LEGEND

▲CMS-422	EPA SOIL SAMPLE, DIOXIN < 1 ppb
▲CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
^MS-091	Ep_A SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 ('0.05/0.08) ▲	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND 1'-2' SAMPLING INTERVAL tN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS

SAMPLE LOCATIONS **AP-DEL-04 ft** AP-DEL-05

Comm.No.	FIGURE 5-4	LEA
15RP102		

'RES-14-399-02'

'RES-14-399-01'

'CMS-192'

'CMS-193'

'CMS-472'

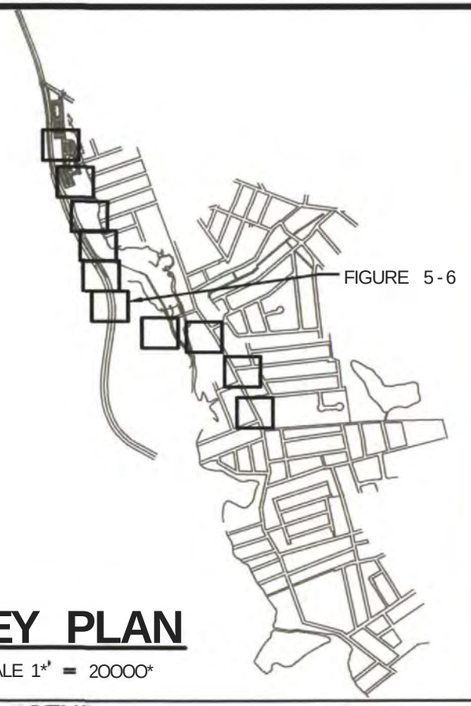
N/F PELOQUIN
PLAT 14/LOT 399
BK 82 PG 592

N/F ASSANTE
PLAT 14/LOT 418
BK 202 PG 108

N

10 0 10 20 30

SCALE IN FEET



KEY PLAN

SCALE 1" = 2000'

LEGEND

▲CMS-422	EPA SOIL SAMPLE, DIOMN < 1 ppb
▲CMS-456	EPA SCHL SAMPLE, DIOMN > 1 ppb
^CMS-091	EPA SEDIMENT SAMPLE, DIOMN < 1 ppb
AP-DEL-01 (0.05/0.08) ▲	APRIL 2002 SAMPLE LOCATION OTOXIN CONCENTRATION FOR THE 0-1' AND 1'-2' SAMPLING INTERVAL IN ppb
ppb	PARTS PER BILLION

'CMS-196'

'CMW-FP-2027'

'CMS-197'

AP-DEL-07 (0.14/0.14)

ALDRICH STREET

N/F ASSELIN
PLAT 14/LOT 419
BK 375 PG 222

'CMS-460'

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATION AP-DEL-07

Comm.No. 15RP102

FIGURE 5-6

LEA

N/F VITULLO
PLAT 14/LOT 425
BK 104 PG 341

N/F SGAMBATO
PLAT 14/LOT 430
BK 229 PG 261

N/F VITULLO
PLAT 14/LOT 424
BK 104 PG 341

N/F VITULLO
PLAT 14/LOT 422
BK 104 PG 341

N/F ASSELIN
PLAT 14/LOT 421
BK 375 PG 222

N

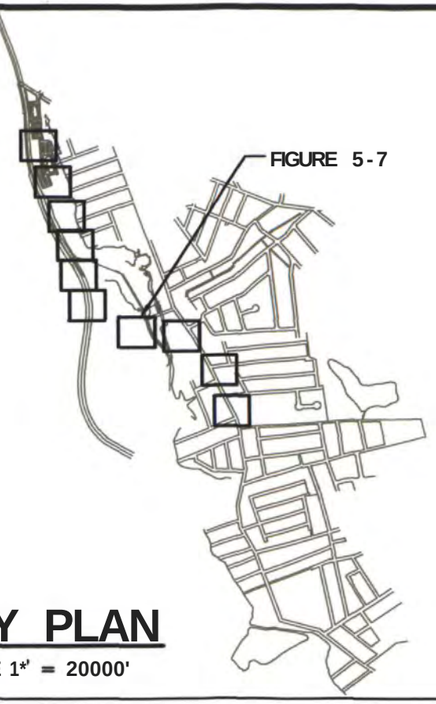
10 0 10 20 30

SCALE IN FEET

▲ AP-DEL-09 (0/0.02)

AP-DEL-10 (0/0)

▲ AP-DEL-08 (0.10/0.01)



KEY PLAN

SCALE 1" = 20000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1 ppb
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 (0.05/0.08) ▲	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND 1'-2' SAMPUNG INTERVAL IN ppb
ppb	PARTS PER BILUON

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATIONS AP-DEL-08, AP-DEL-09, & AP-DEL-10

Comm.No. 15RP102

FIGURE 5-7

LEA

CENTERDALE AVE

N/F S GAMBATO
PLAT 14/LOT 430
BK 229 PG 261

N/F SARAVO
PLAT 14/LOT 448
BK 58 PG 306/309

N/F DILAZZARO
PLAT 14/LOT 449
BK 276 PG 299

N/F MCCUSKER
PLAT 14/LOT 450
BK 269 PG 420

97

95

95

95

AP-DEL-12 (0.05/0.05)

AP-DEL-11 (0.02/0)

AP-DEL-13 (0.15/0)

AP-DEL-14 (0.30/0.50)

N

10 0 10 20 30

SCAIE IN FEET

FIGURE 5-8

KEY PLAN

SCALE 1" - 20000'

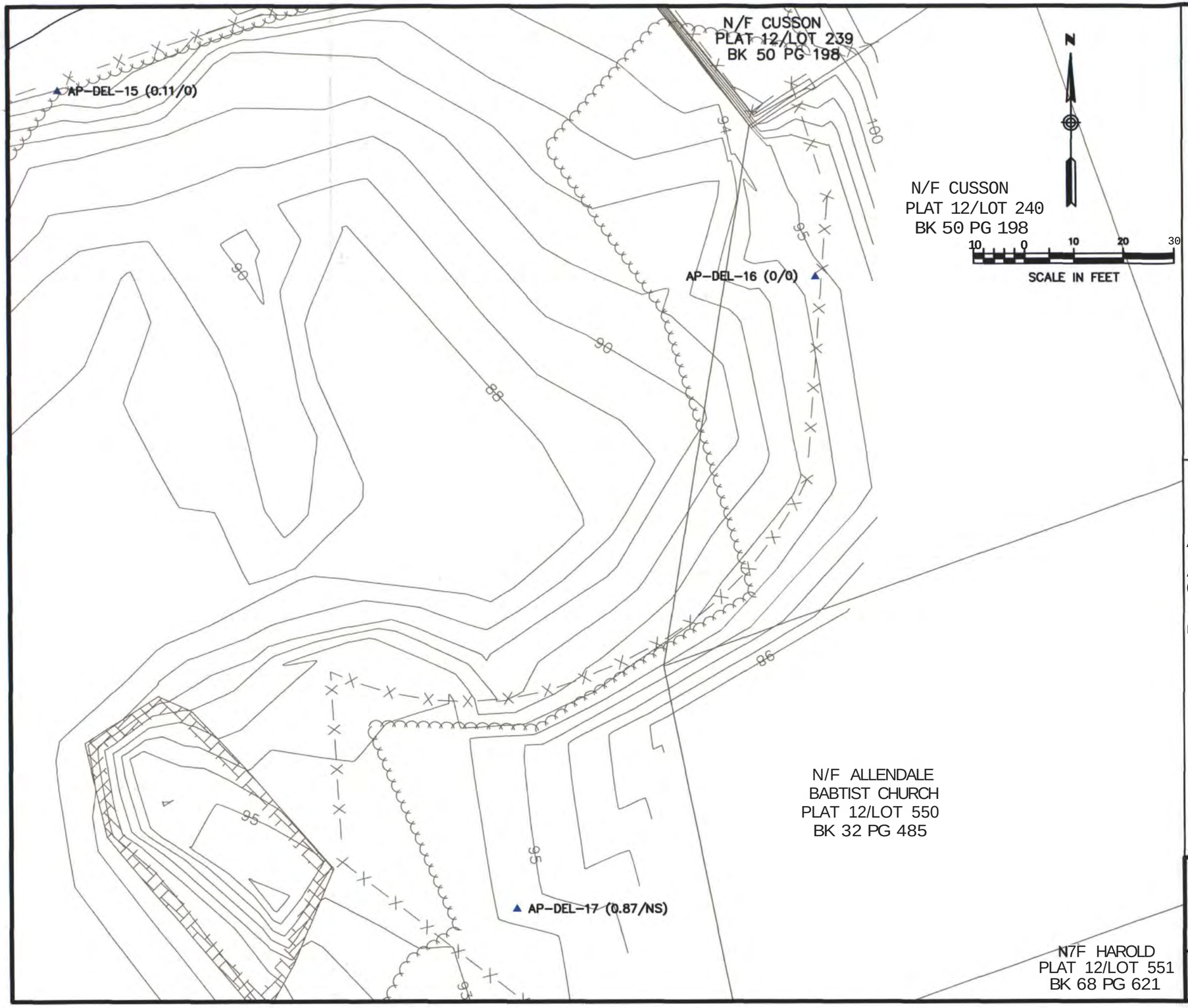
LEGEM

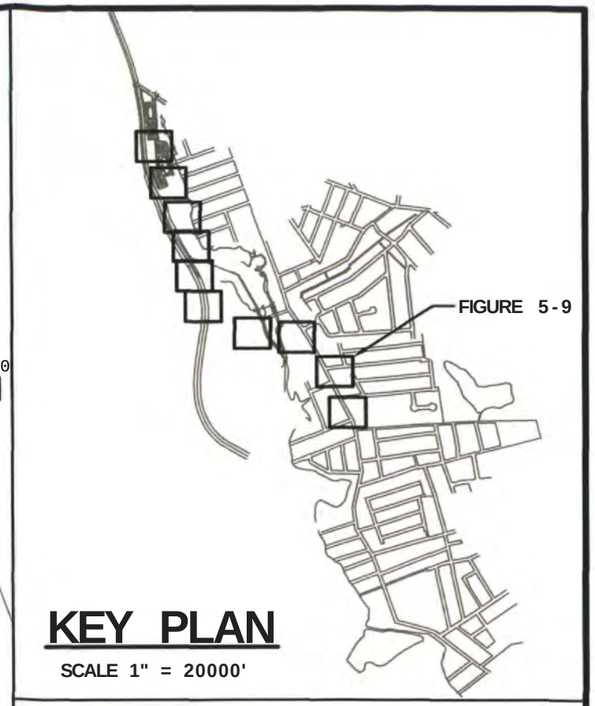
▲CMS-422	EPA SOIL SAMPLE. DIOXIN < 1 ppb
▲CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
◆CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 (0.05/0.08) ▲	APRIL 2002 SAMPLE LOCATION OIOXIN CONCENTRATION FOR THE 0-1' AND 1'-2* SAMPUNG INTERVAL IN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATIONS AP-DEL-11, AP-DEL-12. AP-DEL-13, & AP-DEL-14

Comm.No.	FIGURE 5-8	LEA
15RP102		





KEY PLAN

SCALE 1" = 20000'

LEGEND

^CMS-422	EPA SOIL SAMPLE, DI0X1N < 1 ppb
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
^MS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 (0.05/O.OB) ▲	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND V-2' SAMPUNG INTERVAL IN ppb
PPb	PARTS PER BILLION

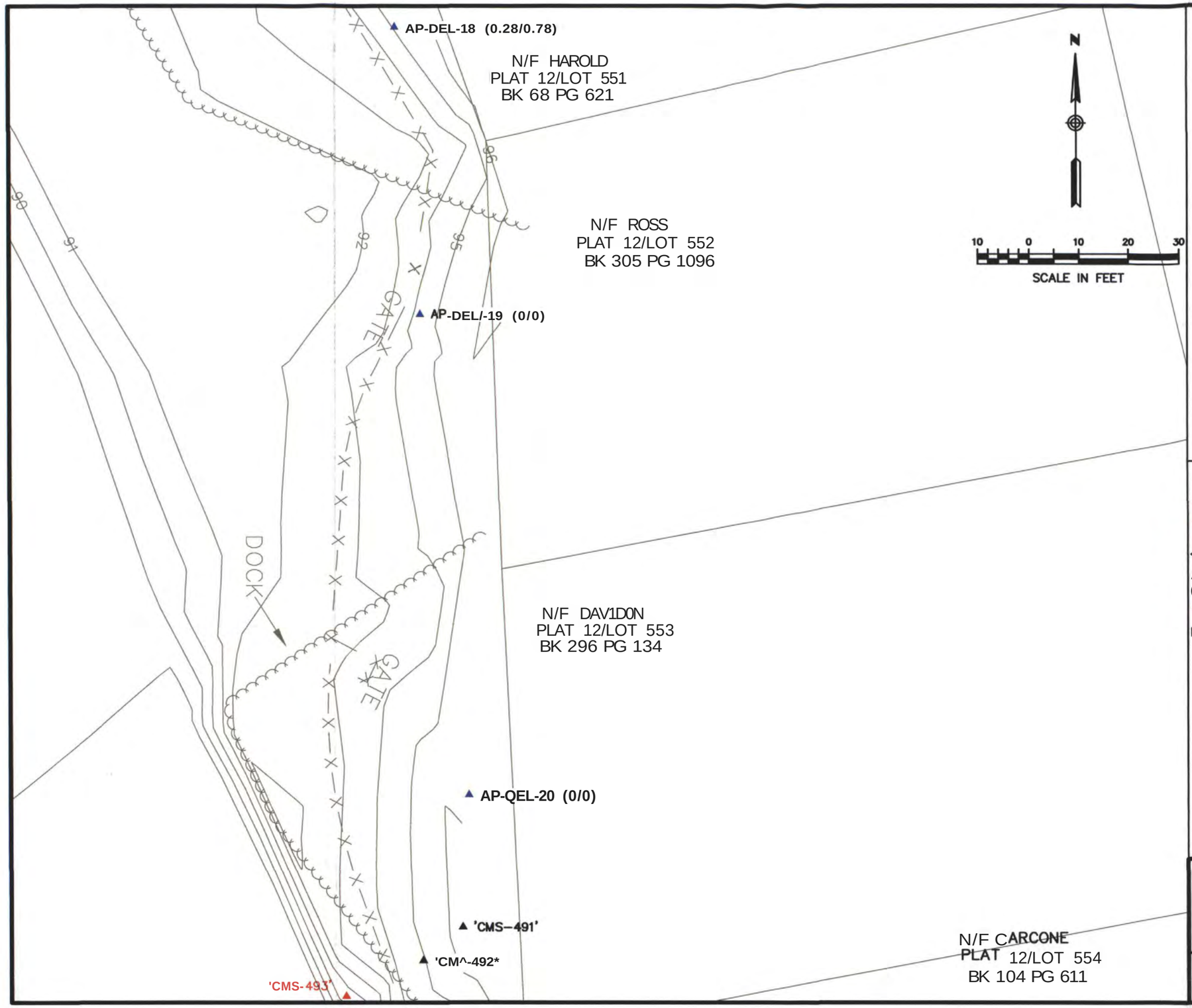
CLNTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

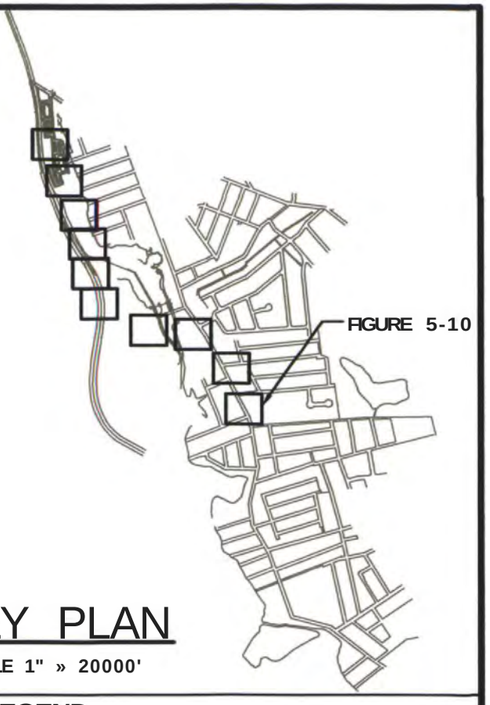
APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATIONS AP-DEL-15, AP-DEL-16, * AP-DEL-17

Comm.No. 15RP102

FIGURE 5-9

LEA





KEY PLAN

SCALE 1" » 20000'

LEGEND

CMS-422	EPA SOIL SAMPLE, DIOXIN < 1 ppb
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1 ppb
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
AP-DEL-01 (0.05/0.08)	APRIL 2002 SAMPLE LOCATION DIOXIN CONCENTRATION FOR THE 0-1' AND i'-2* SAMPLING INTERVAL IN ppb
ppb	PARTS PER BILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

APRIL 2002 SAMPLE RESULTS
SAMPLE LOCATIONS AP-DEL-18, AP-DEL-19, & AP-DEL-20

Comm.No. 15RP102

FIGURE 5-10

LEA

N/F CENTERDALE MANOR ASSOCIATES
PLAT 14/LOT 250
BK 117 PG 414-419

E 332000

N/F 2050 CENTREDALE VILLAGE, L.P.
PLAT 14/LOT 270
BK 131 PG 016

N/F SCOTT
PLAT 14/LOT 268
BK 301 PG 740

WOOD FENCE

GARAGE

N/F SERVO
PLAT 14/LOT 271
BK 111 PG 453

'CMS-445'
'CMS-422'
'CMS-078'
'CMS-079'
'CMS-424'
01-DEL-201 (9,612)
'CMS-084'
'CMS-085'
01-DEL-202 (944)
'CMS-456'
01-DEL-203 (8,699)
'CMW-SD-2018'
'CMS-427'
'CMS-426'
'CMS-090'
'CMS-091'
'CMS-508'
'CMS-431'
'RES-14-271-01A'[1]
AP-DEL-01 (50.3/78.6)
'CMS-507'
'CMS-098'
'CMS-099'
'CMS-100'
'CMS-220'

CONC
EXHAUST
CHAMBER

EMERGENCY
GENERATOR

ELECTRIC
TRANSFORMER

5' CLF

S 13°31'00" E
60.40'

84.64

SCALE IN FEET
10 0 10 20 30

KEY PLAN
SCALE 1" = 2000'

LEGEND

^CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0*)
02-DEL-201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
[4] 01-DEL-201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
+ 96.70	SPOT EUEV- & OR WATER ELEV.
Q	PIEZOMETER LOCATION
Ppt	PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

JULY 2002 SAMPLE RESULTS
ACTION AREA 1

Comm.No. 15RP102

FIGURE 5-11

LEA

'CMS-107'
'CMS-108'
'CMS-223'
'CMW-SD-2019'
AP-DEL-02 (155.0/ND)
A 'CMS-SOS'
'CMS-503'
'CMS-504'
'CMS-114'
'CMS-115'
'CMS-116'
02-DEL-101
02-0EL-102
02-DEL-103
'CMS-502'
02-DEL-201 (45)
'CMS-123'
02-DEL-202 (23)
02-DEL-203 (41)
02-DEL-301
02-DEL-300
02-DEL-303
'CMS-501'
'CMS-222'
'CMS-121'
'CMS-128'
'CMW-SD-2020'
'CMS-226'
SD-30
'CMS-130'
'CMS-500'
STEERE AVENUE
N/F NABER
PLAT 14/LOT 272
BK 117 PG 186
N/F GRENIER
PLAT 14/LOT 302
BK 105 PG 106
GROVER STREET
(2) I-BEAM PIPEHANGERS
INV=94.6
5' CLF
CONC HW
GATE
SHED
S 14°14'52" E
89.96'
80.31'
S33°2
E 332000
N 281500
N
10 0 10 20 30
SCALE IN FEET

KEY PLAN

SCALE 1" - 2000'

LEGEND

▲CMS-422	EPA SOIL SAMPLE. DIOXIN < 1000 ppt
▲CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 * (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 A (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
1	AREA OF EXCAVATION
+ 96.70	SPOT ELEV- * °R WATER ELEV.
ppt	PIEZOMETER LOCATION PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 2

Comm.No.	FIGURE 5-12	LEA
15RP102		

AP-DEL-03 (22.6/77.4)
'RES-14-303-02'
'CMS-143'
'CMS-144'
'CMS-142'
'RES-14-303-01'
'CMS-225'
E 332000
'CMW-SD-2021'
'RES-14-333-02'
'CMS-149'
'CMS-150'
'CMS-151'
03-DEL-101 (131)
03-DEL-102 (5)
'RES-14-333-01'
'RES-14-333-03'
03-DEL-103 (645)
'CMS-157'
'CMS-158'
'CMS-159'
03-DEL-201 (384)
03-DEL-202 (24)
'CMS-483'
'CMS-481'
03-DEL-203 (5)
CMS-167
'CMS-165'
'CMS-166'
'CMW-SD-2022'
N/F ROTELLA
PLAT 14/LOT 333
BK 100 PG 1043
N/F ROTELLA
PLAT 14/LOT 334
BK 100 PG 1043
REDFERN
STREET
SWALE
GARAGE
SHED

N

10 0 10 20 30
SCALE IN FEET

AREA 3

KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◊	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

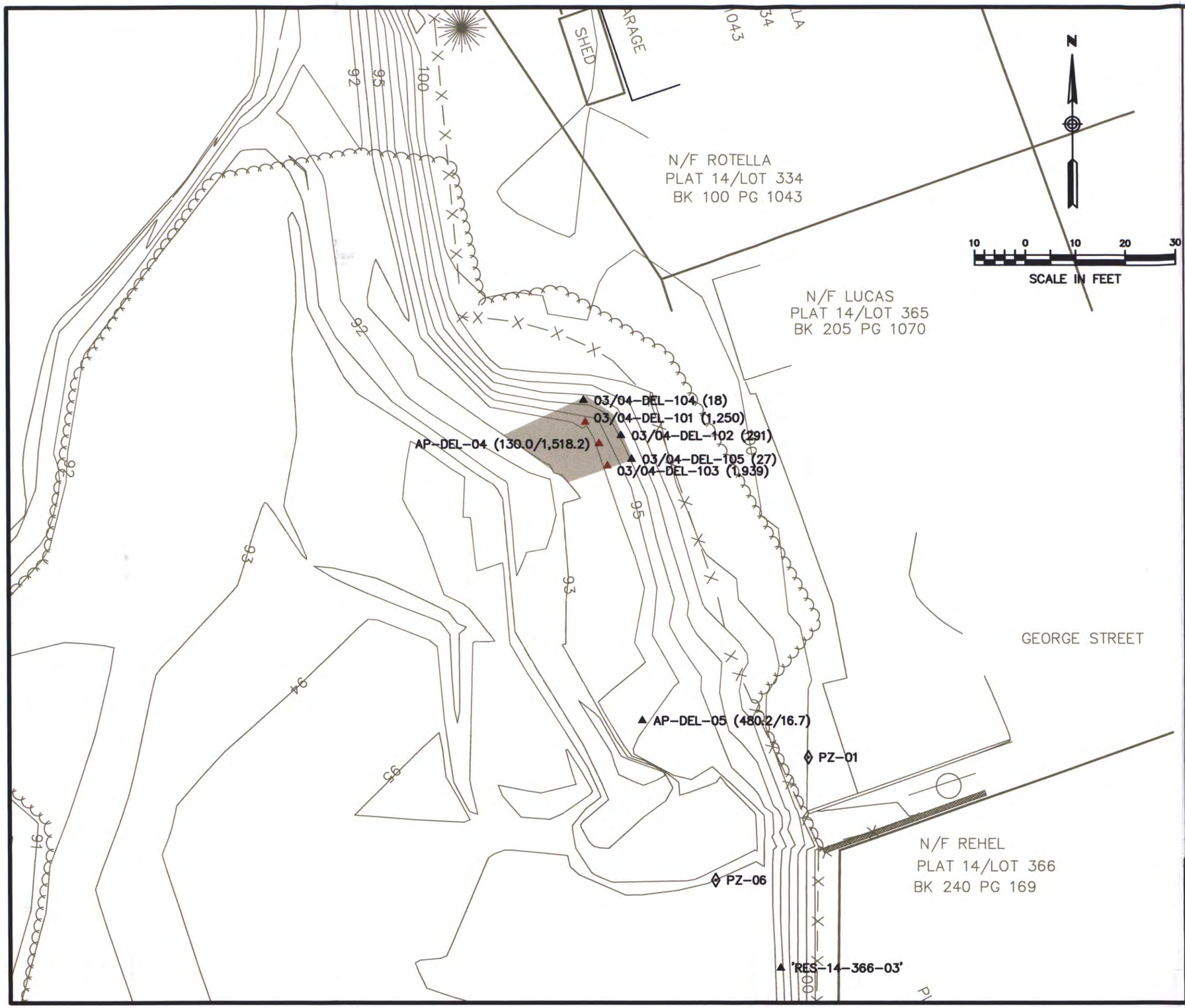
CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

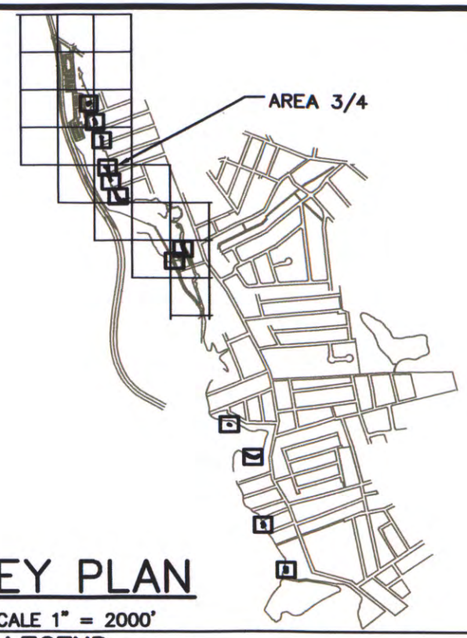
AREA OF EXCAVATION - ACTION AREA 3

Comm.No. 15RP102

FIGURE 5-13

LEA





KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS–422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS–456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS–091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS–123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP–DEL–01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0–1.0'/1.0'–2.0')
▲ 02–DEL–201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
▲ 01–DEL–201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◊	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

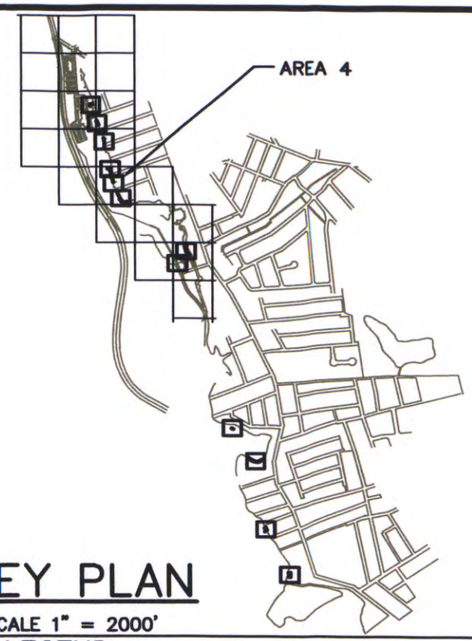
NOTE: SAMPLES 03/04–DEL–104 AND 03/04–DEL–105 OBTAINED IN SEPTEMBER 2002

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION – ACTION AREA 3/4

Comm.No.	FIGURE 5–14	LEA
15RP102		

'RES-14-366-03'
'RES-14-366-02'
'CMS-184'
'CMS-185'
'CMS-499'
'CMW-SD-2025'
'CMS-498'
04-DEL-201 (141)
04-DEL-202 (57)
'CMS-221'
04-DEL-203 (311)
'CMS-188'
'CMS-497'
'CMS-189'
PZ-07
AR-DEL-06 (1.6/6.6)
PZ-02
N 281000
UPLAND AREA
UPLAND AREA
N/F REHEL
PLAT 14/LOT 366
BK 240 PG 169
BENCHMARK
CHISELED SQUARE
TOP CONC CURB
ELEVATION = 101.36
N/F FITZGERALD
PLAT 14/LOT 398
BK 248 PG 803
STEPHEN STREET
ALLENDALE MILL ASSOCIATES
LIMITED PARTNERSHIP
PLAT 12/LOT 560
BK 361 PG 101
ANPC ASSOCIATES
&
LIMITED PARTNERSHIP
N/F
SHED
CONC
DW
3'CLF
SITE
95
94
93
92
91
99
100
101
10 0 10 20 30
SCALE IN FEET



KEY PLAN

SCALE 1" = 2000'

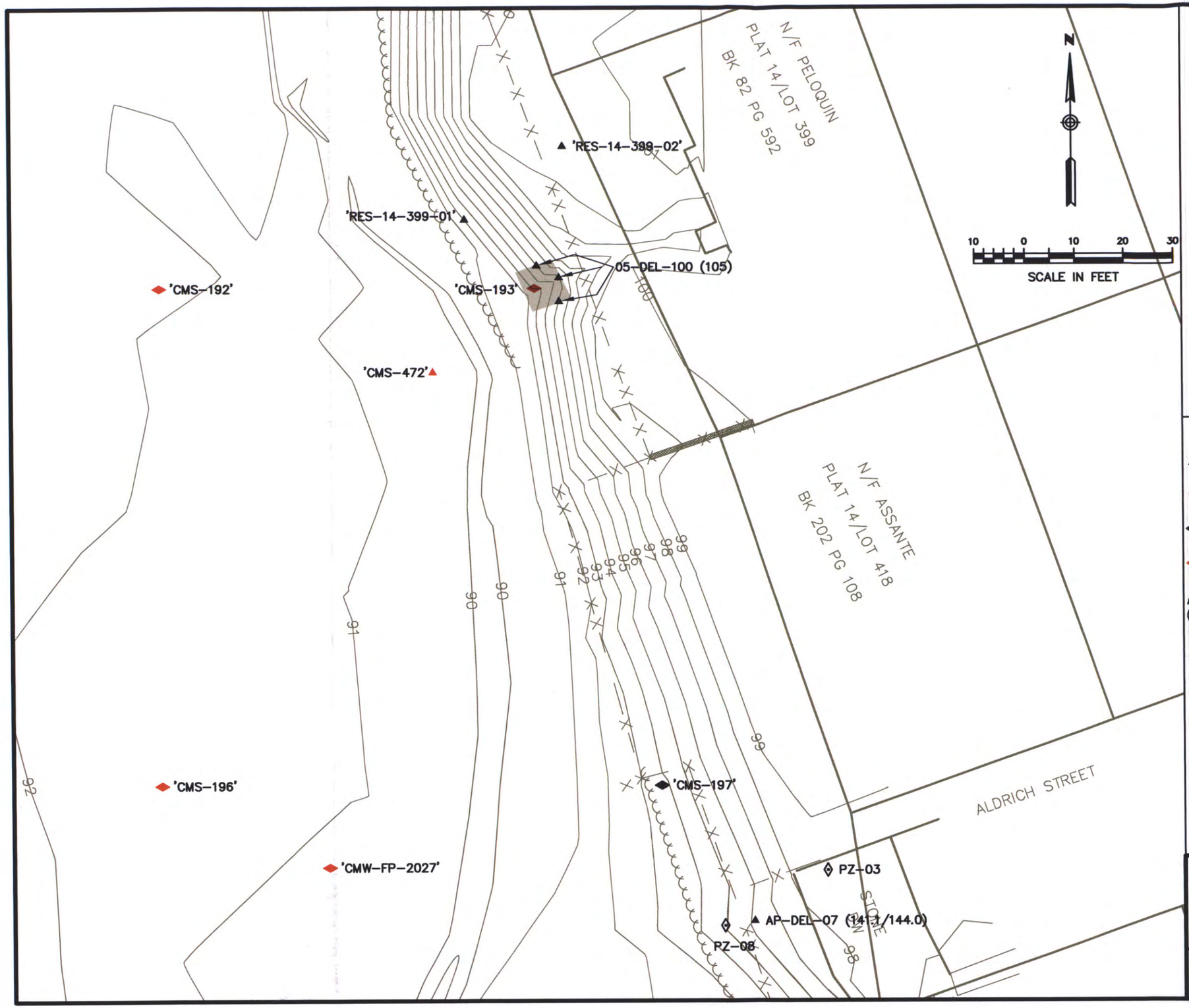
LEGEND

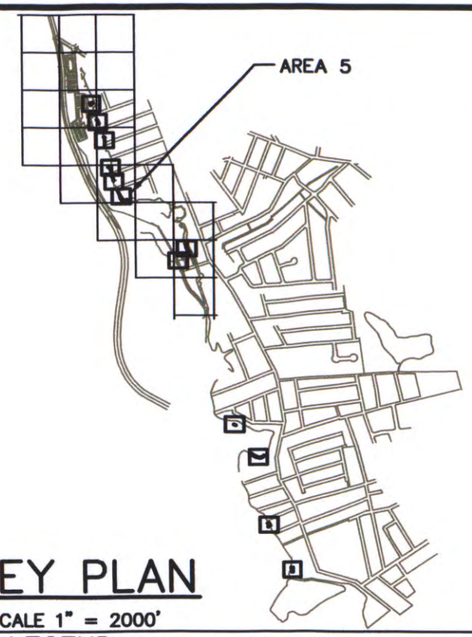
CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
ppt	PIEZOMETER LOCATION PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 4

Comm.No.		
15RP102	**FIGURE 5-15**	LEA





KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◊	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 5

Comm.No.		
15RP102	**FIGURE 5-16**	LEA

'CMS-460'

'CMS-418'

'CMS-201'

'CMS-202'

'CMS-461'

'CMS-204'

'CMS-205'

'CMS-206'

06-DEL-100 (2)

06-DEL-200 (0)

STOCKADE

QLF

N/F ASSELIN
PLAT 14/LOT 419
BK 375 PG 222

N/F ASSELIN
PLAT 14/LOT 420
BK 375 PG 222

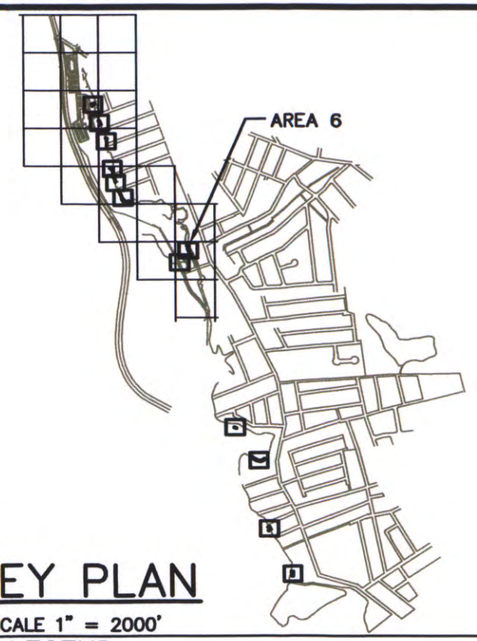
N/F ASSELIN
PLAT 14/LOT 421
BK 375 PG 222

92 93 94 95 96 97 98 99 90 91

N 280500

N

10 0 10 20 30
SCALE IN FEET



KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
▲ AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
▲ 02-DEL-201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
▲ 01-DEL-201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◈	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 6

Comm.No. 15RP102

FIGURE 5-17

LEA

AP-DEL-20 (1.7/2.7)

'CMS-491'

'CMS-492'

'CMS-493'

4'CEDAR PICKET

5'CL

N/F DAVIDON
PLAT 12/LOT 553
BK 296 PG 134

N/F CARCONE
PLAT 12/LOT 554
BK 104 PG 611

N

10 0 10 20 30
SCALE IN FEET

88 89 90 91 92 94 95 99

07-DEL-201 (432)

'CMS-475'

07-DEL-202 (98)

CMS-477

'CMS-476'

07-DEL-203 (406)

GARAGE

PZ-09

'RES-12-555-01'

'CMS-474'

'CMS-634'

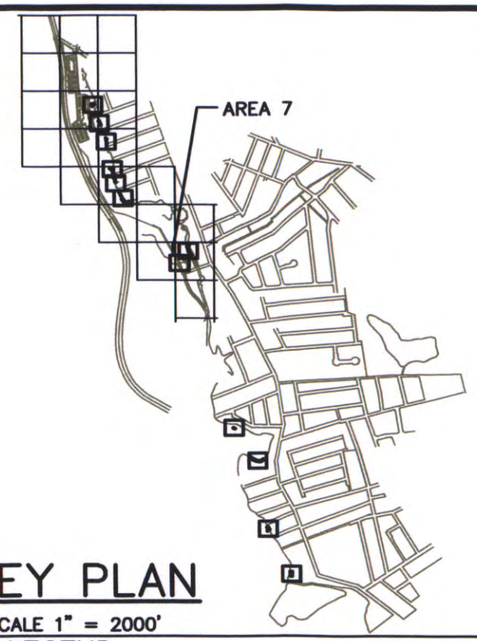
'AD-04'

SD-22

'CMS-473'

N/F RICHARDSON
PLAT 12/LOT 555
BK 289 PG 296

ALLENDALE



KEY PLAN

SCALE 1" = 2000'

LEGEND

CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

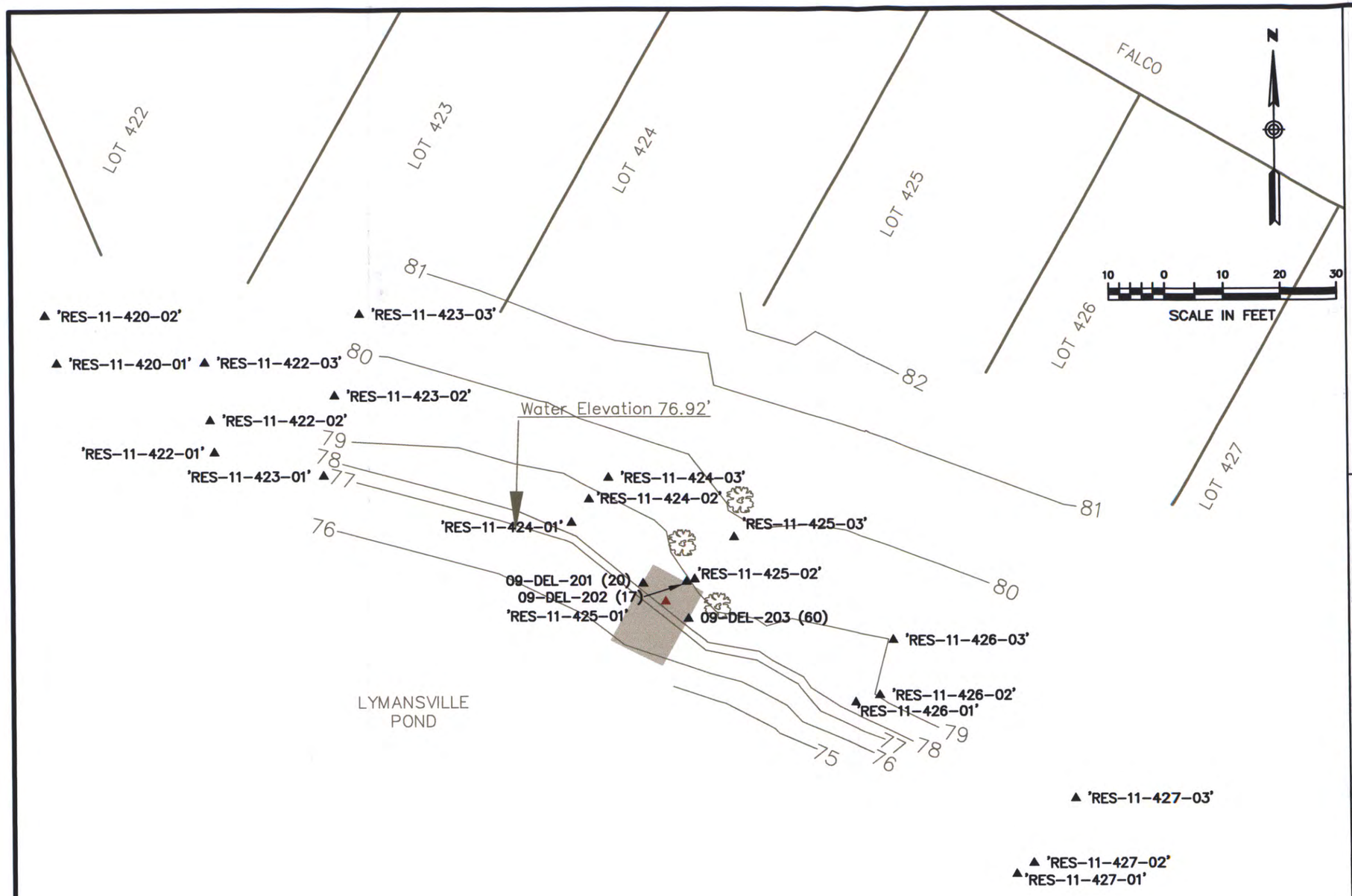
CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

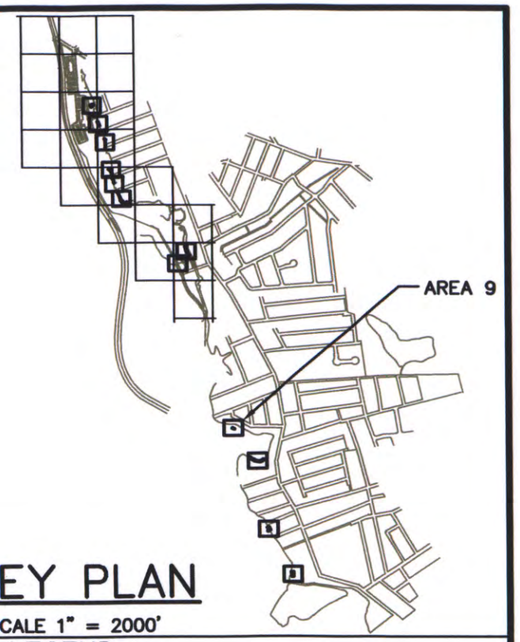
AREA OF EXCAVATION - ACTION AREA 7

Comm.No. 15RP102

FIGURE 5-18

LEA





KEY PLAN

SCALE 1" = 2000'

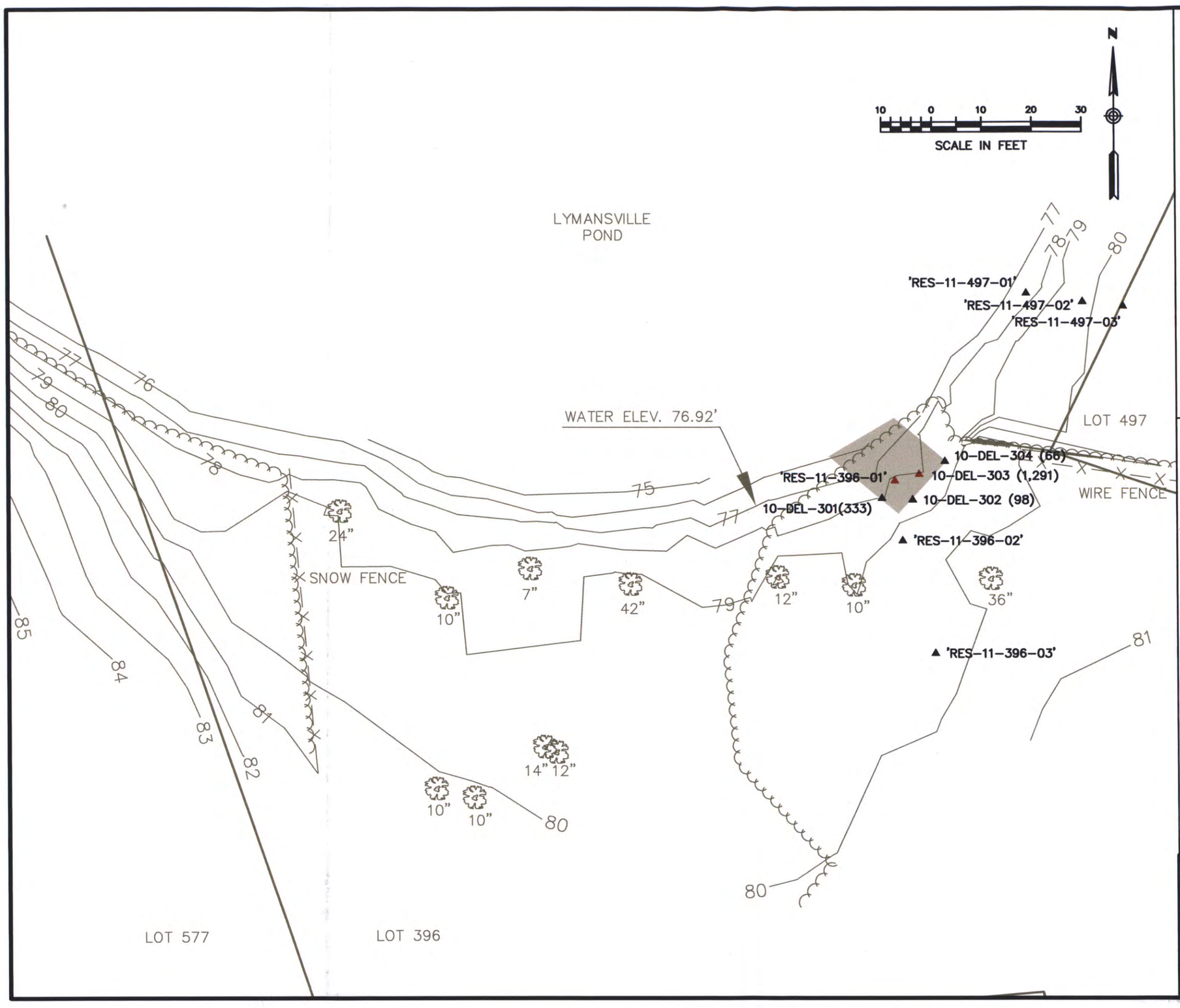
LEGEND

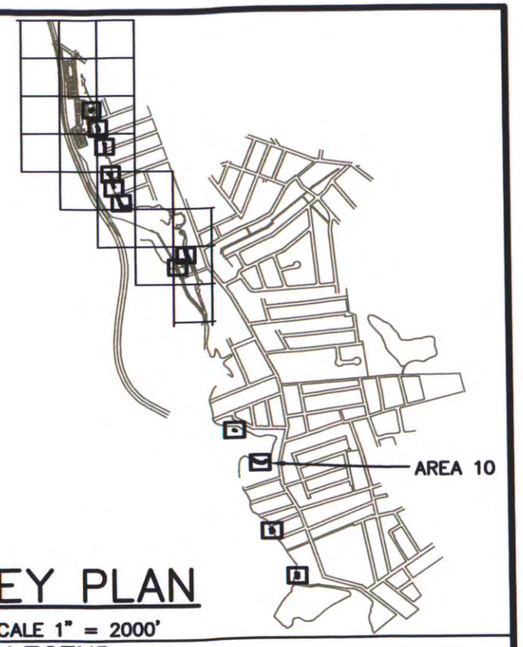
▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◈	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION – ACTION AREA 9

Comm.No.		
15RP102	**FIGURE 5-19**	LEA





KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◊	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

NOTE: SAMPLE 10-DEL-304 OBTAINED IN SEPTEMBER 2002

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 10

Comm.No.		
15RP102	**FIGURE 5-20**	LEA

(FORMERLY LYMAN AVE.)

WATER ELEV 76.92'

'RES-10-053-03'

'RES-10-053-02'

'RES-10-053-01'

'LPX-BK-2006'

11-DEL-100 (51)

'LPX-SD-2050'

'RES-10-068-03'

'RES-10-068-02'

'RES-10-068-01'

'RES-10-074-03'

'RES-10-074-02'

'RES-10-074-01'

LYMANSVILLE POND

LOT 68

LOT 70

LOT 71

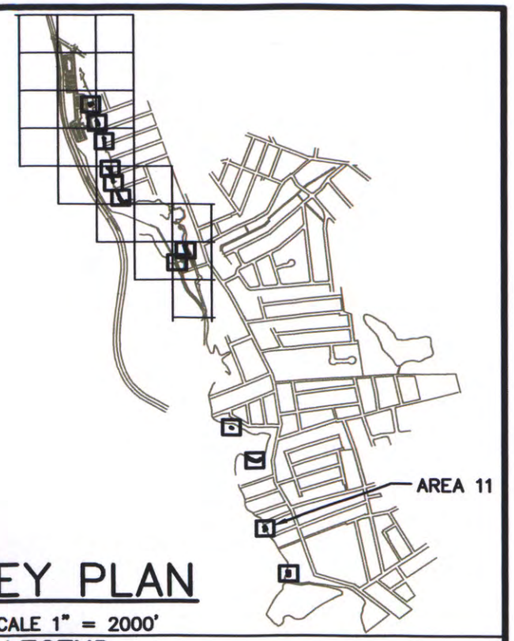
LOT 74

WATER ST.

N

10 0 10 20 30

SCALE IN FEET



KEY PLAN

SCALE 1" = 2000'

LEGEND

CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9)	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612)	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

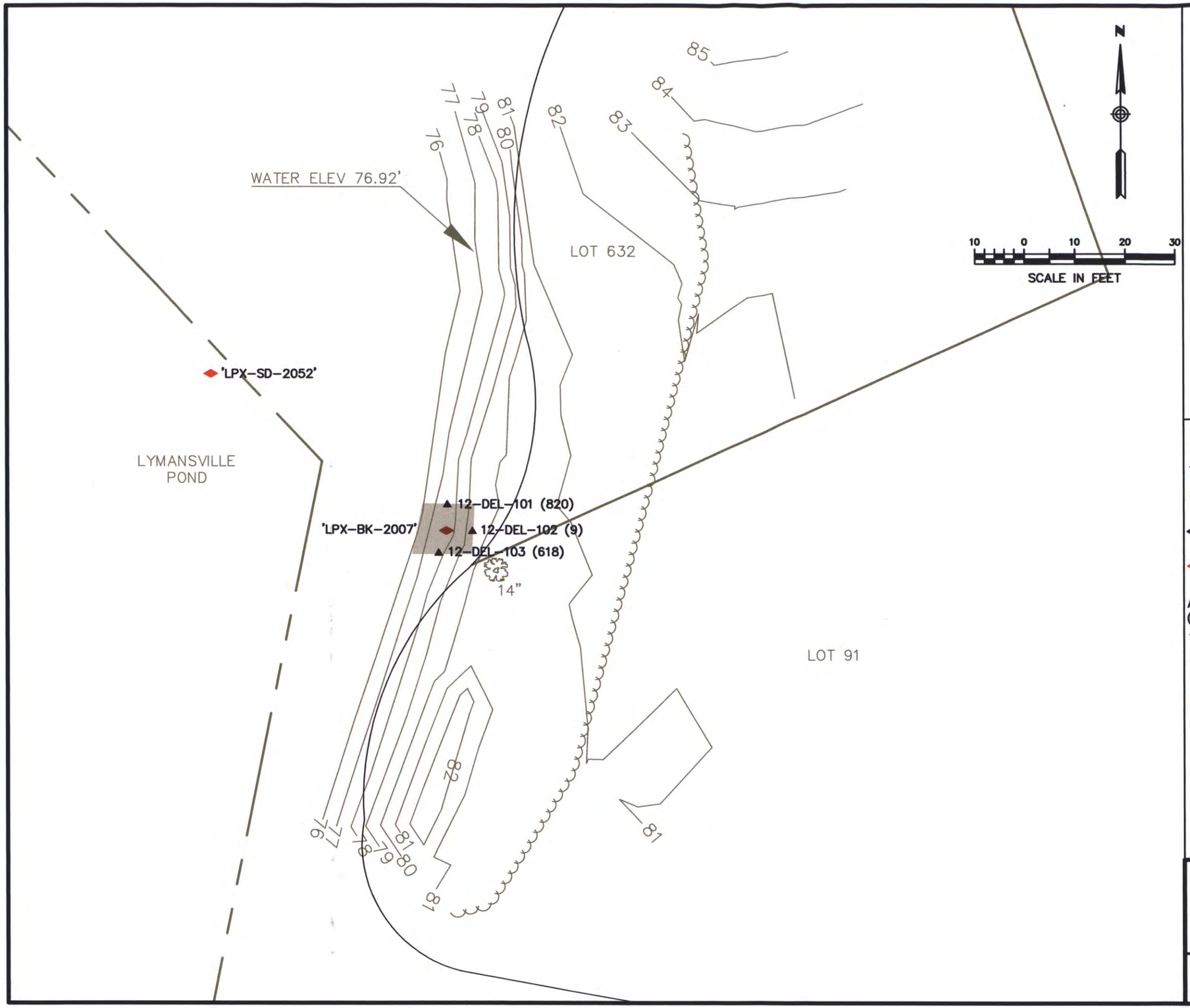
CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

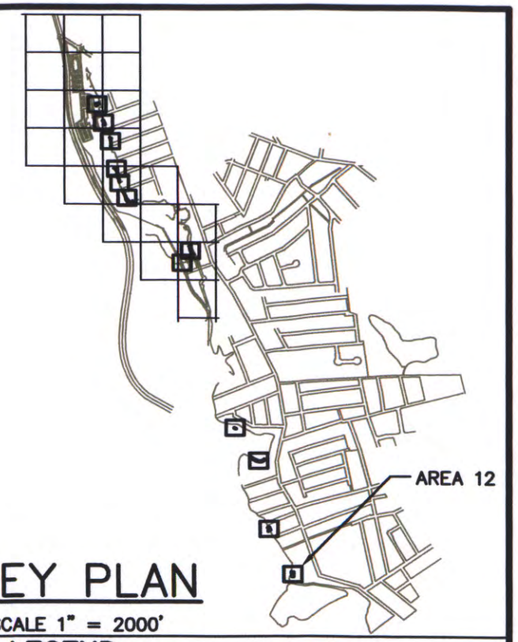
AREA OF EXCAVATION - ACTION AREA 11

Comm.No. 15RP102

FIGURE 5-21

LEA





KEY PLAN

SCALE 1" = 2000'

LEGEND

▲ CMS-422	EPA SOIL SAMPLE, DIOXIN < 1000 ppt
▲ CMS-456	EPA SOIL SAMPLE, DIOXIN > 1000 ppt
◆ CMS-091	EPA SEDIMENT SAMPLE, DIOXIN < 1000 ppt
◆ CMS-123	EPA SEDIMENT SAMPLE, DIOXIN > 1000 ppt
AP-DEL-01 (50.9/78.9) ▲	APRIL 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (0-1.0'/1.0'-2.0')
02-DEL-201 (54) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (< 1000 ppt)
01-DEL-201 (9612) ▲	JULY 2002 SAMPLE LOCATION (TOTAL TEQ CONCENTRATION IN ppt) (>1000 ppt)
	AREA OF EXCAVATION
+ 96.70	SPOT ELEV. & OR WATER ELEV.
◊	PIEZOMETER LOCATION
ppt	PARTS PER TRILLION

CENTREDALE MANOR RESTORATION PROJECT
SUPERFUND SITE, NORTH PROVIDENCE, RI

AREA OF EXCAVATION - ACTION AREA 12

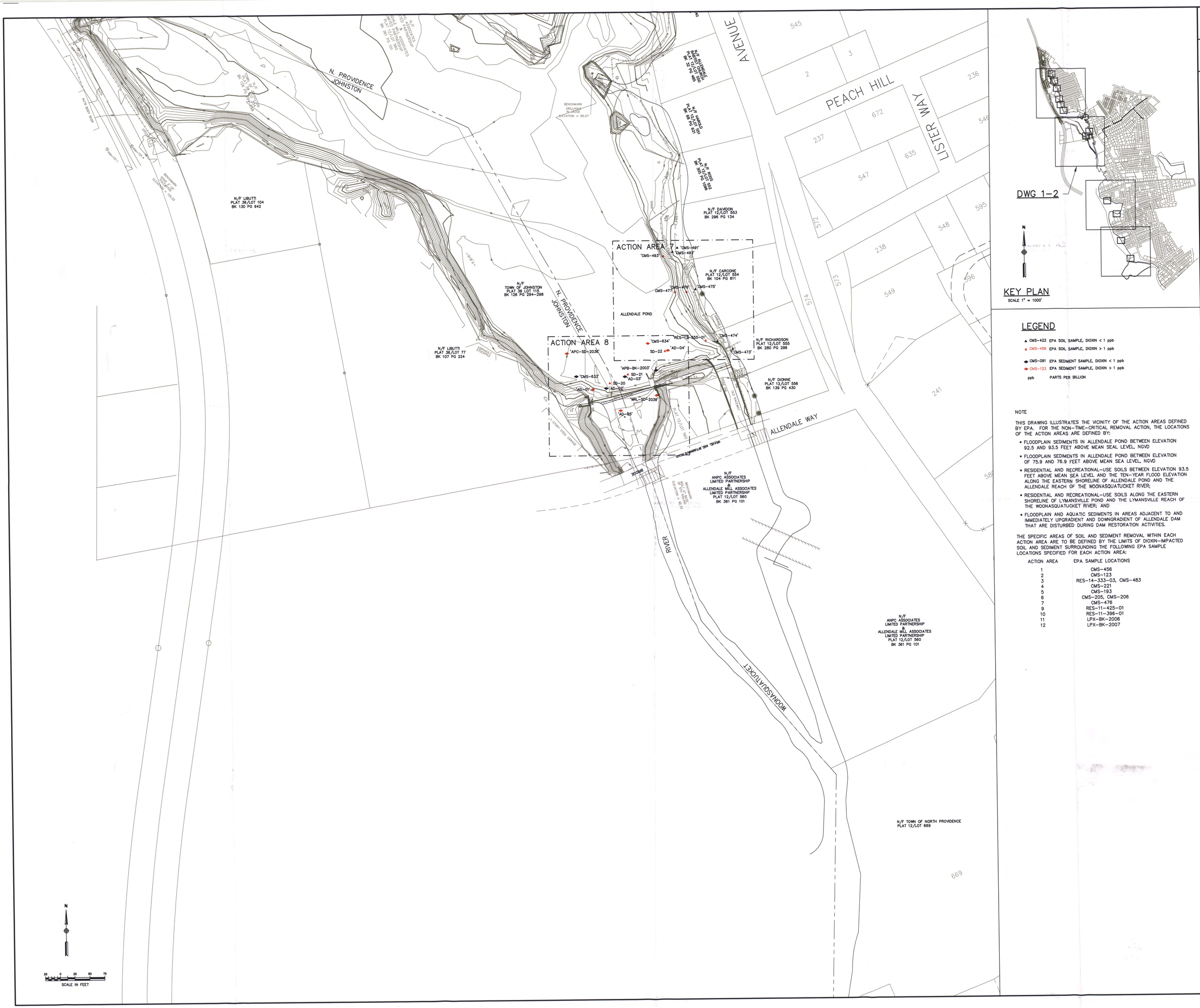
Comm.No. 15RP102

FIGURE 5-22

LEA

DRAWINGS


ACTION AREA 1
ACTION AREA 2
ACTION AREA 3
ACTION AREA 4
ACTION AREA 5
ACTION AREA 6
CAP AREA
FORMER TAILRACE
FORMER TAILRACE
STEERE AVENUE
GROVER STREET
REDFERN STREET
GEORGE STREET
STEPHEN STREET
ALDRICH STREET
CENTERDALE AVE
WOONASQUATUCKET RIVER AVE
N. PROVIDENCE JOHNSTON
N. PROVIDENCE JOHNSTON
N/F 2050 CENTREDALE VILLAGE, L.P. PLAT 14/LOT 511 BK 328 PG 828
N/F 2050 CENTREDALE VILLAGE, L.P. PLAT 14/LOT 270 BK 131 PG 016
N/F CENTREDALE MANOR ASSOCIATES PLAT 14/LOT 250 BK 117 PG 414-419
N/F BROOK VILLAGE ASSOCIATES PLAT 14/LOT 200 BK 117 PG 414-419
N/F SCOTT PLAT 14/LOT 268 BK 301 PG 740
N/F SERIO PLAT 14/LOT 271 BK 110 PG 453
N/F NABER PLAT 14/LOT 272 BK 117 PG 186
LOT 273
N/F GRENIER PLAT 14/LOT 302 BK 105 PG 108
LOT 303
N/F ROTELLA PLAT 14/LOT 303 BK 100 PG 1043
N/F ROTELLA PLAT 14/LOT 333 BK 100 PG 1043
LOT 332
N/F ROTELLA PLAT 14/LOT 334 BK 100 PG 1043
N/F LUCAS PLAT 14/LOT 365 BK 205 PG 1070
N/F REHEL PLAT 14/LOT 366 BK 240 PG 189
N/F FITZGERALD PLAT 14/LOT 398 BK 248 PG 803
N/F ANPC ASSOCIATES LIMITED PARTNERSHIP & ALLENDALE MILL ASSOCIATES LIMITED PARTNERSHIP PLAT 12/LOT 560 BK 361 PG 101
N/F PELOQUIN PLAT 14/LOT 399 BK 85 PG 592
N/F ASSANTE PLAT 14/LOT 418 BK 202 PG 108
LOT 417
N/F ASSELIN PLAT 14/LOT 419 BK 375 PG 222
BENCHMARK WESTERLY BONNETT BOLT ON HYDRANT ELEVATION = 99.93
BENCHMARK CHISELED SQUARE TOP CONC CURB ELEVATION = 101.36
BENCHMARK CHISELED SQUARE ELEVATION = 100.03
N/F NARRAGANSETT ELECTRIC COMPANY PLAT 14/LOT 1 BK 1204 PG 294-298
N/F NARRAGANSETT ELECTRIC COMPANY PLAT 14/LOT 1 BK 1204 PG 294-298
CMS-422
CMS-078
CMS-445
CMS-079
CMS-424
CMS-084
CMS-085
CMS-456
CMW-SD-2018
CMS-429
CMS-426
CMS-090
CMS-091
CMS-506
CMS-431
RES-14-271-01A
CMS-507
CMS-100
CMS-098
CMS-099
CMS-201
CMS-107
CMS-108
CMS-223
CMW-SD-2019
CMS-503
CMS-504
CMS-505
CMS-114
CMS-115
CMS-116
CMS-502
CMS-123
CMS-121
CMS-501
CMS-222
CMS-128
CMW-SD-2020
CMS-130
CMS-226
SD-30
CMS-500
CMS-143
CMS-142
RES-14-303-02
RES-14-303-01
CMS-144
CMS-225
CMW-SD-2021
CMS-149
CMS-150
CMS-151
RES-14-333-01
RES-14-333-03
CMS-159
CMS-157
CMS-158
CMS-483
CMS-167
CMS-481
CMS-165
CMS-166
CMW-SD-2022
CMS-184
RES-14-366-02
RES-14-366-03
CMS-183
CMS-499
CMW-SD-2025
CMS-498
CMS-221
CMS-188
CMS-497
CMS-189
RES-14-398-02
RES-14-398-01
CMS-192
CMS-193
CMS-472
CMS-196
CMW-FP-2027
CMS-197
CMS-460
CMS-418
CMS-201
CMS-202
CMS-461
CMS-204
CMS-205
CMS-206
N/F VITELLO PLAT 14/LOT 424 BK 104 PG 341
N/F VITELLO PLAT 14/LOT 422 BK 104 PG 341
N/F SCARPELLO PLAT 14/LOT 201 BK 228 PG 201
N/F SANAD PLAT 14/LOT 488 BK 58 PG 362 & BK 58 PG 359
N/F FAZZARO PLAT 14/LOT 298 BK 78 PG 298
N/F ASSELIN PLAT 14/LOT 420 BK 375 PG 222
N/F ASSELIN PLAT 14/LOT 421 BK 375 PG 222
N/F ASSELIN PLAT 14/LOT 422 BK 375 PG 222
N/F ASSELIN PLAT 14/LOT 423 BK 375 PG 222
N/F ASSELIN PLAT 14/LOT



KEY PLAN
SCALE 1" = 1000'

LEGEND

- ▲ CMS-422 EPA SOIL SAMPLE, DIOXIN < 1 ppb
- ▲ CMS-456 EPA SOIL SAMPLE, DIOXIN > 1 ppb
- ◆ CMS-091 EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
- ◆ CMS-123 EPA SEDIMENT SAMPLE, DIOXIN > 1 ppb
- ppb PARTS PER BILLION

NOTE

THIS DRAWING ILLUSTRATES THE VICINITY OF THE ACTION AREAS DEFINED BY EPA. FOR THE NON-TIME-CRITICAL REMOVAL ACTION, THE LOCATIONS OF THE ACTION AREAS ARE DEFINED BY:

- FLOODPLAIN SEDIMENTS IN ALLENDALE POND BETWEEN ELEVATION 92.5 AND 93.5 FEET ABOVE MEAN SEAL LEVEL, NGVD
- FLOODPLAIN SEDIMENTS IN ALLENDALE POND BETWEEN ELEVATION OF 75.9 AND 76.9 FEET ABOVE MEAN SEA LEVEL, NGVD
- RESIDENTIAL AND RECREATIONAL-USE SOILS BETWEEN ELEVATION 93.5 FEET ABOVE MEAN SEA LEVEL AND THE TEN-YEAR FLOOD ELEVATION ALONG THE EASTERN SHORELINE OF ALLENDALE POND AND THE ALLENDALE REACH OF THE WOONASQUATUCKET RIVER;
- RESIDENTIAL AND RECREATIONAL-USE SOILS ALONG THE EASTERN SHORELINE OF LYMANSVILLE POND AND THE LYMANSVILLE REACH OF THE WOONASQUATUCKET RIVER; AND
- FLOODPLAIN AND AQUATIC SEDIMENTS IN AREAS ADJACENT TO AND IMMEDIATELY UPGRADIENT AND DOWNGRADIENT OF ALLENDALE DAM THAT ARE DISTURBED DURING DAM RESTORATION ACTIVITIES.

THE SPECIFIC AREAS OF SOIL AND SEDIMENT REMOVAL WITHIN EACH ACTION AREA ARE TO BE DEFINED BY THE LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT SURROUNDING THE FOLLOWING EPA SAMPLE LOCATIONS SPECIFIED FOR EACH ACTION AREA:

ACTION AREA	EPA SAMPLE LOCATIONS
1	CMS-456
2	CMS-123
3	RES-14-333-03, CMS-483
4	CMS-221
5	CMS-193
6	CMS-205, CMS-206
7	CMS-476
9	RES-11-425-01
10	RES-11-396-01
11	LPX-BK-2006
12	LPX-BK-2007

N
25 0 25 50 75
SCALE IN FEET

NO.	DESCRIPTION OF REVISION	DATE	APPR.
REV.			

Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
An Employee Owned Company

SCALE 1" = 50'
COMM. NO. 15RP102
DRAWN BY A.C.L. DATE 11/18/03
APP. BY D.N.S. DATE 11/18/03

CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SITE PLAN - ACTION AREAS 7 AND 8

An Employee Owned Company

DRAWING 1-2

SHEET NO. 1 NO. OF SHEETS 1

LEGEND

- ▲ CMS-422 EPA SOIL SAMPLE, DIOXIN < 1 ppb
- ▲ CMS-456 EPA SOIL SAMPLE, DIOXIN > 1 ppb
- ◆ CMS-091 EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
- ◆ CMS-123 EPA SEDIMENT SAMPLE, DIOXIN > 1 ppb
- ppb PARTS PER BILLION

NOTE

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- RESIDENTIAL AND RECREATIONAL-USE SOILS ALONG THE EASTERN SHORELINE OF LYMANSVILLE POND AND THE LYMANSVILLE REACH OF THE WOONASQUATUCKET RIVER; AND
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ACTION AREA	EPA SAMPLE LOCATIONS
1	CMS-456
2	CMS-123
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4	CMS-221
5	CMS-193
6	CMS-205, CMS-206
7	CMS-476
9	RES-11-425-01
10	RES-11-396-01
11	LPX-BK-2006
12	LPX-BK-2007

REV.	DESCRIPTION OF REVISION	DATE	APPR.

Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
An Employee Owned Company
LEA

SCALE	COMM. NO.	DRAWN BY	DATE	APP. BY	DATE
1" = 50'	15RP102	A.C.L.	11/18/03	D.N.S.	11/18/03

CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SITE PLAN - ACTION AREAS 9 AND 10

LEA An Employee Owned Company

DRAWING 1-3

SHEET NO. 1 NO. OF SHEETS 1

LEGEND

- ▲ CMS-422 EPA SOIL SAMPLE, DIOXIN < 1 ppb
- ▲ CMS-456 EPA SOIL SAMPLE, DIOXIN > 1 ppb
- ◆ CMS-091 EPA SEDIMENT SAMPLE, DIOXIN < 1 ppb
- ◆ CMS-123 EPA SEDIMENT SAMPLE, DIOXIN > 1 ppb
- ppb PARTS PER BILLION

NOTE

THIS DRAWING ILLUSTRATES THE VICINITY OF THE ACTION AREAS DEFINED BY EPA. FOR THE NON-TIME-CRITICAL REMOVAL ACTION, THE LOCATIONS OF THE ACTION AREAS ARE DEFINED BY:

- FLOODPLAIN SEDIMENTS IN ALLENDALE POND BETWEEN ELEVATION 92.5 AND 93.5 FEET ABOVE MEAN SEAL LEVEL, NGVD
- FLOODPLAIN SEDIMENTS IN ALLENDALE POND BETWEEN ELEVATION OF 75.9 AND 76.9 FEET ABOVE MEAN SEA LEVEL, NGVD
- RESIDENTIAL AND RECREATIONAL-USE SOILS BETWEEN ELEVATION 93.5 FEET ABOVE MEAN SEA LEVEL AND THE TEN-YEAR FLOOD ELEVATION ALONG THE EASTERN SHORELINE OF ALLENDALE POND AND THE ALLENDALE REACH OF THE WOONASQUATUCKET RIVER;
- RESIDENTIAL AND RECREATIONAL-USE SOILS ALONG THE EASTERN SHORELINE OF LYMANSVILLE POND AND THE LYMANSVILLE REACH OF THE WOONASQUATUCKET RIVER; AND
- FLOODPLAIN AND AQUATIC SEDIMENTS IN AREAS ADJACENT TO AND IMMEDIATELY UPGRADIENT AND DOWNGRADIENT OF ALLENDALE DAM THAT ARE DISTURBED DURING DAM RESTORATION ACTIVITIES.

THE SPECIFIC AREAS OF SOIL AND SEDIMENT REMOVAL WITHIN EACH ACTION AREA ARE TO BE DEFINED BY THE LIMITS OF DIOXIN-IMPACTED SOIL AND SEDIMENT SURROUNDING THE FOLLOWNG EPA SAMPLE LOCATIONS SPECIFIED FOR EACH ACTION AREA:

ACTION AREA	EPA SAMPLE LOCATIONS
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3	RES-14-333-03, CMS-483
4	CMS-221
5	CMS-193
6	CMS-205, CMS-206
7	CMS-476
9	RES-11-425-01
10	RES-11-396-01
11	LPX-BK-2006
12	LPX-BK-2007

REV.	DESCRIPTION OF REVISION	DATE	APPR.

Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
An Employee Owned Company

SCALE	COMM. NO.	DRAWN BY	DATE	APP. BY	DATE
1" = 50'	15RP102	A.C.L.	11/18/03	D.N.S.	11/18/03

CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

SITE PLAN - ACTION AREAS 11 AND 12

An Employee Owned Company

DRAWING 1-4

SHEET NO. 1 NO. OF SHEETS 1

APPENDIX A

Correspondence Regarding Completion of Work Report Documents

Loureiro Engineering Associates, Inc.

May 29, 2003

U.S. Environmental Protection Agency
New England Regional Office
1 Congress Street, Suite 1100 (HBO)
Boston, Massachusetts 02114-2023

Attn: Anna Krasko, On-Scene Coordinator

RE: Allendale Dam Restoration Drawings
Centredale Manor Restoration Project
North Providence, Rhode Island

Dear Ms. Krasko:

The Allendale Dam Restoration Drawings for the Centredale Manor Restoration Project are attached. One copy of the set of Drawings is provided along with an electronic copy provided on compact disc. Along with the data validation summary reports previously submitted under correspondence dated October 4, 2002, November 8, 2002, and November 22, 2002, the Allendale Dam Restoration Drawings comprise part of the Completion of Work Report. Upon your review of the attached Drawings, please feel free to contact me at (860) 410-2976 should you have any questions.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

David N. Scotti, P.G.
Project Manager

Copy to: A. Borochaner (USACE)
L. Maccarone (RIDEM)
Centredale Manor Performing Parties Group (w/o attachment)

Attachment

Loureiro Engineering Associates, Inc.
An Employee Owned Company

TRANSMITTAL

TO:	USEPA	DATE	22 November 2002
	1 Congress Street	PROJECT	Centredale Manor
	Boston, Massachusetts 02114	LOCATION:	N. Providence, RI
		COMM. NO.:	15RP102.010
ATTN:	Anna Krasko	PHONE #	(617) 918-1232

We are sending you ☒ Herewith ☐ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Signed Data Validation Report

COPIES	DATE OR NO.	DESCRIPTION
2		Signed Data Validation Report for SDG No. G2I120184

THESE ARE TRANSMITTED AS INDICATED BELOW

☒ For your use ☐ No Exceptions Taken ☐ Return _____ Corrected Prints

☒ For Approval ☐ Make Corrections Noted ☐ Submit _____ Copies for _____

☒ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☐ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS:

As requested, I have attached 2 copies of the signed data validation report for the laboratory results of the samples obtained from Action Area 3 / 4 and Action Area 10 in September 2002 (SDG No: G2I120184). Should you have any questions, please feel free to contact me at 860.410.2976.

Attachment

Loureiro Engineering Associates, Inc.

November 8, 2002

U.S. Environmental Protection Agency
New England Regional Office
1 Congress Street, Suite 1100 (HBO)
Boston, Massachusetts 02114-2023

Attn: Anna Krasko, On-Scene Coordinator

RE: Data Validation Summary Report
September Sampling Event
Centredale Manor Restoration Project
North Providence, Rhode Island

Dear Ms. Krasko:

As requested, the data validation summary report for the September 2002 sampling event is attached for your review. This report includes Region I worksheets and annotated Form Is for the sample delivery group associated with this sampling event. Upon your review of the attached report, please feel free to contact me at (860) 410-2976 should you have any questions.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

David N. Scotti, P.G.
Project Manager

Copy to: Centredale Manor Performing Parties Group (w/o attachment)

Attachment

100 Northwest Drive • Plainville, CT 06062 • 860.747.6181 • Fax 860.747.8822 • www.LoureiroEngineering.com
An Employee Owned Company

Loureiro Engineering Associates, Inc.

October 4, 2002

U.S. Environmental Protection Agency
New England Regional Office
1 Congress Street, Suite 1100 (HBO)
Boston, Massachusetts 02114-2023

Attn: Anna Krasko, On-Scene Coordinator

RE: Data Validation Summary Reports
April / July 2002 Sampling Events
Centredale Manor Restoration Project
North Providence, Rhode Island

Dear Ms. Krasko:

As requested, the data validation summary reports for the April and July 2002 sampling events are attached for your review. The reports include Region I worksheets and annotated Form Is for the sample delivery groups associated with these sampling events. Upon your review of the attached reports, please feel free to contact me at (860) 410-2976 should you have any questions.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

David N. Scotti, P.G.
Project Manager

Copy to: Centredale Manor Performing Parties Group (w/o attachment)

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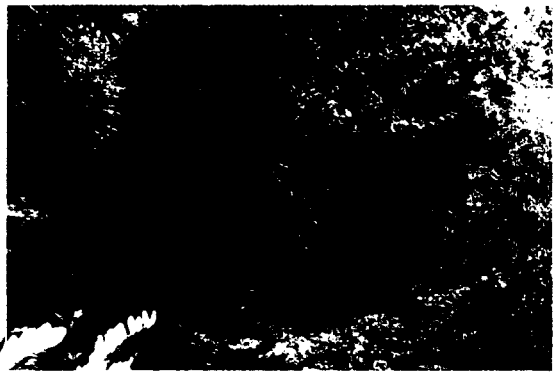
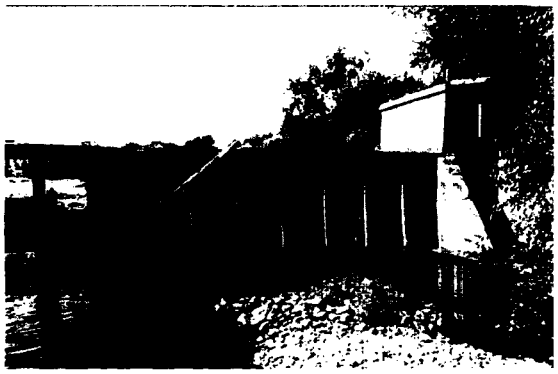
APPENDIX B

APPENDIX B

Photodocumentation Log

Photodocumentation
Reconstruction of Allendale Dam
Tree Cutting and Clearing

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

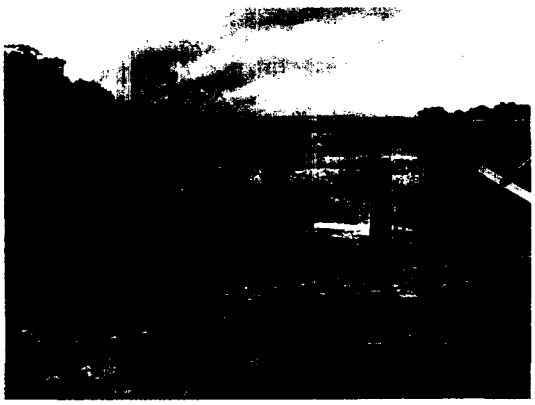
Photograph	Date	View Point	View Direction	Description
	08.13.2001	East side of embankment, east of existing gate structure	W	Existing gate structure, prior to tree cutting and clearing activities
	08.13.2001	East side of embankment, north of existing gate structure	S	Existing gate structure, prior to tree cutting and clearing activities
	08.13.2001	Downstream of Allendale Dam and South of existing gate structure	NNE	Existing gate structure, prior to tree cutting and clearing activities
	08.15.2001	Southeast of existing gate structure, standing in construction parking lot	NNW	Existing gate structure, following tree cutting and clearing activities

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

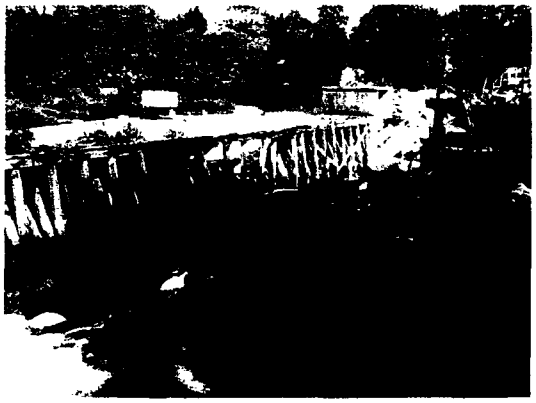
Photograph	Date	View Point	View Direction	Description
	08.13.2001	Downstream of Allendale Dam	WNW	Allendale Dam abutting west embankment adjacent to the Town Asphalt Company Property, prior to tree cutting and clearing activities
	08.14.2001	The Town Asphalt Company property, above west embankment	NNE	The Town Asphalt Company property following tree cutting and clearing activities
	08.14.2001	Existing gate structure	W	View of the Town Asphalt Company property following tree cutting and clearing activities
	08.14.2001	East side of embankment	WNW	View of the existing Allendale Dam structure and the Town Asphalt Company property following tree cutting and clearing activities

Photodocumentation
Reconstruction of Allendale Dam
Surface Water Control and Diversion

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

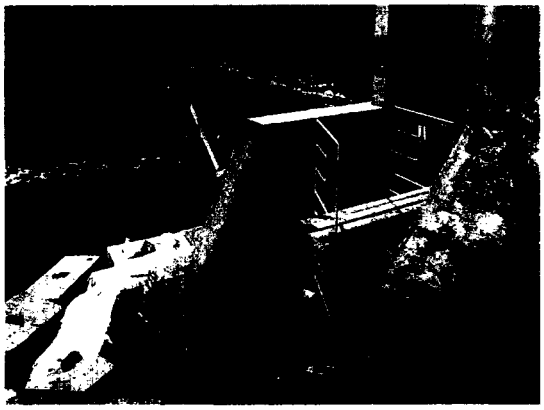
Photograph	Date	View Point	View Direction	Description
	09.19.2001	South of existing Allendale Dam structure	N	Former Allendale Dam Structure
	09.24.2001	Existing gate structure	W	Placement of filter fabric for upstream cofferdam
	09.24.2001	East side of The Town Asphalt Company property	E	Placement of gravel for upstream cofferdam
	09.26.2001	Existing gate structure	W	Construction of upstream cofferdam

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	10.10.2001	Downstream of Allendale Dam structure on downstream cofferdam	NE	Exposed timber structure of former Allendale Dam
	10.10.2001	Downstream cofferdam	E	Exposed timber structure of former Allendale Dam
	10.11.2001	Downstream cofferdam	E	Placement of sandbags along edge of downstream cofferdam
	10.11.2001	East embankment	WNW	Removal of debris below the former Allendale Dam structure

Photodocumentation
Reconstruction of Allendale Dam
Concrete Wingwall

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

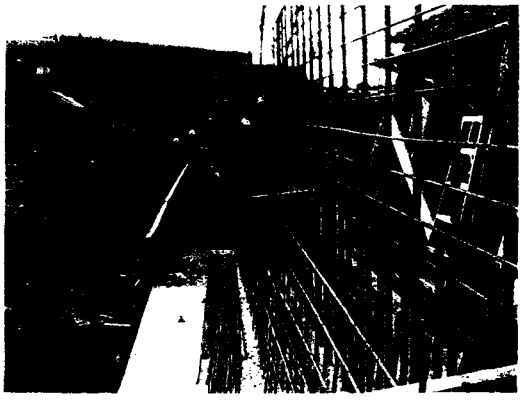
Photograph	Date	View Point	View Direction	Description
	09.19.2001	East side of embankment, downstream of gate structure	NW	Forming extension of wing-wall
	09.24.2001	East side of embankment, downstream of gate structure	NW	Finished wing-wall
	09.26.2001	West side of tailrace, standing in construction parking lot	NE	Forming plugs for tailrace
	10.04.2001	West side of tailrace	NNE	Plugged tailrace

Photodocumentation
Reconstruction of Allendale Dam
Concrete Footing

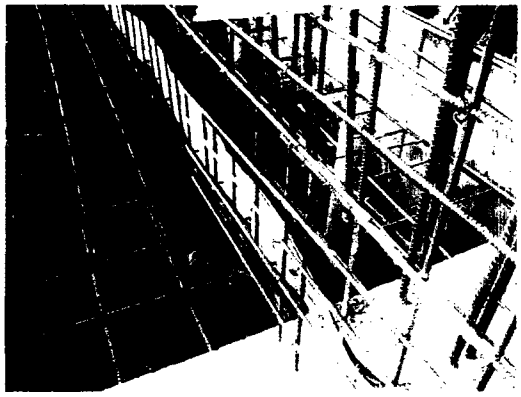
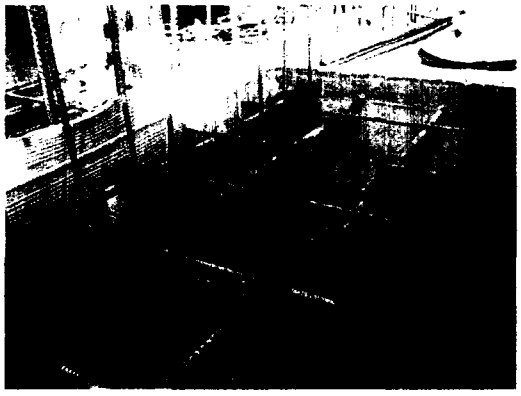
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	11.30.2001	East side of embankment, immediately downstream of existing gate structure	W	Concrete Formwork: Section of formed wall for dam footing Note: Rock anchor bolts on downstream side of formed wall
	12.01.2001	West end of downstream cofferdam	NE	Concrete Formwork: Installation of forms and reinforcing steel bars for dam footing
	12.01.2001	Downstream cofferdam	NE	Concrete Formwork: Installation of forms and reinforcing steel bars for dam footing Note: Wing-wall and gate structure in background
	12.05.2001	West end of proposed dam	E	Concrete Formwork: Installed forms and reinforcing steel bars for dam footing

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

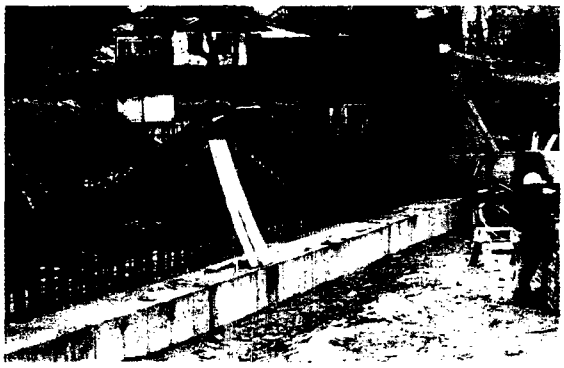
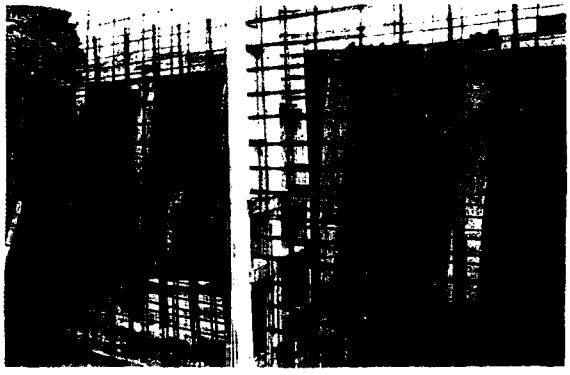
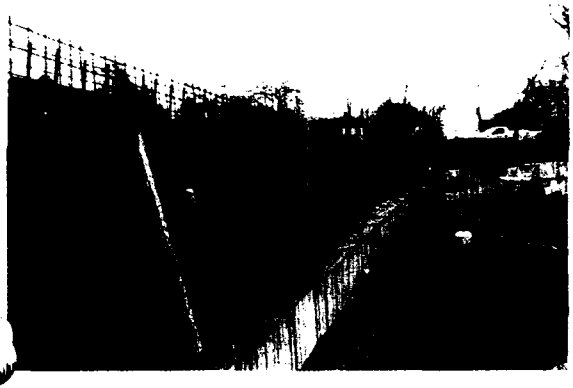
Photograph	Date	View Point	View Direction	Description
	12.05.2001	Downstream cofferdam	E	Dam footing concrete pour
	12.05.2001	Standing on top of existing gate structure	W	Dam footing concrete pour
	12.05.2001	West abutment of existing dam structure	E	Dam footing concrete pour
	12.07.2001	Eastern embankment downstream of existing gate structure	W	Concrete Formwork: Installed forms and reinforcing steel bars for dam footing Note: Reinforcing steel bars for concrete wall tied to reinforcing steel bars of poured footing

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

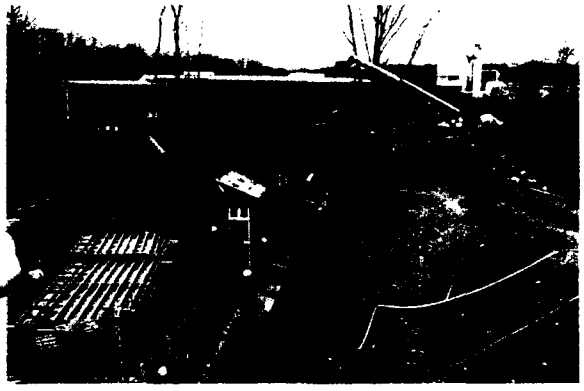
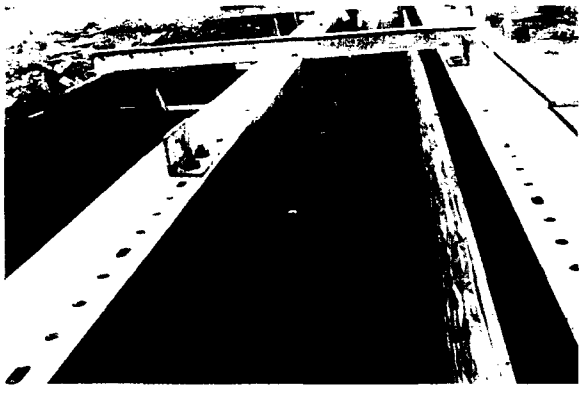
Photograph	Date	View Point	View Direction	Description
	12.07.2001	Downstream of center section of dam structure	W	Concrete Formwork: Installed forms and reinforcing steel bars for dam footing
	12.07.2001	Downstream of center section of dam structure	E	Concrete Formwork: Installed forms and reinforcing steel bars for dam footing Note: PVC waterstop placed between reinforcing steel bars
	12.07.2001	West end of dam structure	E	Concrete Formwork: Installed forms and reinforcing steel bars for dam footing Note: Just prior to concrete pour

Photodocumentation
Reconstruction of Allendale Dam
Concrete Wall

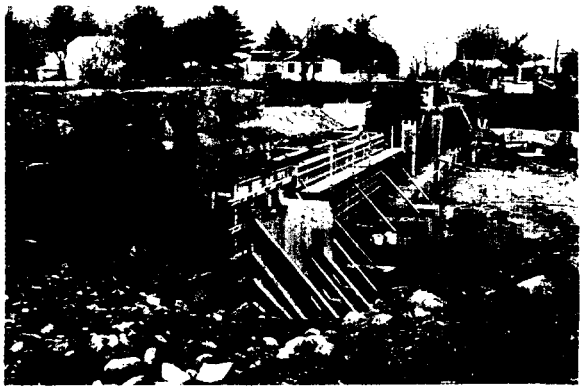
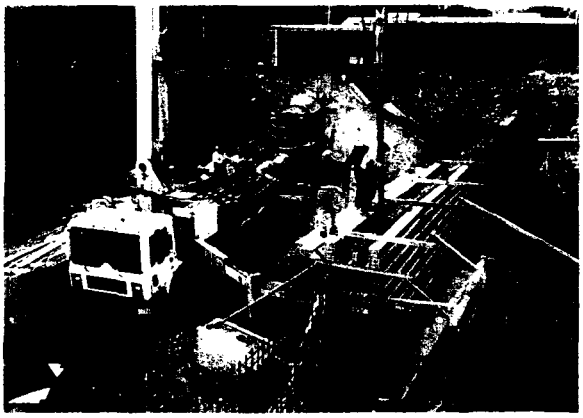
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	12.11.2001	Downstream cofferdam	NE	Placement of fabricated bar mats and reinforcing steel bars for dam wall construction
	12.13.2001	Downstream cofferdam	NE	Placement of fabricated bar mats and reinforcing steel bars for dam wall construction
	12.13.2001	Downstream of dam wall	NW	Placement of fabricated bar mats and reinforcing steel bars for dam wall construction
	12.13.2001	Downstream of dam wall at west end	E	Placement of fabricated bar mats and reinforcing steel bars for dam wall construction

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	12.11.2001	Downstream cofferdam at west abutment	N	Placement of fabricated bar mats and reinforcing steel bars for dam wall construction Note: PVC waterstop along abutment with existing granite stone wall
	12.14.2001	Standing on top of existing gate structure	W	Placement of forms for concrete dam wall
	12.18.2001	West side of dam	E	Close-up view of forms for concrete dam wall
	12.18.2001	Downstream of dam along east side	NW	Placement of forms for concrete dam wall where it abuts existing granite stone wall

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	12.18.2001	Downstream cofferdam	NE	Placement of forms for concrete dam wall where it abuts existing granite stone wall
	12.19.2001	Standing on top of existing gate structure	W	Dam wall concrete pour
	12.26.2001	Standing on top of existing gate structure	W	Dam wall concrete pour (2nd section of wall) Note: Placement of concrete curing mat
	12.20.2001	Downstream cofferdam	NE	Removal of first section of forms for concrete dam wall

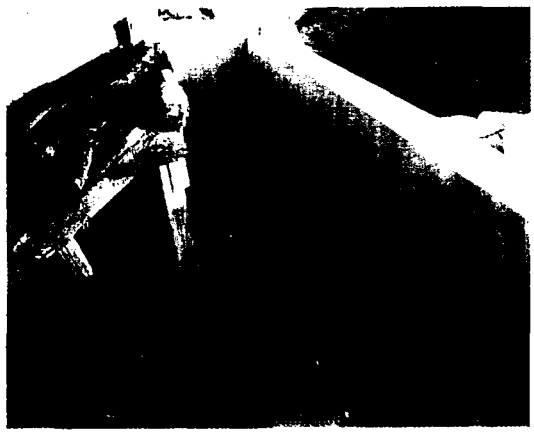
Photodocumentation
Reconstruction of Allendale Dam
Concrete Containment Pad

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	08.14.2001	East end of Allendale Avenue, adjacent to The Town Asphalt Company property	E	View of location of future containment pad, beyond guardrail
	10.11.2001	South side of The Town Asphalt Company property	W	Containment pad surrounded by temporary chain-link fence
	10.16.2001	The northeast corner of containment pad on The Town Asphalt Company property	SW	View of the lined containment pad; note the timber removed from the existing Allendale Dam structure temporarily stored on the containment pad liner

Photodocumentation
Reconstruction of Allendale Dam
General Restoration Activities

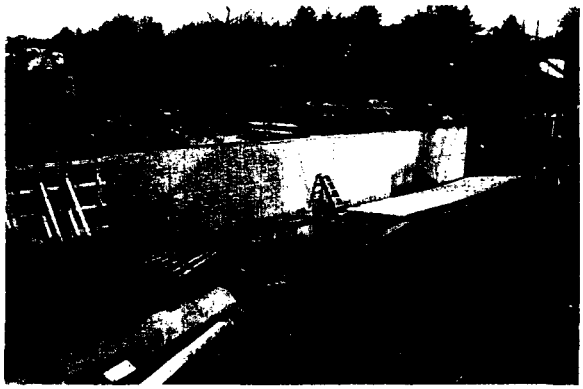
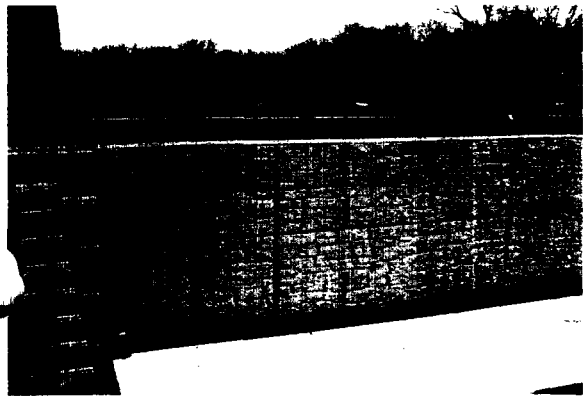
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	10.16.2001	Existing gate structure	W	Removal of debris below the former Allendale Dam structure
	10.16.2001	Downstream cofferdam	NE	Rock coring activities (30 ft rock core)
	10.17.2001	Downstream cofferdam along The Town Asphalt Company property	ENE	Removal of timber of former Allendale Dam structure and rock coring activities
	01.04.2002	Western embankment at dam abutment	E	Rock anchor bolt testing

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	01.08.2002	Standing on top of existing gate structure	W	Placement of concrete flowable fill between concrete dam wall and old dam structure
	01.14.2002	Eastern embankment	W	Installation of filter fabric for toe drain
	01.17.2002	Eastern embankment	W	Removal of downstream cofferdam following placement of riprap at foot of concrete dam wall

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

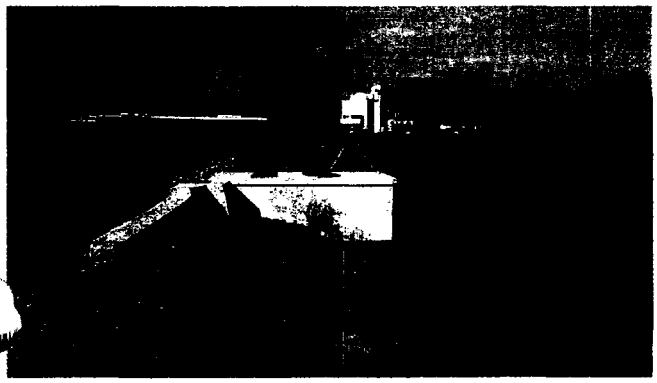
Photograph	Date	View Point	View Direction	Description
	12.21.2001	Downstream cofferdam	NE	Removal of forms for concrete dam wall Note: Factory fabricated elastomeric textured concrete form liner
	12.21.2001	Downstream of concrete dam wall where it abuts the existing granite stone wall	N	Exposed face of the stem of the dam Note: Ashlar Stone Texture pattern
	01.08.2002	Downstream cofferdam	NE	Exposed face of the stem of the dam
	01.17.2002	Downstream cofferdam	NE	Exposed face of the stem of the dam Note: Riprap placed at the foot of the concrete wall

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

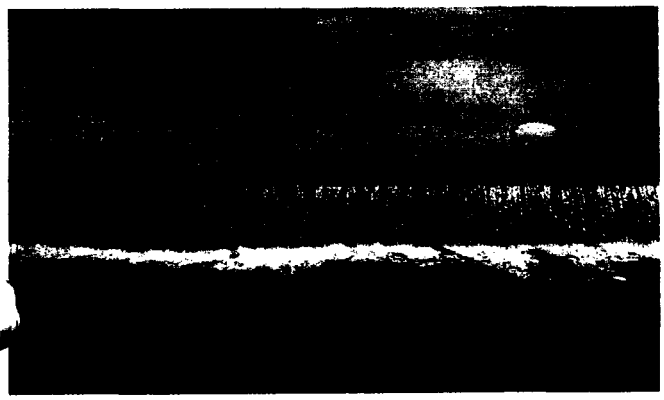
Photograph	Date	View Point	View Direction	Description
	01.29.2002	Eastern embankment	W	Concrete dam wall Note: Capstones on top of the wall and grouted riprap at the foot of the wall

Photodocumentation
Reconstruction of Allendale Dam
Restored Dam

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

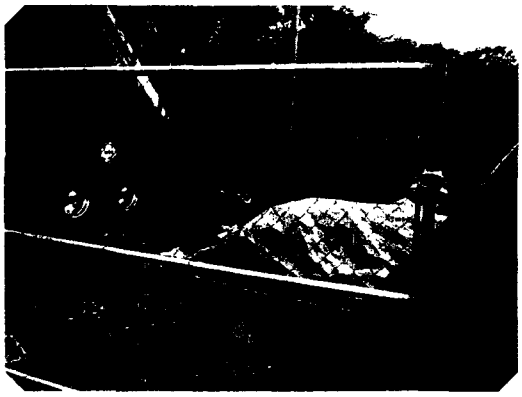
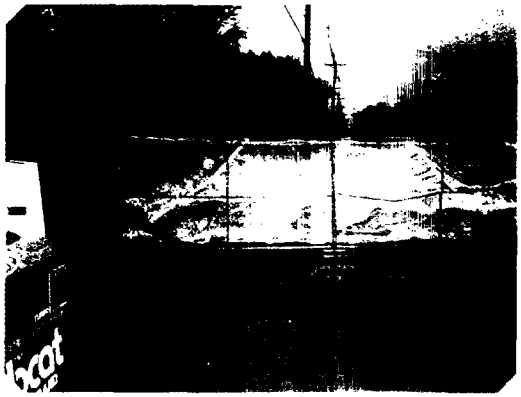
Photograph	Date	View Point	View Direction	Description
	04.09.2002	East side of embankment, southeast of gate structure	NW	Finished dam Note: Sluice gate adjusting mechanism arising from gate structure
	04.09.2002	East side of embankment, east of gate structure	W	Gate structure
	04.09.2002	Bridge on Allendale Way, downstream of Allendale Dam	N	Allendale Dam
	04.09.2002	West side of embankment, downstream of Allendale Dam	NNE	Allendale Dam Note: Capstones on west abutment wall

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

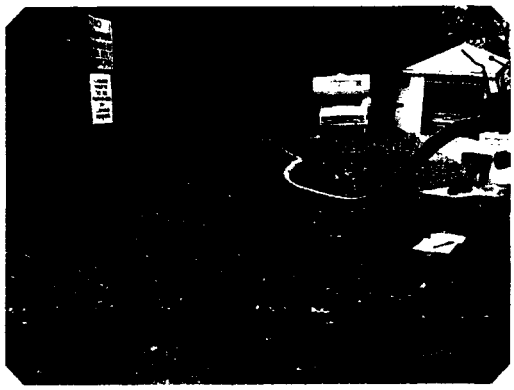
Photograph	Date	View Point	View Direction	Description
	04.09.2002	Midstream, Downstream of Allendale Dam	NE	East embankment Note: Recently placed soil and seed
	04.09.2002	Midstream, Downstream of Allendale Dam	N	Allendale Dam wall
	04.09.2002	Midstream, Downstream of Allendale Dam	NNW	Allendale Dam wall and west abutment
	04.09.2002	Midstream, Downstream of Allendale Dam	NNE	Allendale Dam wall and east abutment

Photodocumentation
Soil and Sediment Excavation

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	10.30.2002	Grover Street	W	Vacuum Truck at the End of Grover Street Vacuuming Soil and Sediment from the Grenier Property (Action Area 2)
	11.01.2002	East of Containment Pad	W	Vacuum Truck Emptying Soil and Sediment onto Lined Containment Pad
	11.19.2001	Top of Embankment Action Area 11	N	Dewatering Pump Used To Dewater Areas of Excavation Along the Shore of Lymansville Pond
	11.13.2002	Allendale Avenue	W	Covered and Secured Soil and Sediment Stockpiled on Containment Pad

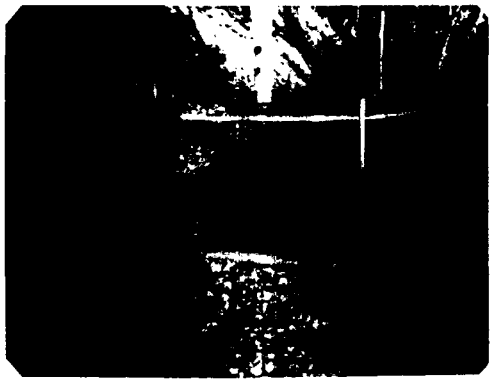
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	Northwest Corner of Grenier Property (Plat 14 / Lot 302)	NW	Area of Excavation Surrounding EPA Sample Location CMS-123 Prior to Soil and Sediment Removal Activities
	09.23.2002	South side of Grover Street	N/NW	General Condition of Grenier Property Prior to Soil and Sediment Removal Activities
	10.30.2002	West End of Grover Street	N	General Condition of Grenier Property During Vacuuming/ Soil and Sediment Removal Activities
	10.30.2002	Action Area 2	N	Soil Removal Note: Significant Root Mat

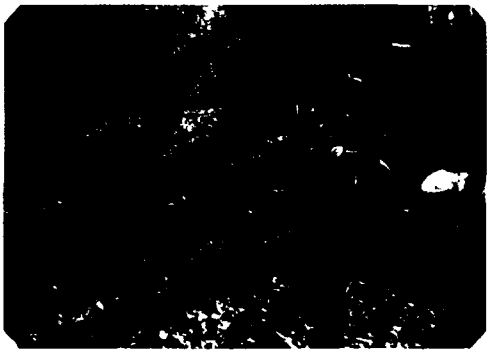
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	West End of Rotella Property (Plat 14 / Lot 333)	W	Area of Excavation Surrounding EPA Sample Location RES-14-333-03 Prior to Soil and Sediment Removal Activities Note: Area of Excavation on West Side of Fence
	10.31.2002	West End of Rotella Property (Plat 14 / Lot 333)	W	Area of Excavation Surrounding EPA Sample Location RES-14-333-03 Prior to Soil and Sediment Removal Activities Note: Area of Excavation on West Side of Fence
	10.31.2002	Southwest of the Northern Section of Action Area 3	NE	Area of Excavation Surrounding EPA Sample Location RES-14-333-03 Prior to Soil and Sediment Removal Activities
	10.31.2002	West of the Northern Section of Action Area 3	E	Limit of the Area of Excavation

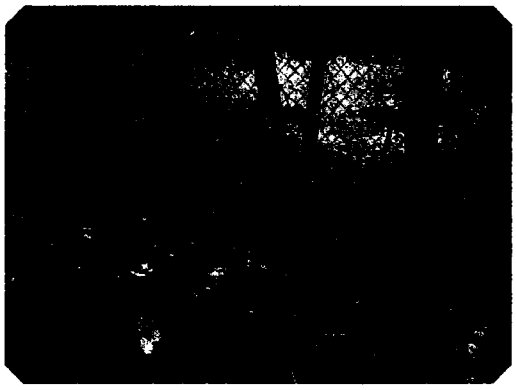
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	11.07.2002	West of Action Area 3 / 4	ENE	Soil Excavation Using Vacuum Extraction Technique
	11.07.2002	West of Action Area 3 / 4	E	Limit of the Area of Excavation
	11.07.2002	West of Action Area 3 / 4	E	Limit of the Area of Excavation Note: Large Boulders and Cobbles and Tree Roots
	11.27.2002	West of Action Area 3 / 4	E	Limit of the Area of Excavation

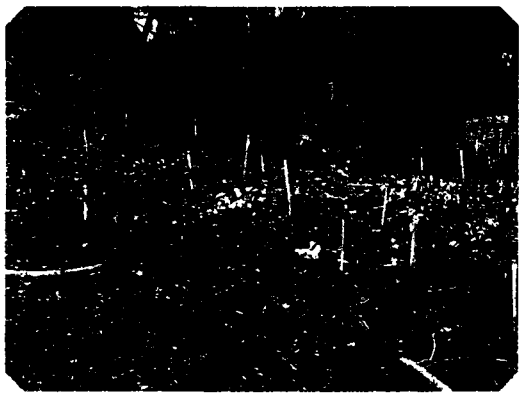
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	Northwest Corner of Fitzgerald Property (Plat 14 / Lot 398)	NW	Area of Excavation Surrounding EPA Sample Location CMS-221 Prior to Soil and Sediment Removal Activities Note: Allendale Pond in Background Prior to Lowering the Elevation of the Pond
	11.27.2002	South of Action Area 4	N	Setting up Around Action Area 4 for Soil and Sediment Removal
	11.27.2002	Northwest of Action Area 4	SE	Soil and Sediment Removal Surrounding EPA Sample Location CMS-221
	11.27.2002	Northwest Corner of Fitzgerald Property (Plat 14 / Lot 398)	NW	Action Area 4 Following Backfilling and Restoration

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	West end of Stevens Street	SW	Peloquin Property (Plat 14 / Lot 399) Prior to Removal Activities Note: Action Area 5 Located on the West side of Fence
	11.11.2002	West side of Peloquin Property	W	Area of Excavation Surrounding EPA Sample Location CMS-193 Prior to Soil and Sediment Removal Activities
	11.11.2002	West side of Peloquin Property	N	Area of Excavation Surrounding EPA Sample Location CMS-193 Prior to Soil and Sediment Removal Activities
	11.12.2002	Bottom of Embankment	SE	Area of Excavation Surrounding EPA Sample Location CMS-193 Note: Significant Rocks and Boulders

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	East of Asselin Property	W	Southern Extent of Asselin Property (Plat 14 / Lot 419) Prior to Removal Activities Note: Action Area 6 Partly Inundated by Allendale Pond
	11.01.2002	Allendale Pond	NE	Area of Excavation for Area 6 North Prior to Excavation
	12.04.2002	Allendale Pond South of Asselin Property	W	Area of Excavation for Area 6 North Surrounding EPA Sample Location CMS-205
	12.06.2002	Allendale Pond South of Asselin Property	W	Area of Excavation for Area 6 North Surrounding EPA Sample Location CMS-205 Note: Vacuum Truck Parked on North Side of Chain-Link Fence

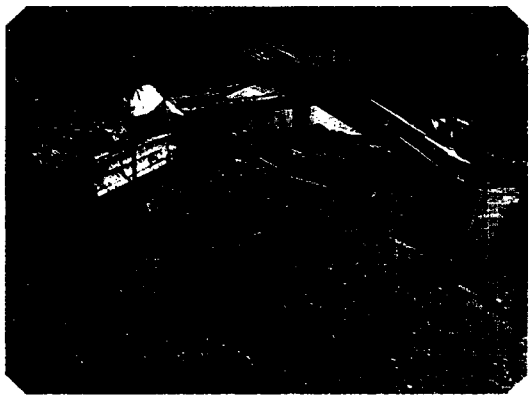
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	12.06.2002	Allendale Pond South of Asselin Property	E	Area of Excavation for Area 6 North Surrounding EPA Sample Location CMS-205
	11.01.2002	Allendale Pond Southeast of Asselin Property	NW	Pulling Back Chain Link Fence in Area 6 South Surrounding EPA Sample Location CMS-206
	11.01.2002	Allendale Pond	N	Area of Excavation for Area 6 South Surrounding EPA Sample Location CMS-206
	11.01.2002	Allendale Pond	N	Limit of the Area of Excavation for Area 6 South

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	West Property Line of Carcone Property	W	Action Area 7 Adjacent to Carcone Property (Plat 12 / Lot 554) and West of Chain Link Fence Note: Prior to Lowering of Allendale Pond
	09.23.2002	Allendale Dam	NE	Area of Excavation for Action Area 7 West of Chain Link Fence Note: Prior to Lowering of Allendale Pond
	11.12.2002	West Property Line of Carcone Property	WNW	Area of Excavation for Action Area 7 Surrounding EPA Sample Location CMS-476 Note: Large Boulders Excavated from Action Area
	11.12.2002	West Property Line of Carcone Property	WSW	Area of Excavation for Action Area 7 Surrounding EPA Sample Location CMS-476 Note: Large Boulders Excavated from Action Area

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	McCoy Property	SE	Action Area 9 Surrounding EPA Sample Location RES-11-425-01 Prior to Excavation
	11.26.2002	McCoy Property	SE	Setting Sedimentation Controls and Aqua Dam Around Action Area 9 Prior to Excavation
	11.26.2002	Campanelli Property	N	Setting Sedimentation Controls and Aqua Dam Around Action Area 9 Prior to Excavation
	11.26.2002	McCoy Property	ESE	Action Area 9 Surrounding EPA Sample Location RES-11-425-01

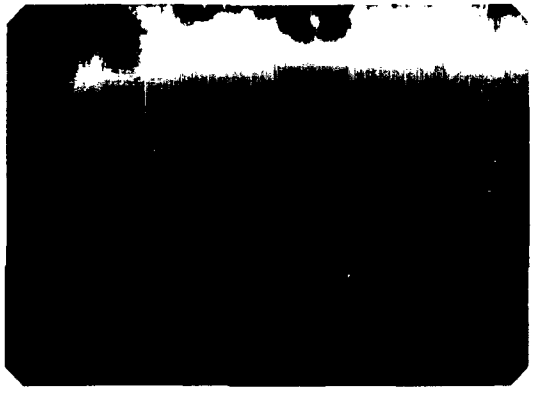
PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	11.20.2002	Eastlande MHP Corporation Property (Plat 11 / Lot 396)	NW	Action Area 10 Surrounding EPA Sample Location RES-11-396-01 Prior to Excavation
	11.21.2002	Eastlande MHP Corporation Property (Plat 11 / Lot 396)	SW	Sedimentation Controls and Aqua Dam Around Action Area 10 Prior to Sediment Excavation
	11.21.2002	Eastlande MHP Corporation Property (Plat 11 / Lot 396)	SW	Oily Debris Excavated from Action Area 10
	11.25.2002	Eastlande MHP Corporation Property (Plat 11 / Lot 396)	SSW	Excavation of Action Area 10 Surrounding EPA Sample Location RES-11-396-01

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	Top of Embankment East of Action Area 11	W	Action Area 11 Surrounding EPA Sample Location LPX-BK-2006 Prior to Excavation
	11.19.2002	Eastern Edge of DeLuca Property (Plat 10 / Lot 68)	SW	Setting Sedimentation Controls and Aqua Dam Around Action Area 11 Prior to Sediment Excavation
	11.19.2002	Eastern Edge of DeLuca Property (Plat 10 / Lot 68)	SW	Dewatering Pump Action Area 11
	11.20.2002	Top of Embankment East of Action Area 11	W	Action Area 11 Following Excavation and Backfilling Note: Aqua Dam Removed at a Later Date

PHOTODOCUMENTATION
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

Photograph	Date	View Point	View Direction	Description
	09.23.2002	West Parking Lot of Industrial Property (Plat 10 / Lot 91)	W	Access to Recreational Use Area - Action Area 12 Surrounding EPA Sample Location LPX-BK-2007 Prior to Excavation
	11.20.2002	Embankment South of Action Area 12	N	Clearing Debris from Action Area 12 Prior to Excavation
	11.20.2002	West Parking Lot of Industrial Property (Plat 10 / Lot 91)	W	Setting Equipment to Excavate Action Area 12 Surrounding EPA Sample Location LPX-BK-2007
	11.20.2002	Embankment East of Action Area 12	W	Action Area 12 Following Excavation and Backfilling

APPENDIX C

APPENDIX C

Construction Submittals

Construction Submittals
Submittal 001
Rock Anchor bolts and Accessories

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	US Army Corps of Engineers	DATE	8/29/01
		PROJECT	Centredale Manor
		LOCATION:	N. Providence, RI
		COMM. NO.:	15RP102.001
ATTN:	Laureen Borochaner	PHONE #	(978) 318-8802

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

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1	8/29/01	Submittal 001 – Rock Anchor Bolts and Accessories

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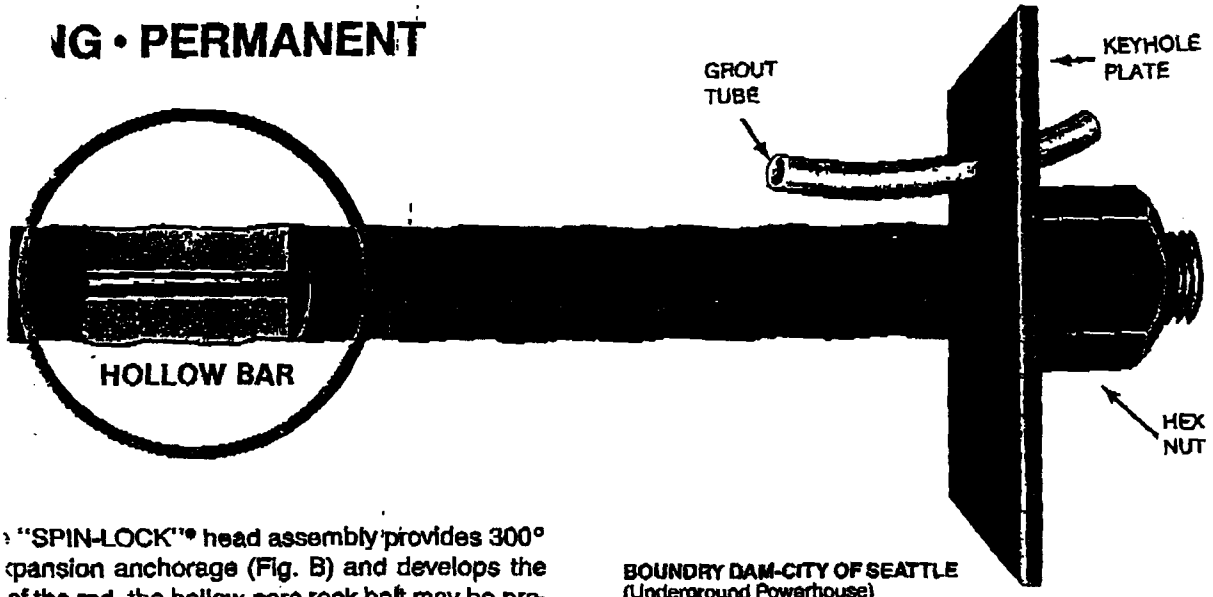
REMARKS:

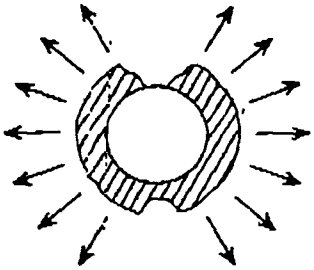
BY: Scott A. Miller

IG • PERMANENT



"SPIN-LOCK"® head assembly provides 300% expansion anchorage (Fig. B) and develops the of the rod, the hollow-core rock bolt may be pre-he desired load and tested prior to grouting.

BOUNDRY DAM-CITY OF SEATTLE
(Underground Powerhouse)
Design - Bechtel Corp
Prime Contractor - Mannix S.G.S.



ns "Spin-Lock" head assem
° perimeter expansion anchor-
formation on "Spin-Lock"
turn to page 20.

STRUCTURAL PROPERTIES

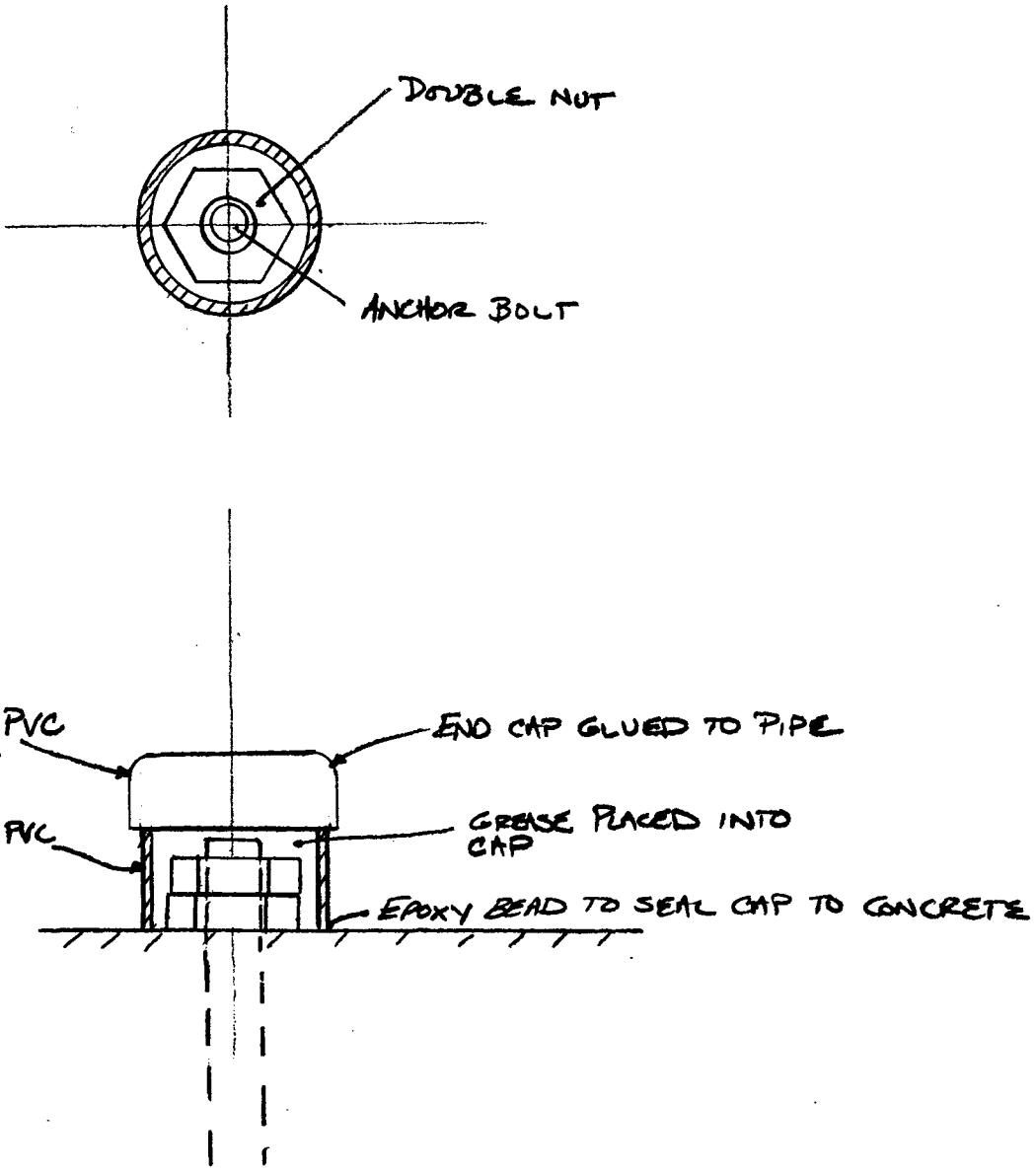
Ultimate Stress	Elongation in 2"	Reduction of Area
124 KSI	15%	40%

I GRADE HOLLOW-CORE PRE-STRESSABLE ROCK & CONCRETE ANCHOR — ASTM A 615 DEFORMATION PATTERN

NET AREA THRU THREADS IN.²	RECOMMENDED DESIGN LOAD AT 50% OF ULTIMATE	MAXIMUM WORKING LOAD TO YIELD	ULTIMATE STRENGTH (6)	ROCK TYPE	DRILL HOLE DIA. (1)	TYPE HEAD ASS'Y	TORQUE FT.-LB. TO EXPAND SHELL (2)	TORQUE FT.-LB. ON NUT FOR TENSION	PART NUMBER
.535 (345mm²)	33,000 LBS. (146.8 kN)	47,000 LBS. (209.1 kN)	66,000 LBS. (293.6 kN)	Hard & Medium	1-5/8"-(41mm)	A 13	250 (Do not exceed 450 ft.-lbs.)	400	R1H08A13
				Hard & Medium	1-3/4"-(44mm)	A 14			R1H08A14
				Medium & Weak	1-3/4"-(44mm)	B 14			R1H08B14
				Weak Rock & Concrete	1-3/4"-(44mm)	C 14			R1H08C14
				Rock & Concrete	2"-(51mm)	B 16			R1H08B16
1.115 (720mm²)	69,000 LBS. (306.9 kN)	100,000 LBS. (444.8 kN)	138,000 LBS. (613.8 kN)	Hard & Medium	2-1/4"-(57mm)	C 18	750 (Do not exceed 1200 ft.-lbs.)	Note (3)	R1H11C18
				Rock & Concrete	2-1/2"-(63mm)	B 20			R1H11B20
				Rock & Concrete	3"-(76mm)	B 24			R1H11B24
2.427 (1566mm²)	150,000 lbs. (667.2 kN)	219,000 lbs. (974.2 kN)	300,000 lbs. (1334.4 kN)	Rock & Concrete	3-1/2"-(89mm)	C 28	1000/ (3700 ft.-lbs.)	Note (3)	R1H16C28

table at left.

CENTREDALE MANOR RESTORATION SUPERFUND SITE
DAM RECONSTRUCTION
NORTH PROVIDENCE, RI



CAP DETAIL FOR TOP OF ANCHOR BOLT

NOT TO SCALE

Construction Submittals
Submittal 002
Gravel Fill Sieve Analysis

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	US Army Corps of Engineers	DATE	8/29/01
		PROJECT	Centredale Manor
		LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Laureen Borochaner	PHONE #	(978) 318-8802

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☐ Reports ☐ Copy of Letter ☒ Material Submittal

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5	8/29/01	Submittal 002 – Gravel Fill Sieve Analysis

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REMARKS:

BY: Scott A. Miller

100 Northwest Drive • Plainville, CT 06062 • 860.747.6181 • Fax 860.747.8822 • www.loureiro.com

RAWSON MATERIALS, INC.
205 Munyan Road
Putnam, CT 06260
Telephone: (860) 928-4536 Fax: (860) 963-5303

FAX

To: Town Asphalt (Ray)

Fax: 231-9552 Date: 8-24-01

From: Harold

Number of Pages (including cover sheet): 1

RE: Sieve Analysis

MESSAGE

Good morning

	Sieve Size	Rawson material	SPEC	
	6"	100%	100%	
	1"	74.2	50-85	
	#4	48.8	25-60	
	#40	15.9	5-30	
	#200	2.7	0-8	

Harold Hopkins

This message is intended for the use of the individual to whom it is addressed and many contain information which is confidential and privileged. Dissemination, distribution or copying of this message by anyone other than the recipient or agent/employee of recipient is prohibited.

Construction Submittals
Submittal 003
Concrete Mix Design for Dam

LCI
LEA-CIANCI, INC.

LETTER OF TRANSMITTAL

TO: GEI Consultants 1021 Main Street Winchester, MA 01890-1970 ATTN: Mike Walker	DATE 9/6/01 | JOB NO. 01-291 RE: Centredale Manor Dam Reconstruction cc: US Army Corps of Engineers –

WE ARE SENDING YOU ☐ Attached ☐ Under Separate Cover via _____ the following items:

☒ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

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1	9/6/01	003	Concrete Mix Design for Dam

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REMARKS:

COPY TO: Laureen Borochaner, USACE

SIGNED: Scott Nile

If enclosures are not as noted, kindly notify us at once.

100 Northwest Drive, Plainville, CT 06062 860-747-6631 Fax 860-747-9330
An Employee Owned Company

PRM CONCRETE CORPORATION
400 FRENCHTOWN RD.
EAST GREENWICH, RI 02861
(401) 885-4010

CONCRETE MIX DESIGN

MIX ID : 1741 LEA CIANCI [12] 5000 PSI 08/29/01

CONTRACTOR : LEA CIANCI,INC
PROJECT : CENTERDALE MANOR
SOURCE OF CONCRETE : PRM CONCRETE CORPORATION
CONSTRUCTION TYPE : FOOTINGS,WALLS,FLATWORK
PLACEMENT : CHUTE/PUMP

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)

			YIELD, CU FT
ATLANTIC CEMENT TYPE II, LB	700		3.56
RIVER SAND SAND, LB	1317		8.06
TILCON-CAPALDI 3/4 BLEND, LB	1800		10.16
WATER, GAL-US (LB)	31.0	(259)	4.15
TOTAL AIR, %	4.0	+/- 1.5	1.08
		TOTAL	27.00
ADVA FLOW, OZ-US	35.00		
DAREX AEA, OZ-US	1.8		
WATER/CEMENT RATIO, LBS/LB	0.37		
SLUMP, IN	4.00		
CONCRETE UNIT WEIGHT, PCF	151.0		

MIX INCLUDES ADVA FLOW FOR HIGH EARLY STRENGTH GAIN

PREPARED BY :

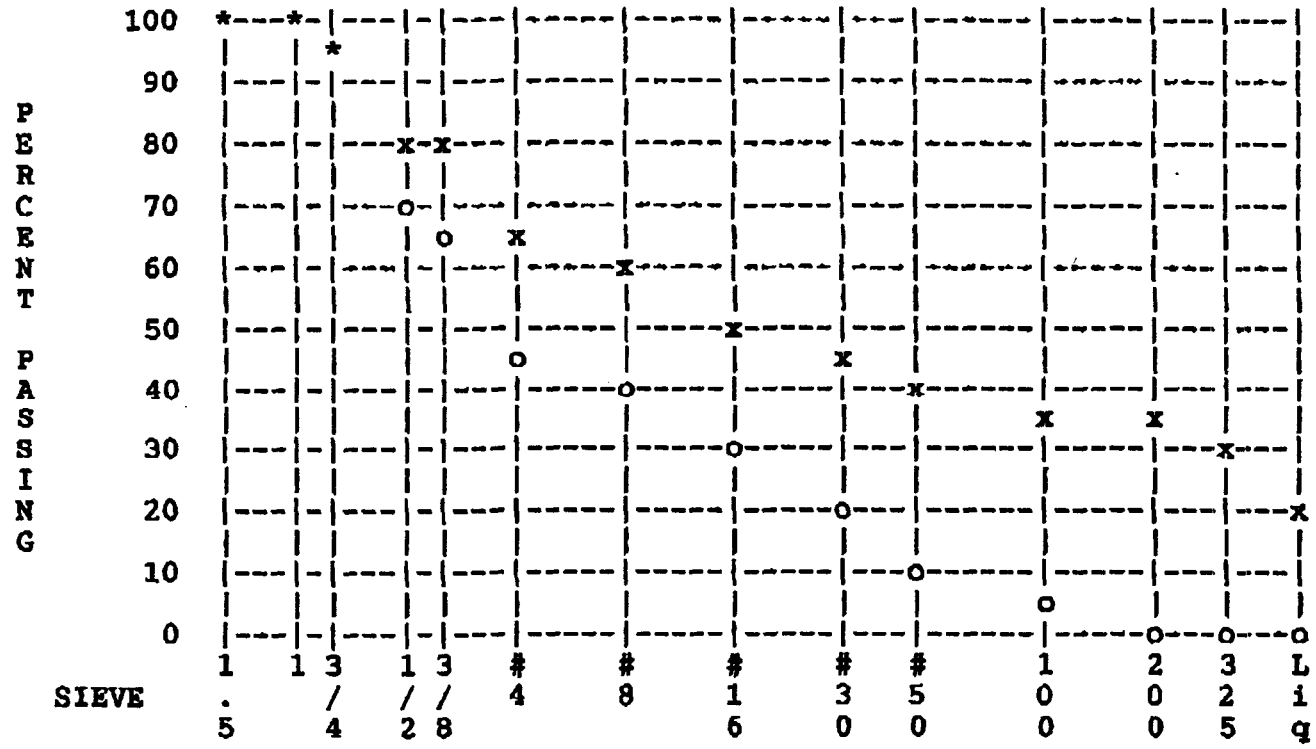
PRM CONCRETE CORPORATION

PSI: 5000 PSI Mix: 1741 LEA CIANCI 08/29/01

FULL GRADATION ANALYSIS

SIEVE	STONE	SAND	PASTE	TOTAL	AGGR
1-1/2 "				100.0	100.0
1 "	100.0			100.0	100.0
3/4 "	90.2			96.3	94.5
1/2 "	48.1			80.5	71.1
3/8 "	40.7	100.0		77.7	66.9
# 4	5.5	98.0		63.9	46.4
# 8	1.5	90.0		60.0	40.6
# 16	-	66.0		52.2	29.2
# 30	-	40.0		44.5	17.7
# 50	-	18.0		37.9	8.0
# 100	-	6.0		34.3	2.7
# 200	-	1.0	100.0	32.8	0.4
# 325	-	-	98.5	32.1	-
Liquid	-	-	59.5	19.4	-

GRADATION CHART



x - ALL COMPONENTS o - AGGREGATES * - BOTH

Construction Submittals
Submittal 004
Product Data for Sluice Gate

LCI
LEA-CIANCI, INC.

LETTER OF TRANSMITTAL

TO:	GEI Consultants 1021 Main Street Winchester, MA 01890-1970 ATTN: Mike Walker	DATE 9/13/01	JOB NO. 01-291
		RE: Centredale Manor Dam Reconstruction	
		cc: US Army Corps of Engineers –	

WE ARE SENDING YOU ☐ Attached ☐ Under Separate Cover via _____ the following items:

☒ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	9/13/01	004	Product Data for Sluice Gate
			Sluice Gate
			Crank-operated floor stand
			Plastic stem Cover and position indicator
			Stem

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☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review & comment ☐ _____

☐ FOR BIDS DUE _____ 19 ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS:
Please review the product data as soon as possible. I have to provide them with an approval of this standard size gate so they can begin to fabricate it. The fabrication should be complete and the gate received at the Site the week before Christmas if I can give them approval next week. Design drawings for the changes to the gate structure to accept this standard size gate should follow in the next 3 or 4 weeks, but are not necessary to fabricate the gate. I appreciate your expedited review. Thanks.

COPY TO: Laureen Borochaner, USACE

SIGNED: Scott Knill

If enclosures are not as noted, kindly notify us at once.

100 Northwest Drive, Plainville, CT 06062 860-747-6631 Fax 860-747-9330
An Employee Owned Company

Presented in this brochure are the actual dimensions for sluice gates that are suitable for the design head listed.

The sluice gates listed are not the only sluice gates available from Rodney Hunt, but are the most common sizes and design heads. For information on sluice gates not listed, please contact the Rodney Hunt representative in your area, or call us directly at 508-544-2511.

Design Head Vs. Operating Head

The design head is the maximum head the gate has been designed to withstand. The operating head is the head under which the gate is to be opened and closed. The operating head is used to determine the size of hoist and stem that is required to operate the gate and should be listed in the project specifications in addition to The design heads.

How to specify

Because of the number of gates involved, the heads for which these gates are suitable, and the several configurations in which the gate can be furnished, the best way to describe the sluice gate is by size of gate and the head for which it is designed, such as 60" x 72", 130-45. Special series gates should be described by size and series number, such as 8 x 8 Series B-240.

General Notes

The dimensions listed are the actual dimensions, to the nearest 1/4", of the size of gate listed, and the head for which that gate is designed. Rodney Hunt will furnish the gate shown in the table for all applications where the head is equal to or less than the design head indicated.

In some instances, several gates are listed for the same size, but with different design heads. This has been done to enable Rodney Hunt to provide the most economically designed gate for the specific design head applicatio n.

Installation Clearance

All sluice gates listed in the tables can be installed where the installation clearance along each side and along the bottom of the gate is 1". The flanges of the gate can be drilled so that the attaching studs extend to the front of the gate where they are easily accessible.

Where flange frame gates are required, such as where the gate must be mounted on a circular pipe flange, the recommended installation clearance is 8" on each side and beneath the bottom of the gate.

SLUICE GATE

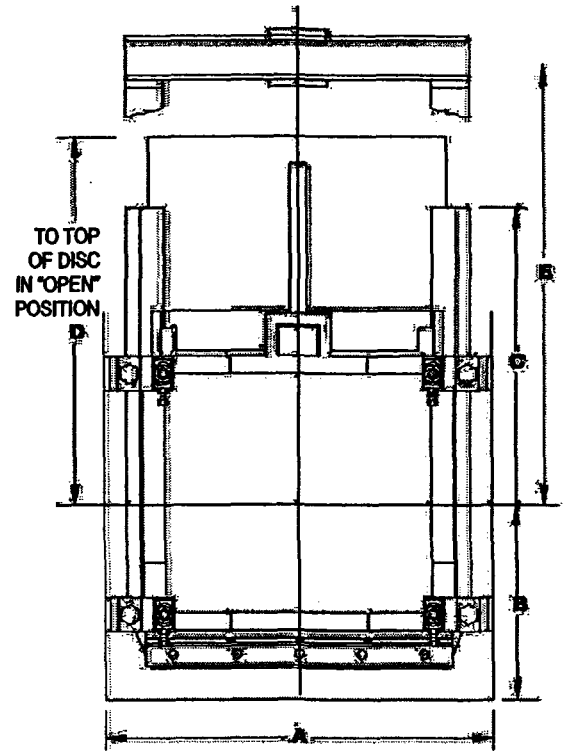
Dimensions

RODNEY HUNT®

Please refer to the following diagrams for use throughout this catalog.

STANDARD SERIES GATES

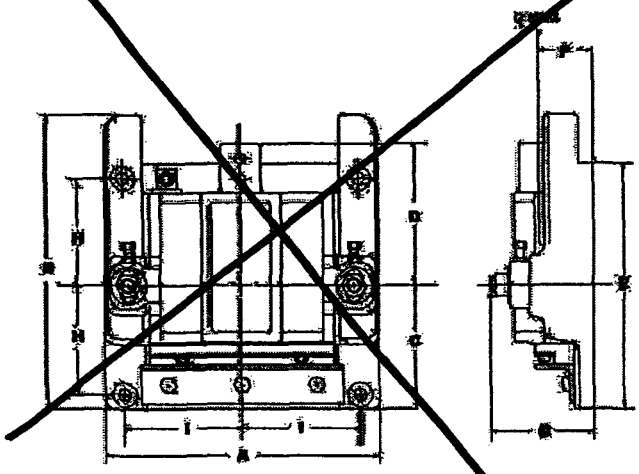
Sluice Gates Size 6" - 120"



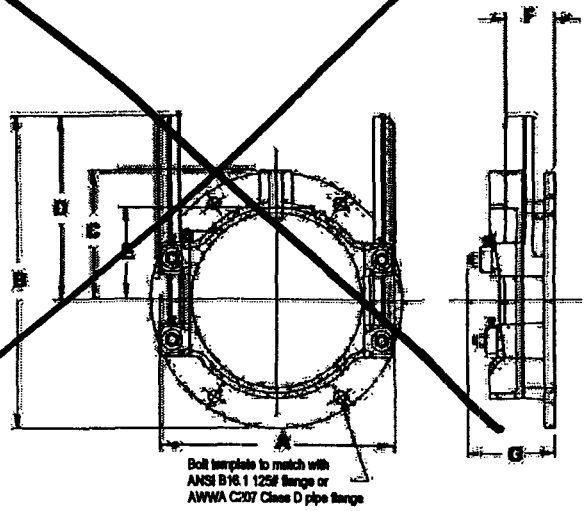
PROPOSED 60"X96" GATE (SEE NEXT SHEET)

SPECIAL SERIES GATES

Bronze Gate (Series B-240) with rising stem



Series R-260 Gate with resilient seat



Sluice Gates

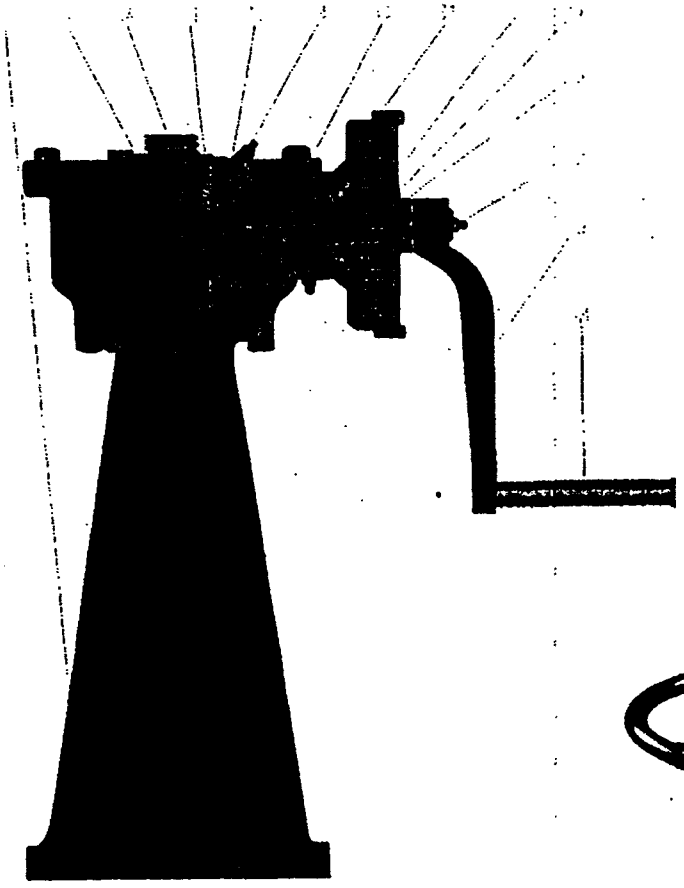
Sizes 54" and 60"

SIZE	DESIGN HEAD FT.		DIMENSIONS						
WIDTH x HEIGHT INCHES (MILLIMETERS)	SEAT	UNSEAT	A	B	C	D	E	F	G
54 x 48 (1350 x 1200)	130	45	67-1/2 (1715)	30-3/4 (781)	51-1/2 (1308)	81-1/2 (2070)	93-1/2 (2375)	15-1/4 (387)	9-1/2 (241)
54 x 54 (1350 x 1350)	130	45	67-1/2 (1715)	33-3/4 (857)	57-1/2 (1308)	90-1/2 (2299)	102-1/2 (2604)	15-1/4 (387)	9-1/2 (241)
54 x 60 (1350 x 1500)	130	45	67-1/2 (1715)	36-3/4 (933)	63-1/2 (1613)	99-1/2 (2527)	111-1/2 (2832)	16-1/2 (419)	9-1/2 (241)
54 x 72 (1350 x 1800)	130	45	67-1/2 (1715)	42-3/4 (1086)	75-1/2 (1918)	117-1/2 (2985)	129-1/2 (3289)	16-1/2 (419)	9-1/2 (241)
54 x 84 (1350 x 2100)	130	45	67-1/2 (1715)	48-3/4 (1238)	87-1/2 (2223)	135-1/2 (3442)	147-1/2 (3747)	17-3/4 (451)	9-1/2 (241)
54 x 96 (1350 x 2400)	130	45	67-1/2 (1715)	54-3/4 (1391)	99-1/2 (2527)	153-1/2 (3899)	165-1/2 (424)	17-3/4 (451)	9-1/2 (241)
60 x 36 (1500 x 900)	80	25	71-1/2 (1816)	23-3/4 (603)	39-1/4 (997)	61-1/2 (1562)	73-1/2 (1867)	13-1/4 (337)	8-3/4 (222)
60 x 48 (1500 x 1200)	80	25	71-1/2 (816)	29-3/4 (756)	51-1/4 (1302)	79-1/2 (2019)	91-1/2 (2324)	13-1/4 (337)	8-3/4 (222)
60 x 48 (1500 x 1200)	130	45	73-1/2 (1863)	30-3/4 (781)	51-1/2 (1308)	81-1/2 (2070)	93-1/2 (2375)	15-1/4 (387)	9-1/2 (241)
60 x 48 (1500 x 1200)	180	90	73-1/2 (1867)	30-3/4 (781)	51-1/2 (1308)	81-1/2 (2070)	93-1/2 (2375)	15-1/4 (387)	9-1/2 (241)
60 x 54 (1500 x1350)	80	25	71-1/2 (1816)	32-3/4 (832)	57-1/4 (1454)	88-1/2 (2248)	100-1/2 (2553)	13-1/4 (337)	8-3/4 (222)
60 x 54 (1500 x 1350)	130	45	73-1/2 (1867)	33-3/4 (857)	57-1/2 (1461)	90-1/2 (2299)	102-1/2 (2604)	15-1/4 (387)	9-1/2 (241)
60 x 54 (1500 x 1350)	180	90	73-1/2 (1867)	33-3/4 (857)	57-1/2 (1461)	90-1/2 (2299)	102-1/2 (2604)	15-1/4 (387)	9-1/2 (241)
60 x 60 (1500 x 1500)	80	25	71-1/2 (1816)	35-3/4 (908)	63-1/4 (1607)	97-1/2 (2476)	109-1/2 (2781)	14 (356)	8-3/4 (222)
60 x 60 (1500 x 1500)	130	45	73-1/2 (1867)	36-3/4 (933)	63-1/2 (1613)	99-1/2 (2527)	111-1/2 (2832)	16-1/2 (419)	9-1/2 (241)
60 x 60 (1500 x 1500)	180	90	73-1/2 (1867)	36-3/4 (933)	63-1/2 (1613)	99-1/2 (2527)	111-1/2 (2832)	16-1/2 (419)	9-1/2 (241)
60 x 72 (1500 x 1800)	80	25	71-1/2 (1816)	41-3/4 (1050)	75-1/4 (1911)	115-1/2 (2934)	127-1/2 (3238)	14 (356)	8-3/4 (222)
60 x 72 (1500 x 1800)	130	45	73-1/2 (1867)	42-3/4 (1086)	75-1/2 (1918)	117-1/2 (2984)	129-1/2 (3264)	16-1/2 (419)	9-1/2 (241)
60 x 72 (1500 x 1800)	180	90	73-1/2 (1867)	42-3/4 (1086)	75-1/2 (1918)	117-1/2 (2984)	129-1/2 (3289)	16-1/2 (419)	9-1/2 (241)
60 x 84 (1500 x 2100)	80	25	71-1/2 (1816)	47-3/4 (1213)	87-1/4 (2216)	133-1/2 (3391)	145-1/2 (3696)	14-3/4 (375)	8-3/4 (222)
60 x 84 (1500 x 2100)	130	45	73-1/2 (1867)	48-3/4 (1238)	87-1/2 (2222)	135-1/2 (3442)	147-1/2 (3746)	17-3/4 (451)	9-1/2 (241)
60 x 84 (1500 x 2100)	180	90	73-1/2 (1867)	48-3/4 (1238)	87-1/2 (2222)	135-1/2 (3442)	147-1/2 (3746)	17-3/4 (451)	9-1/2 (241)
60 x 96 (1500 x 2400)	80	25	71-1/2 (1816)	53-3/4 (1365)	99-1/4 (2527)	151-1/2 (3848)	163-1/2 (4153)	14-3/4 (375)	8-3/4 (222)
60 x 96 (1500 x 2400)	130	45	73-1/2 (1867)	54-3/4 (1391)	99-1/2 (2527)	153-1/2 (3899)	165-1/2 (4204)	17-3/4 (451)	9-1/2 (241)
60 x 96 (1500 x 2400)	180	90	73-1/2 (1867)	54-3/4 (1391)	99-1/2 (2527)	153-1/2 (3899)	165-1/2 (4204)	17-3/4 (451)	9-1/2 (241)
60 x 108 (1500 x 2700)	130	45	73-1/2 (1867)	60-3/4 (1543)	114 (2896)	171-1/2 (4356)	183-1/2 (4661)	19 (483)	9-1/2 (241)
60 x 108 (1500 x 2700)	180	90	73-1/2 (1867)	60-3/4 (1543)	114 (2896)	171-1/2 (4356)	183-1/2 (4661)	19 (483)	9-1/2 (241)
60 x 120 (1500 x 3000)	130	45	73-1/2 (1867)	66-3/4 (1695)	126 (3200)	189-1/2 (4813)	201-1/2 (5118)	19 (483)	9-1/2 (241)
60 x 120 (1500 x 3000)	180	90	73-1/2 (1867)	66-3/4 (1695)	126 (3200)	189-1/2 (4813)	201-1/2 (5118)	19 (483)	9-1/2 (241)

Far 54" (1350 mm) and 60" (1500 mm) gates to be mounted on pipe flanges, the dimensions "F" and "G" are increased by 3-1/2" (89 mm).

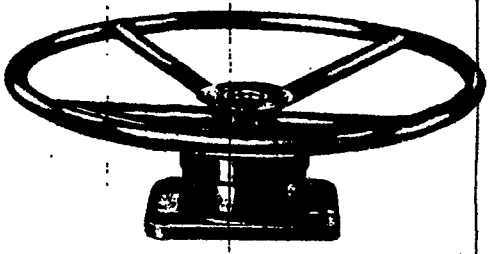
Floor Stands and Bench Stands

Rodney Hunt offers a complete line of floor stand and bench stand hoists to meet every operating requirement, as well as interconnected systems, portable hoist opertors, motor-operated hoists, hydraulic actuators and automatic control arrangements. All handwheel and crank operated floor stands and bench stands are selected so that no more than 40 lb. effort on the handwheel or crank is required to open or close the sluice gate or slide gate. They are designed to withstand without damage, at least a 200 lb effort on the handwheel or crank. Completeness of the line permits economical selection of the most suitable equipment for any specified operating condition. Our experienced Engineering Department is always available for consultation and to make recommendations. Hoists and accessory equipment with accurately rated capacities are the result of many engineering studies and laboratory tests conducted by Rodney Hunt. They have been tested for strength and capacity under all types of conditions. Field-tested in thousands of installations, this equipment has proven its superiority by its ease of operation and continuously reliable performance.



CRANK-OPERATED FLOOR STAND

- Bronze Operating Nut
- Lubrication Fittings
- Bevel Gears
- Cut Spur Gears
- Needle Bearing and Oil Seal
- Removable Crank
- Sleeved Grip
- Tapered Roller Bearings
- Mechanical Seal
- Pedestal

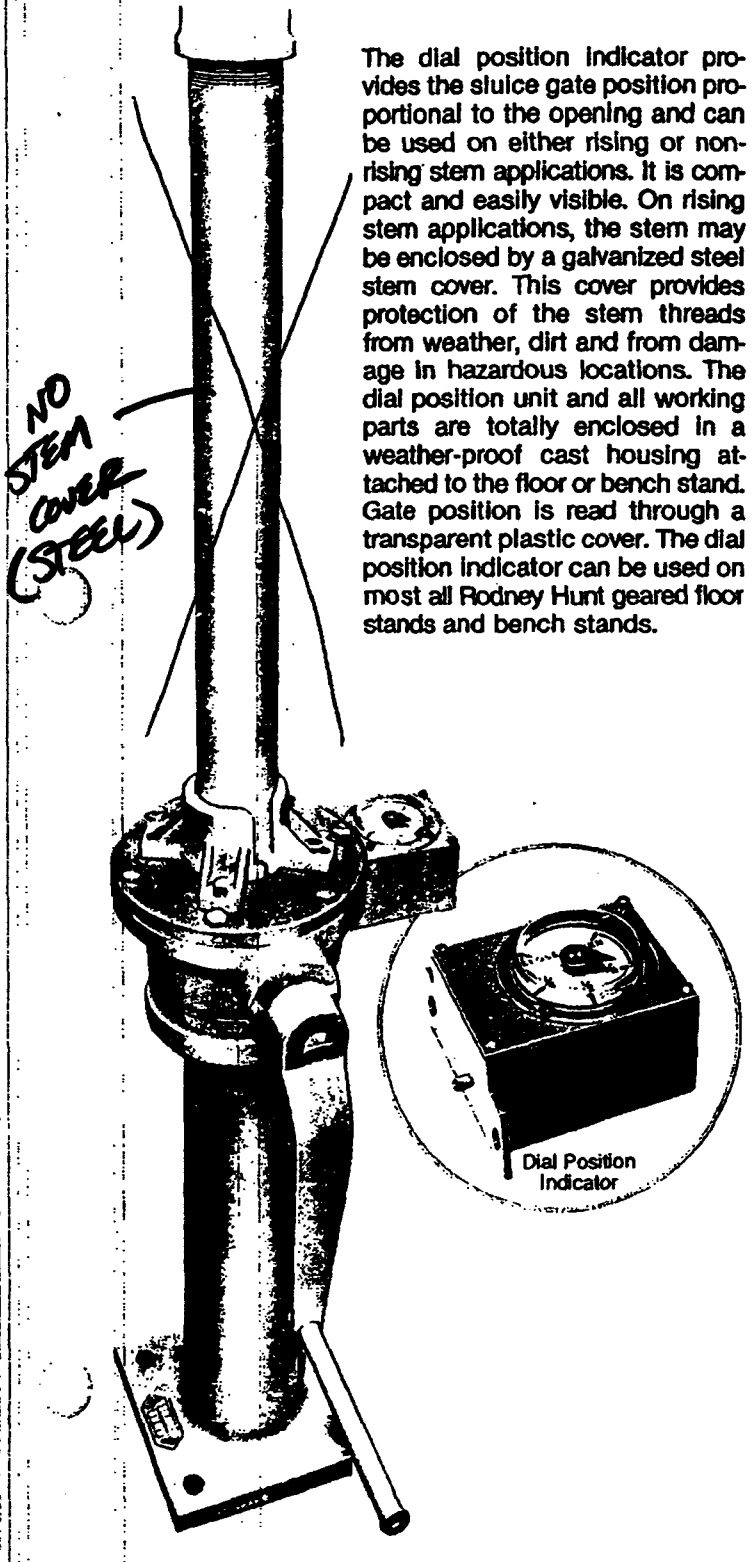


HANDWHEEL-OPERATED BENCH STAND

Stem Covers and Position Indicators

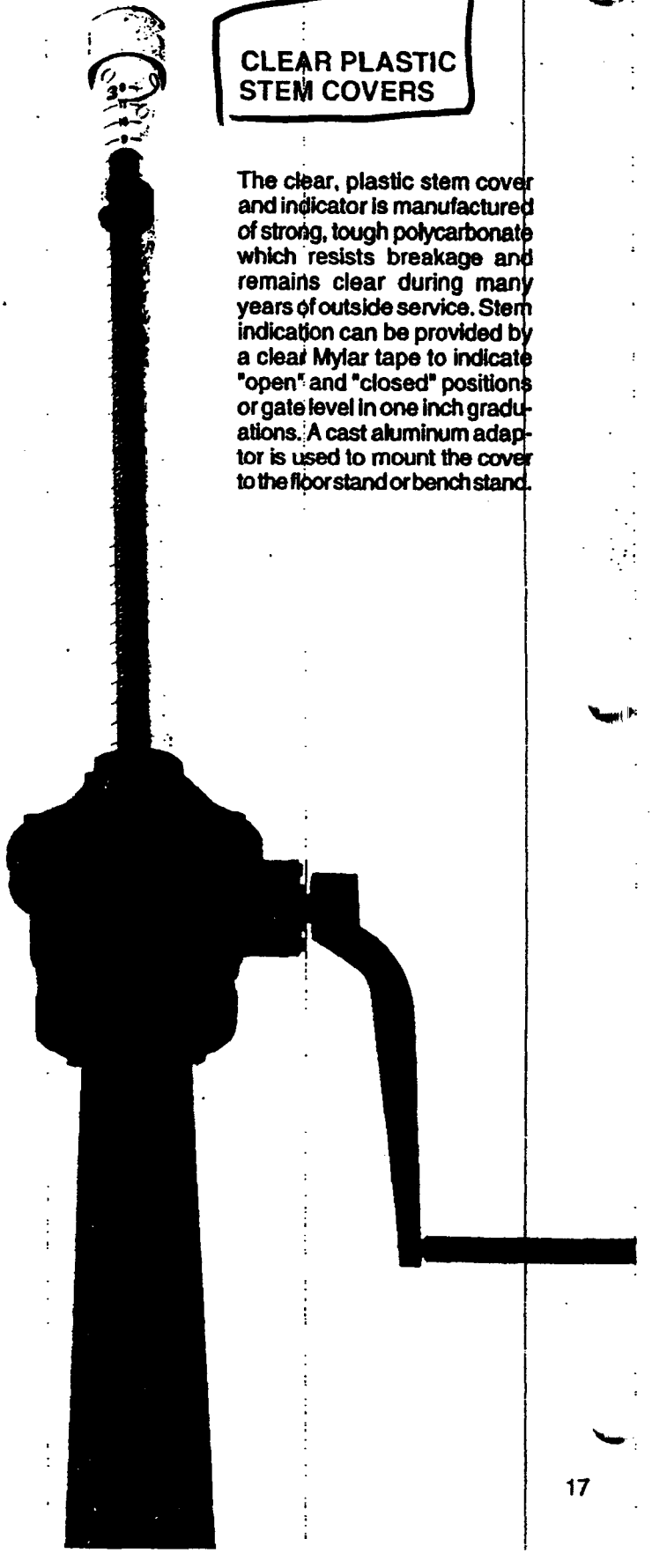
RODNEY HUNT

DIAL POSITION INDICATOR ~~WITH GALVANIZED STEEL STEM COVER~~



The dial position indicator provides the sluice gate position proportional to the opening and can be used on either rising or non-rising stem applications. It is compact and easily visible. On rising stem applications, the stem may be enclosed by a galvanized steel stem cover. This cover provides protection of the stem threads from weather, dirt and from damage in hazardous locations. The dial position unit and all working parts are totally enclosed in a weather-proof cast housing attached to the floor or bench stand. Gate position is read through a transparent plastic cover. The dial position indicator can be used on most all Rodney Hunt geared floor stands and bench stands.

CLEAR PLASTIC STEM COVERS

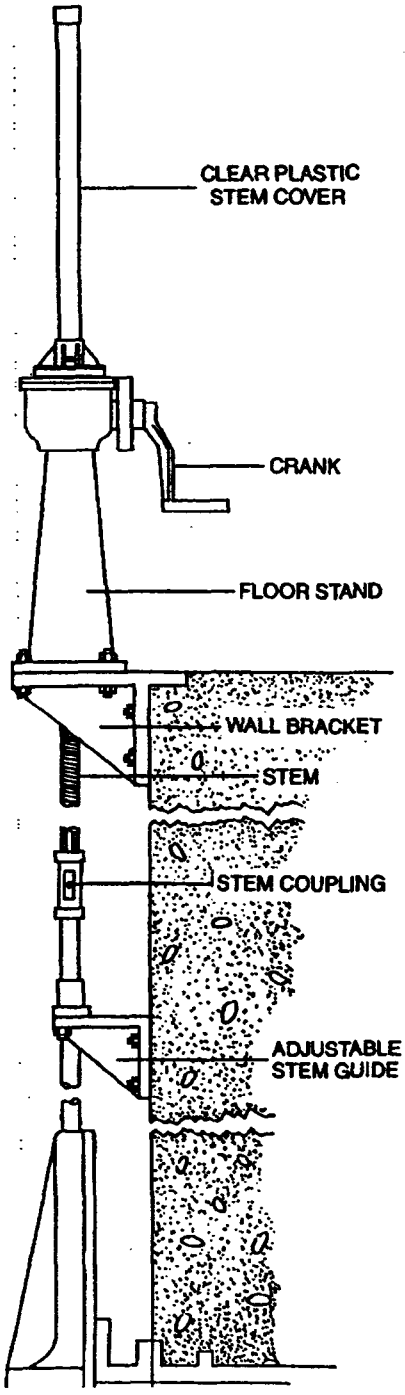


The clear, plastic stem cover and indicator is manufactured of strong, tough polycarbonate which resists breakage and remains clear during many years of outside service. Stem indication can be provided by a clear Mylar tape to indicate "open" and "closed" positions or gate level in one inch graduations. A cast aluminum adaptor is used to mount the cover to the floor stand or bench stand.

Accessory Equipment

Long, trouble free performance of a gate and hoist installation depends on the quality of the accessory equipment which is used. These accessories include operating stems, stem couplings, stem guides, stem covers, wall brackets, handwheels, cranks and stem stuffing boxes.

All Rodney Hunt accessory equipment is of the same high quality as the sluice gate and actuator.

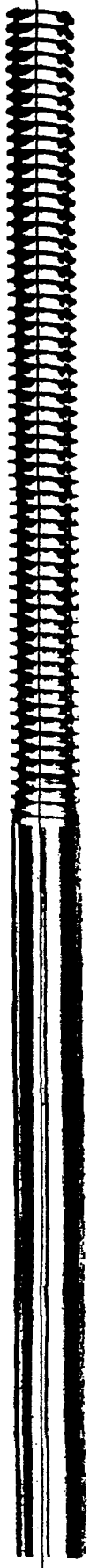


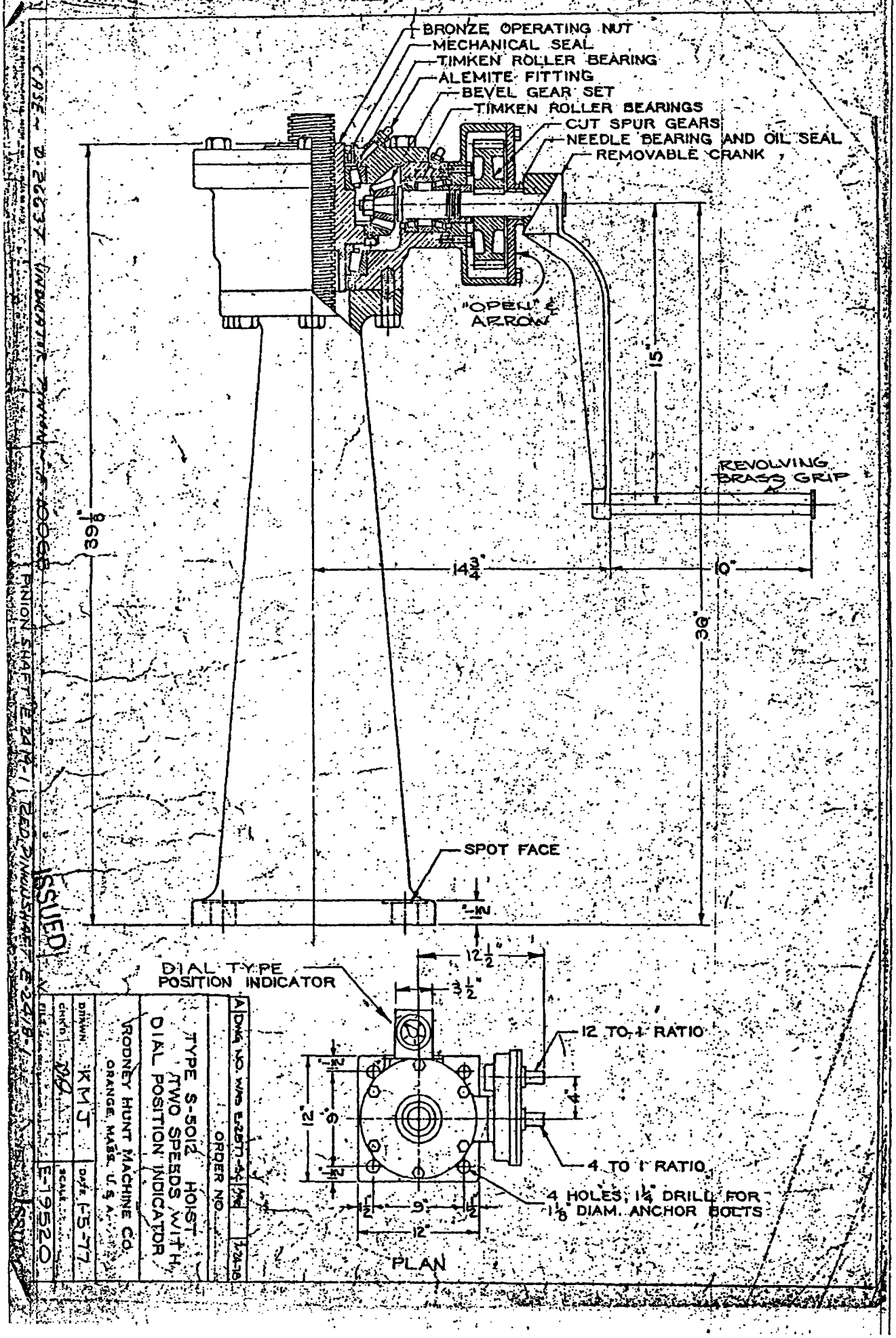
Stems

Rodney Hunt stems are used to operate cast iron, bronze mounted sluice gates, fabricated metal gates and timber gates. They are normally stainless steel. The threaded stems have accurate machine cut threads of the 29° acme type. All Rodney Hunt stems are sized to withstand the expected output of the actuators with which they are used.

STEM TABLE

STEM DIAMETER INCHES	NUMBER ACME THREADS PER INCH	WEIGHT OF STEMS LBS./LINEAR FOOT STAINLESS STEEL
1	4	2.87
1 1/8	4	3.38
1 1/4	4	4.17
1 1/2	3 1/2	6.01
1 3/4	3 1/2	8.18
2	3	10.68
2 1/4	3	13.52
2 1/2	3	16.69
2 3/4	2 1/2	20.19
3	2 1/2	24.03
3 1/4	2	28.21
3 1/2	2	32.71
3 3/4	2	37.55
4	2	42.73
4 1/4	2	48.23
4 1/2	2	54.08
4 3/4	2	60.25
5	2	66.76





CASE ~ D.26637 INDICATOR, PINION ~ A.10068 PINION SHAFT TYPE 24M-1 1/2 ED. PINION SHAFT E-2475-A

ISSUED

ALDMA NO. WAS E2877-A-1	
ORDER NO.	1-24-78
TYPE S-5012 HOIST, TWO SPEEDS WITH DIAL POSITION INDICATOR	
RODNEY HUNT MACHINE CO. ORANGE, MASS. U.S.A.	
DRAWN KMJ	SCALE
CHKD	DATE 1-15-77
FILE	E-19520

Construction Submittals
Submittal 005
Chemical Analysis for Cofferdam Material (Gravel)

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	9/26/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15RP102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	9/26/01	Submittal 005 – Chemical Analysis Cofferdam Material (Gravel) - **RESUBMITTED**

THESE ARE TRANSMITTED AS INDICATED BELOW

☐ For your use ☐ No Exceptions Taken ☐ Return _____ Corrected Prints

☐ For Approval ☐ Make Corrections Noted ☐ Submit _____ Copies for _____

☐ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☒ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS: The attached laboratory results constitute Submittal 005 – Chemical Analysis Cofferdam Material (Gravel), resubmitted to specify the method of sample preparation and analysis for each analytical test, and to provide a more formal, final report of results for metals, as requested by the USACE.

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM
Dave Scotti, LEA

BY: Scott A. Miller

SEVERN TRENT SERVICES

September 19, 2001

STL Connecticut
128 Long Hill Cross Road
Shelton, CT 06484

Tel: 203 929 8140
Fax: 203 929 8142
www.stl-inc.com

Mr. David Scotti
LOUREIRO ENGINEERING ASSOCIATES

100 Northeast Drive
Plainville, CT 06062

Dear Mr. Scotti :

Please find enclosed the analytical results of 1 sample(s) received at our laboratory on September 12, 2001. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

STL Report #7001-2380A	
Project ID: CENTRE DALE MANOR	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 929-8140 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

This report contains 20 pages.

7001-2380A
LOUREIRO ENGINEERING ASSOCIATES

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Semi-Volatile Organics - Semi-volatile organic samples were extracted and analyzed by capillary GC/MS using guidance provided in Methods 3541/8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

Samples SBLKWQ and 2003984 had one surrogate out of recovery criteria, but within laboratory sample acceptance criteria.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered.

Analyte	Method	Reference
Petroleum Hydrocarbons	418.1	1
pH	9045	2

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.
2. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.

Polychlorinated Biphenyls (PCB's) - PCB samples were extracted and analyzed by GC/ECD using guidance provided in Methods 3550B/8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

All samples were extracted, concentrated and analyzed without any apparent problems.

Manual integrations were performed if required, and any affected peaks were designated with an "MM" on the area report in the column titled "Code". Manual integrations were initialed by the analyst that performed the integration.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett Packard Model 5970A GC/MS/DS.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control sample (020PPB_QCS).

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3050B/6010B; mercury-7471A.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

TABLE VO-1.0 Soil
7001-2380A
LOUREIRO ENGINEERING ASSOCIATE
TCL VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2003984		Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKB	012380A-01		
Method Blank I.D.	VBLKKB	VBLKKB		
Quant. Factor	1.00	1.04		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	U	U		10
Chloroethane	U	U		10
Methylene Chloride	.7J	3JB		5.0
Acetone	4J	9JB		10
Carbon Disulfide	U	U		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	U	U		5.0
1,1-Dichloroethane	U	U		5.0
cis-1,2-Dichloroethene	U	U		5.0
trans-1,2-Dichloroethene	U	U		5.0
Chloroform	U	U		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	U		10
1,1,1-Trichloroethane	U	U		5.0
Carbon Tetrachloride	U	U		5.0
Bromodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	U	U		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	U	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	U		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	U	U		5.0
Toluene	U	U		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	U	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received		09/12/01		
Date Extracted	N/A	N/A		
Date Analyzed	09/12/01	09/12/01		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE SV-1.0 Soil
7001-2380A
LOUREIRO ENGINEERING ASSOCIATE page 1 of 2
TCL SEMI-VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2003984		Quant. Limits with no Dilution
Lab Sample I.D.	SBLKWQ	012380A-01		
Method Blank I.D.	SBLKWQ	SBLKWQ		
Quant. Factor	1.00	1.03		
Phenol	U	U		330
bis(2-Chloroethyl)ether	U	U		330
2-Chlorophenol	U	U		330
1,3-Dichlorobenzene	U	U		330
1,4-Dichlorobenzene	U	U		330
Benzyl alcohol	U	U		330
1,2-Dichlorobenzene	U	U		330
2-Methylphenol	U	U		330
2,2'-oxybis(1-Chloropropane)	U	U		330
4-Methylphenol	U	U		330
N-Nitroso-di-n-propylamine	U	U		330
Hexachloroethane	U	U		330
Nitrobenzene	U	U		330
Isophorone	U	U		330
2-Nitrophenol	U	U		330
2,4-Dimethylphenol	U	U		330
Benzoic acid	U	U		16(
bis(2-Chloroethoxy)methane	U	U		330
2,4-Dichlorophenol	U	U		330
1,2,4-Trichlorobenzene	U	U		330
Naphthalene	U	U		330
4-Chloroaniline	U	U		330
Hexachlorobutadiene	U	U		330
4-Chloro-3-methylphenol	U	U		330
2-Methylnaphthalene	U	U		330
Hexachlorocyclopentadiene	U	U		330
2,4,6-Trichlorophenol	U	U		330
2,4,5-Trichlorophenol	U	U		1600
2-Chloronaphthalene	U	U		330
2-Nitroaniline	U	U		1600
Dimethylphthalate	U	U		330
Acenaphthylene	U	U		330
2,6-Dinitrotoluene	U	U		330
3-Nitroaniline	U	U		1600
Acenaphthene	U	U		330
Date Received		09/12/01		
Date Extracted	09/12/01	09/12/01		
Date Analyzed	09/13/01	09/13/01		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2003984		Quant. Limits with no Dilution
Lab Sample I.D.	SBLKWQ	012380A-01		
Method Blank I.D.	SBLKWQ	SBLKWQ		
Quant. Factor	1.00	1.03		
2,4-Dinitrophenol	U	U		1600
4-Nitrophenol	U	U		1600
Dibenzofuran	U	U		330
2,4-Dinitrotoluene	U	U		330
Diethylphthalate	U	U		330
4-Chlorophenyl-phenylether	U	U		330
Fluorene	U	U		330
4-Nitroaniline	U	U		1600
4,6-Dinitro-2-methylphenol	U	U		1600
N-Nitrosodiphenylamine (1)	U	U		330
4-Bromophenyl-phenylether	U	U		330
Hexachlorobenzene	U	U		330
Pentachlorophenol	U	U		1600
Phenanthrene	U	U		330
Anthracene	U	U		330
Carbazole	U	U		330
Di-n-butylphthalate	U	U		330
Fluoranthene	U	U		330
Pyrene	U	U		330
Butylbenzylphthalate	U	U		330
3,3'-Dichlorobenzidine	U	U		660
Benzo(a)anthracene	U	U		330
Chrysene	U	U		330
bis(2-Ethylhexyl)phthalate	U	U		330
Di-n-octylphthalate	U	U		330
Benzo(b)fluoranthene	U	U		330
Benzo(k)fluoranthene	U	U		330
Benzo(a)pyrene	U	U		330
Indeno(1,2,3-cd)pyrene	U	U		330
Dibenzo(a,h)anthracene	U	U		330
Benzo(g,h,i)perylene	U	U		330
Date Received		09/12/01		
Date Extracted	09/12/01	09/12/01		
Date Analyzed	09/13/01	09/13/01		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE GC-1.0 Soil
7001-2380A
LOUREIRO ENGINEERING ASSOCIATES
8082 POLYCHLORINATED BIPHENYL'S

All values are ug/Kg dry weight basis.

Client Sample I.D. Lab Sample I.D. Method Blank I.D. Quant. Factor	Method Blank 091301-B04 PBLK21 1.00	2003984 012380A-01 PBLK21 1.03	PBLK21 QC2 091301-B04 QC2 PBLK21 1.00	Quant. Limits with no Dilution
Aroclor-1016	U	U	U	33.
Aroclor-1221	U	U	U	67.
Aroclor-1232	U	U	U	33.
Aroclor-1242	U	U	120X	33.
Aroclor-1248	U	U	U	33.
Aroclor-1254	U	U	U	33.
Aroclor-1260	U	U	160X	33.
Date Received		09/12/01		
Date Extracted	09/13/01	09/13/01	09/03/01	
Date Analyzed	09/13/01	09/13/01	09/13/01	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE AS-1.0
7001-2380A
LOUREIRO ENGINEERING ASSOCIATES
RCRA METALS

Soil

All values are mg/Kg dry weight basis.

Client Sample I.D.	2003984			
Lab Sample I.D.	012380A-01			
Arsenic	1.2U			
Barium	20.7			
Cadmium	1.0U			
Chromium	8.2			
Lead	2.7			
Mercury	0.0030U			
Selenium	1.0U			
Silver	1.0U			

See Appendix for qualifier definitions

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

2003984

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 2380A SAS No.: _____ SDG No.: A2380

Matrix (soil/water): SOIL Lab Sample ID: 012380A-01

% Solids: 96.7 Date Received: 09/12/01

CAS No.	Analyte	Concentration	C	Units	Q	M
	Petroleum Hydrocarbons	31.0		mg/Kg		D
12408-02-5	pH	6.20		S.U.		D

Comments:

FORM I - WC

SEVERN TRENT SERVICES

STL Connecticut

ORGANICS APPENDIX

U – Indicates that the compound was analyzed for but not detected.

J – Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B – This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N – Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S – Estimated due to surrogate outliers.

X – Matrix spike compound.

(1) – Cannot be separated

(2) – Decomposes to azobenzene. Measured and calibrated as azobenzene.

A – This flag indicates that a TIC is a suspected aldol condensation product.

E – Indicates that it exceeds calibration curve range.

D – This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C – Confirmed by GC/MS.

T – Compound present in TCLP blank.

P – This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

SEVERN TRENT SERVICES

STL Connecticut

INORGANICS APPENDIX

C – Concentration qualifiers

U – Indicates analyte was not detected at method reporting limit.

B- Indicates analyte result between IDL and contract required detection limit (CRDL)

Q – QC qualifiers

E – Reported value is estimated because of the presence of interference

M – Duplicate injection precision not met

N – Spiked sample recovery not within control limits

S – The reported value was determined by the method of standard additions (MSA)

W – Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M – Method codes

P – ICP

A – Flame AA

F – Furnace AA

CV – Cold vapor AA (manual)

C – Cyanide

NR – Not required

NC – Not calculated as per protocols

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the STL-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

STL-Connecticut
Certification Summary (as of February 2001)

[illegible]	[illegible]	[illegible]	[illegible]
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Health and Environmental Services	Drinking Water, Wastewater/Solid, Hazardous Waste	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste NELAC	10602
North Carolina	Division of Environmental Management	Wastewater	388
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Utah	Department of Health	RCRA	2032614458
Washington	Department of Ecology	Wastewater/Hazardous Waste	C231
Wisconsin	Department of Natural Resources	Wastewater	998355710

7001-2380A
LOUREIRO ENGINEERING ASSOCIATES
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
2003984	012380A-01	SOIL	09/12/01	09/12/01

STL CT ANALYTICAL SUMMARY

3013

Client ID: 2003984
Job Number: 7001-2380A

Date: 9/20/101

Qty	Matrix	Analysis	Description
1	SOIL	BNA-8270C-TCL	TCL Semi-Volatile Or
1	SOIL	MET-SW846-RCRA	RCRA Metals
1	SOIL	PCB-8082	PCB's
1	SOIL	PH-9045	pH
1	SOIL	PHC-418.1M	Petroleum Hydrocarbo
1	SOIL	VOA-8260B-TCL	TCL Volatile Organic

Loureiro Engineering Associates, Inc.

CHAIN OF CUSTODY

2004769009

Case Number

LEA Comm. No.	**15RP102.003**
Project	Soil Sampling Excavation Delineation
Location	Centredale Manor Superfund Site
Project Manager	Dave Scotti

Page 1 of 1
Date 9/11/01

Sampling Method GRAB
Matrix (Soil) Vapor Water Other
Container Type 4oz

7001- 2380A

	No. of Cont.		Time	Mass (gm)	PID/FID Reading	Sample Matrix	Analysis(es) Requested	
1	2	2003984	13:00	NA	NA	Soil	VOCs-8260B, SVOCs-8270C, TPH, PCBs, RCRA8 By MASS(MERMS), pH * HOLD	01
2	1	2003986	13:02					02
3	1	2003987	13:04					03
4	1	2003988	13:06					04
5	1	2003989	13:08					05
6	1	2003990	13:10					06
7	1	2003991	13:12				→ received by courier broken transferred to new jar at lab ML 09-12-01	07
8	1	2003992	13:14					08
9	1	2003993	13:16					09
10	1	2003994	13:18					10
11								
12							* RUSH 24-HR TURN-AROUND - TIV	
13								
14							AS PER MARYM TAYLOR.	
15								
16								
17								
18								
19							"PASSED RAD SCREEN"	
20							06°C	

Comments

Cooler ID(s)

Transfer Number	Item No.
1	1-10
2	9-12-01
3	
4	

Transfer	Relinquished By	Accepted By	Date	Time
			9/12/01	12:00
		SPL-CT	9/13/01	1430
			09-12-01	16:04

Field Personnel Scott Miller

Signature Scott Miller

100 North Drive, Plainville, CT 06062 Tel: 860.747.6181 Fax: 860.747.8822 e-mail: tmclemmey@loureiro.com

Construction Submittals
Submittal 006
Reactive Aggregate Test Data for Concrete Mix

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	9/18/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM
Dave Scotti, LEA

BY: Scott A. Miller

SUMMIT LTD.
CONSTRUCTION MATERIALS SERVICES

Fax Note 7671 | Date 9-15 | # of pages 1
To Scott Muller
From Dick Gay
Phone PRM Concrete

November 20, 2000

Mr. Nick Squeo
PRM Concrete
400 Frenchtown Road
East Greenwich, Rhode Island 02818

Re: *Potential Alkali Reactivity of Aggregates*
Summit Project No. 02002

Dear Mr. Squeo:

Laboratory testing of samples which were batched at our Lincoln, Rhode Island facility on 11/2/00 has been completed. The concrete raw materials were prepared, mixed and tested in accordance with ASTM C1260 "Potential Alkali Reactivity of Aggregates". The certification which was submitted with the portland cement indicates compliance with the requirements of ASTM C150 and has an autoclave expansion of less than 0.20%.

Test results are as follows:

	Type	Source
Coarse Aggregate	3/4 Blend #67	Tilcon Capaldi
Fine Aggregate	ASTM C33	PRM
Portland Cement	Type II	Atlantic
Average Expansion @ 16 days		0.05%

It is generally accepted that expansions of less than 0.10% at 16 days after casting are indicative of innocuous behavior in most cases.

Please do not hesitate to call with any questions concerning these test methods and results.

Respectfully submitted,
SUMMIT LTD.

Pamela Olsen
Managing Director

7 Charlton Street
Everett, Massachusetts 02149
(617) 389-3700 Fax (617) 387-3100

197 U.S. Rte. 1 Box 6826
Scarborough, Maine 04070
(207) 885-0004 Fax (207) 885-1421

9 New England Way
Lincoln, Rhode Island 02865
(401) 333-1011 Fax (401) 333-5556

Construction Submittals
Submittal 007
Seven-Day Concrete Break Test Results

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	10/09/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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☐ Reports ☐ Copy of Letter ☒ Material Submittal

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM
Dave Scotti, LEA

BY: Scott A. Miller

Briggs Engineering & Testing *A Division of PK Assoc., Inc.*				**Daily Report** Project: Allendale Dam Restoration Project #: 21165 Inspector: Josh Melvin			
ARRVL:	03:30	**JOB HRS.:**	1 1/2	**DATE:**	09/19/01	**CODE:**	C26
TEMP:	70F	**WIND:**	Low	**HUMID.:**	Low	**CLOUDY**	
NO OF PAGES TO THIS REPORT:			1 of 2	**NO OF BACKUP SHEETS TO THIS REPORT:**			1

I reported to the above mentioned project site at the request of the client in order to conduct a concrete inspection.

Visual Observations / Inspections:

1) Small work area due to contamination.

Reinforcing Steel and Concrete:

1) A reinforcing steel inspection was not conducted today.

2) Contractor placed 8 cubic yards of 5000 PSI concrete today in which 1 set of 4 test cylinders was fabricated and stored at trailer.

Notified super of all findings. Please see the attached report for all details.

cc: Mr. Scott Miller, LCI

Approved: Dr. Asnaul H. Mahmood, Ph. D., C. Eng.

Briggs Engineering & Testing
A Division of PK Associates, Inc

CONCRETE PLACEMENT INSPECTION

PROJECT: LEA-CIANCI A
PROJECT#:
INSPECTOR: Josh Melvin
PAGE 2 OF 2
DATE: 9-19-01
CODE: C26
TEMP.: H • L 70° WIND.: H M (L) HUMID.: H M (L) (SUNNY) CLOUDY
Concrete Source: PRM General Contractor: LEA-CIANCI
Storage Location: Curing Box: Other: Trailer

Inspection completed as per ACI-301 and Contract Documents. A checklist of major items is presented. All items in non-conformance are either corrected during inspection or noted herein. Detailed inspection of reinforcing for size, quantity, grade, spacing and configuration is reported separately when performed.

Preplacement:
Weather Cool
Temp. 70
Forms for general requirements. ✓
Grade preparation ✓

Steel arrangement ✓
Steel clearance ✓
Steel cleanliness ✓
Steel supports ✓

Placement:
Concrete placed within limits of ASTM C-94 and Contract Documents. Non-compliance items are either corrected before placement or noted herein. Concrete sampled in accordance with ASTM C-172.

ASTM C-94 Limits			ASTM C-94 Limits		
Time Limits	✓	1-1/2 hrs. max.	Temperature	✓	50-90° F
Slump	✓	1-4 "	Mixing	-	70-300 Rev.
Air Content	✓	4-7 %	Density	-	± 3 p.c.f.

Location: Wing Wall at Gate Structure

Remarks:

Method of Placement: Chute ✓ Pump _____ Other _____

Load No.	Arr. Time	Truck No.	No. of Yds.	Mix Duration (min.)	Conc. Temp. (°F)	Slump (in.)	Air (%)	Air Temp. (°F)	Conc. Strength Deliv.	Conc. Strength Required	CA Size	Cyl. Fabr.	Set #	Gals. added water	Unit Weight (pcf)
1	355	177	8	65	83	2	5.5	70	5000	5000	3/4	4	1		
2															
3															
4															
5															
6															
7															
8															
9															
10															

Approved:

Briggs Engineering & Testing
A Division of PK Associates, Inc.

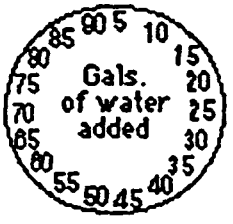
Concrete Cylinder Test Result CF-11

Project: Allendale Dam Rest.
Project#: 21165 Date: 9-19-01
Client: LEA-CIANCI

Location: Wing Wall at Gate

Cement Brand or Class:		Approved Mix Design Mix proportions (by Wt) 1 cubic yard Amount	
Mix I.D. :			
Cement	lbs.		Ticket No.: 32869 Batch Time: 2:55
Fine Aggregate	lbs.		Strength Delivered: 5000 Early Strength
Coarse Aggregate	lbs.		Strength Required: 5000 ES
Water	Gals.		Set No.: 1 Time of Test: 7:05
Water Reducing	oz.		Truck No.: 177 Load #.:
Air Entraining	oz.		Number of Cyl.: 4 C.A. Size: 3/4"
Other	oz.		Slump ASTM C-143: 2 Air Content ASTM C-231/C-173: 5.5
d Unit Weight ASTM C-138	pcf	Target:	Concrete Temp.: ASTM C-1064: 83 Air Temp.: 76

Remarks: Contractor and producer are both responsible for added water as per ASTM C-94. Discharge time limit 90 min. or 300 revolutions.



By whom prepared: Josh Melvin
Concrete Source: PRM
General Contractor LEA-CIANCI
Storage Location: Trailer min. max.
Curing Box: Curing Temp. F° ___ ___

CONCRETE SAMPLES FABRICATED AND TESTED PER ASTM C-31 and C-39

28 Day Air Dry Unit Weight: pcf
Unit Weight As Received: pcf

Specimen Number	Date Tested	Age at test	Dia. (in.)	Height (in.)	Area (sq. in.)	Density pcf	Max. Load LBS.	Compressive Strength PSI	Type/Fracture (ASTM C-39)
1 A	9-26	7	4	8	12.56	150.1	69000	5490	B
1 B	10-17	28	↓	↓	↓				
1 C	10-17	28							
1 D	10-17	28							

Approved: [signature]

cf-11,rev1,00

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Concrete Cylinder Test Result CF-11

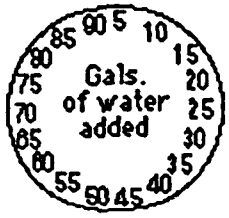
Project: Allendale Dam Rest.
Project#: 21165 Date: 9-19-01
Client: LEA-CIANCI

Location: Wing Wall at Gate

Cement Brand or Class:		Approved Mix Design Mix proportions (by Wt) 1 cubic yard Amount
Mix I.D. :		
Cement	lbs.	
Fine Aggregate	lbs.	
Coarse Aggregate	lbs.	
Water	Gals.	
Water Reducing	oz.	
Air Entraining	oz.	
Other	oz.	
Unit Weight ASTM C-138	pcf	Target:

Ticket No.: 32869 Batch Time: 2:55
Strength Delivered: 5000 Early Strength
Strength Required: 5000 LES
Set No.: 1 Time of Test: 4:05
Truck No.: 177 Load #.: 1
Number of Cyl.: 4 C.A. Size: 3/4"
Slump ASTM C-143: 2 Air Content ASTM C-231/C-173: 5.5
Concrete Temp.: 83 ASTM C-1064 Air Temp.: 76

Remarks: Contractor and producer are both responsible for added water as per ASTM C-94. Discharge time limit 90 min. or 300 revolutions.



By whom prepared: Josh Melvin
Concrete Source: PRM
General Contractor LEA-CIANCI
Storage Location: Trailer min. max.
Curing Box: Curing Temp. F° ___ ___

CONCRETE SAMPLES FABRICATED AND TESTED PER ASTM C-31 and C-39

28 Day Air Dry Unit Weight: pcf
Unit Weight As Received: pcf

Specimen Number	Date Tested	Age at test	Dia. (in.)	Height (in.)	Area (sq. in.)	Density pcf	Max. Load LBS.	Compressive Strength PSI	Type/Fracture (ASTM C-39)
1 A	9-26	7	4	8	12.56	150.1	69000	5490	B
1 B	10-17	28							
1 C	10-17	28							
1 D	10-17	28	↓	↓	↓				

cf-11,rev1,00

Approved: _____

Construction Submittals
Submittal 008
Construction Area Dewatering Sampling:
Treatment Train Schematic and Background Turbidity Levels

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	RIDEM	DATE	10/24/01
	Office of Waste Management	PROJECT	Centredale Manor
	235 Promenade Street	LOCATION:	N. Providence, RI
	Providence, RI 02908-5767	COMM. NO.:	15RP102.001
ATTN:	Sarah Martino, Project Manager	PHONE #	401.222.2797

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☐ Reports ☐ Copy of Letter ☒ Material Submittal

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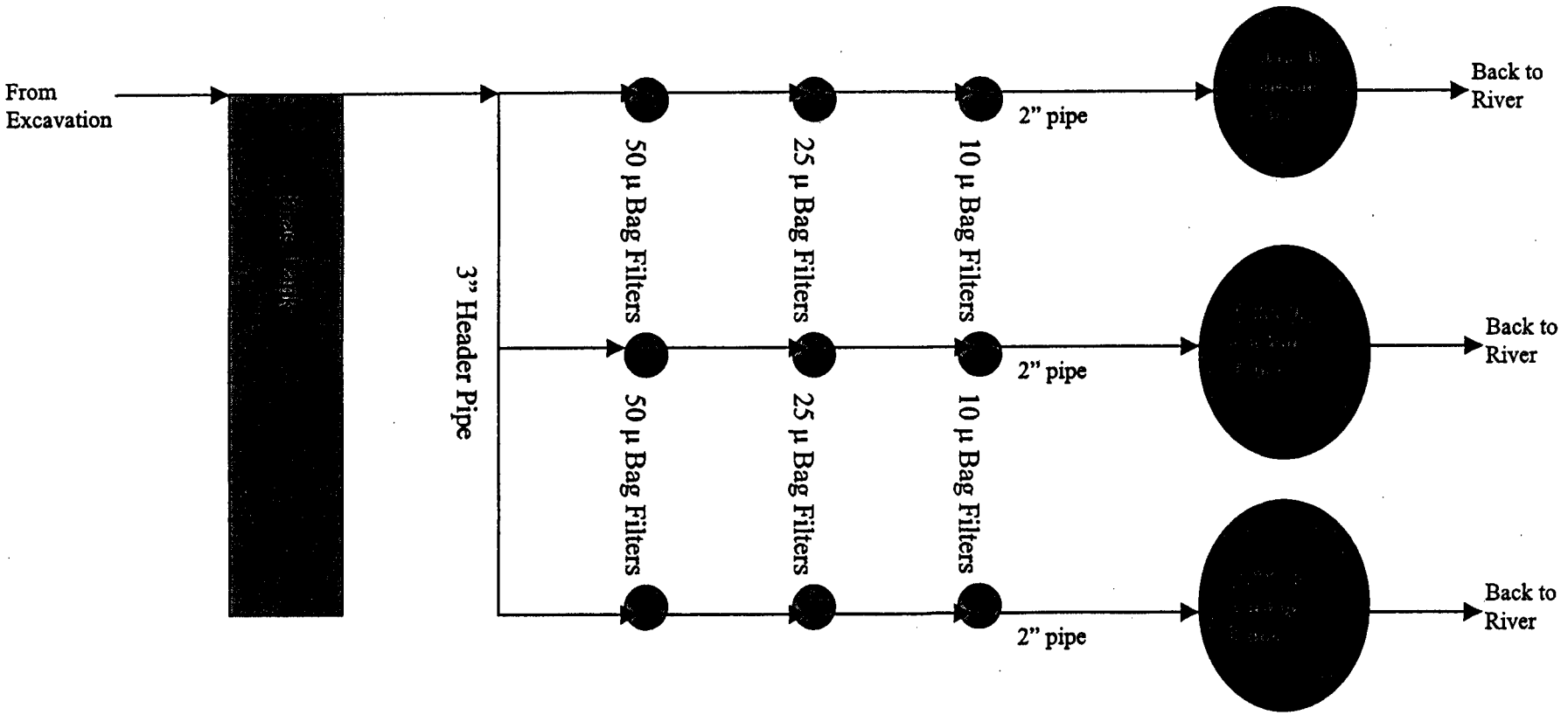
REMARKS: The attached schematic and field data (background turbidity levels) constitute Submittal 008 – Construction Area Dewatering Sampling: Treatment Train Schematic and Background Turbidity Levels.

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Dave Scotti, LEA

BY: Scott A. Miller

Dewatering Wastewater Treatment Train

Centredale Manor Restoration Superfund Site
North Providence, Rhode Island



Flow rate through each treatment train will be as much as 100 gallons per minute depending upon pressure and head due to the bag filters. Discharge monitoring for turbidity from each treatment train will be performed twice daily during water treatment.

SUBMITTAL 008 - CONSTRUCTION AREA DEWATERING SAMPLING
BACKGROUND TURBIDITY MEASUREMENTS
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

DATE: 12 September 2001

Sample ID	Location ID	Time	Sample Type	Depth	Reading (NTU)	Comments
2003995	Turbidity #1	1655	Water	Surface	1.86	Woonasquatucket - By Walgreens/Burger King Properties
2003996	Turbidity #2	1640	Water	Surface	1.40	Allendale Pond - North
2003997	Turbidity #3	1615	Water	Surface	2.08	Allendale Pond - South (in front of cofferdam)
2003998	Turbidity #4	1625	Water	Surface	3.88	McCoy Property
2003999	Turbidity #5	1630	Water	Surface	2.65	Lymansville Dam
2004000	Turbidity #6	1620	Water	Surface	2.84	Downstream of Dam

Notes:
NTU = Nephalometric Turbidity Units

Construction Submittals
Submittal 009
Sluice Gate: Design Drawings
Affidavit of Compliance
Installation and O&M Manual

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	9/18/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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2	10/25/01	Submittal 009 – Sluice gate Design Drawings
		Affidavit of Compliance
		Installation, O&M Manual

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

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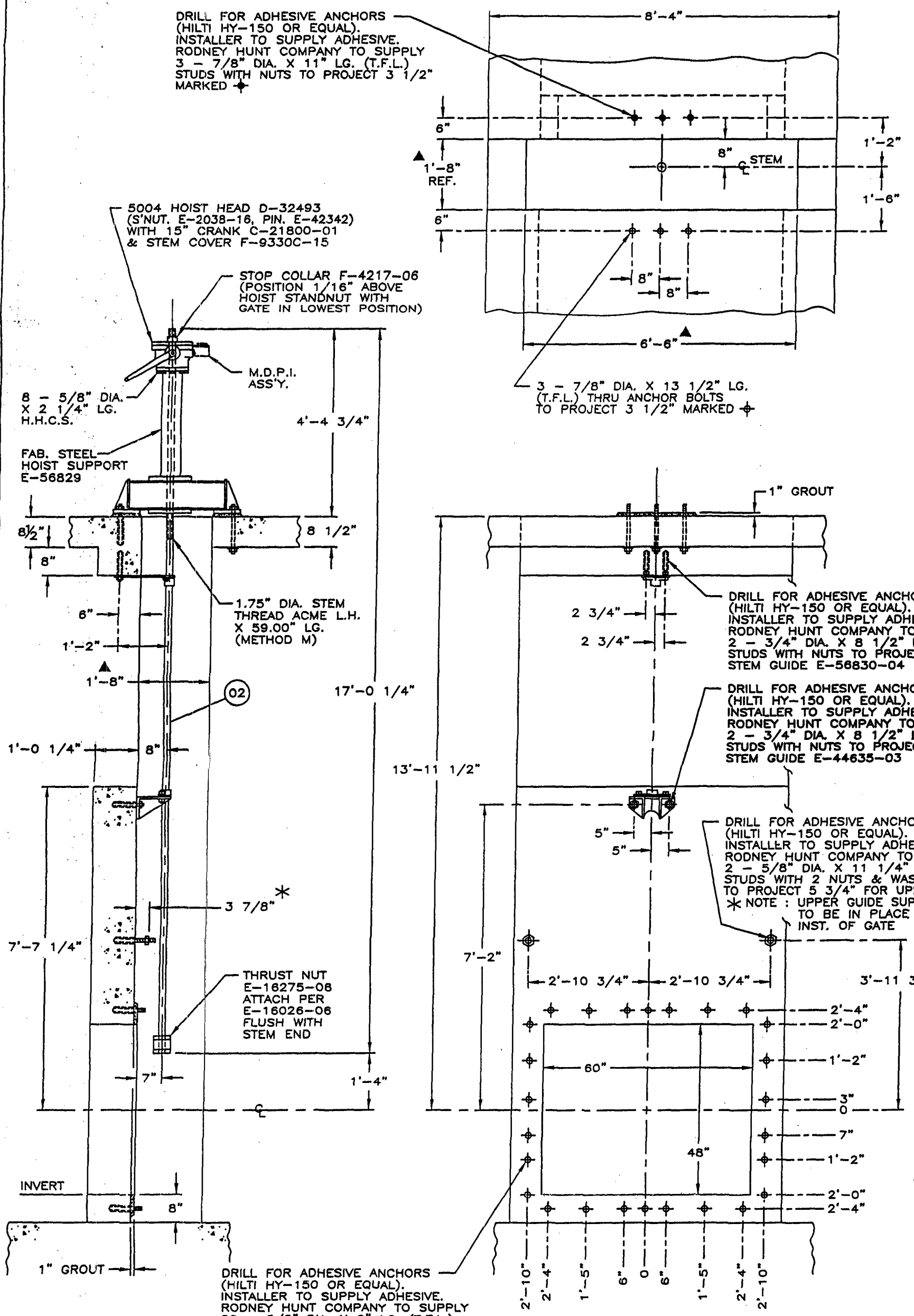
An Employee Owned Company

DWG. NO. E-56828



NOTES :

1. WASHERS PROVIDED WITH 5/8" ATTACHING HARDWARE
2. ▲ CONTRACTOR TO NOTE REQUESTED SLOT DIMENSIONS
3. ALL EXISTING STRUCTURE DIMENSIONS *SHOULD BE FIELD VERIFIED*

GATE RATING :

82' SEATING

27' UNSEATING

ALT.	CHANGE	BY	CKD	DATE

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INDEX SYMBOL

PROJECT : NORTH PROVIDENCE
NORTH PROVIDENCE, RI

GATE LOCATION : LOW LEVEL OUTLET WORKS

GATE NO. : QUANTITY : 1

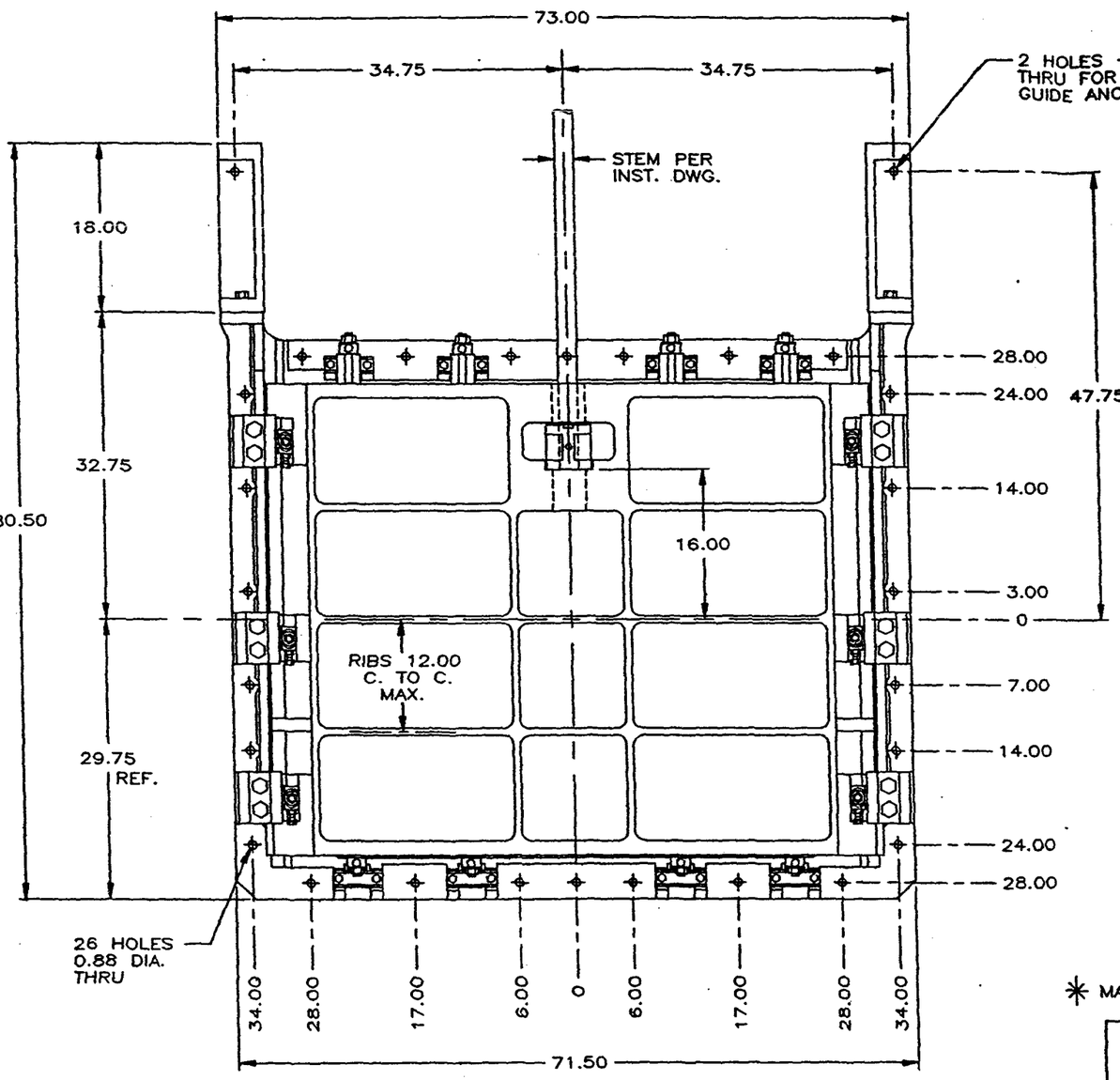
ITEM NO. : 1 FOR MATERIALS SEE SPECIFICATION SHEET : 010341-2

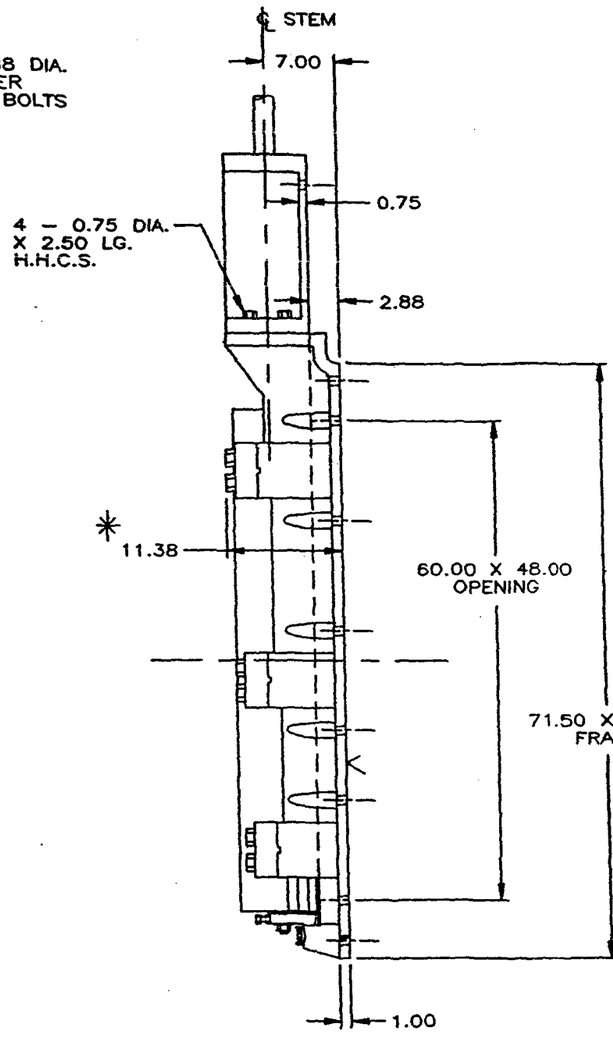
RODNEY HUNT COMPANY, ORANGE, MASS., 01364

INSTALLATION : 60" X 48" SLUICE GATE

SERIES 140 FOR LCI

DRAWN TFB	DESIGNED JER	DATE 10-19-01
CHECKED JER	APPROVED	SCALE N.T.S.
ORDER NO. 010341-2		DWG. NO. E-56828





✳ MAXIMUM OVERALL DEPTH OF ASSEMBLY

FRAME
C–23615–03
DISC
C–18907–05
WEDGE CAP
E–31961
SIDE WEDGE
E–5008A
TOP WEDGE
E–18376
BOT. WEDGE
E–18377
GUIDE EXT.
C–22656
THRUST NUT
RS. E–16275
HYD. F–9904

TEMPLATE NO. B060128

TOLERANCE UNLESS OTHERWISE SPECIFIED				ALT.	CHANGE	BY	CKD	DATE
DEC. DIM.	MACHINE	CAST	FABRICATE					
1 PLACE	±0.060	±0.250	±0.250					
2 PLACE	±0.030	±0.125	±0.125					
3 PLACE	±0.015	±0.060	±0.060					
ANGLE	±1°0'	±2'0'	±2'0'					

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RODNEY HUNT COMPANY ORANGE, MA. 01364–1251

ASSEMBLY : 60.00 X 48.00 SLUICE GATE

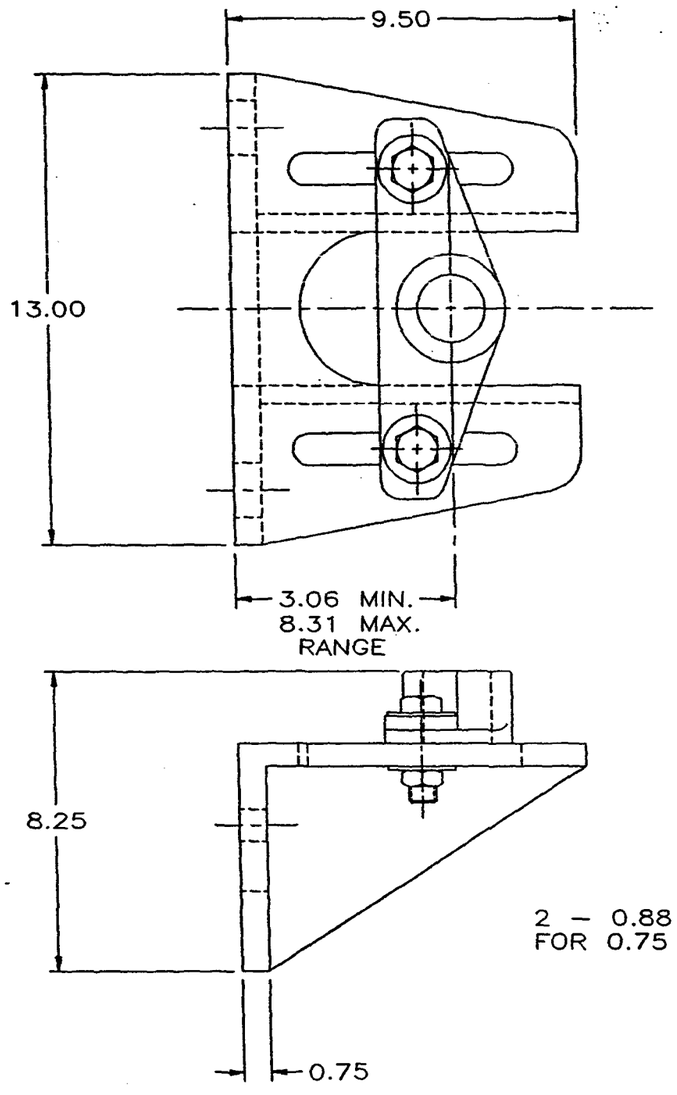
SERIES 140

WITH GUIDE EXTENSIONS

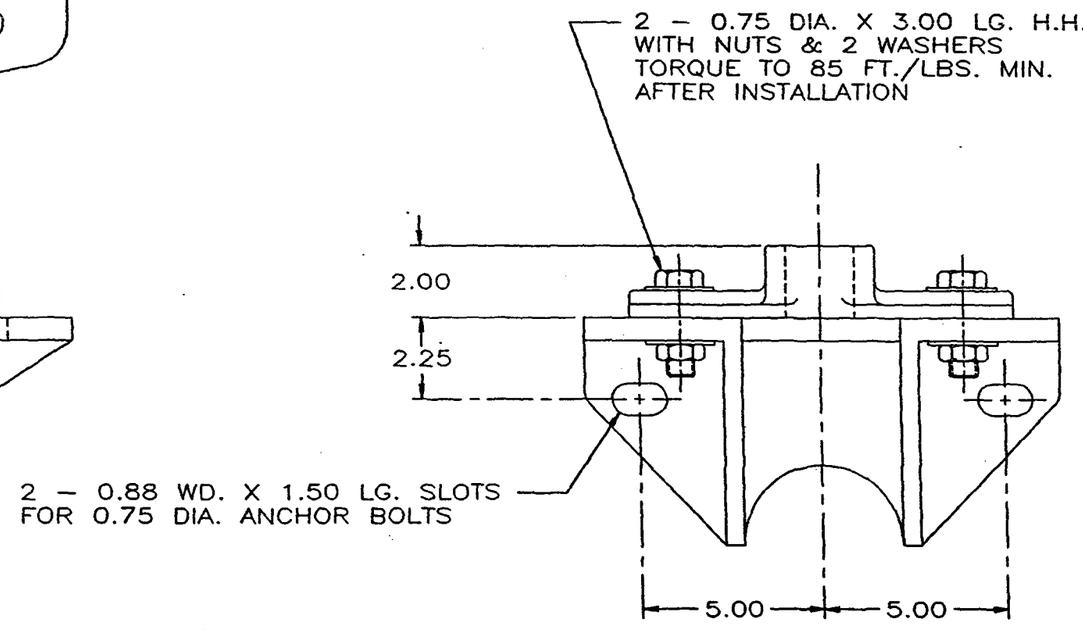
DRAWN TFB	DESIGNED JER	DATE 9–18–97
CHECKED JER	APPROVED	SCALE N.T.S.
ORDER NO.		DWG. NO. E–49497

FROM: E–47256

ISSUED



ITEM	STEM
01	1.25
02	1.50
03	1.75
04	2.00
05	2.25
06	1.38



TOLERANCE UNLESS OTHERWISE SPECIFIED				ALT.	CHANGE	BY	CKD	DATE
DEC. DIM.	MACHINE	CAST	FABRICATE	A	1. ADDED ITEM 6	TLK		10/9/97
1 PLACE	±0.060	±0.250	±0.250					
2 PLACE	±0.030	±0.125	±0.125					
3 PLACE	±0.015	±0.060	±0.060					
ANGLE	±1°0'	±2°0'	±2°0'					

BRACKET: D-3981, GUIDE HALVES: D-37217,8

RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

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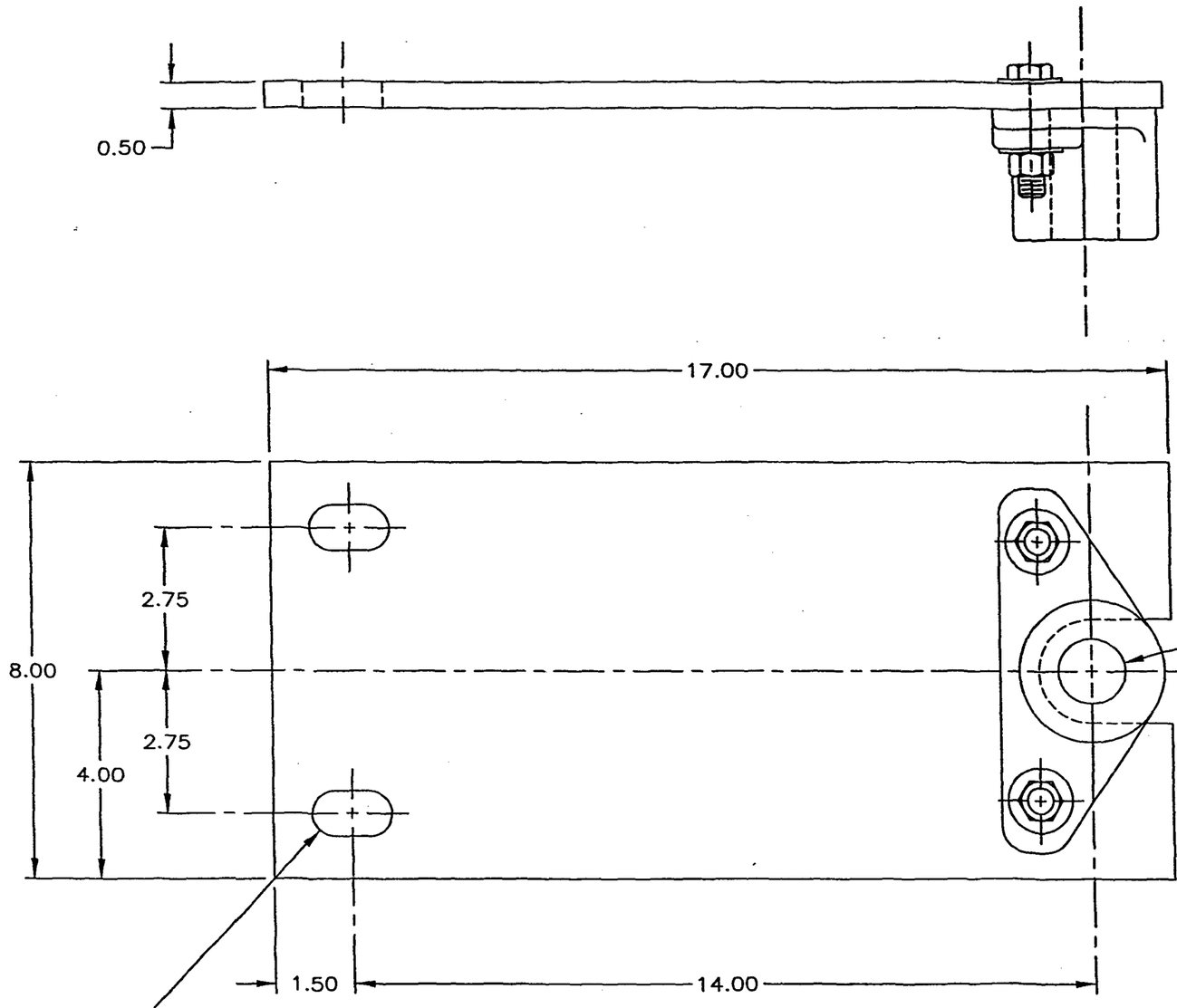
ASSEMBLY : SPLIT 2-BOLT STEM GUIDE
WITH CAST BRONZE GUIDE HALVES
RANGE 3.06 TO 8.31

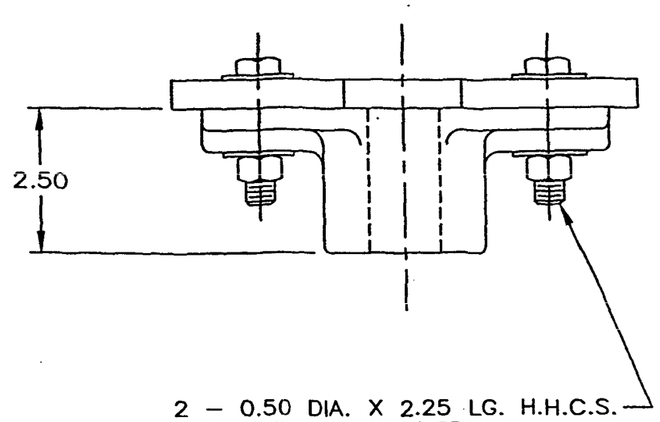
DRAWN TFB	DESIGNED RMS	DATE 1-28-94
CHECKED	APPROVED	SCALE N.T.S.

INDEX SYMBOL IBM V | ORDER NO. | DWG. NO. E-44635

Issued

Issued





STEM DIA. + 0.06

ITEM	STEM
01	1.00
02	1.25
03	1.50
04	1.75

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.060	±0.060
ANGLE	±1°0'	±2°0'	±2°0'

ALT.	CHANGE	BY	CKD	DATE

MOUNTING PLATE : E–56831 GUIDE HALVES : D–30407 & D–30408

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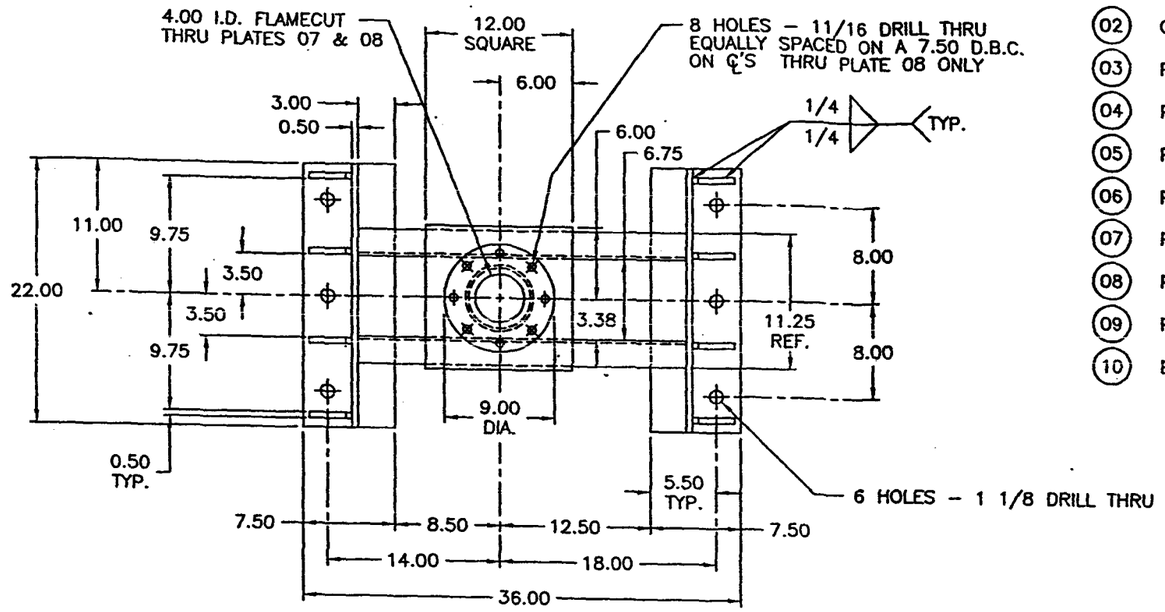
ASSEMBLY : OFFSET FLOOR MOUNTED

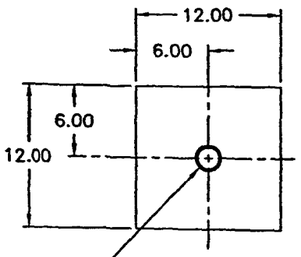
SPLIT 2–BOLT STEM GUIDE

DRAWN TFB	DESIGNED JER	DATE 10–19–01
CHECKED JER	APPROVED	SCALE N.T.S.
INDEX SYMBOL IBM V	ORDER NO.	DWG. NO. E–56830

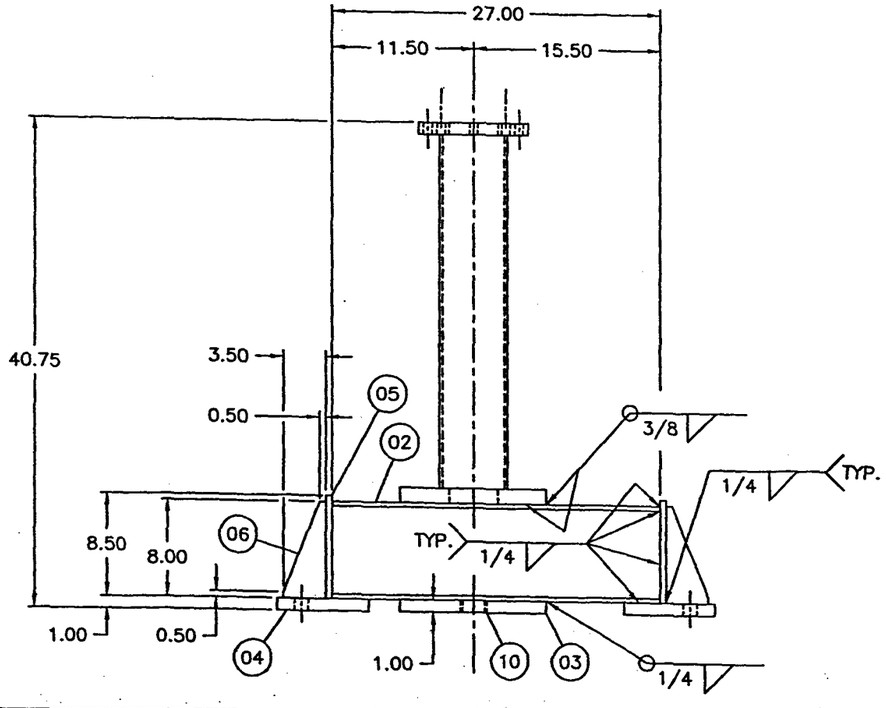
FROM: E–47506

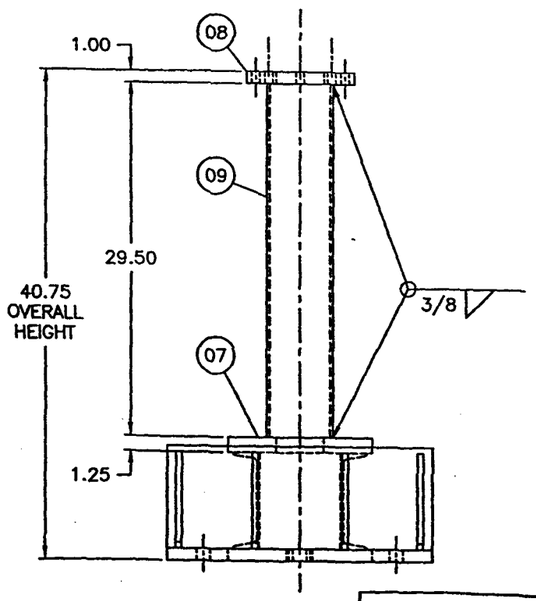


(02)	CHANNEL : C8 X 11.5 LBS./FT. X 27.00 LG.	2 REQ'D.	A–36 STEEL
(03)	PLATE : 1.00 X 12.00 X 12.00 LG.	1 REQ'D.	A–36 STEEL
(04)	PLATE : 1.00 X 7.50 X 22.00 LG.	2 REQ'D.	A–36 STEEL
(05)	PLATE : 0.50 X 8.50 X 22.00 LG.	2 REQ'D.	A–36 STEEL
(06)	PLATE : 0.50 X 3.50 X 8.00 LG.	8 REQ'D.	A–36 STEEL FLAMECUT
(07)	PLATE : 1.25 X 12.00 X 12.00 LG.	1 REQ'D.	A–36 STEEL FLAMECUT
(08)	PLATE : 1.00 X 9.00 O.D. X 4.00 I.D.	1 REQ'D.	A–36 STEEL FLAMECUT
(09)	PIPE : 5.00 SCH. 40 X 29.50 LG.	1 REQ'D.	A–53 STEEL
(10)	BUSHING : F–4448–06	1 REQ'D.	BRONZE



DETAIL ITEM (03)





EST. WEIGHT : 325 LBS.

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.060	±0.060
ANGLE	±1°0'	±2'0'	±2'0'

ALT	CHANGE	BY	CHK	DATE

ALT	CHANGE	BY	CHK	DATE

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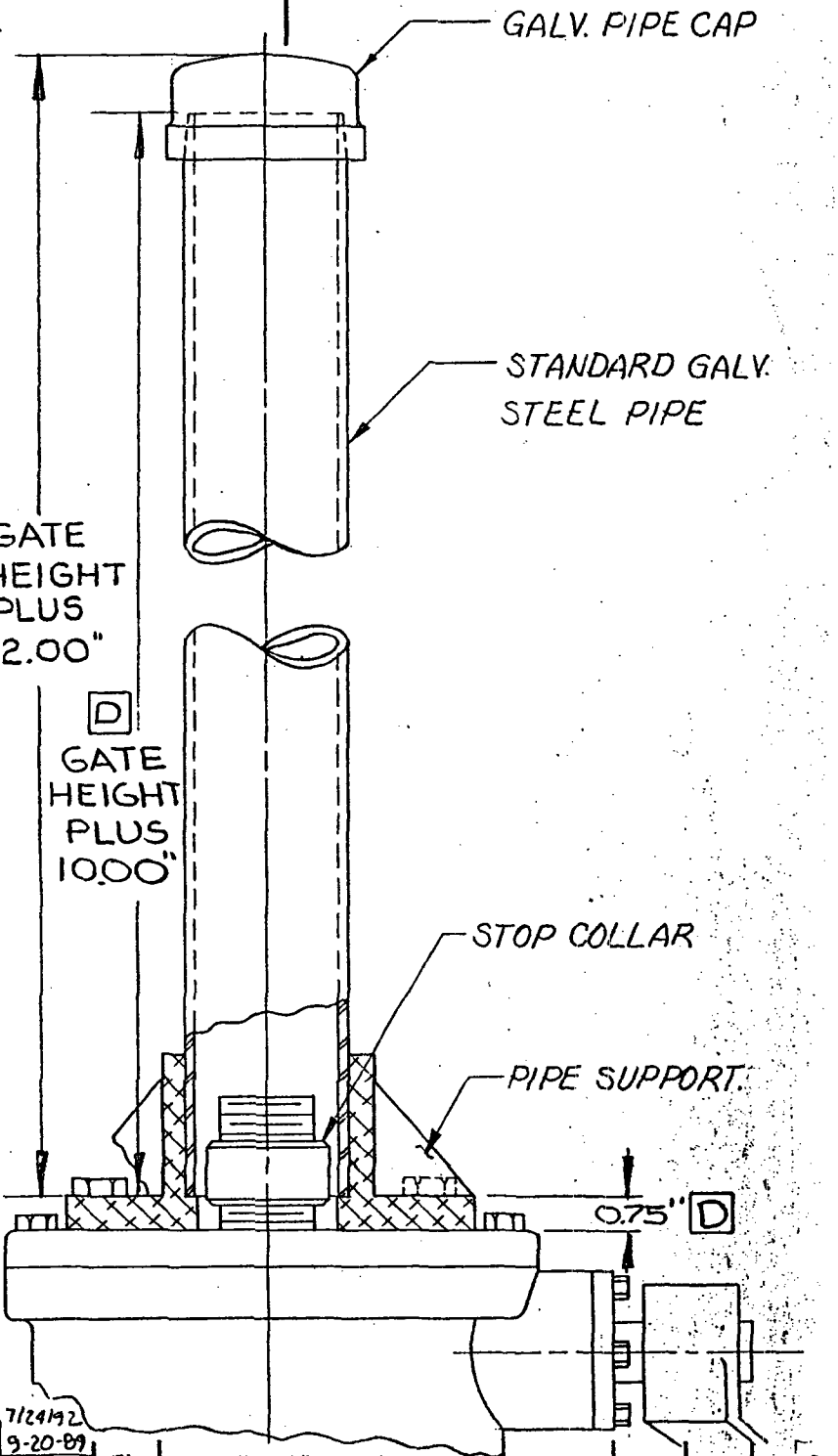
ASSEM. : FABRICATED STEEL HOIST SUPPORT
FOR 5004, 5012, 5020 HOIST HEADS
WITH 1.75 STEM

DRAWN TFB	DESIGNED JER	DATE 10–19–01
CHECKED JER	APPROVED	SCALE N.T.S.
INDEX SYMBOL IBM	ORDER NO.	DWG. NO. E–56829

FROM: D–39055

NOTES

STEMS UP TO 2.00" DIA.		STEMS 2.25" TO 3.00" DIA.	
3.00" PIPE		4.00" PIPE	
ITEM	GATE HGT.	ITEM	GATE HGT.
01.	6.00"	26	6.00"
02.	8.00"	27	8.00"
03.	10.00"	28	10.00"
04.	12.00"	29	12.00"
05.	14.00	30	14.00"
06	15.00"	31	15.00"
07.	16.00"	32	16.00"
08.	18.00"	33	18.00"
09.	20.00"	34	20.00"
10.	21.00"	35	21.00"
11.	24.00"	36	24.00"
12.	30.00"	37	30.00"
13.	36.00"	38	36.00"
14.	42.00"	39	42.00"
15.	48.00"	40	48.00"
16.	54.00"	41	54.00"
17.	60.00"	42	60.00"
18.	66.00"	43	66.00"
19.	72.00"	44	72.00"
20.	78.00"	45	78.00"
21.	84.00"	46	84.00"
22.	90.00"	47	90.00"
23	96.00	48	96.00"
F 24.	6.00 LG.	49	99.00"
25.		50	114.00"



ALT	CHANGE	BY	CKD	DATE
F	ADDED IT. # 24 - N.R.S.	DLB	DRL	7/24/92
E	E-39439 WAS E-15812C, E-39440 WAS E-16374C	TFB	DRL	9-20-89
D	ADDED DIM.	TFB		2/82
C	WAS "GALV. STEEL PIPE COVER"	DRA		3-31-81

ALT	CHANGE	BY	CKD	DATE
B	ADDED 4" ASSEMBLY NOTE	MAB		1-27-
A	ADDED ITEMS 26 THRU 48	CAP	DKD	4-14-

RODNEY HUNT COMPANY, ORANGE, MASS., 01364

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ASSEMBLY: GALV. STEEL STEM COVER FOR C

S-5004, S-5012, S-5020, S-5036 &

S-5054 HOISTS

DRAWN DRL	DESIGNED	DATE 4-14-75
CHECKED RAP.	APPROVED	SCALE N.T.S.
INDEX SYMBOL V	ORDER NO. ISSUED	DWG. NO. F-9330-C

SUPPORT ~ D-23893 (3") D-25766 (4")

Rodney Hunt Shop Order # 010341-2 Date: 9/21/01

Item No. 1 Prepared By: JCR

Location: (1) LOW LEVEL OUTLET WORKS

Gate Size: 60" x 48" 140 Disc Weight: 2470 #

Operating Head: 15' Hoist: MANUAL

Stem Diameter: 1 3/4" Minor Dia: 1.44"

Stem Weight: 142 # Stem Factor: .017 T.P.I. 3 1/2

Maximum Operating Load

F = (62.4)(f)(A)(H) + P_1 + P_2 where:
F = Total maximum force required to open Slide in (Lbs.)
f = Friction factor of disc against seat = (0.35)
A = Area of gate opening, in square feet
H = Head of water at gate centerline, in (feet)
P_1 = Weight of Slide in (Lbs.)
P_2 = Weight of Stem in (Lbs.)

F = (62.4)(.35)(20)(15) + 2470 + 142 = 9164 (LB

Output of S-5004 hoist with 1 3/4 Dia. stem at 40 (Lb.)

Effort on a 15" crank or _____ Dia. handwheel = 9882 Lbs.

Stem Design Load = 2 x hoist output = 19.765 (Lbs.)

Column Buckling Limits Euler's

Euler's Maximum Unsupported Length Allowable "L_T" (Threaded Stem Section)

"L_T" = $\sqrt{(2)(\pi^2)(28 \times 10^6)[1/64\,\pi)(1.44)^4] \div (19765)}$ = 77.00"

Slenderness Ratio L/R Maximum Unsupported Length Allowable "L_T" =

"L_T" = .25(200)(1.44) = 72.00"

Maximum Unsupported Length "L_T" Actual = 42.75"

Euler's Maximum Unsupported Length Allowable "L_P" (Plain Stem Section)

"L_P" = $\sqrt{(2)(\pi^2)(28 \times 10^6)[1/64\,\pi)(1.75)^4] \div (19765)}$ = 113.00"

Slenderness Ratio L/R Maximum Unsupported Length Allowable "L_P" =

"L_P" = .25(200)(1.75) = 87.50"

Maximum Unsupported Length "L_P" Actual = 72.25"

Stem and Operator Calculations

North Providence
North Providence RI.

Item Number:	1	Rodney Hunt SO#	010341-2
Gate Size:	60 x 48	Prepared by:	Jay Rossi
Gate Description:	Low Level Outlet Works		Rodney Hunt Co.
Installation Dwg:			10/22/2001

The following units are used in the calculations:

Length:	Inches	Weight:	Pounds	Torque:	Foot pounds	Stress:	PSI
Force:	Pounds	Area:	Square Inches	Pressure:	PSI	Speed:	Inches / Minute

Stem Diameter (D) Nominal:	**1.75**	in	
Stem Diameter (d) Minor:	1.442	in	Root diameter per machining drawing
Threads per Inch:	3.5		
Stem Thread Lead	**single**		Per specification
Stem Factor :	0.0170		≈(D-1/2 pitch) x (0.96815 x tan a + 0.20) / (24 x (0.96815 - 0.20 x tan a) where 0.20 is the friction factor and tan a = lead/(Dp - 1/2 pitch)
Gate Travel:	**49.13**	in	
MOL from attached load charts or spec. :	**9,164**	lbs	This is the highest single value from the **Sluice Gate Operating Load** calculations
Handwheel Gear Ratio: (HGR)	**4.0**		This value includes all the gears in the train.
H'wh'l Gear Efficiency: (HGE)	**0.84**		This is a cummulative value
Handwheel Diameter : or two times crank length	**30.0**	in	See the installation drawing for confirmation (two times the crank radius is used for consistency in the formulas)
Manual output @ 40 lbs effort	9,882	lbs	= HGR x HGE x Handwheel Dia / 24 x 40 pounds / Stem Factor
Turns required to open:	688		= Travel required / thread lead x handwheel gear ratio
Stem Design Load Manual :	19,765	lbs	= Operator Output at a 80 pound rim effort
Plain Section of Stem			
Max. Unsupported Length at a Slenderness ratio of 200 :	**87.50**	in	= 200 x (Nominal Dia./4)
Max. Unsupported Length Based on Euler's Formula:	**113.46**	in	= $(2 \times p^2 \times E \times I_{NOMinal\ DIA} / \text{Stem Design Load})^{.5}$
Max. Allowable Unsupported By specification	n/a	in	From the Sluice Gate Specification or Schedule
Max. Allowable Unsupported Length is Controlled by:	L/r		This tests for which design parameter controls.
Actual Max. Unsupported Length is:	**72.25**	in	Refer to the installation drawing
Resulting L/r ratio is:	**165**		= Unsupported length / (Nom. Dia / 4)
Threaded Section of Stem			
Max. Unsupported Length at a Slenderness ratio of 200 :	**72.10**	in	= 200 x (Minor Dia. / 4)
Max. Unsupported Length Based on Euler's Formula:	**77.04**	in	= $(2 \times p^2 \times E \times I_{Minor\ DIA} / \text{Stem Design Load})^{.5}$
Max. Allowable Unsupported Length is Controlled by:	L/r		This tests for which design parameter controls.
Actual Max. Unsupported Length is:	**42.75**	in	Refer to the installation drawing
Resulting L/r ratio is:	**119**		= Unsupported length / (Minor Dia / 4)
Stem Tensile Area:	**1.828**	in^2	= p x ((Minimum pitch diameter + Minimum minor diameter) / 4)^2
Tensile Stress at MOL Allowable = 6,000:	**5,013**	psi	= MOL/ Stem Tensile Area
Tensile Stress at Stem Design Load : Allowable = 30,000:	**10,812**	psi	= Stem Design Load / Stem Tensile Area

RODNEY HUNT

RODNEY HUNT COMPANY
SLUICE GATE MATERIAL SPECIFICATIONS

CUSTOMER: LCI | **September 24, 2001**
SHOP ORDER:010341-2 | **PROJ ENGR: JER**
MATERIAL SPECIFICATION SHEET # 1
OTHER TESTS REQUIRED- SEE REMARKS | **PAGE 1 OF 2**

PAINT:

FERROUS SUBMERGED (GATES, STEM GUIDE)

CLEAN:	SSPC SP10	
PRIMER:	AMERLOCK 400	1 COAT 5.0 MILS THICK EA
FINISH:	AMERLOCK 400	1 COAT 5.0 MILS THICK EA

FERROUS NON-SUBMERGED (HOISTS, HOIST SUPPORT)

CLEAN:	SSPC SP6	
PRIMER:	AMERLOCK 400	1 COAT 5.0 MILS THICK EA
FINISH:	AMERCOAT 450HS	1 COAT 2.0 MILS THICK EA

GATE COMPONENTS		**MATERIALS:**
FRAME	CI	ASTM A126 CL B
DISC	CI	ASTM A126 CL B
GUIDE EXTENSIONS	CI	ASTM A126 CL B
TOP WEDGE	BRZ	ASTM B584 C865
SEAT	BRZ	ASTM B584 C873
FASTENER	BRZ	ASTM B98 C655
SIDE WEDGE	BRZ	ASTM B584 C865
FASTENER	BRZ	ASTM B98 C655
BOTTOM WEDGE	BRZ	ASTM B584 C865
SEAT	BRZ	ASTM B584 C873
FASTENER	BRZ	ASTM B98 C655
SEAT FACING	BRZ	ASTM B21 C464
GUIDE CAP	CI	ASTM A126 CL B
H H CAP SCREW	SS	ASTM F593-304 44KSI MIN YIELD
STOP COLLAR	BRZ	ASTM B584 C865
THRUST NUT	BRZ	ASTM B584 C865
STEM-THREADED	SS	ASTM A276-304 COND A
LIFT NUT	BRZ	ASTM B584 C865
STEM COVER	STL	ASTM A53 GALV'D
HOIST SUPPORT	STL	ASTM A36 & A53 (PIPE)
STEM GUIDE BRKT	CI	ASTM A126 CL B
STEM GUIDE	BRZ	ASTM B584 C873
UNDER FLR.MTG.STEM GUIDE MTG.PLATE	SS	ASTM A240-304

EMBEDDED ITEMS		
ANCHOR BOLT	SS	ASTM A276-304 COND A
ANCHOR NUT	SS	ASTM F594-304 COND A

REMARKS:

ALL MATING, MACHINED, FERROUS SURFACES THAT ARE UNPAINTED SHALL BE COATED WITH PROTECTIVE GREASE.

ADDITIONAL MATERIALS & NOTES:

PAINT: THE COLOR OF THE FINISH PAINT WILL BE MEDIUM GRAY.

RODNEY HUNT

OTHER TESTS:

PER AWWA C501-92.

Amerlock® 400

High-solids epoxy coating

Product Data/ Application Instructions

- VOC compliant
- High-performance general maintenance coating for new or old steel
- Cures through wide temperature range
- Self-priming topcoat over most existing coatings
- Can be overcoated with wide range of topcoats
- Compatible with prepared damp surfaces
- Compatible with adherent rust remaining on prepared surfaces
- 5 mils or more in a single coat
- Resists high humidity and moisture

Amerlock's low solvent level meets VOC requirements, reduces the chances for film pinholing and solvent entrapment at the substrate-coating interface, often a major cause of coating failure with conventional epoxies and lower solids systems.

Amerlock 400 is available in a variety of colors, including aluminum, and therefore does not require a topcoat. For extended weatherability or special uses, a topcoat may be desired.

Typical Uses

Amerlock 400 is used in those areas where blasting is impractical or impossible. As a maintenance coating, Amerlock 400 protects steel structures in industrial facilities, bridges, tank exteriors, marine weathering, offshore, oil tanks, piping, roofs, water towers and other exposures. Amerlock 400 has good chemical resistance to splash/spillage, fumes and immersion in neutral, fresh and salt water (see resistance table). Contact your Ameron representative for specific information.

Typical Properties

Physical

Abrasion resistance (ASTM D4060)	
1 kg load/1000 cycles	weight loss
CS-17 wheel	102 mg
Impact resistance (ASTM D2794)	
Direct	24 in · lb
Reverse	6 in · lb
Moisture vapor transmission (ASTM F1249)	
	4.49 g/m²
Adhesion (ASTM D4541)	900 psi

Performance

Salt spray (ASTM B117) 3000 hours	
Face blistering	None
Humidity (ASTM D2247) 750 hours	
Face corrosion, blistering	None
Immersion (NACE TM-01-69) fresh water 1 year	
blistering	None

Physical Data

Finish	Semigloss
Color	Standard, Rapid Response, custom colors and aluminum

White and light colors may show yellowing on aging. Use of Amercoat 861 with white or light colors will slightly discolor. Do not use Amercoat 861 with 400FD cure. With white and light colors, 400FD cure will cause yellowing.

Yellow, red and orange colors will fade faster than other colors due to the replacement of lead-based pigments with lead-free pigments in these colors

Components	2
Curing mechanism	Solvent release and chemical reaction between components

Volume solids (ASTM D2697 modified)		
400, 400FD	83% ± 3%	
400AL	88% ± 3%	
Dry film thickness (per coat)	4-8 mils (100-200 microns)	
Coats	1 or 2	
Theoretical coverage	ft²/gal	m²/L
1 mil (25 microns)		
400	1331	32.6
400AL	1412	34.7
5 mils (125 microns)		
400	266	6.5
400AL	282	6.9
VOC	lb/gal	g/L
400 mixed	1.4	168
mixed/thinned (1/2 pt/gal)	1.7	204
400AL mixed	1.0	120
mixed/thinned (1 1/2 pt/gal)	2.0	240
400FD mixed	1.2	144
mixed/thinned (1/2 pt/gal)	1.6	192

Temperature resistance,	wet		dry	
	°F	°C	°F	°C
continuous	100	38	200	93
intermittent	100	38	350	177

Flash point (SETA)	°F	°C
400 resin	131	55
400 cure	85	29
400FD cure	87	30
400AL resin	110	43
400AL cure	116	47
Amercoat® 8	67	19
Amercoat 65	78	25
Amercoat 12	2	-17

Qualifications

USDA – Incidental food contact
NFPA – Class A

NSF Standard 61 – For use in drinking water; Amerlock 400 and 400FD – White, Ivory and RT-1805 Blue, Medium Gray

Certain restrictions do apply.

Chemical Resistance Guide

Environment	Immersion		Splash and Spillage		Fumes and Weather	
	400	400AL	400	400AL	400	400AL
Acidic	*	*	F	F	G	G
Alkaline	*	*	E	G	E	E
Solvents	*	*	G	G	E	E
Salt water	E	E	E	E	E	E
Water	E	E	E	E	E	E

F-Fair G-Good E-Excellent

**Contact your Ameron representative.*

This table is only a guide to show typical resistances of Amerlock 400 and 400AL. For specific recommendations, contact your Ameron representative representative for your particular corrosion protection needs.

Systems using Amerlock 400 or 400AL

1st coat	2nd Coat***	3rd coat***
400	None	None
400	450HS	None
Amershield™ 400**	None 400	None
Dimetcote® 9, 9FT or 9HS	400	None
Dimetcote 9, 9FT or 9HS	400	450HS

***Water immersion.*

****For color contrast when 2 coats of 400AL are used, 400AL red can be used as first coat.*

Recoat/Topcoat time minimum (hours)	°F/°C 90/32	70/21	50/10
400	8	16	30
400 with 1 pt 861	4	7	16
400FD	2	3½	10
400AL	3	12	48
400AL with ½ pt 861	3	5	12

Recoat/Topcoat time @ 70°F (21°C)

System	Maximum time
400/400	3 months
400 with 861/400	1 month
400FD/400FD	2 weeks
400/Amershield or 450HS	1 month
400/5405	1 day
400FD/Amershield or 450HS	7 days
400 with 861/Amershield or 450HS	2 weeks

Note: If maximum time is exceeded, roughen surface. For topcoats (finish coats) not listed, see Product Data sheet for specific topcoat time limitations.

Surface Preparation

Coating performance is, in general, proportional to the degree of surface preparation. Abrasive blasting is usually the most effective and economical method. When this is impossible or impractical, Amerlock 400 can be applied over mechanically cleaned surfaces. All surfaces must be clean, dry and free of all contaminants, including salt deposits.

Amerlock 400 may be used over most types of properly prepared and tightly adhering coatings. A test patch is recommended for use over existing coatings.

Steel – Remove all loose rust, dirt, moisture, grease or other contaminants from surface. Power-tool clean SSPC-SP3 or hand-tool clean SSPC-SP2. For more severe environments, dry abrasive blast SSPC-SP7. Water blasting is also acceptable. For immersion service – dry abrasive blast SSPC-SP10.

Aluminum – Remove oil, grease or soap film with neutral detergent or emulsion cleaner, treat with Alodine® 1200, Alumiprep® or equivalent or blast lightly with fine abrasive.

Application Data

Applied over	Steel, concrete, aluminum, galvanizing
Surface preparation	
Steel	SSPC-SP2, 3, 6, 7, 10 or 11
Concrete	ASTM D4259 or 4260
Aluminum	Alodine®, Alumiprep® or light abrasive blast
Galvanizing	Galvaprep® or light abrasive blast
Method	Airless or conventional spray. Brush or roller may require additional coats.
Mixing ratio (by volume)	1 part resin to 1 part cure

Pot life (hours)

861 Accelerator Amount	Amerlock /mixed 5 gal	°F/°C 90/32	70/21	50/10	32/0
None	400	1½	2½	4	7
	400AL	3½	5½	10	15
	400FD	1	1½	2½	4
½ pt	400	1	1½	2½	4
	400AL	1	1½	2½	4
1 pt	400	½	1	1½	2

Pot life is the period of time after mixing that a five-gallon unit of material is sprayable when thinned as recommended. Mixture may appear fluid beyond this time, but spraying and film build characteristics may be impaired.

Environmental conditions

Product	Air and Surface Temperature
Amerlock 400 or 400 AL	40° to 122°F (4° to 50°C)
Amerlock with 861	20° to 122°F (-6° to 50°C)
Amerlock 400FD cure	20° to 122°F (-6° to 50°C)

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation. At freezing temperatures, surface must be free of ice.

Do not use Amerlock 400AL on water damp surfaces. Do not use 400FD cure with 400AL resin.

Drying time (ASTM D1640) (hours)

861 Amt	Amerlock /mixed 5 gal	120/49	90/32	70/21	50/10	32/0	20/-6
				touch °F/°C			
None	400	1½	4½	9	28	96	NR
	400AL	1	4	12	36	96	NR
	400FD cure	½	1	2	8	24	48
½ pt	400	1½	3	5	24	72	120
	400AL	1	1½	2½	5	10	24
1 pt	400	1	2	4	15	48	96
				through			
None	400	6	12	20	40	140	NR
	400AL	1½	7½	24	72	216	NR
	400FD cure	1½	2½	4½	13	38	96
½ pt	400	3	6	10	30	96	180
	400AL	2	4	9	24	48	120
1 pt	400	2½	5	9	24	72	160
				Cure for immersion (days)			
None	400	2	4	7	21	NR	NR
	400AL	2	4	7	21	NR	NR
	400FD cure	1	2	3	7	21	NR
½ pt	400AL	1	2	3	7	21	NR
1 pt	400	1	2	3	7	21	NR

Amercoat 861 Accelerator will slightly discolor Amerlock 400 white and other Amerlock light colors. Do not use 861 Accelerator with 400FD cure.

NR = Not recommended

Thinner	Amercoat 8 or 65
Equipment cleaner	Thinner or Amercoat 12

Galvanizing – Remove oil or soap film with detergent or emulsion cleaner, then use zinc treatment such as Galvaprep® or equivalent or blast lightly with fine abrasive.

Concrete – Acid etching (ASTM D4260) or abrasive blast (ASTM D4259) new concrete cured a minimum of 14 days.

Application Equipment

The following is a guide; suitable equipment from other manufacturers may be used. Changes in pressure, hose and tip size may be needed for proper spray characteristics.

Airless spray – Standard equipment such as Graco Bulldog 30:1 or larger, with a 0.017- to 0.021-inch fluid tip.

Conventional spray – Industrial equipment, such as DeVilbiss MBC or JGA or Binks 18 or 62 spray gun. A moisture and oil trap in the main air supply line, a pressure material pot with mechanical agitator and spearate regulators fo air and fluid pressure are recommended.

Power mixer – Jiffy Mixer powered by an air or explosion-proof electric motor.

Brush or roller – Additional coats may be required to attain proper thickness.

Application Procedure

1. Flush all equipment with thinner or Amercoat® 12 before use.
2. Stir resin using an explosion-proof power mixer to disperse pigments.
3. Add cure to resin. Mix thoroughly until uniformly blended to a workable consistency. For low temperature application, use Amercoat 861 accelerator or 400FD cure. Do not use Amercoat 861 when using Amerlock 400FD cure or with Amerlock white or light colors as color variation may result. Do not exceed the 1 pint Amercoat 861 accelerator per 5 gallon unit recommendation. Do not use 400FD cure with 400AL resin.
4. Do not mix more material than can be used within the expected pot life.
5. For optimum application, material should be from 50° to 90°F (10° to 32°C). Above 122°F (50°C), sagging may occur.
6. Use only Ameron recommended thinners. Above 85°F (29°C) use Amercoat 8, at lower temperatures use Amercoat 65. A small amount of thinner greatly reduces viscosity; excessive thinning will cause running or sagging. Thin cautiously as follows:

Amercoat 8 or 65 thinner	400 and 400FD	400AL
Airless – up to	1/4 pt/gal	1 1/2 pt/gal
Conventional – up to	1/2 pt/gal	1 1/2 pt/gal

Below 50°F additional thinning may be needed and multiple coats required to achieve specified thickness.

7. To minimize orange peel appearance, adjust conventional spray equipment to obtain adequate atomization at lowest air pressure.
8. Apply a wet coat in even, parallel passes with 50 percent overlap to avoid holidays, bare areas and pinholes. If required, cross spray at right angles.
9. When applying Amerlock 400 directly over inorganic zincs or zinc rich primers, a mist coat/full coat technique may be required to minimize bubbling. This will depend on the age of the Dimetcote®, surface roughness and conditions during curing.

Note – Do not use Amerlock 400AL on water damp surfaces

10. Ventilate confined areas with clean air between coats and while curing the final coat. Prevent moisture condensation on the surface between coats.
11. Repair damaged areas by brush or spray.
12. Clean equipment with thinner or Amercoat 12 immediately after use.

Shipping Data

Packaging unit	2 gal	5 gal
cure	1-gal can	2.5-gal can
resin	1-gal can	2.5-gal can
Shipping weight (approx)	lbs	kg
2-gal unit		
400 cure	12.5	5.7
400FD cure	12.2	5.5
400 resin	13.7	6.2
400AL cure	12.1	5.5
400AL resin	11.0	5.0
5-gal unit		
400 cure	31.8	14.4
400FD cure	31.2	14.2
400 resin	35.0	15.9
400AL cure	30.9	14.0
400AL resin	28.3	12.8

Shelf life when stored indoors at 40° to 100°F (4° to 38°C)
resin and cure 1 year from shipment date.

Numerical values are subject to normal manufacturing tolerances, color and testing variances. Allow for application losses and surface irregularities.

This mixed product is photochemically reactive as defined by the South Coast Air Quality Management District's Rule 102 or equivalent regulations.

Safety Precautions

Read each component's material safety data sheet before use. Mixed material has hazards of each component. Safety precautions must be strictly followed during storage, handling and use.

CAUTION – Improper use and handling of this product can be hazardous to health and cause fire or explosion.

Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: implementation of proper ventilation, use of proper lamps, wearing of proper protective clothing and masks, tenting and proper separation of application areas. Consult your supervisor. Proper ventilation and protective measures must be provided during application and drying to keep solvent vapor concentrations within safe limits and to protect against toxic hazards. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces, such as tank interiors and buildings.

This product is to be used by those knowledgeable about proper application methods. Ameron makes no recommendation about the types of safety measures that may need to be adopted because these depend on application and space, of which Ameron is unaware and over which it has no control.

***If you do not fully understand the warnings and instructions* or if you cannot strictly comply with them, do not use the product.**

Note: Consult Code of Federal Regulations Title 29, Labor, parts 1910 and1915 concerning occupational safety and health standards and regulations, as well as any other applicable federal, state and local regulations on safe practices in coating operations.

This product is for industrial use only. Not for residential use in California.

Limitation of Liability

Ameron's liability on any claim of any kind, including claims based upon Ameron's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or part thereof which give rise to the claim. **In no event shall Ameron be liable for consequential or incidental damages.**

Warranty

Ameron warrants its products to be free from defects in material and workmanship. Ameron's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Ameron's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to Ameron in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify Ameron of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.

Ameron makes no other warranties concerning the product. No other warranties, whether expressed, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply. In no event shall Ameron be liable for consequential or incidental damages.

Any recommendation or suggestion relating to use of the products made by Ameron, whether in its technical literature, or in response to specific inquiry, or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for Buyer to satisfy itself of the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results.

AMERON INTERNATIONAL

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Ameron PCG/Europe • J. F. Kennedylaan 7, 4191 MZ Geldermalsen, The Netherlands • (31) 345-573341

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AMERON
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PERFORMANCE TEST RESULTS

Amerlock 400

High-Solids Epoxy

TEST	METHOD	TYPICAL RESULTS
ABRASION	ASTM D4060 Abrasion Resistance of Organic Coatings by the Taber Abraser.	No more than 102 milligrams average loss after 1000 cycles with CS-17 wheels and 1000 grams load.
ADHESION	ASTM D4541 Pull-off Strength of Coatings Using Portable Adhesion Testers.	No less than 900 psi (average of three readings).
CLEVELAND HUMIDITY	ASTM D2247 Testing Water Resistance of Coatings in 100% Relative Humidity.	No blistering, cracking, or delamination. No rusting after 750 hours of exposure.
EXTERIOR SEVERE WEATHERING	South Florida Marine Exposure, exposed 45 degrees facing south.	No blistering, cracking or delamination of film. No more than 1/64 inch rust creepage at scribe and no face rusting after 15 months of exposure.
FLAME SPREAD	ASTM E84-84 Standard Method of Test for Surface Burning Characteristics of Building Materials.	Flame Spread: 5 Fuel Contribution: 0 Smoke Developed: 5
FRESH WATER IMMERSION	NACE's TM-01-69 Test Method for Laboratory Corrosion (Immersion) Testing of Metals for the Process Industry. Surface Preparation: Abrasive blasted to SSPC-SP10 "Near White."	No rusting, blistering, cracking or delamination of film after one year of immersion.
IMPACT RESISTANCE	ASTM D2794 Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).	Direct 24 inch-lbs Reverse 6 inch-lbs
MOISTURE VAPOR TRANSMISSION	ASTM D1653 Water Vapor Permeability of Organic Coating Films.	Water Vapor Transmission (WVT) Rate of 6.28 grams per square meter, p 1 hrs.
	HARDNESS	
		ASTM D 3363 Film Hardness by Pencil

PERFORMANCE TEST RESULTS FOR AMERLOCK 400 HIGH-SOLIDS EPOXY

Test.		
	Rating not less than HB.	
QUV WEATHERING	Accelerated Ultraviolet Cyclic Weathering Test. ASTM G53, QUV B-bulb.	No blistering, cracking, or delamination of film after 1000 hours exposure. Typical epoxy fading and chalking, 0% gloss at 4 weeks.
SALT (OXYGENATED MARINE) WATER IMMERSION	NACE's TM-01-69 Test Method for Laboratory Corrosion (Immersion) Testing of Metals for the Process Industry. Surface Preparation: Abrasive blasted to SSPC-SP10 "Near White."	No rusting, blistering, cracking or delamination of film after six months of immersion.
SALT SPRAY (FOG)	ASTM B117 Salt Spray (Fog) Testing. Surface Preparation: Abrasive blasted to SSPC-SP10 "Near White." Surface Preparation: Hot rolled steel, first abrasive-blasted and then rusted outdoors in So.California weather for 60 days with daily forced watering. After rusting, panels were hand wire-brushed to remove all loose rust and one coat at 5 mils minimum was applied.	No blistering, cracking, softening or delamination of film. No more than 3/16 rust creepage at scribe and no more than 1% rusting at edges after 1,500 hours exposure. No blistering, cracking, softening, delamination or more than 1/16 rust creepage from the center of the scribe after 3,000 hours exposure.

QUALIFICATIONS:

USDA	Complies with requirements for incidental food contact.
NSF Standard 61	For use in drinking water; Amercoat 400 and 400FD - White, Ivory and RT-1805 Blue. *Certain restrictions do apply.*
Nuclear Power Plants	Service level I & II for specific project conditions.
NFPA	Class A

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AMERON INTERNATIONAL

Protective Coatings

Amercoat® 450HS

Gloss aliphatic polyurethane topcoat

Product Data/ Application Instructions

- Gloss topcoat
- Outstanding weather resistance with excellent color and gloss retention
- VOC compliant
- Resistant to broad range of corrosive atmospheres
- Resists soil pickup – cleans easily
- Cures through wide temperature range
- Hard, flexible and abrasion resistant

Typical Uses

Amercoat 450HS can be used as a finish coat where attractive appearance and a wide range of corrosive resistance is required.

- Chemical plants
- Pulp and paper mills
- Off shore platforms
- Petroleum refineries and containers.

Systems Using 450HS

First* Coat	Intermediate Coat	Finish Coat
Dimetcote®	385	450HS
Amercoat 83HS, 185HS, 385 or Amerlock 400		450HS

**Maximum curing time at 70°F (21°C) for epoxy coatings varies when overcoating with Amercoat 450HS: 400, 385, 83HS, – 4 weeks; 400 plus 861 – 1 week.*

Topcoat Recommendations

Topcoat Color	Substrate Color		
Number Coats of 450HS over substrate color	White	Light	Dark Contrast
450HS white	1	2	2
450HS pastels	1	1	2
450HS yellow, red, orange	1	2	2

Chemical Resistance Guide

When applied over suitable primer or intermediate coat:

Environment	Splash and Spillage	Fumes and Weather
Acidic	VG	E
Alkaline	VG	E
Solvents	G	E
Salt solutions		
Acidic	E	E
Neutral	E	E
Alkaline	E	E
Water	E	E

G-Good VG-Very Good E-Excellent

This table is only a guide. For specific recommendations, contact your Ameron representative for your particular corrosion protection needs. Amercoat 450HS is not presently recommended for immersion service.

Physical Data

Finish	Gloss
Color	See color card

Yellow, red and orange colors will fade faster than other colors due to the replacement of lead-based pigments with lead-free pigments in these colors.

Components	2
Curing mechanism	Solvent release and chemical reaction between components
Volume solids (ASTM D2697 modified)	
450HS	66% ± 3%
Clear coat	52% ± 3%
Dry film thickness per coat	2 mils (50 microns)
Coats	1-2

Uniform appearance may require two coats on tanks and other large structures previously coated with contrasting primer or intermediate coat.

Theoretical coverage	ft²/gal	m²/L
450HS		
1 mil (25 microns)	1059	26
2 mils (50 microns)	530	13
Clear		
1 mil (25 microns)	834	20.5
2 mils (50 microns)	417	10.2

Measured VOC (EPA Method 24)

Amercoat 450HS	2.4 lb/gal	287.5 g/L

Maximum thinning for VOC at 340 g/L:

Thinner	Volume %
923	10.9
101	9.5

Maximum thinning for VOC at 340 g/L with 866M accelerator:

Thinner	Volume %
923	9
101	8

Note: 1 pint per gallon is equivalent to 12.5 volume %.

VOC (calculated) Amercoat 450HS Clear		
mixed/unthinned	3.4	407

Temperature resistance (Dry)	°F	°C
continuous	200	93
intermittent	250	121

Flash point (SETA)	°F	°C
cure	92	33
resin	97	36
mixed	98	37
Amercoat 923	102	39
Amercoat 101	140	60
Amercoat 12	0	-18
Amercoat 866M	94	34

Application Data

Applied over	Primed concrete or steel
Surface preparation	See specific primer or intermediate
Method	Airless or conventional spray

Environmental conditions		
Temperature	°F	°C
air and surface	20 to 120	-7 to 49

Surface temperature must be at least 5°F (3°C) above dew point to prevent condensation.

Adhere to all instructions, precautions, conditions and limitations during storage, handling, application and drying periods to obtain maximum performance. For conditions outside the requirements or limitations described, contact your Ameron representative.

Surface Preparation

Coating performance, in general, is proportional to the degree of surface preparation. Refer to application instructions for specific primers and intermediate coats being used for application and curing procedures. All previous coats must be clean and dry. Aged epoxy coatings must be roughened before applying 450HS.

Application Equipment

The following is a guide; suitable equipment from other manufacturers may be used. Changes in pressure and tip size may be needed for proper spray characteristics.

Airless spray—Standard equipment such as Graco, DeVilbiss, Binks, Speeflo, or others having a 28:1 or higher pump ratio and a fluid tip with 0.013- to 0.015-inch (0.33- to 0.38-mm) orifice.

Conventional spray—Industrial equipment such as DeVilbiss MBC or Binks BBR spray gun. Separate air and fluid pressure regulators, mechanical pot agitator and a moisture and oil trap in main air supply line are recommended.

Application Procedure

Amercoat 450HS is packaged in two components in the proper proportions which must be mixed together before use:

1. Flush equipment with thinner or Amercoat 12 before use.
2. Stir each component thoroughly, then add cure to resin and mix until uniformly blended to a workable consistency. Do not mix more material than will be used within 4 hours at 65-80°F (18-27°C). Pot life is shortened by higher temperatures. Use up to 1/2 pint of Amercoat 866M Accelerator per 5 gallons mixed.
3. Thin only if necessary for workability.
4. When applying by conventional spray, use adequate air pressure and volume to ensure proper atomization.
5. Apply a wet coat in even parallel passes, overlap 50 percent to avoid holidays, bare areas and pinholes. If required, cross spray at right angles.
6. Application of 3 to 5 mils (75 to 125 microns) wet film thickness will normally provide 2 mils (50 microns) dry film.
7. Clean all equipment with thinner or Amercoat 12 immediately after use.
8. Keep containers tightly closed since repeated exposure to moisture will cause gelation. Moisture contaminated material is also subject to gassing on storage. Handle bulged containers with caution; lids may eject forcibly.

Mixing ratio (by volume) 4 parts resin to 1 part cure

	°F/°C		
	90/32	70/21	50/10
Pot life (hrs)	2	4	6
with 866M*	3/4	1-1/2	3

Drying time (ASTM D1640) (hours)		°F/°C			
	120/49	90/32	70/21	50/10	32/0
touch (minutes)	NA	10	30	90	---
with 866M*	1 1/2	7	25	72	240
through (hours)	1 1/2	4	8	24	---
with 866M*	3/4	1 3/4	2 1/2	8	36
Recoat Time					
minimum (hours)	1/2	2	4	12	---
with 866M*	1/4	1	1 1/2	4	16
maximum (days)	8 (hrs)	7	30	60	---
with 866M*	4 (hrs)	2	7	15	30

NA = not applicable

** Accelerated at 1/2 pint per 5 gallons mixed.*

Thinner	Amercoat 923, 924
Equipment cleaner	Thinner or Amercoat 12

Numerical values are subject to normal manufacturing tolerances, color and testing variances. Allow for application losses and surface irregularities. See application instructions for complete information and safety precautions.

The mixed product is nonphotochemically reactive as defined by the South Coast Air Quality Management District's Rule 102 or equivalent regulations.

Shipping Data

Packaging units	1 gal	5-gal
cure	0.2 gal in 1-qt can	1 gal in 1-gal can
resin	0.8 gal in 1-gal can	4 gal in 5-gal can

Shipping weight (approx)	lb	kg
1-gal unit		
cure	2	0.9
resin	10.2	4.6
5-gal unit		
cure	9	4.1
resin	49	22

Shelf life when stored indoors at 40 to 100°F (4 to 38°C)
resin and cure 1 year from shipment date

Safety Precautions

Read each component's material safety data sheet before use. Mixed material has hazards of both components; gives off harmful vapor of solvents and isocyanates. Use only with adequate ventilation. A positive pressure air-supplied respirator (TC19C NIOSH/MSHA) is recommended. Follow directions for respirator use. Wear respirator for the entire time of mixing, spraying and until all vapors and mists are gone. Safety precautions must be strictly followed during storage, handling and use.

CAUTION – Improper use and handling of this product can be hazardous to health and cause fire or explosion.

Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: implementation of proper ventilation, use of proper lamps, wearing of proper protective clothing and masks, tenting and proper separation of application areas. Consult your supervisor. Proper ventilation and protective measures must be provided during application and drying to keep spray mists and vapor concentrations within safe limits and to protect against toxic hazards. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces, such as tank interiors and buildings.

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Warranty

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Ameron makes no other warranties concerning the product. No other warranties, whether express, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply. In no event shall Ameron be liable for consequential or incidental damages.

Any recommendation or suggestion relating to the use of the ducts made by Ameron, whether in its technical literature, or in response to specific inquiry, or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for Buyer to satisfy itself of the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results.

Limitation of Liability

Ameron's liability on any claim of any kind, including claims based upon Ameron's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or part thereof which give rise to the claim. **In no event shall Ameron be liable for consequential or incidental damages.**

ROONEY HUNT

Performance Test Results For Amercoat 450HS

Property	ASTM Method	Amercoat 450 HS
Volume Solids	D-2697	66 +/- 3%
V.O.C.	D-3960	2.8 lbs./gal (Max.) (335g/L)
Abrasion	D-4060	57mg (500 Cycles)
Adhesion	D-4541	1625 PSI (Min)
Humidity	D-2247	No Change after 1000 hours
Impact Resistance	D-2794	Direct 51 in.-lbs. Reverse 16 in.-lbs.
Moisture Vapor Transmission	D-1653	0.537 mg.mm/cm^2/24 hours
Salt Spray	B-117	No blistering, cracking, softening or delamination. Max 1/16" rust creepage at scribe and Max 1% edge rusting after 1000 hours.
Flame Spread	E-84	Flame Spread 5 Fuel Contrib. 0 Smoke Developed 5
QUV Weathering	Accelerated Ultraviolet Cyclic Weathering.	No physical change after 840 hours. 75% gloss retention after 840 hours.

JER:ged
/WP/C/JER/PERFORM
9/10/90

RODNEY HUNT

LCI
RODNEY HUNT CO. SHOP ORDER # 010341-2

COMMENTS AND CLARIFICATIONS

1. We are submitting for approval our standard paint system for the sluice gate equipment on this order. It is a full factory applied coating system, which needs no additional field applied coats, except for normal touch-up painting. Please refer to comments 2, 3 & 4 for further information.

2. An amine cured polyamide epoxy paint, Amerlock 400, is submitted for your approval for immersed equipment. Rodney Hunt has selected Amerlock 400 as our standard for immersion service because it is a high-performance coating suitable for use in a wide variety of conditions. Amerlock 400 is a high solids coating minimizing the volatile organic compounds released to the atmosphere as air pollution from the painting operation. It is also free of the known carcinogens associated with many industrial-coating systems.

3. For the hoisting equipment, we are submitting for your approval a system consisting of one coat of Amerlock 400 and one coat of high solids aliphatic polyurethane, Amercoat 450HS. This system has been selected as Rodney Hunt's standard for this type of equipment because of its exceptional resistance to corrosive fumes/spills and to degradation from ultra-violet light. This system also addresses environmental and industrial safety concerns very well.

4. The number of coats and mil thickness of each are detailed on the enclosed specification sheet. The colors, which have been selected to enhance long-term performance by utilizing stable, fade resistance pigment systems, are also free of any carcinogenic pigments. The color of the topcoat will also provide for easy field matching and maintenance touch-up. Manufacturer's technical data sheets are enclosed for your reference.

5. Enclosed in this submittal are (6) copies of our Operation and Maintenance Manual WCE82-4. Installation instructions are also included in this manual.

6. Note: Our quote and submittal is based on excerpts and sketches only of the existing structure. All dimensions should be field verified, by the Contractor, prior to release of the equipment for manufacture.

RODNEY HUNT

7. Specification 11285.2.4- The Sluice Gate disc (slide) material is Cast Iron ASTM A126 CL B as required AWWA C501-92 specification not aluminum.

8. Specification 11285.2.6- Rodney Hunt Co's mechanical dial position indicator is graduated in "close", ¼, ½, ¾, and "open" markings. Graduations in feet and inches are not available.

   Please return (1) copy of approved drawings directly to this office. Manufacture of this equipment is on hold pending receipt of approval drawings or your written release.

RODNEY HUNT COMPANY
a GA Industries Company

ESTABLISHED 1840

ORANGE, MASSACHUSETTS, 01364-1268, U.S.A.

LCI
100 Northwest Drive
Plainville, CT. 06062

Attention: Mr. Scott Miller

Reference: Your Purchase Order: 366
Rodney Hunt Shop Order: 010341-2

Project: North Providence
North Providence, RI.

AFFIDAVIT OF COMPLIANCE

We herby certify that the equipment supplied by Rodney Hunt Company (shop order # 010341-2) meets the requirements set forth in specification section 11285 "Slide Gates" (except as noted in our letter dated 10/23/01 and complies with all applicable provisions of the American Water Works Association Standard C501-92.

Very truly yours,
James E. Rossi
Project Engineer

010341-2 affidavit of compliance #1 dated 9-12-01

RODNEY HUNT COMPANY

a GA Industries Company

RODNEY HUNT

ESTABLISHED 1840

ORANGE, MASSACHUSETTS, 01364-1268, U.S.A.

To: LCI
100 NORTH WEST DRIVE
PLAINVILLE, CT. 06062

Attn: MR. SCOTT MILLER

Date: 10/23/01
Your P.O.#: 366
Our S.O. #: 010341-2
Project: NORTH PROVIDENCE
NORTH PROVIDENCE, RI.
Engineering Transmittal # 1

We are sending herewith 6 copies of X **preliminary** _____ **revised** materials listed on the enclosed **Transmittal Drawing List/Print Order.** These materials are transmitted for your X **approval** _____ **distribution** _____ **information** _____ **records.**

X Manufacture is being held pending receipt of approved drawings or your manufacturing release and your purchase order.

_____ If all contract issues are resolved, manufacture will begin soon. If you have any corrections, please advise at once.

X Please return one (1) set of the enclosed materials marked approved or with your comments, **directly to this office**, by the week of 11/12/01.

X Remarks: PLEASE REFER TO OUR ENCLOSED COMMENTS AND CLARIFICATION SHEET.

cc: MCMANUS & ASSOCIATES, INC.
T. AGUDA - R.H. CO.

Signed: JAMES E. ROSSI
PROJECT ENG.

/WP60/G/GED/FORM2
September 19, 1996

TRANSMITTAL DRAWING LIST / PRINT ORDER

RODNEY HUNT

Rodney Hunt Co. S.O.# 01034/-2 Date:

Customer: Notes: SHT. 2 OF 2

Project Engineer: JER

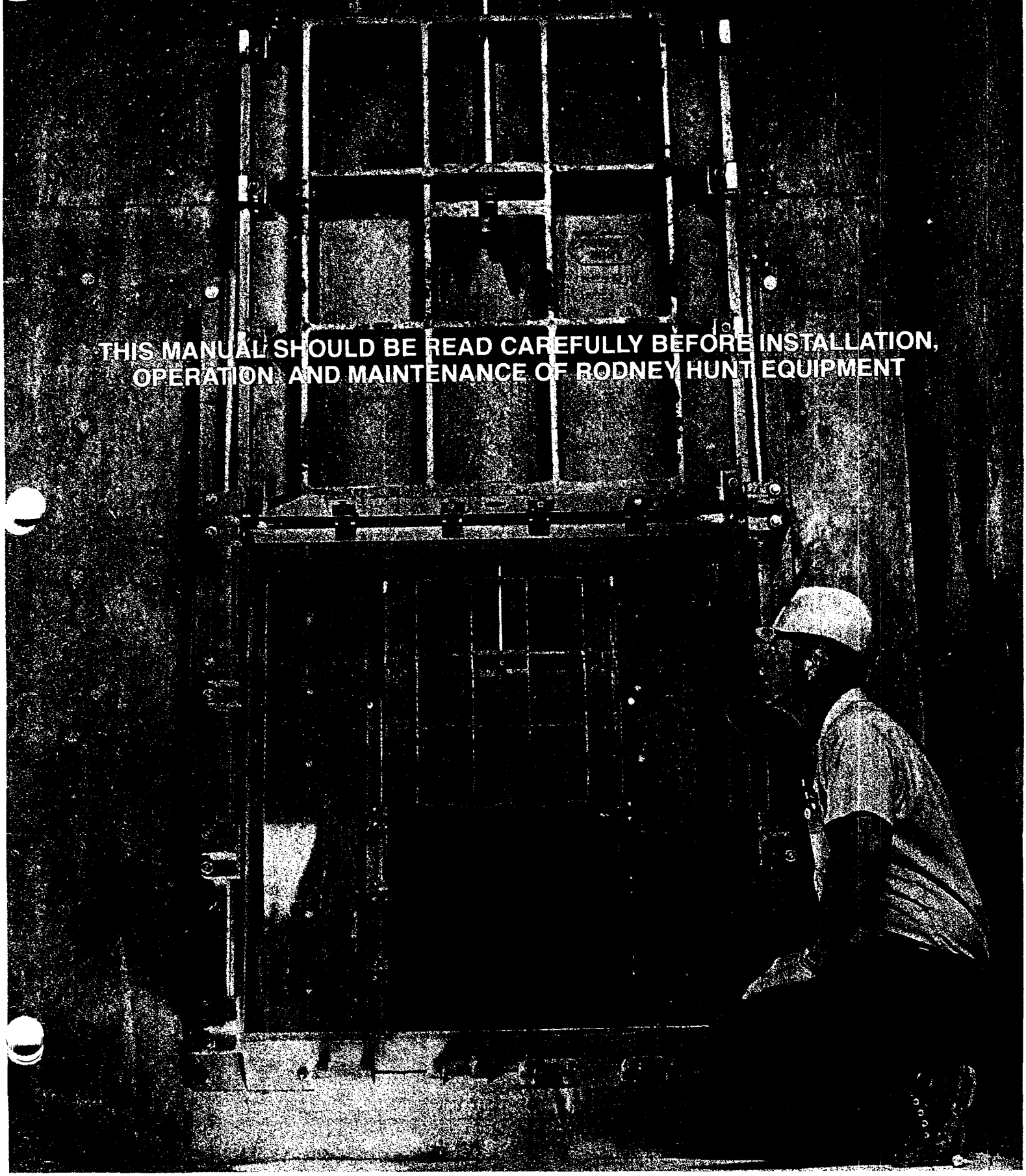
Item #/Drawing #	Cust. Qty.	File Qty.	Other Qty.	Comments/Status
E-56828	6	1	1	LOW LEVEL OUTLET
E-49497	↓	↓	↓	WORKS - SLUICE GATE
E-44635-03				↓
E-56830				
E-56829				
F-9330C-15				
ENG. CALC. (2 PGS)				
01034/-2 (2 PGS)				
TECH. DATA SHT. AMERLOCK 400				PAINT
TECH. DATA SHT. AMERCOAT 450 HS	↓	↓	↓	↓
AFFIDAVIT OF COMPLIANCE	3	1	1	
WCE 82-4	6	0	0	OPERATION AND MAINTENANCE MANUAL

Internal Handling and Transmittal Processing Notes:

RODNEY HUNT

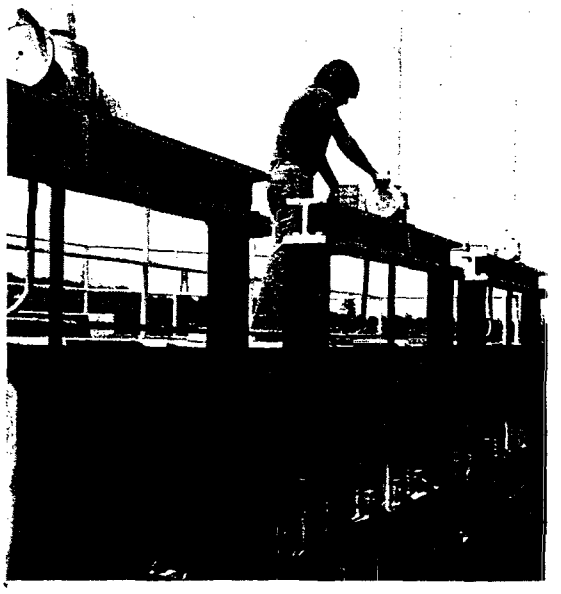
Instruction Manual

SLUICE GATES, GLYDASEAL GATES AND SLIDE GATES



THIS MANUAL SHOULD BE READ CAREFULLY BEFORE INSTALLATION, OPERATION, AND MAINTENANCE OF RODNEY HUNT EQUIPMENT

TABLE OF CONTENTS



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Rodney Hunt Company
Orange, Massachusetts

The information herein is, to our knowledge, true and accurate. However, Rodney Hunt Company makes no warranties or representation, expressed or implied, other than those set forth in the specifications of a formal quotation. No agent, representative or employee of this company is authorized to vary the terms of this notice.

Introduction

This manual describes the recommended methods of installation, adjustment, initial operations, maintenance and safety precautions for Rodney Hunt sluice gates, slide gates, operating mechanisms and related equipment. It should be used in conjunction with approved drawings provided by the Rodney Hunt Company.

The information in this manual pertains to most Rodney Hunt gates. However, there are special installations which require more specific information. In these cases a special set of instructions is forwarded to the gate user before installation.

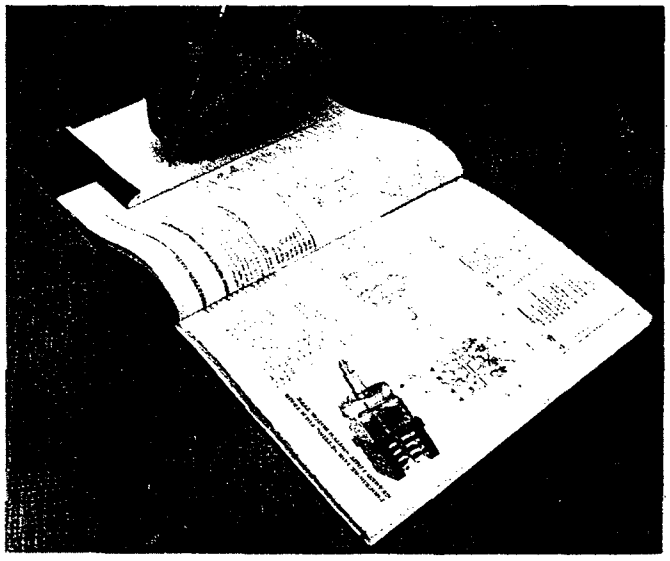
Rodney Hunt sluice gates have been designed and manufactured to result in a nearly watertight closure. Before leaving the Rodney Hunt plant, equipment is inspected and the gate wedges are properly adjusted.

These precautions result in gates with low leakage characteristics. However, great care must be used in the handling, storage and installation of Rodney Hunt sluice gates to insure that they will operate as designed, and with maximum watertightness.

Rodney Hunt slide gates have also been designed and manufactured to meet your specific requirements.

The information in this manual is intended only as a recommendation for the proper and satisfactory installation of our equipment. Rodney Hunt Company assumes no liability, expressed or implied, for the interpretation of the recommendations or the faulty installation of the gates. Its responsibility is limited to defects in manufacturing rather than installation, adjustment and related problems subsequent to manufacturing.

This installation drawing is typical of many sent to the contractor long before sluice gates are cast.



Special instruction manuals for intricate systems and components are also prepared for the contractor.

Handling and Storage

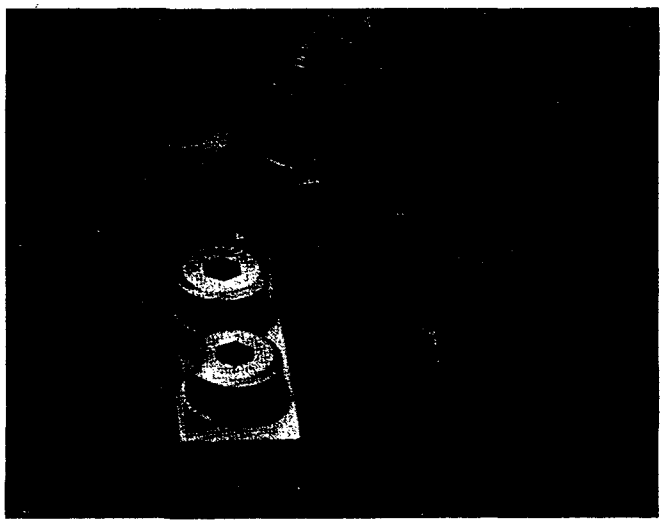
For Safety

To prevent personal injury or equipment damage, follow standard safety procedures when handling equipment and be sure rigging equipment is properly placed and in safe working condition.

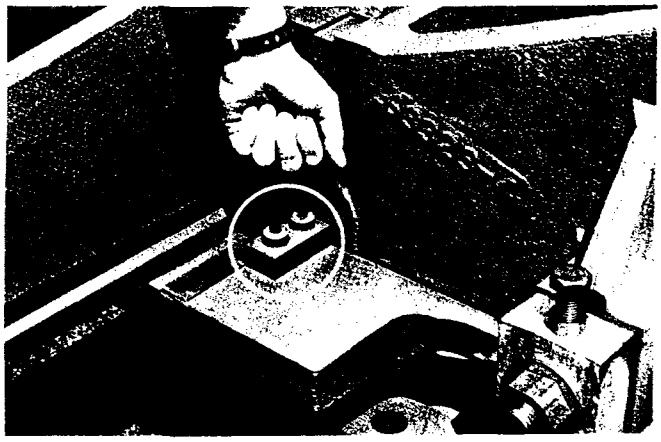
Although Rodney Hunt sluice gate equipment is durable and heavily constructed, there are precision-machined seat and wedge facings which require a great deal of attention and care when being installed. Stem threads and hoists have precision surfaces that should be protected from damage.

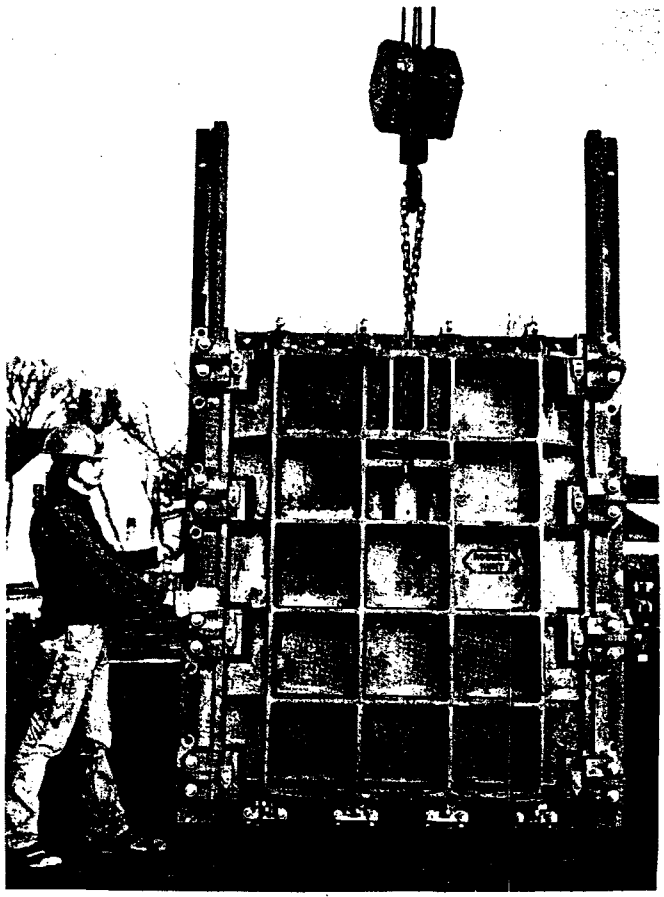
Sluice gates are provided with locking plates to hold the disc firmly in place in the guides during shipping and installation. **Gates can be lifted by a chain or sling through the stem hole in the disc only when locking plates are in place.** Locking plates have been designed to withstand normal lifting stresses. When lifting gates, take special care to protect machined surfaces and wedges. **Locking plates must be removed before opening gate.**

Equipment should be stored on planks or timbers over an even surface to keep them off the ground and to prevent distortion. Equipment should also be covered



Locking plates are positioned above the disc or between the disc and guide on either side of the frame.

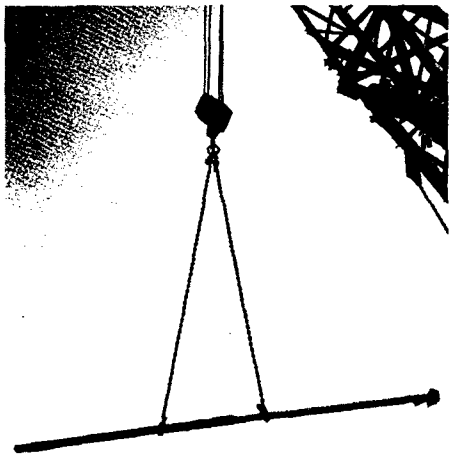




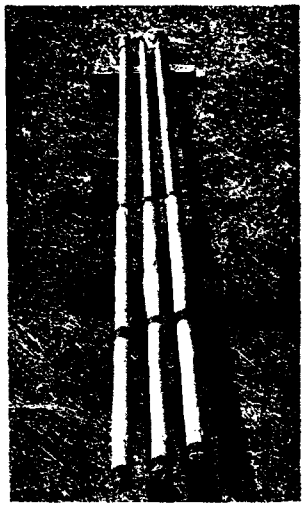
Sluice gate is properly lifted by the stem hole in the disc as long as locking plates are in place.

to protect seat facings and other machined surfaces from foreign matter. Where there are a number of medium or small gates and where storage space is limited, it may be necessary to stack the gates. Sluice gates should not be stacked more than three high, and then, only with heavy timber blocking placed between the gates to prevent damage to gates.

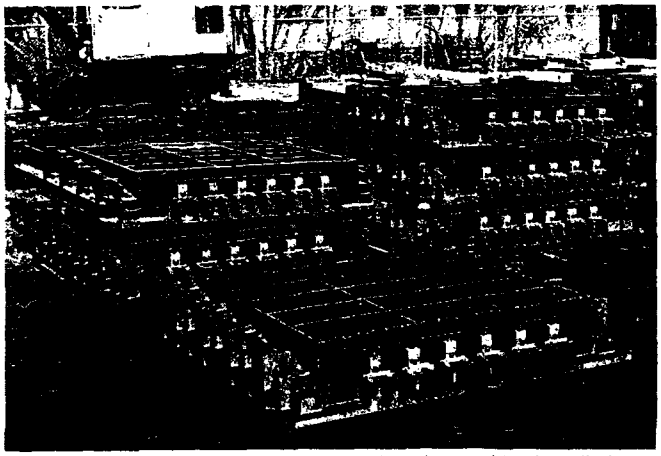
To prevent bending when lifting, handling and storing, stems should be supported over their full length. They should be stored carefully only on an even surface in a clean, dry area. The threaded portion of the stem is protected by a heavy fiber cover which should not be removed until the stem is ready for installation. Couplings and thrust nuts are shipped in place on the stems and should be removed prior to installation. Stop collars are normally shipped in a bag or box accompanying the floor stands. Operating mechanisms should be handled and treated as precision machinery and protected accordingly. Refer to page 29.



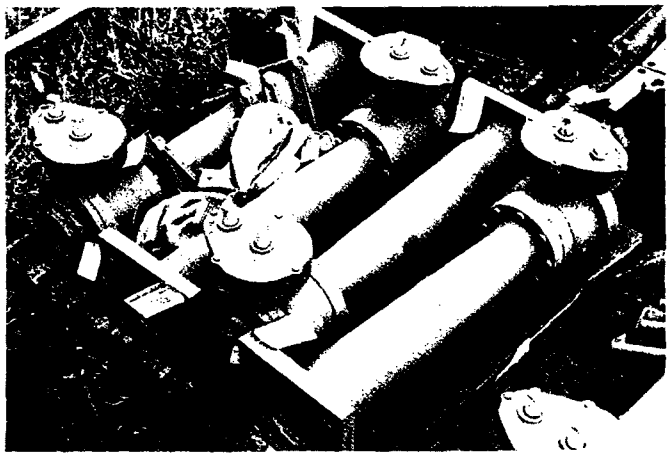
Note how stem is carefully supported when lifted.



Stems are supported evenly and kept off the ground.

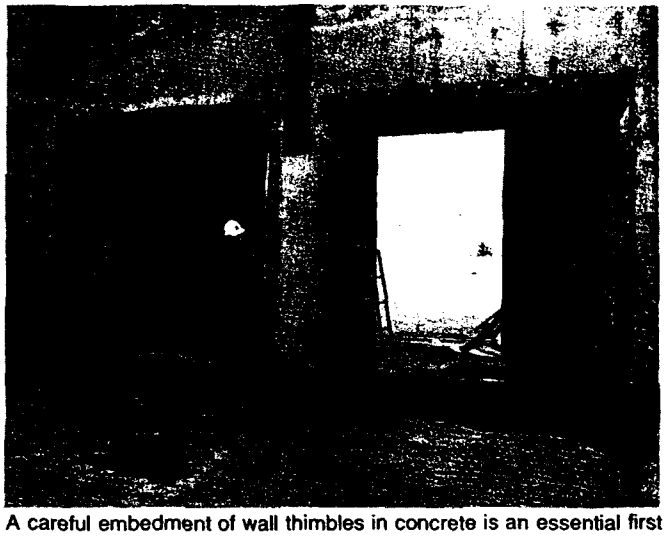


Gates and Hoists stored at the construction site awaiting installation.



Installation

The most important single aspect of a sluice gate installation is the correct placement of the embedded items in the concrete. If these embedded items are accurately and carefully located and held in place during the concrete pour, a proper sluice gate installation is practically assured.



A careful embedment of wall thimbles in concrete is an essential first step in a proper gate installation.

Items Embedded in Concrete

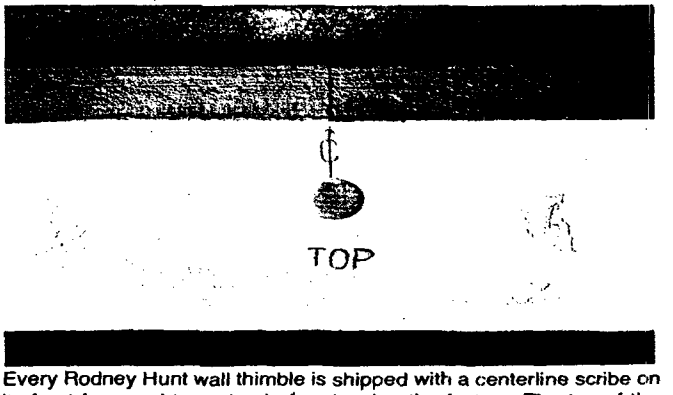
WALL THIMBLES

1. The front face of all Rodney Hunt thimbles .... rectangular, square and circular .... are marked on vertical and horizontal centerlines. The centerline marks are also placed on the outer edge of the mounting flange of the wall thimble so that they can be seen after the thimbles are bolted to the forms.

2. Wall thimbles should be set with the top mark up and top and bottom centerline marks plumb.

3. After being set at the proper elevation, the wall thimble must be internally braced to carry the weight of the concrete. Care should be used in placement of the braces so as not to distort the wall thimble. Gate attaching holes and hardware will be misaligned if the wall thimble is distorted.

4. The wall thimble should be firmly supported on the form. The studs and nuts furnished with the thimble can be used for bolting the thimble in place. Forms should be supported and stiffened against movement. If forms move they will distort the wall thimble mounting flange, and the sluice gate will leak.



Every Rodney Hunt wall thimble is shipped with a centerline scribe on its front face and top edge before leaving the factory. The top of the thimble is clearly marked. In this way, thimbles can be mounted and aligned quickly into position during installation.

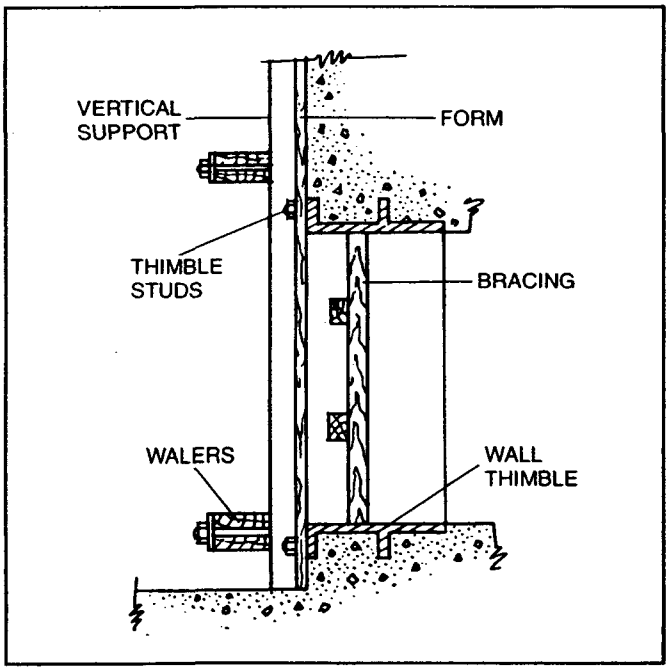
5. The tapped holes in the face of the wall thimble must be plugged or capped to prevent concrete from entering the holes. Rodney Hunt furnishes wall thimbles with plastic caps in the ends of each tapped hole. These caps should be left in place until the thimble is cast in the concrete and the gate is prepared for installation. The caps are easily removed by puncturing with a screw driver.

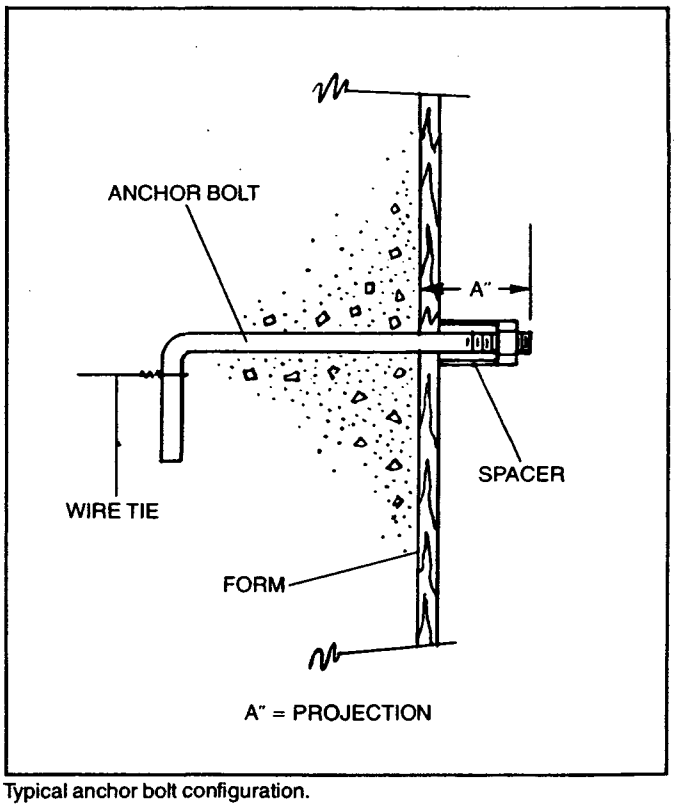
6. Where the depth of the wall thimble and thickness of the wall are the same, care is taken to maintain the length of the thimble within acceptable tolerances. This prevents distortion of the forms or the necessity of blocking the area between the casting and the forms.

7. After the concrete has hardened and the forms removed, the front surface of the wall thimble should be thoroughly cleaned. Make sure to remove any concrete that has flowed onto the surface from the edges. Care should be taken to prevent damage to machined surfaces. The front flange of each Rodney Hunt wall thimble is purposely oversized to minimize this problem.

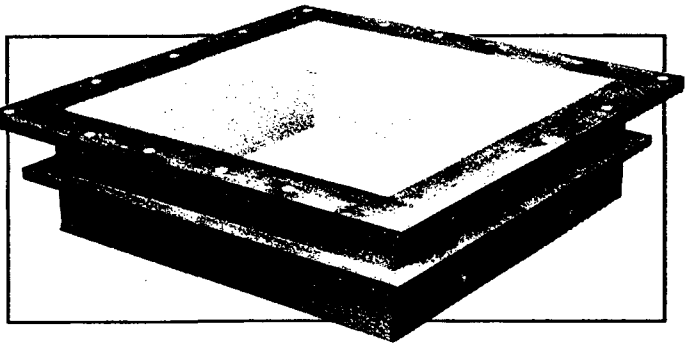
ANCHOR BOLTS

Anchor bolts may be furnished for mounting gates, supporting the upper gate guides, or mounting stem guides and hoists. The location and projection of the anchor bolts are shown on the installation drawing. Anchor bolts should be placed in the holes drilled in the forms at locations indicated on the drawings. The hook ends of the anchor bolts should then be wired to the opposite form or to reinforcing rods to hold the bolts firmly in place.



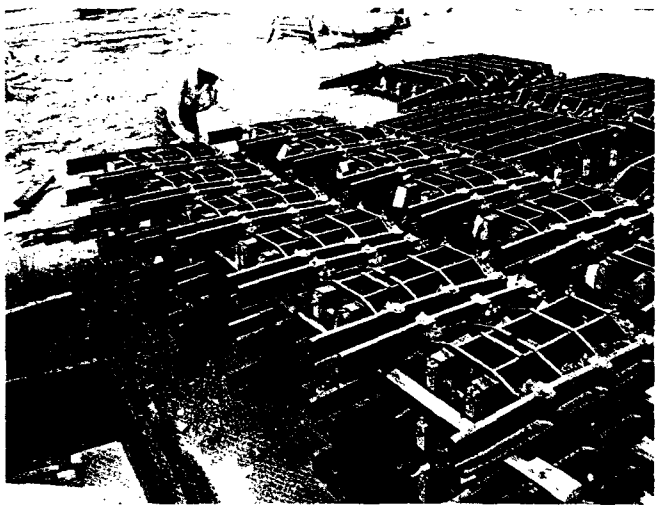


Typical anchor bolt configuration.



Rodney Hunt wall thimbles are furnished with plastic cap plugs in the mounting holes to prevent damage to threads and to keep concrete out of the holes.

A sluice gate should be set on wall thimble studs or anchor bolts as a complete unit. It is essential that the gate disc be firmly wedged in the closed position so that the unit will be held rigid to prevent distortion. The sluice gate can be lifted by the stem hole in the disc only when the locking plates are in place. In this way, the gate will hang nearly vertical.



Gates, properly stacked, await installation on a construction site.

Sluice gates leaving Rodney Hunt are well secured and protected against in-transit damage.

INSTALLATION ON WALL THIMBLES

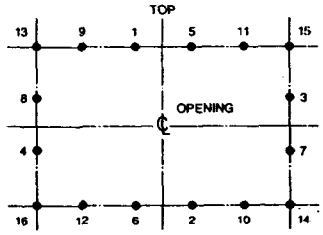
1. The face of the wall thimble should be thoroughly cleaned and all wall thimble studs in place. Care should be taken to prevent damage to machined surfaces. The plastic plugs in the bolt holes are easily removed by puncturing with a screwdriver.

2. A gasket should be provided between the surface of the wall thimble and the mounting flange of the sluice gate. A butyl rubber mastic is normally supplied with Rodney Hunt gates for this purpose and should be applied in accordance with the label directions.

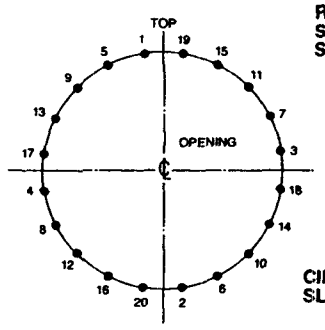
3. If gasket material other than mastic is used, it should be installed over the studs to provide a smooth mounting surface for the gate. If the gasket is other than one piece, the dovetailed gasket joints should be aligned in accordance with the match markings and cemented with a liquid-type gasket material. When applying gasket materials, care should be taken to insure that excessive amounts of lumpy, dried materials are not present when the sluice gate is drawn tightly to the wall thimbles.

4. The mounting flange of the sluice gate should be thoroughly cleaned. Care should be taken to prevent damage to machined surfaces.

5. The gate can then be lifted and set over the studs, and nuts put in place and tightened. The sequence of tightening should be as indicated in the drawings below. Nearly equal torque should be applied to all nuts so that the gate is firmly and evenly tightened to the mounting flange without distortion.



RECTANGULAR OR SQUARE OPENING SLUICE GATE



CIRCULAR OPENING SLUICE GATE

INSTALLATION WITH ANCHOR BOLTS

Where sluice gates are mounted on anchor bolts it is recommended that 1" of grout be placed between the mounting flange of the gate and the concrete wall. The projection of the anchor bolts shown on the installation drawings includes provisions for this 1" of grout.

1. All anchor bolt threading should be checked to make sure that threads are undamaged.

2. The gate should be lifted and put in place over the anchor bolts. Attach nuts.

3. Shims should be placed between the back flange of the sluice gate and the concrete wall in sufficient number so that the gate can be firmly tightened against the shims without distortion.

4. With the gate flange located approximately 1" from the wall, a non-shrink grout should be placed between the flange and the concrete wall.

5. After the grout has hardened, the shims can be removed and the nuts further tightened so that the gate is firmly in place against the grout.

UPPER GATE ANCHOR BOLTS

1. Anchor bolts required to support the upper gate guides must be positioned in forms at the time the concrete is poured.

2. These anchor bolts are provided with double nuts so that upper gate guides can be firmly clamped in position. **The back-up nuts must be placed on the anchor bolts before the gate is installed.**

The gate should not be bolted directly to an uneven surface. Even a very small amount of gate distortion will cause excessive leakage.

INSTALLATION ON PIPE FLANGES

1. Where sluice gates are mounted on cast-iron pipe flanges, the procedure is the same as when the gate is mounted on a wall thimble.

2. Where the gate is being mounted on a steel flange that has been welded to a pipe or adaptor, the front surface of the pipe or adaptor will not be sufficiently flat unless it has been machined after welding.

A. The gate should be bolted loosely to the flange so that surfaces touch. Be sure that neither surface is distorted. A feeler gauge should be used to check the clearance completely around the periphery of the gate.

B. Leakage may occur if the distortion is more than 0.010 when the two surfaces are bolted together.

C. By using a thick fibrated mastic between surfaces, it may be possible to prevent leakage between flanges. In no case should the gate flange be firmly tightened against a flange that is not flat.

D. If the spacing is very large, the gate should be shimmed a small distance away from the flange. Space between the flanges can be caulked with lead wool. This will allow the gate to be tightened to the steel flange without distortion or leakage between the flanges.

Consult the factory for assistance if the flange on which the gate is to be installed is not flat and the gap between the gate flange and the mounting flange is excessive.

NUT TIGHTENING TORQUE

Proper tightening of nuts on anchor bolts or studs holding the sluice or slide gate to the wall or wall thimble may prevent serious problems in operation or performance of the gate. Tabulated below are recommended torque values for common fastener sizes.

*DIAMETER (in.)	TORQUE (ft.-lb.)
1/2	35
5/8	75
3/4	100
7/8	150
1	200

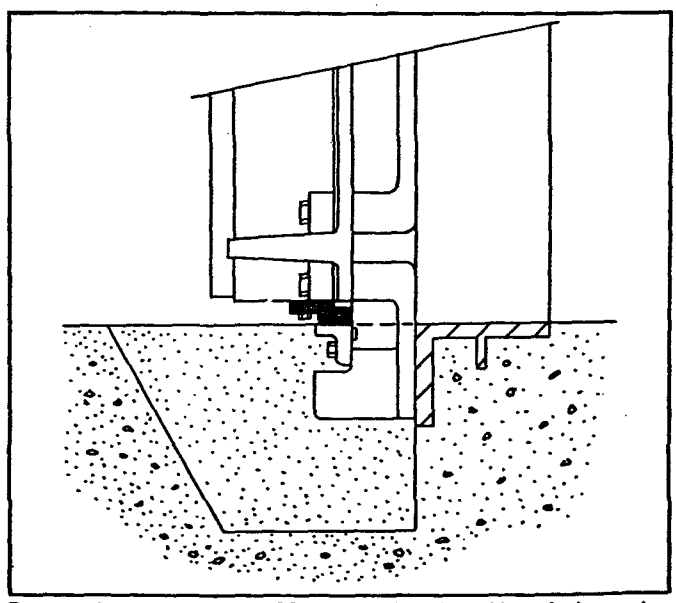
*Consult with factory for sizes not shown.

HY-Q® SLUICE GATE

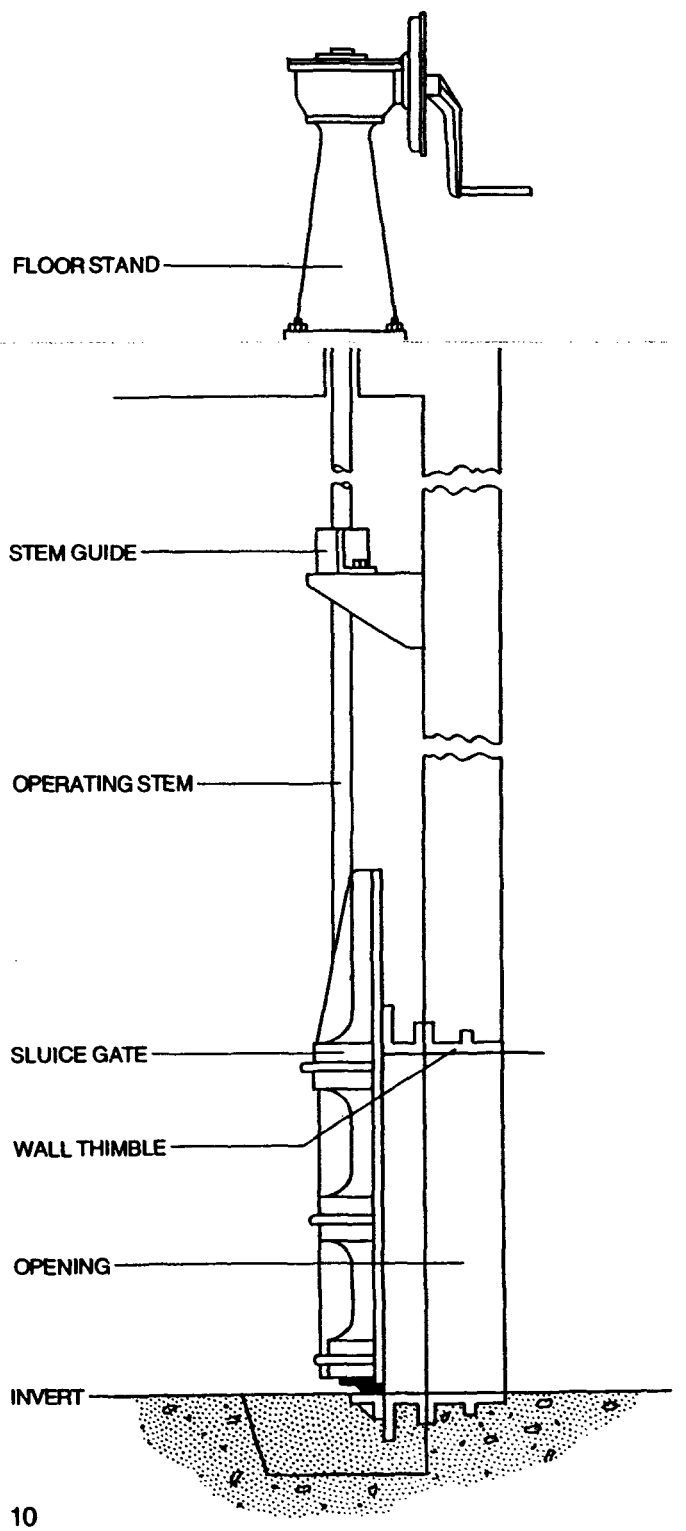
Hy-Q flush-bottom sluice gates are installed in the same manner as conventional gates. However, after the gate has been installed it is necessary to fill the cut-out, or recess, which has been left beneath the gate. It can be filled with asphalt surfacing material which packs firmly, or concrete which contains sawdust or vermiculite. The recess should be filled level with the floor of the chamber and with the top of the cast-iron stop bar on the sluice gate.

The stop bar must be thoroughly cleaned after installation and prior to use.

The flush-bottom closure gate must not be supported in the open position by blocks placed beneath the resilient seal, since damage to the seal may occur.



Recessed area beneath HY-Q® gate can be filled with surfacing material or concrete.



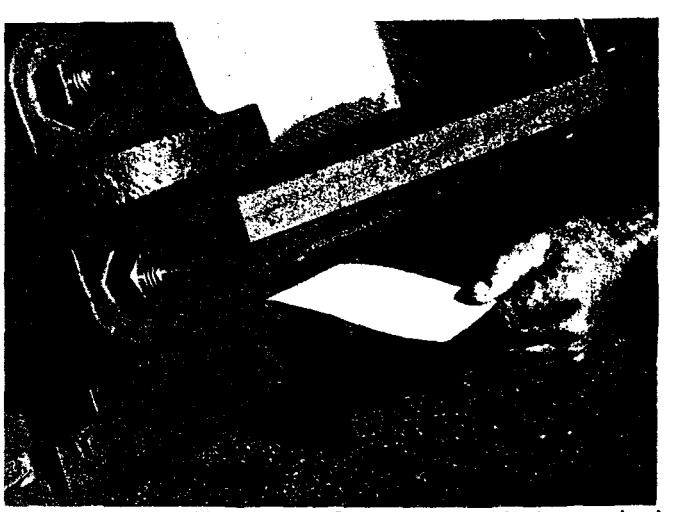
The Hy-Q sluice gate is different than conventional gates in that it uses a heavy resilient strip on the bottom of the disc rather than wedges. It is generally used to eliminate the need for vertical walls or pockets on the invert surface which might otherwise impede flow. It makes an extremely effective invert seal when compressed against the stop bar attached to the gate frame. A typical installation of a Hy-Q sluice gate with flush bottom closure is shown in the diagram at left. Care should be taken to insure that the resilient seal is not damaged by blocks which might be used to keep the gate open or by concrete or debris on the stop bar.

Installation of Hy-Q Sluice Gates

Setting wedges on Hy-Q sluice gates requires a slightly different procedure than conventional gates.

First loosen all wedges so there is no contact between the wedges and wedge seats. Using the operating mechanism, the gate disc should be lowered to compress the resilient seal to the degree required for proper sealing. After the resilient seal is compressed, wedges should be adjusted as described on pages 12 and 13.

The wedges on Hy-Q gates can be overtightened, and this should be avoided. Setting the wedges too tightly will tend to raise the gate disc and allow leakage beneath the seal. When properly set, there should be less than 0.004 inches clearance between the seat facings at the top and sides. The bottom seal should firmly clamp a sheet of paper in place against the stop bar at any point along the invert.

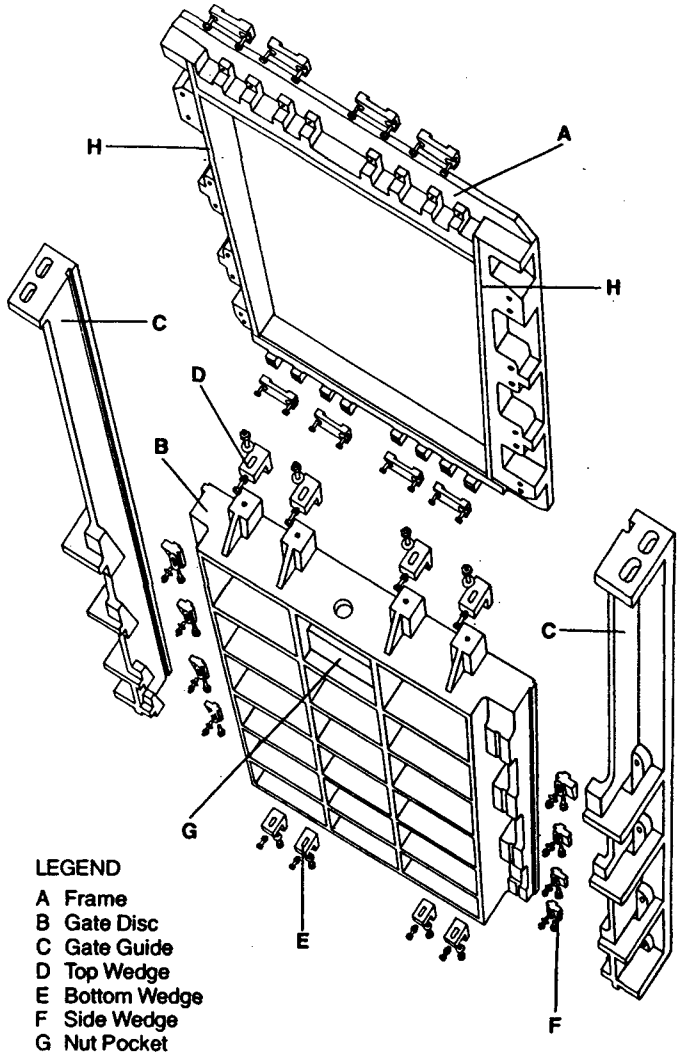


When properly set, this bottom HY-Q seal should firmly clamp a sheet of paper in place against a stop bar at any point along the invert.

Conventional Sluice Gates

These illustrations show how a conventional Rodney Hunt sluice gate is assembled and disassembled with parts keyed to a legend for identification. Conventional Rodney Hunt sluice gates are essentially the same design as the Hy-Q gate, but without the resilient seal and stop bar. Both types of gates are available as self-contained units with yokes. Large and special gates are often shipped partially disassembled. Match markings should be carefully noted when gate and components are assembled.

These self-contained gates are supplied with rising stems so the stem threads can be kept out of water. They are operated by a bench stand mounted on a yoke. Unlike conventional gates, the guides of self-contained gates are longer to fully support the yoke and the disc in the open position.



LEGEND
A Frame
B Gate Disc
C Gate Guide
D Top Wedge
E Bottom Wedge
F Side Wedge
G Nut Pocket
H Seat Facing

Field Adjustment

It is not unusual to have to make minor wedge adjustments on sluice gates after installation. Electric operator "open" and "close" limit switches must always be set after installation. **These adjustments are the responsibility of the installing contractor unless specifically included in the purchase order.**

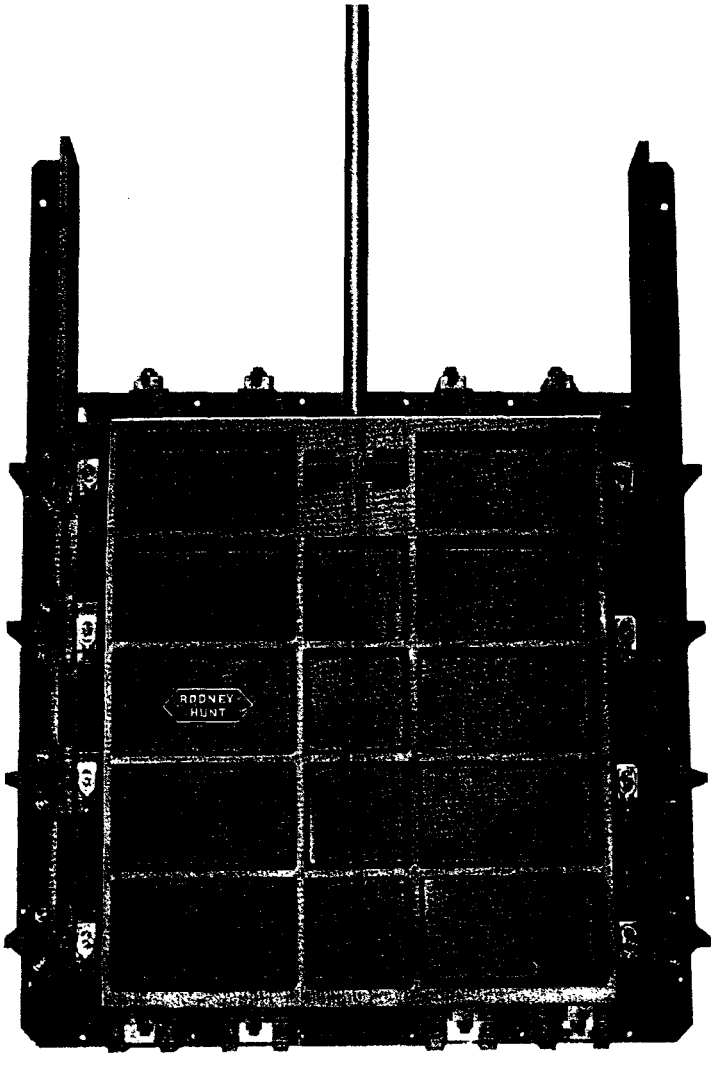
SLUICE GATES

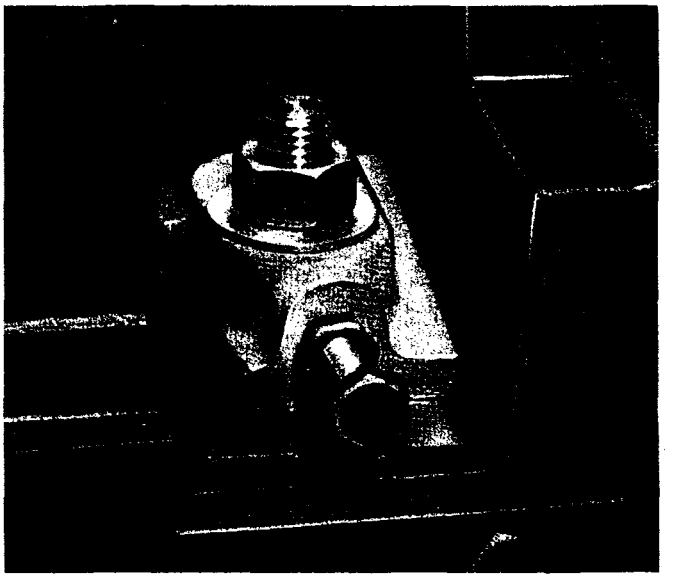
Before a sluice gate is shipped from the factory the adjustable wedges are properly set. However, vibration in the handling and shipping of the gate can loosen or change the setting of the wedges and resetting may be required after installation. The procedure for correctly setting the side, top and bottom wedges is as follows:

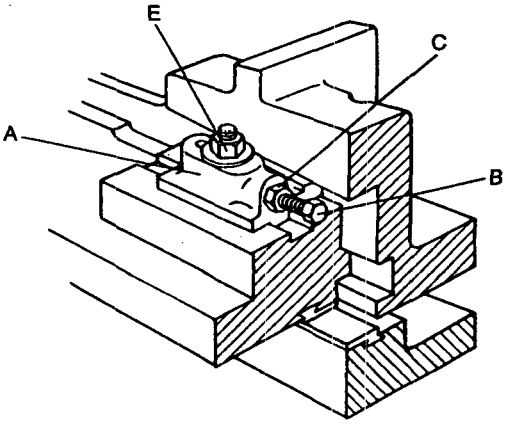
SIDE WEDGES

1. Loosen nuts clamping all wedges in place (E).
2. Loosen lock nuts (C) on bronze adjusting screws (B) and back screws out several turns.
3. Close gate so that horizontal seat facing on disc is aligned with horizontal seat facing (D) on frame.
4. Tap wedges (A) downward into position with light hammer blows until all wedges are evenly tightened.
5. Tighten adjusting screws (B) to bear against studs.
6. Tighten adjusting screw lock nuts (C).
7. Tighten nuts (E).

CAUTION!
When working around the sluice gate in the open position, care should be taken to insure that the disc is securely supported.







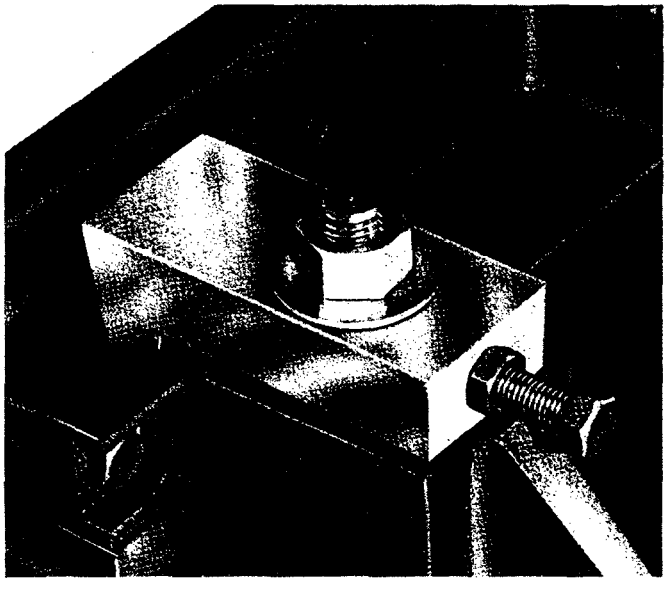
TOP WEDGES

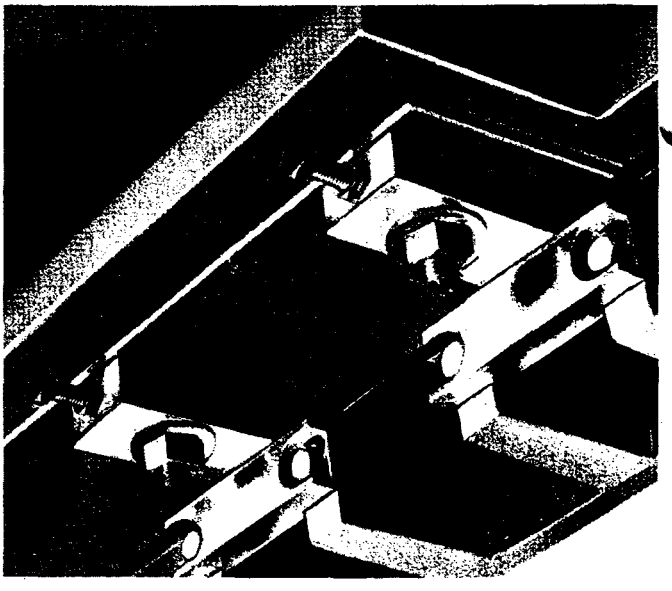
1. Loosen nuts (E) clamping wedges in place sufficiently to allow wedges to slide.
2. Back adjusting screw lock nuts (C) away from wedges.
3. Tighten adjusting screws (B) until desired wedge tightness is reached.
4. Simultaneously tap wedges (A) with hammer directly over the wedge seats to assure that wedges do not deflect.
5. Tighten nuts (E) clamping wedges in place.
6. Tighten adjusting screw lock nuts (C) against wedges.

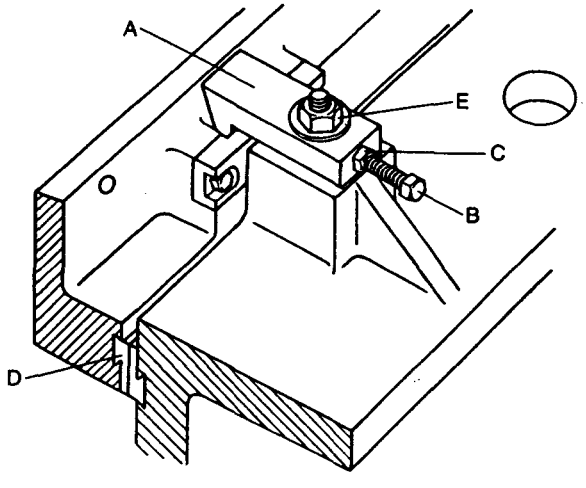
BOTTOM WEDGES

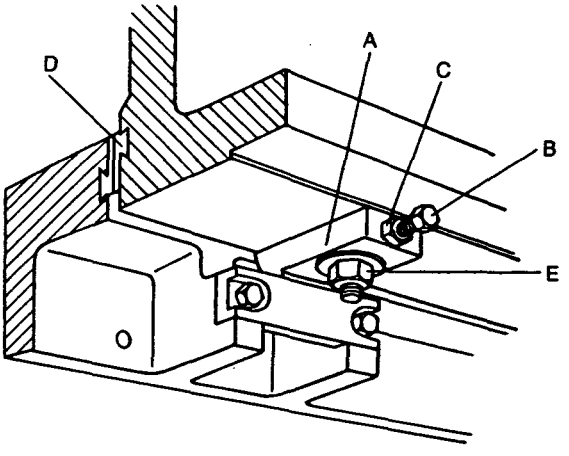
1. Loosen nuts (E) clamping wedges in place sufficiently to allow wedges to slide.
2. Back adjusting screw lock nuts (C) away from wedges.
3. Turn adjusting screws (B) until desired wedge tightness is reached.
4. Tighten nuts (E) clamping wedges in place.
5. Tighten adjusting screw lock nuts (C) against wedges.

When the wedges are properly set, the clearance between the seat facings on the disc and frame should not exceed 0.004 inches. Each wedge should be tightened to the same degree. When tightening adjusting screws, do not use a wrench larger than 8 inches in length.









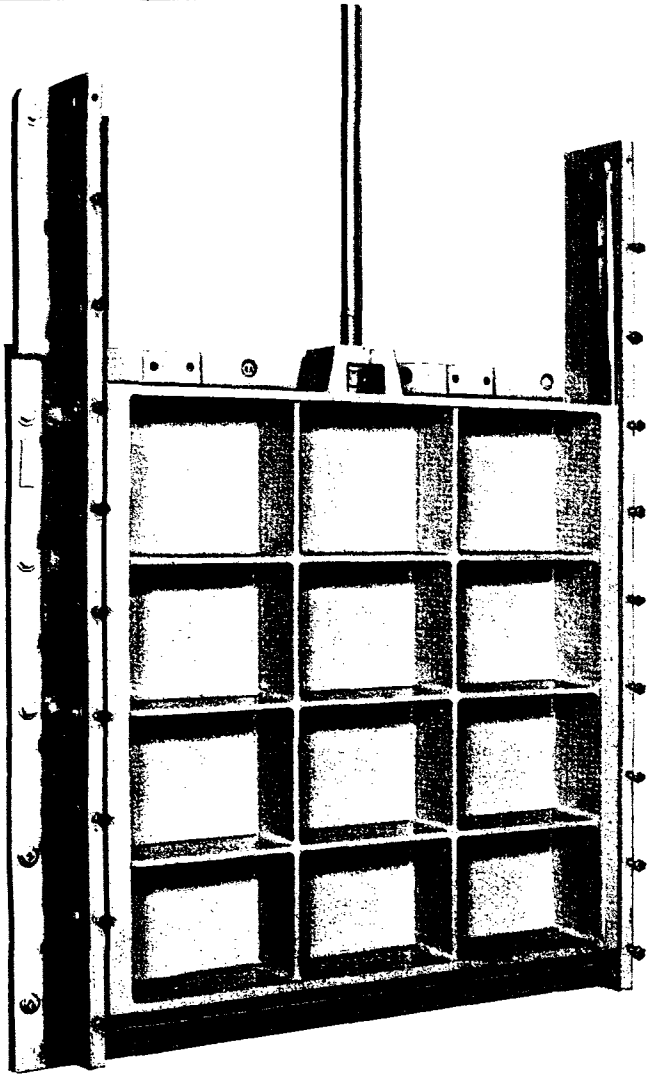
GlydaSeal

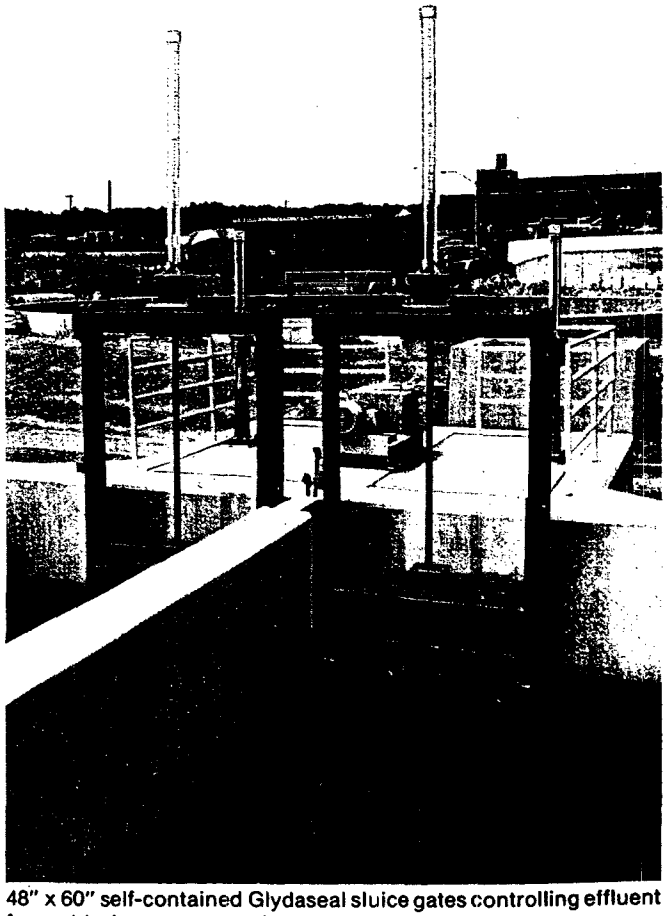
Glydaseal Gates

The Rodney Hunt Glydaseal sluice gate is a well designed, heavily constructed gate suitable for many years of excellent performance with very little leakage. However, it has precisely machined surfaces and well matched seat facings that are essential for its low leakage performance. The care with which this equipment is handled, stored and installed has an important bearing on how well the gate will perform in service.

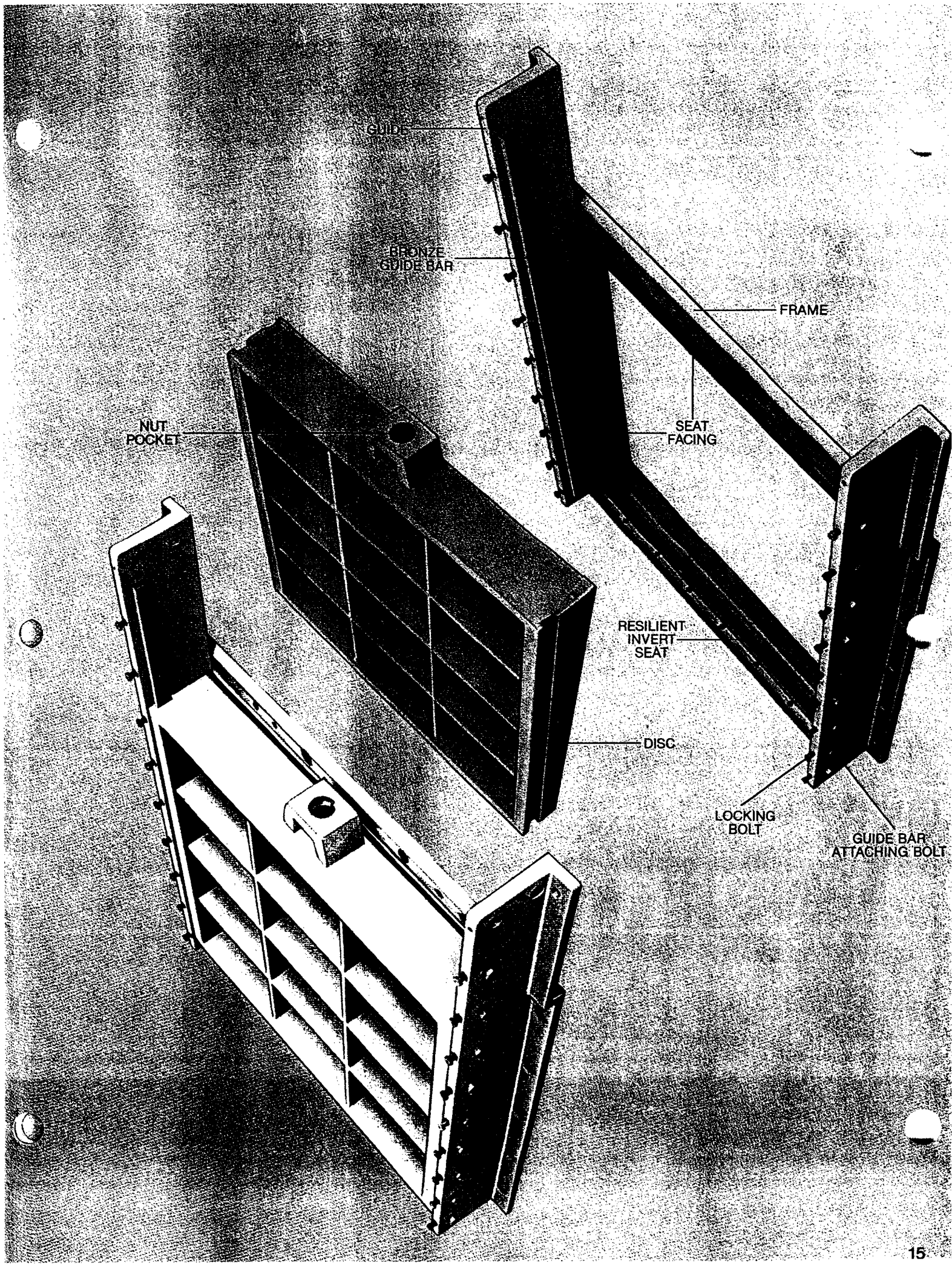
The instructions for the proper handling, storage and installation of the Glydaseal gate are the same as for a conventional sluice gate. These are described in this Rodney Hunt Instruction Manual.

Adjustment of the Glydaseal gate differs from standard sluice gates, and these instructions should be followed closely if adjustments are required.





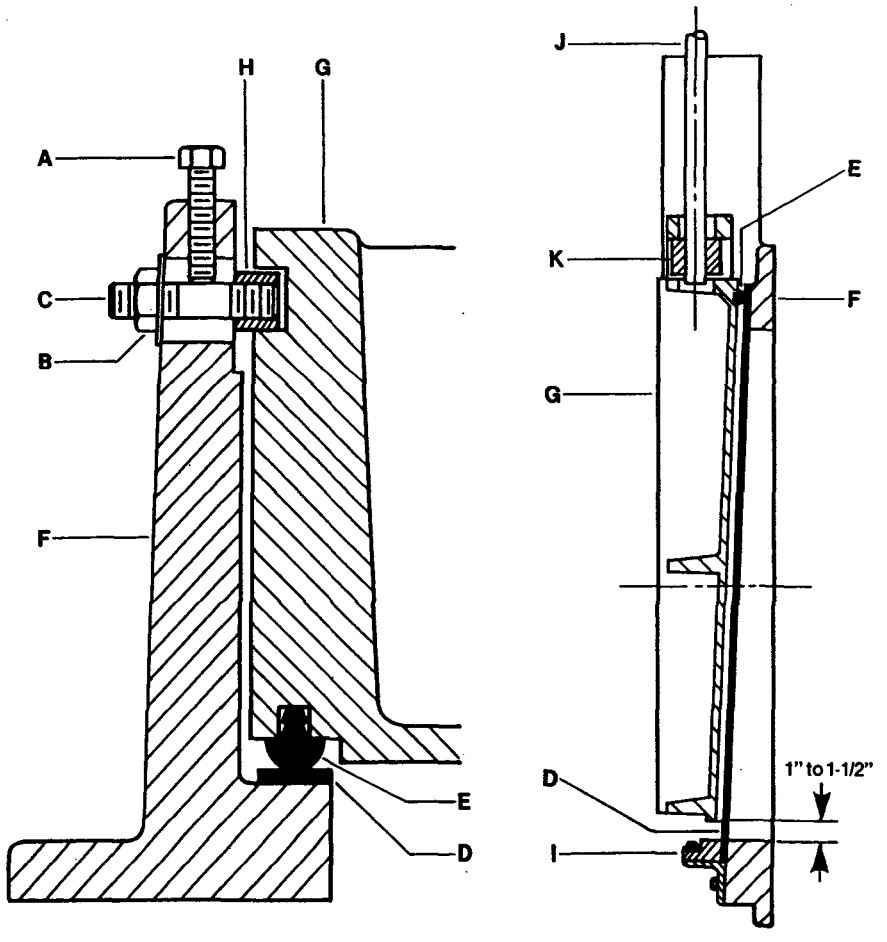
48" x 60" self-contained Glydaseal sluice gates controlling effluent from chlorine contact tank.


GUIDE
BRONZE GUIDE BAR
FRAME
NUT POCKET
SEAT FACING
RESILIENT INVERT SEAT
DISC
LOCKING BOLT
GUIDE BAR ATTACHING BOLT

Gydaseal Gate Installation

This Instruction Manual describes the installation of conventional sluice gates. All of the same directions should be followed for installation of the Glydaseal gate. However, there are four instructions that should be followed closely for the successful performance of the Glydaseal sluice gate.

1. The locking plates that hold the disc to the frame and prevent it from opening must be removed prior to opening the gate. These are located at the top edge of the disc.
2. Concrete or foreign matter must be removed from the top of the gates, from the PVC seat facings on the frame and the seal on the disc. These surfaces must be clean to insure that they are not damaged during initial operation.
3. The guide bar studs (C) should not project beyond the guide bar.
4. If the Glydaseal is to be field painted, the seal, the PVC seat facing, the bronze bar and the guide bar groove in the disc should be well masked to exclude paint from those surfaces.



LEGEND

A	Hex Head Cap Screw
B	Hex Nut
C	Guide Bar Stud
D	PVC Facing
E	Disc Seal
F	Frame
G	Disc
H	Guide Bar
I	Flush Bottom Seal
J	Stem
K	Thrust Nut

Glydaseal Gate Adjustment

All Rodney Hunt Glydaseal gates are carefully checked and adjusted at the factory prior to shipment to assure that they meet the specified leakage requirements. Further adjustment in the field will normally not be required, and no adjustment should be undertaken unless there is clear evidence that the seal attached to the disc is not contacting the PVC facing attached to the frame when the gate is fully closed. This can be determined by trying to place a feeler gauge between the disc seal and PVC seat facings (D and E) with the gate in the fully closed position.

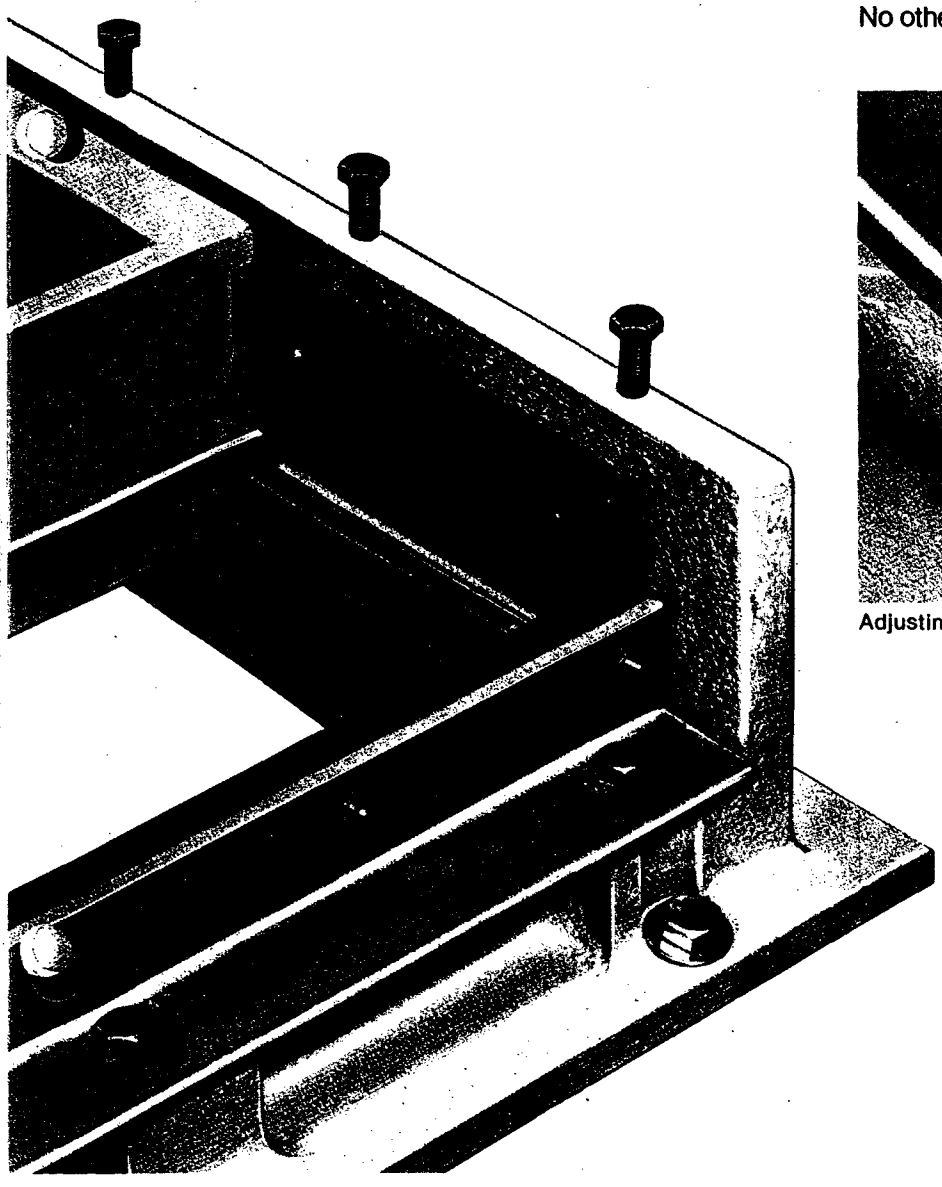
Any adjustment should be made when the water level is below the invert of the gate.

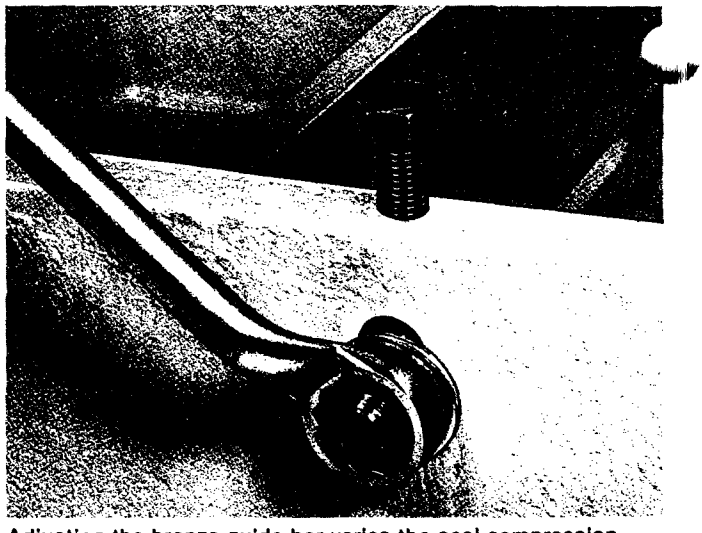
If adjustment is necessary, the following procedures should be followed:

1. Raise the gate disc (G) 1" to 1-1/2" above the flush bottom seal (I).
2. Loosen the guide bar hex-head locking screw (A) on each side of the gate.
3. Loosen the hex-nut (B) on each side of the frame.
4. Re-tighten the hex-head screws (A) against the guide bar studs until the disc seal (E) is in contact with the PVC seat (D). The adjustment of each screw should be made a small amount at each time and alternate between the sides of the gate to distribute the load evenly.
5. With a feeler gauge determine that the disc seal is in touch with the PVC seat across the top and along both sides of the gate.
6. Once the adjustment has been made, re-tighten all hex-nuts (B) along each side of the gate.

The Glydaseal is now ready for use. When the disc is fully closed the disc seal will be compressed the proper amount for low leakage performance.

No other adjustments are required on the Glydaseal gate.





Adjusting the bronze guide bar varies the seal compression.

Slide Gates

INSTALLATION

The most important aspects of a slide gate installation are listed below. If these are accurately followed, a proper slide gate installation is assured. To minimize leakage the seating surfaces of the slide gate frame must be installed **flat.**

WALL MOUNTED SLIDE GATES

The frame must be flat and square, and properly anchored in accordance with the installation drawings prior to grouting to avoid distortion.

EMBEDDED SLIDE GATES

The frame must be well supported to prevent distortion that will cause binding of the slide and leakage.

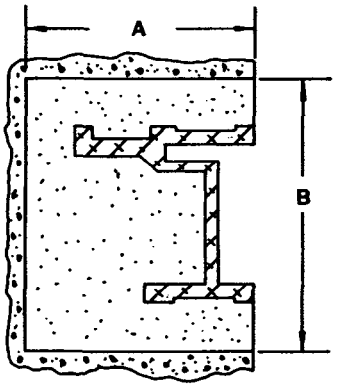
PLATE ABOVE OPENING

When a top seal plate is furnished across the top of the opening, it must be installed flat to prevent leakage.

The following sketches are for "Box-Out" dimensions that are recommended for standard aluminum slide gate applications.

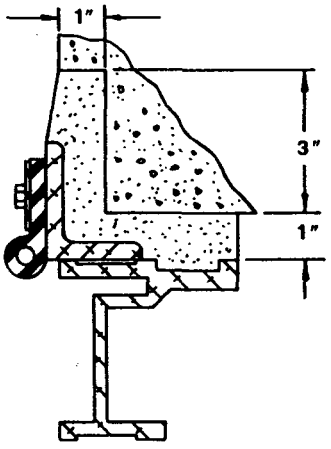
BEFORE OPERATING SLIDE GATES

1. Clean the gate slide, guides, invert and stem of all sand, concrete droppings, paint and other debris.
2. Check to make sure that stem guides and brackets are securely fastened.
3. Clean and lubricate the stem threads.

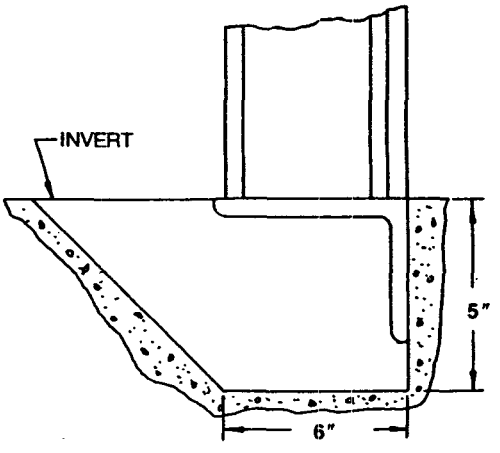


FOR GATES:	A	B
Up to and including 60" wide	5"	5"
Over 60" wide	6"	6½"

EMBEDDED SLIDE GATE (Side Guide)



SPIGOT GATE WITH J-SEAL (Side Guide)



GATE SILL FLUSH INVERT

NOTE: For information regarding: stem guides, hoisting equipment and field service, see sections in booklet under their respective titles.

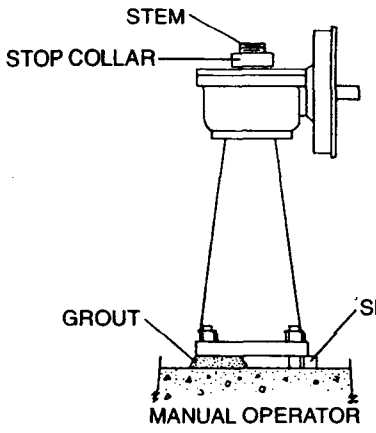
Operating Mechanisms

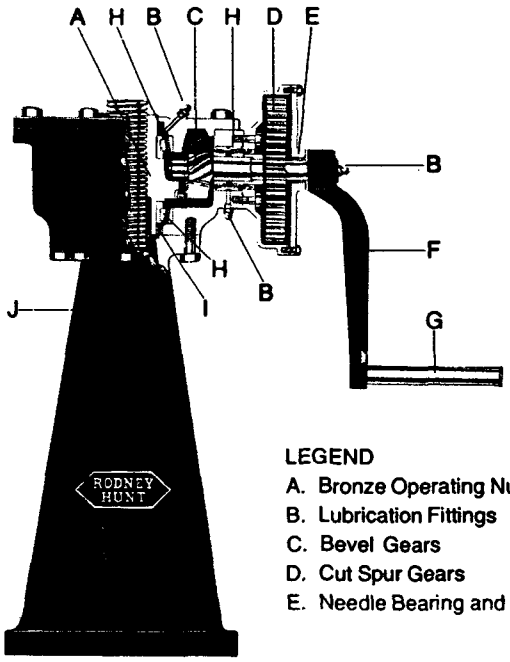
MANUALLY OPERATED FLOOR STANDS

All floor stands and operating devices are identified by a tag showing the installation drawing number and should be used with the proper gate and stem.

1. After the stem has been completely assembled and positioned in place, the manual operator can be lowered onto the stem and turned into position by operation of the handwheel or crank.

2. Shims should be placed between the floor and the operator so that the operator is plumb and the base of the floor stand is approximately 1" above the operating floor. (Illustration below)





LEGEND

A. Bronze Operating Nut
B. Lubrication Fittings
C. Bevel Gears
D. Cut Spur Gears
E. Needle Bearing and Oil Seal
F. Removable Crank
G. Sleeved Grip
H. Tapered Roller Bearings
I. Mechanical Seal
J. Pedestal

3. Approximately 1" of grout should then be placed between the pedestal base and the operating floor.

4. After the grout has hardened, the shims should be removed and the nuts tightened firmly in place.

5. When the operating mechanism has been installed, tension should be applied to the stem by turning the handle or crank in a direction that would normally open the gate. However, the gate should not be opened. The intent is merely to apply tension that will result in a straight stem.

6. The stem guide should be aligned on the bracket with uniform clearance between the stem and the bored hole in the stem guide.

7. Firmly bolt the stem guide to the stem guide bracket. Where there is likely to be vibration because of high head or high water velocity, the guide should be pinned to the bracket. Any loosening of the guide will result in the stem being unsupported. This may cause the stem to be damaged when the gate is operated.

8. The stem should be thoroughly cleaned and lubricated with a heavy duty grease, such as Shell Alvania #2EP or similar heavy duty grease.

9. The stop collar should be threaded onto the stem only after the operator has been installed and the gate is in the fully closed position. Set it so there is approximately $^{1}/_{16}$" of clearance between the bottom of the stop collar and the top of the operator nut. The two set screws should then be tightened to hold the stop collar in place.

10. The crank or handwheel should turn easily. If there is any binding in operation, check to be sure that the stem guides, floor stand and stem are properly aligned. The locking plates on the gate should be removed before the gate is operated.

11. All Rodney Hunt manually operated floor stands are lubricated prior to leaving the factory and do not need lubrication at time of installation.

Operating Mechanisms

ELECTRIC MOTOR DRIVEN FLOOR STANDS

1. After the operating stem has been properly installed, the electric unit is lowered over the top of the stem and turned into place. The handwheel can be used to lower the unit onto its anchor bolts.

2. The unit should be shimmed approximately 1" above the floor so that the operating nut in the unit and stem are properly aligned.

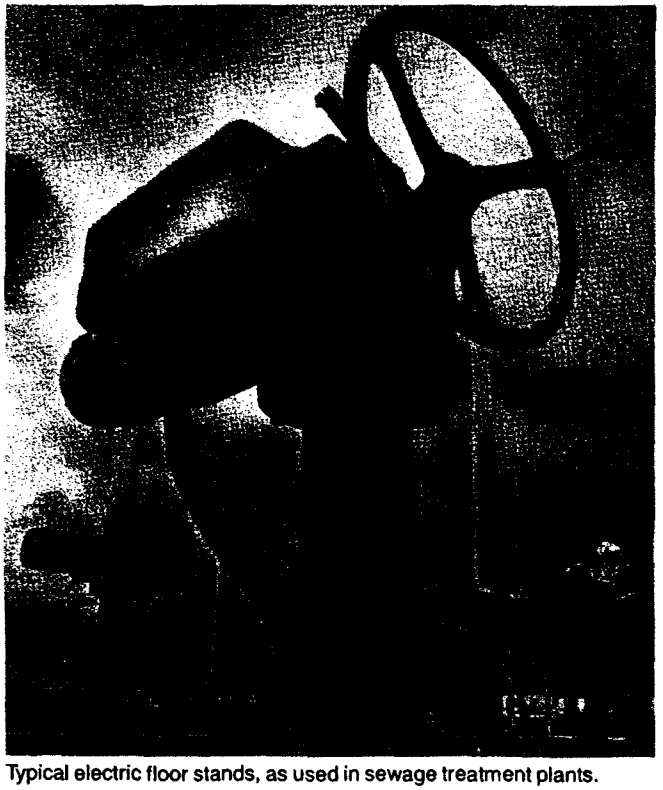
3. Approximately 1" of grout should be placed between the base of the pedestal and the operating floor.

4. The unit should be wired following the wiring diagrams and instructions closely.

5. **The sluice gate should be opened by the manual handwheel at least 3 inches before using the electrical controls.** In this manner, the direction of rotation of the motor can be determined without damaging the stem or hoisting unit.

6. Once the unit has been installed, the manufacturer's directions should be followed closely in setting the closing and opening limit switches. The torque switches have been properly set at the factory and should not need adjustment. Follow the manufacturer's instructions if it appears that adjustment is necessary.

7. For inverted gates refer to page 23 for operating procedures.



Typical electric floor stands, as used in sewage treatment plants.

HYDRAULIC CYLINDER OPERATORS

Hydraulic cylinders should be stored in a vertical position and filled with hydraulic fluid. If it is necessary to store them horizontally for a short period, they should be rotated every two weeks so that the seals are not damaged.

1. Hydraulic cylinders should be mounted on the anchor bolts in such a way that the piston rod and stem are in proper alignment.

2. The coupling between the piston rod and the stem should be screwed into place and locked.

3. Note that the thrust nut of hydraulic cylinder operated gates is round so that it can turn in the thrust nut pocket.

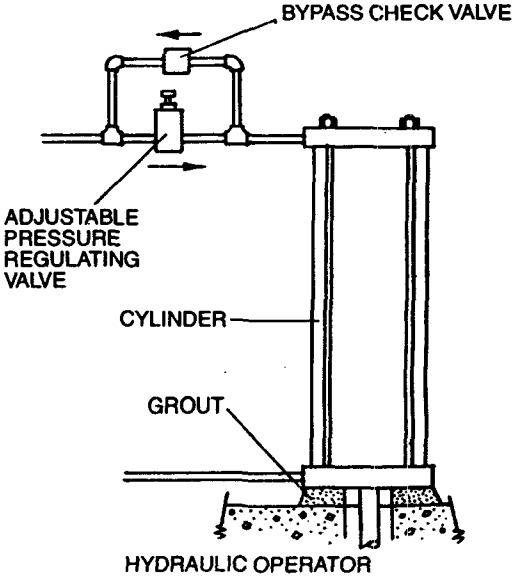
4. With the gate in the closed position, the piston should be lowered so that it is in contact with the bottom head of the cylinder.

5. With the piston in this position, the thrust nut should be adjusted on the stem so that it is in contact with the bottom of the thrust nut pocket. Set screws should be tightened to lock it in place.

In most cases, the top area of the piston is larger than the underside. Therefore, if pressure applied to both surfaces is the same, more force will be applied in the closing direction than in the opening direction. For that reason, pressure reducing valves should be provided in the line to the top of the cylinder to lower the pressure to that required to properly close the gates. In this way, full operating pressure can be applied to the bottom of the piston resulting in more opening than closing force. (Illustration below).

All piping should be thoroughly flushed and cleaned prior to making connection to the hydraulic cylinder.

6. For inverted gates refer to page 23 for operating procedures.



HYDRAULIC OPERATOR

Pipe Covers

GALVANIZED STEEL PIPE COVER

Galvanized steel pipe covers are furnished with brackets for bolting to the top of the crank operated floor stand. Care should be taken that the proper length of cover is placed on the correct gate. In general, the cover should be approximately 6" longer than the height of the sluice gate. The cover will be identified at the time of shipment.

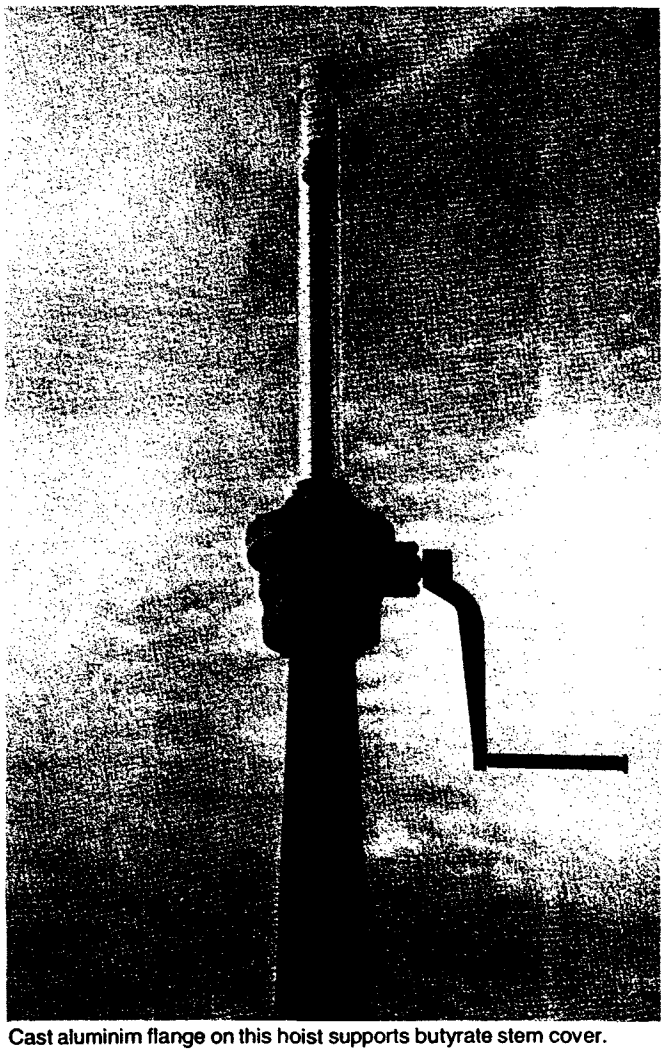
CLEAR PLASTIC COVER

1. The clear butyrate cover is mounted on the manual hoist by aluminum brackets bolted to the top of the hoist. On electric driven hoists, the butyrate cover is threaded into the top of the hoist.

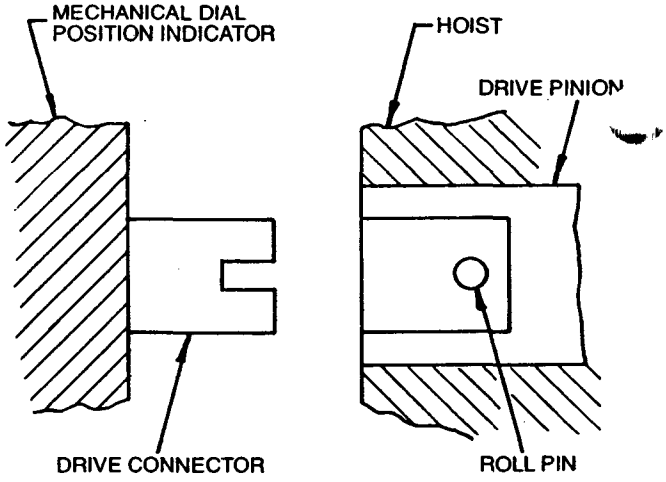
2. Mylar tapes placed on clear covers for position indication should be properly located with the gate in the fully closed or open position. Mylar tape is self-sticking and easily applied. The surface of the plastic should be cleaned before application.

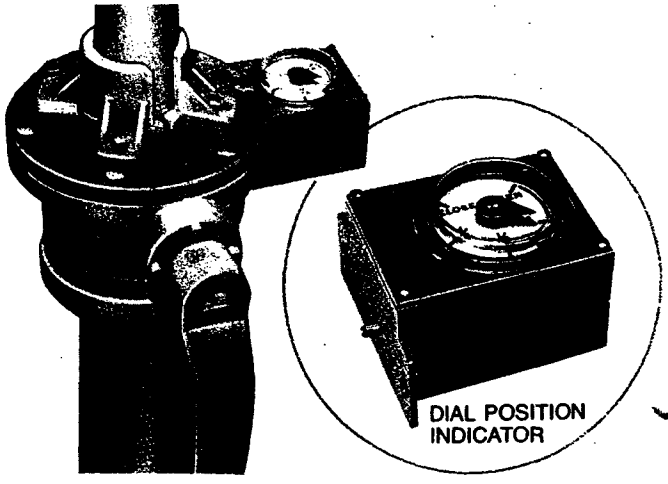
Mechanical Dial Position Indicator

The mechanical dial position indicator is designed to read the opening/closing of the gate as fractions of the total gate travel. With the gate in the closed position, set the position indicator to the "closed" point. To do this, remove the two bolts attaching the mechanical dial position indicator to the hoist. Remove the mechanical dial position indicator and turn the drive connector until the pointer aligns with "closed". Align the slot in the drive connector with the roll pin in the drive pinion, and bolt the mechanical dial position indicator to the hoist. (Illustration below).



Cast aluminim flange on this hoist supports butyrate stem cover.





Stems and Stem Guide

1. Stems are shipped with thrust nuts and couplings attached. These should be removed before installation.

2. Stem guide brackets should be mounted tightly to the wall with anchor bolts positioned in concrete as indicated in the installation drawings. The stem guide, or collar, should be loose on the bracket.

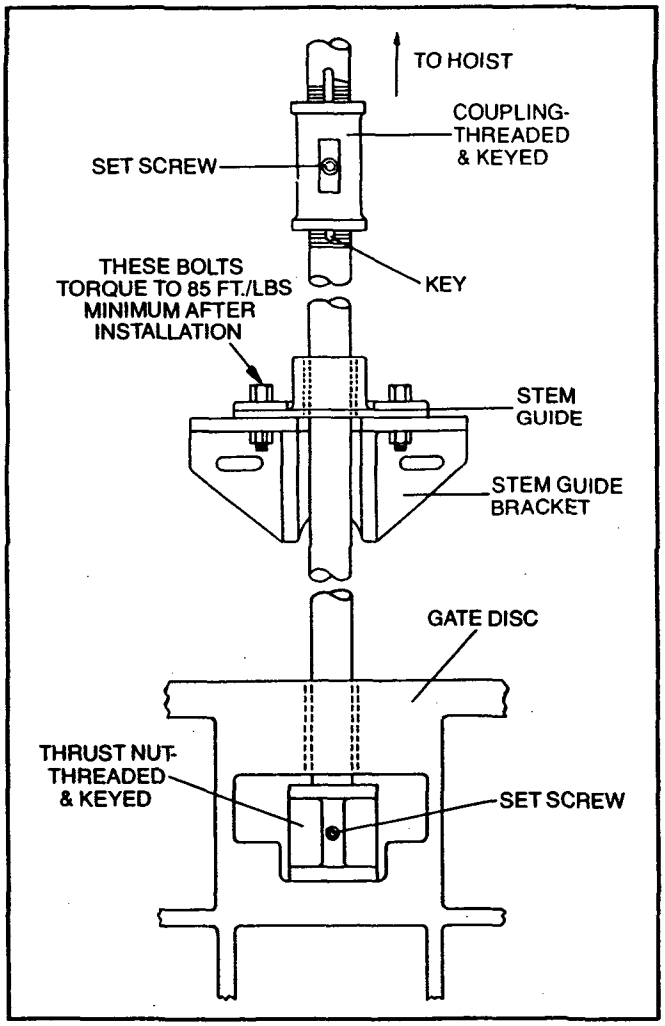
3. The lowest section of the stem should be lowered through the holes in the upper disc ribs and threaded into the bronze thrust nut until the stem is flush with the bottom of the nut.

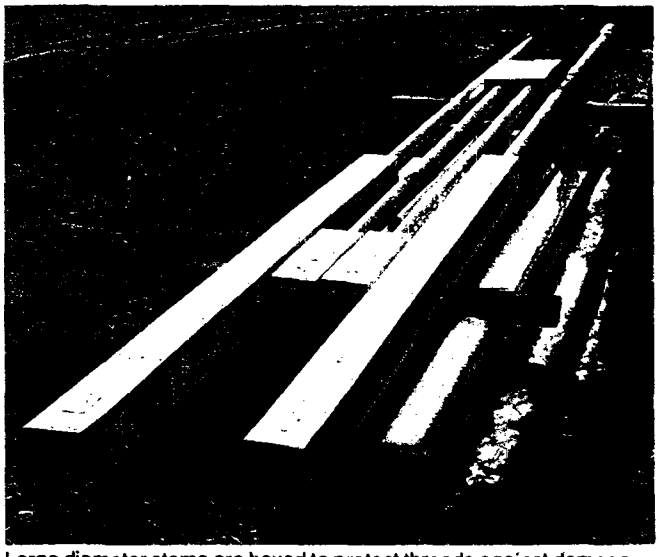
4. The gib head key is inserted from the top and the locking set screw should be tightened. The stem should be lightly supported as it passes through stem guides in the proper sequence.

5. Stem couplings, where required, should be threaded onto the lower section of the stem. The upper section of the stem is then threaded into the coupling. Take care to make sure the coupling is threaded an equal amount onto each stem.

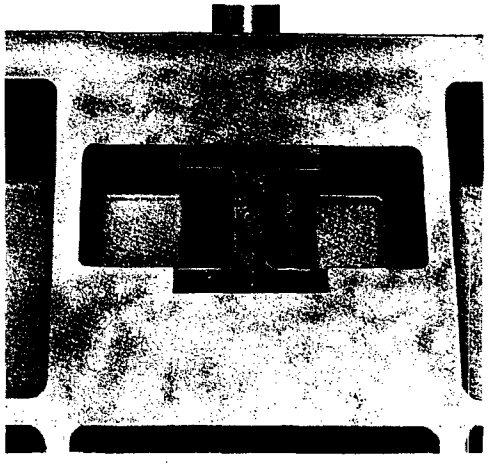
6. The key should then be inserted and locked in place by means of the set screw.

7. The threaded section of stem should be cleaned and checked to make sure that no damage has occurred to the threads during installation.





Large diameter stems are boxed to protect threads against damage.



Set screw on typical thrust nut locks gib head key in place.

Operating Instructions — Sluice Gates

WARNING — Inverted Sluice Gates

Locking plates for inverted sluice gates should not be removed until the operating mechanism is securely attached to the gate disc.

For electric and manual operators, a stop collar should be attached to the top of the stem to prevent accidentally running the stem through the operating nut and dropping the disc. For Hydraulic Cylinder operators, the disc should be supported externally until the cylinder and all connecting lines have been filled with pressurized fluid and then only when the directional valves are in the neutral or up positions. Note that filling the cylinder with fluid while the piston is fully retracted can result in a trapped air pocket which could allow the disc to drop a few inches after removal of the locking plates.
(See photo on page 30)

Before Operating Sluice Gate

1. MAKE SURE THAT ALL LOCKING PLATES HAVE BEEN REMOVED.

2. CLEAN THE TOP OF THE GATE OF ALL SAND, CONCRETE DROPPINGS AND OTHER DEBRIS.

3. CHECK TO MAKE SURE THAT STEM GUIDES AND BRACKETS ARE SECURELY FASTENED.

4. CLEAN AND LUBRICATE THE STEM.

Initial Operation

SLUICE GATES

1. Before using the sluice gates, seat facings should be thoroughly cleaned. Paint which may have been deposited on the seat facing should be removed. Seats and wedges should be coated with a light grease.

2. Operating stems should be thoroughly cleaned and greased with a high grade, heavy duty lubricant such as:

Shell Alvania 2EP
Tycol Azepro II
Mobilox Grease 2EP
Valvoline Val-Lith 2EP

3. The gate should be operated to the fully open and fully closed positions slowly, and carefully, to check for misalignment or problems in operation.

MANUAL OPERATORS

1. Manual operators are lubricated at the factory before initial operation and do not require additional lubrication.

2. If operation becomes difficult, check stem lubrication. Excess force should not be applied to the crank.

ELECTRIC OPERATORS

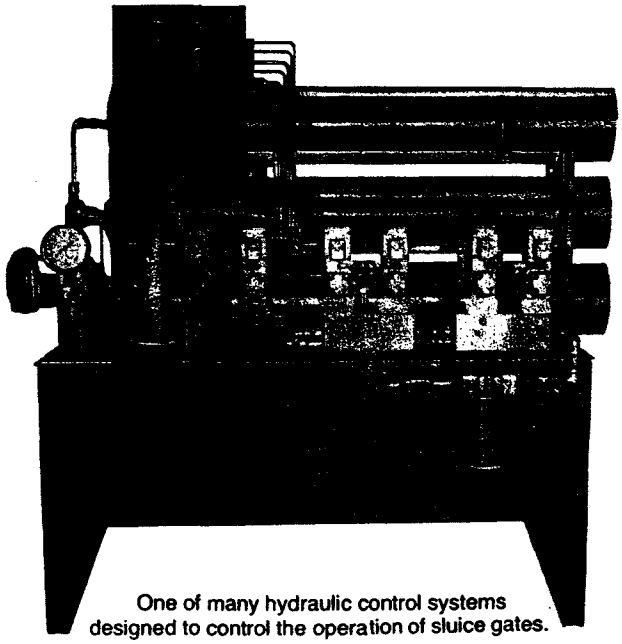
The Instruction Manual furnished with electric motor driven floor stands should be read carefully before the unit is installed and operated. The gate must be manually opened about 3" before initial electric operation is attempted. Check motor rotation by activating the "close" circuit making certain the gate travels in the "close" direction. Revise motor leads to obtain proper rotation if necessary.

The gate should not be operated electrically through its full travel until both "close" and "open" geared limit switches have been properly set. Adjust the "open" switch so that the opening cycle does not allow the end of the thread of the operating stem to enter the floor stand nut. **Geared limit switches cannot be factory set and must be set by the contractor at the jobsite. Follow all safety precautions for electric operators.**

HYDRAULIC OPERATORS

The Instruction Manual furnished with the hydraulic equipment should be read carefully before the units are installed and operated.
Hydraulic systems vary considerably in terms of operating characteristics and in the types of equipment available. Specific operating modes, start-up instructions and safety precautions **must** be understood prior to initial operation. All hydraulic systems use a pressurized fluid and should be operated with care.

The Rodney Hunt Co. can provide a representative for start-up assistance on those systems supplied by us. See our field service policy on the back cover.



One of many hydraulic control systems designed to control the operation of sluice gates.

Operating Instructions — Slide Gates

Rodney Hunt fabricated slide gates are constructed to operate satisfactorily under the specified operating conditions. These gates should be operated with care so as not to exceed the specified conditions. If, in the operation of the gate, an obstruction is met, either in the opening or closing direction, the obstruction should be removed before continuing in the operation. When the gate is fully opened or closed, excessive force should not be placed on the gate or gate stem by the operator in an effort to move the gate further.

If a problem arises in the operation of the gate, such as an unusual head condition or evidence of excessive corrosion, the factory should be consulted before the gate is used or operated.

Installation Inspection Check List

MANUALLY OPERATED SLIDE GATES

1. Check hoist, stem guide, and gate attaching bolts for proper tightness.

2. Apply tension to stem and check any stem guides for proper alignment. There must be a uniform clearance between the operating stem and all stem guides.

3. Check gate guide groove and clean off any foreign matter.

4. With gate in fully opened position, check seating surfaces of slide and frame for paint, concrete or other foreign matter. Also check the threaded portion of the stem. It must be clean and lubricated with a heavy duty grease such as:

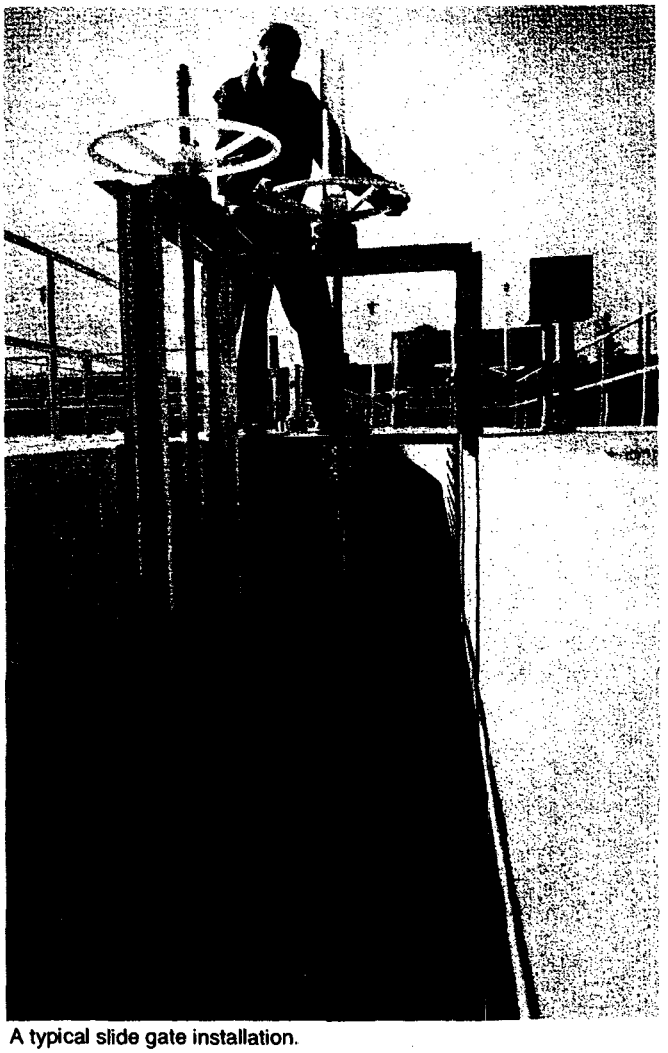
Shell Alvania 2EP
Tycol Azepro II
Mobilith AW2
Valvoline Val-lith 2EP

5. If J-seals are supplied, clean contact surfaces on disc and adjust seal.

6. Check the invert of flush botttom gates for concrete splatter or other debris.

7. Adjust stem stop collar to within $^1/_{16}$" of the top of the hoist operating nut and lock in place.

8. Install stem cover if furnished.

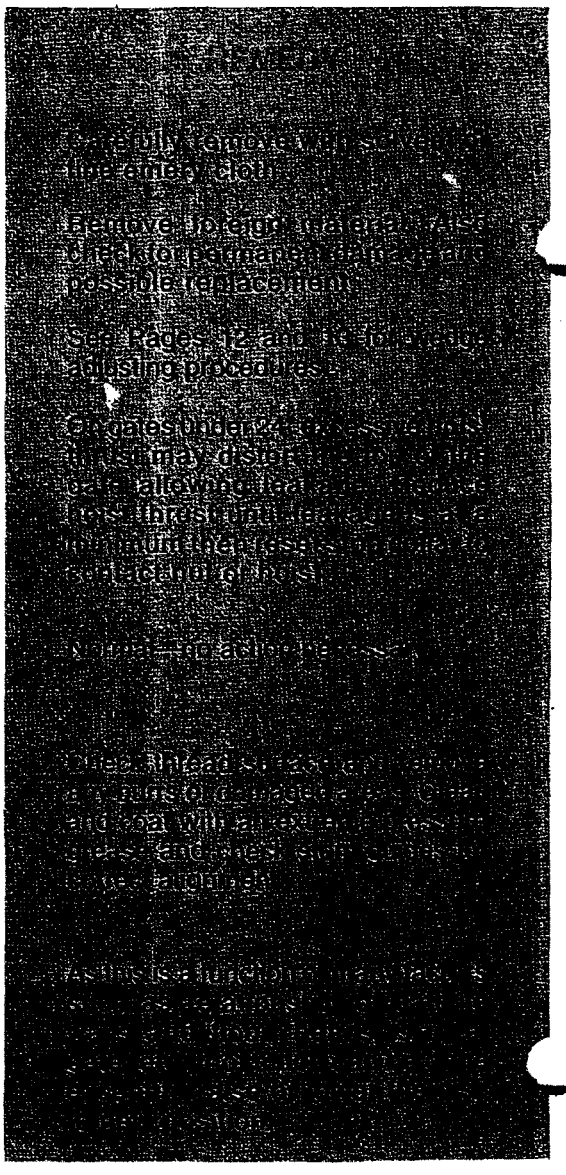


A typical slide gate installation.

Sluice Gate Trouble Shooting Tips

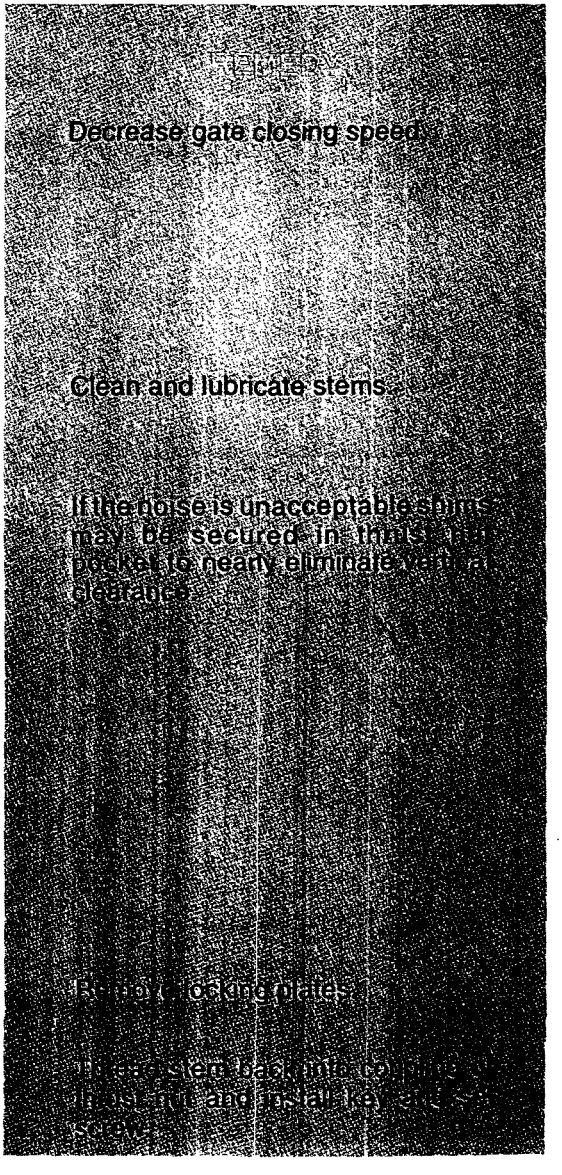
Despite their rugged appearance, sluice gates are precision equipment with carefully machined seating surfaces and accurate adjustability. Each sluice gate is checked at the factory and properly adjusted, but improper installation or maintenance can seriously affect its performance. If there appears to be a problem in the performance of the gate, the following trouble-shooting tips may help determine the cause and correct the problem.

SYMPTOM	CAUSE
LEAKAGE	Paint, mastic, concrete or other foreign material on seat facing.
	Concrete, asphalt, or debris on stop bar under HY-Q seal.
	Loose or unevenly adjusted wedge.
	Excessive hoist force.
NOISE	
Loud bang occuring at opening only.	Withdrawal of disc from tightly wedged condition.
A high pitched squeal or singing.	Generally confined to gates operated by electric motor driven hoists. The stem threads may be dry. The stem guides may be misaligned causing excessive rubbing as the stem passes through.
Chatter.	Generally occurs on partially open gates with a high discharge velocity through the gate.



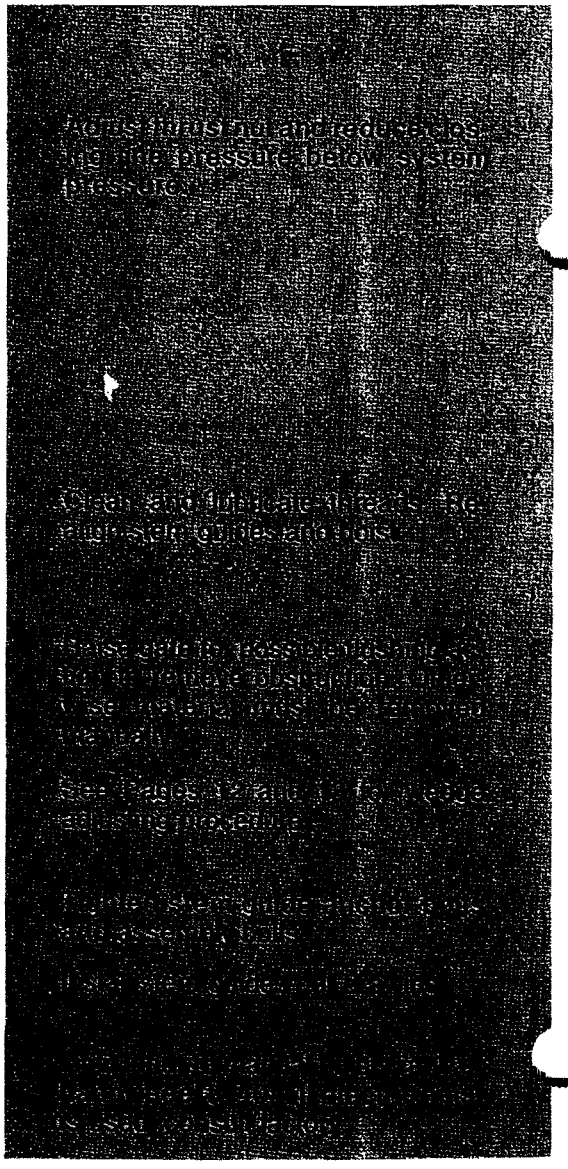
Sluice Gate Trouble Shooting Tips (cont'd.)

SYMPTOM	CAUSE
Chatter.	May occur when closing hydraulically operated gates. The speed control valve may be adjusted for a speed high enough to decrease pressure to the top of the cylinder to a level where the pilot operated check valves may close, stopping the gate until pressure builds up.
Chatter.	Also may be heard on electric hoists with dry stems or grit laden grease on stems.
Slow rhythmic bang during closing.	Generally occurs on electric hoist operated gates which during their closing stroke have the condition that the resistance to closing offered by water pressure and sliding friction is nearly equal to the dead weight of the disc. The disc then remains stationary while the thrust nut travels downward until it uses up the vertical clearance with the pocket at which time the disc will drop with a small bang to hang on the thrust nut. This repeats until the water pressure and friction is sufficient to need constant nut force to move.
GATE WILL NOT OPEN	Locking plates still in place. See Page 4.
STEM TURNS ON RISING STEM GATE	Key not installed in stem coupling or thrust nut, allowing stem to thread itself out.



If there is a problem in the operation or performance of a sluice gate and trouble-shooting procedure doesn't help solve the problem, please call the Rodney Hunt Company, Orange, Massachusetts, Area Code 978/544-2511, and ask for the Field Service Department.

SYMPTOM	CAUSE
HYDRAULICALLY OPERATED GATE WILL NOT OPEN	The thrust nut may be adjusted so that the piston bottoms out in the cylinder, stopping the downward force, at the same time that the disc is wedged sufficiently for water tightness. In the absence of a correctly adjusted pressure reducing valve in closing direction pressure line, there is generally more force available to seat the disc in the wedges than there is to unseat it.
EXCESSIVE FORCE REQUIRED TO OPERATE	Dry stem threads or misaligned stem, stem guides and hoist.
DISC WILL NOT COMPLETELY CLOSE	Interference from obstruction under the disc or between top wedge of disc and frame.
DISC WILL NOT COMPLETELY CLOSE	Wedges badly out of adjustment.
BOWING STEMS	Loose stem guides.
	Stem guides not placed per manufacturers installation drawing.
	Excessive hoist output.



Slide Gate Trouble Shooting Tips

The installation of slide gates requires a great deal of care to prevent damage to the gates and distortion of the frame. Slide gates are an economical choice for open channel flow applications where tight sealing is not necessary. There is no standard allowable leakage specification for slide gates and some leakage is to be expected. However, the following trouble-shooting tips may help to reduce the leakage and improve the performance of the gate.

SYMPTOM	CAUSE
LEAKAGE At bottom of gate.	Concrete, asphalt or debris under HY-Q seal on stop bar or in sill slot of a standard invert gate.
At sides of gate.	Concrete or debris wedged between disc and guide.
At sides or bottom of gate.	Generally occurs on gates distorted by bolting to uneven concrete walls without the use of grout.
At top of gate.	Excessive hoist effort at closed position deflecting the top of disc outward.
At invert of gate used as downward opening weir.	"J" seal may be out of adjustment across invert.
EXCESSIVE EFFORT TO OPERATE	Dry stem threads or grit laden grease in threads.
EXCESSIVE EFFORT TO OPERATE	May occur on long weirs with multi stem application pulling the disc unevenly.

REMEDY
Remove foreign material. Check seal for permanent damage and possible replacement.
Remove foreign material.
Loosen anchor bolt nuts, shim gate to true plane and fill void between guide and wall with grout.
Adjust stem nuts to obtain proper seal compression as described on Page 15.
Loosen stem nuts and adjust seal as described on Page 15.
Clean threads and lubricate with [illegible]
[illegible]

If there is a problem in the operation or performance of a slide gate and trouble-shooting procedure doesn't help solve the problem, please call the Rodney Hunt Company, Orange, Massachusetts, Area Code 978/544-2511, and ask for the Field Service Department.

Maintenance Instructions

GATES

No periodic maintenance is required for sluice or slide gates. However, gates should be operated periodically (at least every three months). Slide gates should be checked at regular intervals (at least every six months) for signs of corrosive attack.

WARNING — Non-Rising Stem Gates

Non-rising stem gates generally require a special maintenance program. If the level of the water or sewerage rises above the top of the opening, the threads on the stem may become coated with grit. Under these conditions, frequent use of the gate will wear the threads in the thrust nut creating a potentially dangerous situation since an excessively worn thrust nut may not support the weight of the gate, causing it to fall. Therefore, the following maintenance procedure must be followed:

A. The stem and thrust nut must be clean and greased at all times.

B. If the gate is cycled on the average of once a week, the thrust nut should be removed every year and inspected for wear. (More frequent inspection is required after the first signs of wear or if the frequency of operation is greater or the conditions are very severe.)

C. Replace the thrust nut as soon as excessive wear is evident.

MANUAL OPERATORS

At least once a year, all grease fittings on manual floor stands should be lubricated with a small amount of heavy duty grease which will not harden in cold weather nor become liquid in warm weather. The following lubricant is recommended:

Mobilgrease Special

ELECTRIC AND HYDRAULIC OPERATORS

Periodic maintenance schedules should be set-up in accordance with the equipment supplied and outlined in the manufacturer's instruction manual.

OPERATING STEMS

It is critical that operating stems be periodically cleaned and greased. Even though some environmental conditions are harsher that others and the use of pipe covers will protect stems, they still need to be cleaned and greased at least once every six months, more often if the grease becomes dirty. The following lubricants are recommended:

Shell Alvania 2EP
Tycol Azepro II
Mobilox Grease 2EP
Valvoline Val-Lith 2EP

WARNING — Electric and Modulating Electric Operators

These operators can cause accelerated wear in the hoist operating nut since the stem and gates are operated more frequently and at times continuously. This condition can cause a potentially dangerous situation since an excessively worn operating nut may not support the weight of the gate, causing it to fall. Therefore, the following maintenance procedure must be followed:

A. The stem and operating nut must be clean and greased at all times. (Plastic stem covers provide protection and allow visual inspection of the stem).

B. The operating nut should be removed and inspected for wear after three months of operation and every year thereafter.

C. Replace operating nut as soon as excessive wear is evident.

STORAGE INSTRUCTIONS

Electric Operators

A. Protect from weather—store indoors.

B. Energize heaters upon receipt of units — to prevent corrosion of controls.

Hydraulic Systems and Cylinders

A. Protect from weather—store indoors to prevent corrosion of components.

B. Store cylinders vertically to prevent damage to seals.

Cleaning and Painting

Some specifications require that sluice gates be cleaned and painted in the field.

1. The gate should not be disassembled unless absolutely necessary. The disc can be removed from the guides for separate handling by removing the locking plates.

2. Before sandblasting, all bronze surfaces should be properly protected. The wedges should not be removed from the gate.

3 After cleaning and painting, all masking should be removed and the bronze machined surfaces thoroughly cleaned. If the slides have been removed, they should be inserted into the proper frame. Locking plates should then be bolted in place.

Spare Parts

The Rodney Hunt Company does not recommend the stocking of spare parts by customers or owners since the equipment is designed for a very long service life when recommended maintenance procedures are followed.

If a repair part is required, contact the FIELD SERVICE DEPARTMENT at the factory with the following information:

1. Original shop order number which is indicated on correspondence and installation drawings and stamped on the end of operating stem.

2. The installation drawing number, and a description of the part, with any other available drawing numbers.

3. Description of damage and cause.

4. Approximate delivery requirements.

This information will help Rodney Hunt to better serve you.

Engineering Drawings

The engineering drawings submitted by Rodney Hunt Co. for approval and/or field use, are planned so that the installation drawing is the master reference.

This drawing depicts as much as possible of the structure surrounding the Rodney Hunt Co. supplied equipment. The location of embedded material such as anchor bolts and wall thimbles are described. The identification of fasteners and components (studs, anchor bolts, gate assemblies, hoists, stems, stem guides, stem couplings, torque plates, wall thimbles, thrust nuts, stop collars and other equipment) is done by calling out physical sizes and/or assembly or detail drawing numbers. More information is available on those detail or assembly drawings which have been included with the installation drawing.

In many cases tabulated drawings are used which describe variables for a given piece of equipment. The applicable variation is identified by the drawing number suffix as shown on the installation drawing.

A typical inverted sluice gate installation.

Any Questions?

Write or call the Rodney Hunt Company if you encounter any installation or adjustment problems not covered in this manual.

A special A-frame rig is used to transport unusually large gates.

Field Service Policy

The equipment furnished on this order has been adjusted and inspected prior to leaving the factory and has been accepted by the transporting company. Please check the packing list accompanying the shipment for shortages and examine the equipment for damages prior to accepting the shipment. Before storing or installing this equipment, read the installation manual that accompanies the shipment.

SHORTAGES

If a shortage exists, notify the Rodney Hunt Company, Customer Service Department, immediately upon receipt of the equipment. Claims for shortages of equipment shown on the packing list will not be accepted unless filed within thirty days after shipment of the equipment.

DAMAGE IN TRANSIT

If the equipment has been damaged in transit, the purchaser is responsible for filing the claim with the transportation company. Contact the Rodney Hunt Shipping Department for assistance in filing the claim.

INSTALLATION, INSPECTION AND ADJUSTMENT

Installation supervision, inspection of installed equipment, adjustment of the wedges, setting of limit switches and certification of satisfactory initial operation are not included unless specifically indicated on the customer's purchase order and accepted by the company. The company will provide this service at the charges listed from the Rodney Hunt Customer Service Department.

FIELD TROUBLE

When trouble develops either in the installation, operation or performance of the equipment, the installation manual and drawings should be checked to determine if the equipment has been installed properly. If proper performance or operation cannot be obtained and assistance from the factory is desired, please contact the company. Arrangements will be made to send a man to the jobsite if this is required. This man will make a thorough examination of the problem and if the equipment is faulty in workmanship or material, the necessary repairs or adjustments will be made by the factory at no cost to the purchaser. If, however, the problem is due to faulty installation or adjustment, the cost of the field service will be charged to the purchaser.

If repairs are made in the field by the purchaser or authorized by the purchaser, backcharges for these repairs will not be accepted by the company unless the company has been notified prior to the incurring of these costs and has accepted the responsibility for these repairs.

The company will not be liable for contingent costs or costs of delays due to the faulty equipment and the repairs thereof.

FIELD SERVICE CHARGES

Field service charges begin from the time of departure until the return of the service man and include a daily rate plus travel and subsistence expenses. Premium day and hourly rates will be charged on Saturdays, Sundays and Holidays and for time spent before 6 a.m. or after 5 p.m., or over eight hours per day. A schedule of Field Service charges is available from the Rodney Hunt Customer Service Department.

The minimum order value for replacement parts is $50.00.

THE RODNEY HUNT GUARANTEE

For a period of one year from the date of delivery of the equipment, the company guarantees that the materials and equipment shall be free from defects of material and workmanship and agrees to replace any part or parts breaking within such one year providing the purchaser gives a written notice of such breakage and that such breakage, in the opinion of the company, shows unmistakable evidence of defective material or workmanship. The liability of the company shall not in any case exceed the cost of repairing or replacing the defective parts and in no event shall the company be liable for loss of income or other expenses or consequential damage. At the end of said one year all liability of the company shall cease and terminate.

544 2544
800 AM +

RODNEY HUNT®
RODNEY HUNT COMPANY
A GA Industries Company
ORANGE, MASSACHUSETTS 01364
TEL: 978-544-2511 / FAX: 978-544-7204
e-mail rh@rodneyhunt.com web: www.rodneyhunt.com

COMM 3500 8/01 PRINTED IN U.S.A.

Construction Submittals
Submittal 010
Soil Boring and Rock Coring Logs

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	10/26/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	10/25/01	Submittal 010 – Soil Boring and Rock Coring Logs

THESE ARE TRANSMITTED AS INDICATED BELOW

☐ For your use ☐ No Exceptions Taken ☐ Return _____ Corrected Prints

☐ For Approval ☐ Make Corrections Noted ☐ Submit _____ Copies for _____

☐ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☒ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

TRANSMITTAL SHEET

GUILD DRILLING CO., INC.

100 WATER STREET, EAST PROVIDENCE, R.I. 02914
(401) 434-0750

Subject: Boring Data - Reconstruction of Allendale Dam

Location: North Providence/Johnston, R.I.

Our Job No: 02-091 **Your Project or Contract No.**

Date: October 23, 2001 **Via:** fcm

To: LEA - Cianci, Inc.
100 Northwest Drive
Plainville, CT 06062

Attention of: Mr. Scott Miller

Copies / or Sets	DESCRIPTION
3	Boring Reports: LEA-1, LEA-2 and LEA-3.

SAMPLES: Taken at Job Site.

Remarks: Project complete.

By: _____

L. L. MORRIS

cc:

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after ____ Hours

At _____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW		NV-II
Size I.D.	3"		
Hammer Wt.			BIT
Hammer Fall			Dia.

DATE

Start 10/16/01

Complete 10/17/01

Boring Foreman J. Medeiros

Inspector/Engr.

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
									(Drill casing down to Rock)			
5												
		7.0-12.0	C					7.0	GRANITE	C1	60	53
10												
		12.0-17.0	C							C2	60	60
15												
		17.0-22.0	C							C3	60	58
20												
		22.0-27.0	C							C4	60	55
25												
		27.0-32.0	C							C5	60	55
30												
		32.0-37.0	C							C6	60	52
35												
		37.0-40.0	C							C7	36	36

GROUND SURFACE TO _____ USED _____ CASING: THEN _____

Sample Type
D=Drive C=Cored W=Washed
UP=Fixed Piston UT=Shelby Tube
TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency	
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:

Earth Boring 7'

Rock Coring 33'

Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 2 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

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								40.0	Bottom of Boring 40'			

GROUND SURFACE TO _____ USED _____ CASING: THEN _____

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TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

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some	20 to 35%
and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency	
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 7'
Rock Coring 33'
Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after ____ Hours

At _____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW		NV-II
Size I.D.	3"		
Hammer Wt.			BIT
Hammer Fall			Dia.

DATE

Start 10/16/01

Complete 10/17/01

Boring Foreman J. Medeiros

Inspector/Engr.

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
									(Drill casing down to Rock)			
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		37.0-40.0	C							C7	36	36

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50+	Very Dense	15-30	V-Stiff	

SUMMARY:

Earth Boring 7'

Rock Coring 33'

Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 2 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

PORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

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								40.0	Bottom of Boring 40'			

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Sample Type
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UP=Fixed Piston UT=Shelby Tube
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SUMMARY:
Earth Boring 7'
Rock Coring 33'
Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.
100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1
PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.
REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS
At _____ after ____ Hours
At _____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW		NV-II
Size I.D.	3"		
Hammer Wt.			BIT
Hammer Fall			Dia.

DATE
Start 10/16/01
Complete 10/17/01
Boring Foreman J. Medeiros
Inspector/Engr.

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
									(Drill casing down to Rock)			
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25												
		27.0-32.0	C							C5	60	55
30												
		32.0-37.0	C							C6	60	52
35												
		37.0-40.0	C							C7	36	36

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Sample Type
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30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 7'
Rock Coring 33'
Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 2 OF 2

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-1

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
								40.0	Bottom of Boring 40'			

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30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 7'
Rock Coring 33'
Samples 0

HOLE NO. LEA-1

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-2

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after ____ Hours

At _____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE

Start 10/18/01

Complete 10/19/01

Boring Foreman J. Medeiros

Inspector/Engr.

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.3-2.3	D	6	3	8			Gray silty SAND, little gravel	1	24	6
						19						
		2.3-4.3	D	68	28	78			" some gravel	2	24	10
						33						
5		4.8-6.8	D	27	22	18				3	24	4
						14						
		6.8-8.8	D	14	15	41				4	24	10
						21						
		8.8-10.2	D	19	36	100/5"				5	17	8
10								10.2				
		11.0-14.0	C						QUARTZITE	C1	36	31
		14.0-19.0	C							C2	60	51
15												
								19.0	Bottom of Boring 19'			

GROUND SURFACE TO _____ USED _____ CASING: THEN _____

Sample Type
D=Drive C=Cored W=Washed
UP=Fixed Piston UT=Shelby Tube
TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M./Stiff
30-50	Dense	8-15	Stiff
50+	Very Dense	15-30	V-Stiff

30 + Hard

SUMMARY:

Earth Boring 11'

Rock Coring 8'

Samples 5

HOLE NO. LEA-2

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-2

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	DATE	
At ____ after ____ Hours	Type	NW	S/S	NV-II	Start	10/18/01
	Size I.D.	3"	1-3/8"		Complete	10/19/01
At ____ after ____ Hours	Hammer Wt.	300#	140#	BIT	Boring Foreman	J. Medeiros
	Hammer Fall	24"	30"	Dia.	Inspector/Engr.	

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.3-2.3	D	6	3	8			Gray silty SAND, little gravel	1	24	6
						19						
		2.3-4.3	D	68	28	78			* some gravel	2	24	10
						33						
5		4.8-6.8	D	27	22	18				3	24	4
						14						
		6.8-8.8	D	14	15	41				4	24	10
						21						
		8.8-10.2	D	19	36	100/5"				5	17	8
10								10.2				
		11.0-14.0	C						QUARTZITE	C1	36	31
		14.0-19.0	C							C2	60	
15												
								19.0	Bottom of Boring 19'			

GROUND SURFACE TO ____ USED ____ CASING: THEN ____

Sample Type
D=Drive C=Cored W=Washed
UP=Fixed Piston UT=Shelby Tube
TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency	
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 11'
Rock Coring 8'
Samples 5

HOLE NO. LEA-2

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-2

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE

Start	10/18/01
Complete	10/19/01
Boring Foreman	J. Medeiros
Inspector/Engr.	

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
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						19						
		2.3-4.3	D	68	28	78			" some gravel	2	24	10
						33						
5		4.8-6.8	D	27	22	18				3	24	4
						14						
		6.8-8.8	D	14	15	41				4	24	10
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10								10.2				
		11.0-14.0	C						QUARTZITE	C1	36	31
		14.0-19.0	C							C2	60	51
15												
								19.0	Bottom of Boring 19'			

GROUND SURFACE TO _____ USED _____ CASING: THEN _____

Sample Type
D=Drive C=Cored W=Washed
UP=Fixed Piston UT=Shelby Tube
TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency	
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:

Earth Boring	11'
Rock Coring	8'
Samples	5

HOLE NO. LEA-2

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-3

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	DATE	
At _____ after ____ Hours	Type	NW	S/S	NV-II	Start	10/19/01
	Size I.D.	3"	1-3/8"		Complete	10/22/01
At _____ after ____ Hours	Hammer Wt.	300#	140#	BIT	Boring Foreman	J. Medeiros
	Hammer Fall	24"	30"	Dia.	Inspector/Engr.	

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.3-2.3	D	5	2	6				1	24	5
						12			Gray SAND, some silt & gravel			
		2.3-4.3	D	26	26	22				2	24	8
						19						
5		4.3-5.0	D	21	50/3"					3	9	6
		5.5-10.5	C					5.0	QUARTZITE	C1	60	48
10												
		10.5-14.5	C							C2	48	60
								14.5	Bottom of Boring 14.5'			

GROUND SURFACE TO _____ USED _____ CASING: THEN _____

Sample Type
D=Drive C=Cored W=Washed
UP=Fixed Piston UT=Shelby Tube
TP=Test Pit A=Auger
OE = Open End Rod
* 300# hammer

Proportions Used

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little	10 to 20%
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and	35 to 50%

140 lb. Wt x 30" fall on 2" O.D. Sampler

Cohesionless	Density	Cohesive	Consistency	
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 5.5'
Rock Coring 9'
Samples 3

HOLE NO. LEA-3

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-3

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE

Start	10/19/01
Complete	10/22/01
Boring Foreman	J. Medeiros
Inspector/Engr.	

LOCATION OF BORING

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From To 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.3-2.3	D	5	2	6				1	24	5
						12			Gray SAND, some silt & gravel			
		2.3-4.3	D	26	26	22				2	24	8
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5		4.3-5.0	D	21	50/3"					3	9	6
		5.5-10.5	C					5.0	QUARTZITE	C1	60	48
10		10.5-14.5	C							C2	48	60
								14.5	Bottom of Boring 14.5'			

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SUMMARY:
Earth Boring 5.5'
Rock Coring 9'
Samples 3

HOLE NO. LEA-3

GUILD DRILLING CO., INC.

100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO LEA - Cianci, Inc. | ADDRESS Plainville, CT | HOLE NO. LEA-3

PROJECT NAME Reconst. of Allendale Dam | LOCATION North Providence/Johnston, R.I. | PROJ. NO.

REPORT SENT TO above | OUR JOB NO. 02-091 | SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE

Start	10/19/01
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						12						
		2.3-4.3	D	26	26	22				2	24	8
						19						
5		4.3-5.0	D	21	50/3"					3	9	6
		5.5-10.5	C					5.0	QUARTZITE	C1	60	48
10		10.5-14.5	C							C2	48	60
								14.5	Bottom of Boring 14.5'			

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Sample Type
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10-30	Med. Dense	4-8	M./Stiff	
30-50	Dense	8-15	Stiff	
50+	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 5.5'
Rock Coring 9'
Samples 3

HOLE NO. LEA-3

Construction Submittals
Submittal 011
Summary of Analytical Data:
Background Containment Pad Sample and Root-Ball Sample

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	USEPA	DATE	10/30/01
	1 Congress Street, Suite 1100 HBR	PROJECT	Centredale Manor
	Boston, MA 02114	LOCATION:	N. Providence, RI
		COMM. NO.:	15RP102.001
ATTN:	Anna Krasko, On-Scene Coordinator	PHONE #	617.918.1232

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	10/30/01	Submittal 011 – Summary of Analytical Data: Background Containment Pad Sample & Root-Ball Sample

THESE ARE TRANSMITTED AS INDICATED BELOW

☐ For your use ☐ No Exceptions Taken ☐ Return _____ Corrected Prints

☐ For Approval ☐ Make Corrections Noted ☐ Submit _____ Copies for _____

☐ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☒ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS: The attached data constitute Submittal 011 – Summary of Analytical Data: Background Containment Pad Sample & Root-Ball Sample

pc: Laureen Borochaner, USACE
Sarah Martino, RIDEM
Dave Scotti, LEA

BY: Scott A. Miller

SUBMITTAL 011 - SUMMARY OF ANALYTICAL DATA
BACKGROUND CONTAINMENT PAD SAMPLE
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

SAMPLE DATE: 27 September 2001

Sample ID	**2004284**
Location ID	CMS-CPAD-001
Time	900
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained adjacent to northeast corner of containment pad

Analyte	Concentration
VOCs (ug/Kg)	
Methylene Chloride	7B
Acetone	10JB
SVOCs (ug/Kg)	
4-Methylphenol	15J
Benzoic Acid	190J
2-Methylnaphthalene	4J
Acenaphthylene	34J
Phenanthrene	110J
Anthracene	39J
Fluoranthene	200J
Pyrene	220J
Benzo (a) anthracene	100J
Chrysene	150J
Benzo (b) fluorantene	170J
Benzo (k) fluoranthene	140J
Benzo (a) pyrene	120J
Indeno (1,2,3-cd) pyrene	11J
Benzo (g,h,i) perylene	9J
PCBs (ug/Kg)	
Aroclor-1260	7.7J
Metals (mg/Kg)	
Arsenic	2.9
Barium	47.9
Chromium	12.0
Lead	34.9
Mercury	0.070
Petroleum Hydrocarbons (mg/Kg)	635
pH	6.27

Notes:
mg/Kg = Milligrams per kilogram.
ug/Kg = Micrograms per kilogram.
J = Estimated concentration.
B = Analyte detected in the laboratory method blank.

SUBMITTAL 011 - SUMMARY OF ANALYTICAL DATA
BACKGROUND CONTAINMENT PAD SAMPLE
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

SAMPLE DATE: 27 September 2001

Sample ID	**2004284**
Location ID	CMS-CPAD-001
Time	900
Sample Type	Soil (Grab)
Depth	0-6"
Comments	Grab sample obtained adjacent to northeast corner of containment pad

Analyte	Result	TEF Factor	TEQ Concentration
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	0.64J	1.000	0.640
Total TCDD	0.64		
Total HxCDD	3.9		
1,2,3,4,6,7,8-HpCDD	37	0.010	0.370
Total HpCDD	65		
OCDD	250	0.001	0.250
Total TCDF	2.6		
Total HxCDF	7.4		
1,2,3,4,6,7,8-HpCDF	11	0.010	0.110
Total HpCDF	24		
OCDF	18	0.001	0.018
Total TEQ Concentration			1.388
Immunoassay Analytical Result (pg/g)			434

Notes:
Sample analyzed and reported in accordance with USEPA Method 8290.
pg/g = Picogram per gram.
J = Estimated Result. Result is less than the reporting limit.

SUBMITTAL 011 - SUMMARY OF WASTE CHARACTERIZATION ANALYTICAL DATA
ROOT-BALL SAMPLE
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

SAMPLE DATE: 27 September 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Concentration	
VOCs (ug/Kg)		
Methylene Chloride	16B	14B
Acetone	30B	16B
1,1,1-Trichloroethane	.9J	<5.0
Ethylbenzene	<5.0	1J
Xylene (Total)	<5.0	10

Note: VOCs were determined by purge and trap GC/MS using guidance provided in Method5035A/8260B. Sample 2004285 was analyzed twice due to results exhibiting suppression of internal standard areas and surrogate recoveries out of criteria. Both analyses were reported because matrix interference was proven. The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control sample.

SVOCs (ug/Kg)	
1,4-Dichlorobenzene	8J
2-Methylnaphthalene	15J
4-Methylphenol	40J
2,4-Dimethylphenol	16J
Benzoic acid	170J
Naphthalene	190J
2-Methylnaphthalene	140J
Acenaphthylene	190J
Acenaphthene	220J
Dibenzofuran	160J
Fluorene	220J
Phenanthrene	2400
Anthracene	580
Carbazole	260J
Fluoranthene	2400
Pyrene	2400
Butylbenzylphthalate	22J
Benzo (a) anthracene	1600
Chrysene	1700
bis(2-Ethylhexyl)phthalate	46J
Benzo (b) fluoranthene	1800
Benzo (k) fluoranthene	1700
Benzo (a) pyrene	1100
Indeno (1,2,3-cd) pyrene	86J
Dibenzo (a, h) anthracene	32J
Benzo (g, h, i) perylene	59J

SUBMITTAL 011 - SUMMARY OF WASTE CHARACTERIZATION ANALYTICAL DATA
ROOT-BALL SAMPLE
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

SAMPLE DATE: 27 September 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Concentration
PCBs (ug/Kg)	
Aroclor-1254	38
Aroclor-1260	70
Metals (mg/Kg)	
Arsenic	7.9
Barium	40.2
Chromium	10
Lead	228
Mercury	0.13
Selenium	2.0
Petroleum Hydrocarbons (mg/Kg)	112
pH	4.77

Notes:
mg/Kg = Milligrams per kilogram.
ug/Kg = Micrograms per kilogram.
J = Estimated concentration.

SUBMITTAL 011 - SUMMARY OF WASTE CHARACTERIZATION ANALYTICAL DATA
ROOT-BALL SAMPLE
CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
North Providence, Rhode Island

SAMPLE DATE: 27 September 2001

Sample ID	**2004285**
Location ID	CMS-RTS-001
Time	930
Sample Type	Soil (Composite)
Depth	0-6"
Comments	Composite soil sample obtained from root-balls grubbed from embankment on northeast side of the existing gate structure.

Analyte	Result	TEF Factor	TEQ Concentration
Dioxins/Furans (pg/g)			
2,3,7,8-TCDD	120	1.000	120.000
Total TCDD	140		
Total PeCDD	5.5		
1,2,3,6,7,8-HxCDD	3.7J	0.100	0.370
1,2,3,7,8,9-HxCDD	4.7J	0.100	0.470
Total HxCDD	33		
1,2,3,4,6,7,8-HpCDD	48	0.010	0.480
Total HpCDD	92		
OCDD	290	0.001	0.290
2,3,7,8-TCDF	4.8CON	0.100	0.480
Total TCDF	51		
2,3,4,7,8-PeCDF	3.2J	0.500	1.600
Total PeCDF	37		
1,2,3,6,7,8-HxCDF	2.9J	0.100	0.290
2,3,4,6,7,8-HxCDF	3.3J	0.100	0.330
Total HxCDF	37		
1,2,3,4,6,7,8-HpCDF	16	0.010	0.160
Total HpCDF	27		
OCDF	20	0.001	0.020
Total TEQ Concentration			124.490
Immunoassay Analytical Result (pg/g)			253

Notes:
Sample analyzed and reported in accordance with USEPA Method 8290.
pg/g = Picogram per gram.
J = Estimated Result. Result is less than the reporting limit.
CON = Confirmation analysis.

SEVERN
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October 23, 2001

Mr. David Scotti
LOUREIRO ENGINEERING ASSOCIATES

100 Northeast Drive
Plainville, CT 06062

Dear Mr. Scotti :

Please find enclosed the analytical results of 2 sample(s) received at our laboratory on September 27, 2001. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

STL Report #7001-2550A	
Project ID: CENTRE DALE MANOR	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 929-8140 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

This report contains 34 pages.

7001-2550A
Loureiro Engineering Associates

Case Narrative

Sample Receipt – All samples were received in good condition and at the proper temperature.

Dioxins – Subcontracted to STL-Sacramento 880 Riverside Parkway, West Sacramento, CA 95605-1500.

Polychlorinated Biphenyls (PCB's) - PCB samples were extracted and analyzed by GC/ECD using guidance provided in Methods 3550B/8082. The instrumentation used was a Hewlett-Packard Gas Chromatograph equipped with an Electron Capture Detector (Ni63).

All samples were extracted and concentrated without any apparent problems.

The recovery of the surrogate, tetrachlorometaxylene, was over QC limits in PBLK57QC2.

The samples were acid cleaned up prior to analysis.

Manual integrations were performed if required, and any affected peaks were designated with an "MM" on the area report in the column titled "Code". Manual integrations were initialed by the analyst that performed the integration.

Metals – ICAP metals were determined using a JA61E trace ICAP; mercury was determined by cold vapor technique using a Leeman Labs mercury analyzer; following guidance provided in SW846 according to methods: ICAP – 3050B/6010B; mercury-7471A.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

Semi-Volatile Organics - Semi-volatile organic samples were extracted and analyzed by capillary GC/MS using guidance provided in Methods 3550B/8270C. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

All samples were extracted, concentrated and analyzed without any apparent problems.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5035A/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett Packard Model 5970A GC/MS/DS.

Sample 2004285 was analyzed twice due to results exhibiting suppression of internal standard areas and surrogate recoveries out of criteria. Both analyses were reported since matrix interference was proven.

The spike compound percent recoveries were within the laboratory generated guidelines in the independent source quality control sample (020ppb_QCS).

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
PH	9045	1
Petroleum Hydrocarbons	418.1	2

References:

1. Test Methods for the Evaluation of Solid Wastes, SW846, 3rd ed., 1986.
2. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.

TABLE VO-1.0
7001-2550A
LOUREIRO ENGINEERING ASSOCIATE
TCL VOLATILE ORGANICS

Soil

All values are ug/Kg dry weight basis.

Client Sample I.D. Lab Sample I.D. Method Blank I.D. Quant. Factor	Method Blank VBLKKM VBLKKM 1.00	2004284 012550A-01 VBLKKM 1.14	2004285 012550A-02 VBLKKM 1.09	Quant. Limits with no Dilution
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	.4J	7B	16B	5.0
Acetone	5J	10JB	30B	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	U	5.0
trans-1,2-Dichloroethene	U	U	U	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	.9J	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	U	U	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	.9J	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		09/27/01	09/27/01	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	10/07/01	10/07/01	10/07/01	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.1 Soil
7001-2550A
LOUREIRO ENGINEERING ASSOCIATE
TCL VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	2004285 RE			Quant. Limits with no Dilution
Lab Sample I.D.	012550A-02RE			
Method Blank I.D.	VBLKKM			
Quant. Factor	1.09			
Chloromethane	U			10
Bromomethane	U			10
Vinyl Chloride	U			10
Chloroethane	U			10
Methylene Chloride	14B			5.0
Acetone	16B			10
Carbon Disulfide	U			5.0
Vinyl Acetate	U			10
1,1-Dichloroethene	U			5.0
1,1-Dichloroethane	U			5.0
cis-1,2-Dichloroethene	U			5.0
trans-1,2-Dichloroethene	U			5.0
Chloroform	U			5.0
1,2-Dichloroethane	U			5.0
?-Butanone	U			10
,1,1-Trichloroethane	U			5.0
Carbon Tetrachloride	U			5.0
Bromodichloromethane	U			5.0
1,2-Dichloropropane	U			5.0
cis-1,3-Dichloropropene	U			5.0
Trichloroethene	U			5.0
Dibromochloromethane	U			5.0
1,1,2-Trichloroethane	U			5.0
Benzene	U			5.0
trans-1,3-Dichloropropene	U			5.0
Bromoform	U			5.0
4-Methyl-2-Pentanone	U			10
2-Hexanone	U			10
Tetrachloroethene	U			5.0
Toluene	U			5.0
1,1,2,2-Tetrachloroethane	U			5.0
Chlorobenzene	U			5.0
Ethylbenzene	1J			5.0
Styrene	U			5.0
Xylene (total)	10			5.0
Date Received	09/27/01			
Date Extracted	N/A			
Date Analyzed	10/07/01			

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE SV-1.0
7001-2550A
LOUREIRO ENGINEERING ASSOCIATE
TCL SEMI-VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2004284	2004285	Quar Limi with Dilu
Lab Sample I.D.	SBLKSR	012550A-01	012550A-02	
Method Blank I.D.	SBLKSR	SBLKSR	SBLKSR	
Quant. Factor	1.00	1.12	1.08	
Phenol	U	U	U	3
bis(2-Chloroethyl)ether	U	U	U	3
2-Chlorophenol	U	U	U	3
1,3-Dichlorobenzene	U	U	U	3
1,4-Dichlorobenzene	U	U	8J	3
Benzyl alcohol	U	U	U	3
1,2-Dichlorobenzene	U	U	U	3
2-Methylphenol	U	U	15J	3
2,2'-oxybis(1-Chloropropane)	U	U	U	3
4-Methylphenol	U	15J	40J	3
N-Nitroso-di-n-propylamine	U	U	U	3
Hexachloroethane	U	U	U	3
Nitrobenzene	U	U	U	3
Isophorone	U	U	U	3
2-Nitrophenol	U	U	U	
2,4-Dimethylphenol	U	U	16J	3
Benzoic acid	U	190J	170J	1
bis(2-Chloroethoxy)methane	U	U	U	3
2,4-Dichlorophenol	U	U	U	3
1,2,4-Trichlorobenzene	U	U	U	3
Naphthalene	U	U	190J	3
4-Chloroaniline	U	U	U	3
Hexachlorobutadiene	U	U	U	3
4-Chloro-3-methylphenol	U	U	U	3
2-Methylnaphthalene	U	4J	140J	3
Hexachlorocyclopentadiene	U	U	U	3
2,4,6-Trichlorophenol	U	U	U	3
2,4,5-Trichlorophenol	U	U	U	1
2-Chloronaphthalene	U	U	U	3
2-Nitroaniline	U	U	U	1
Dimethylphthalate	U	U	U	3
Acenaphthylene	U	34J	190J	3
2,6-Dinitrotoluene	U	U	U	3
3-Nitroaniline	U	U	U	1
Acenaphthene	U	U	220J	3
Date Received		09/27/01	09/27/01	
Date Extracted	10/01/01	10/01/01	10/01/01	
Date Analyzed	10/03/01	10/05/01	10/05/01	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture a sample dilution.

TABLE SV-1.0 Soil
7001-2550A
LOUREIRO ENGINEERING ASSOCIATE
TCL SEMI-VOLATILE ORGANICS

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2004284	2004285	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKSR	012550A-01	012550A-02	
Method Blank I.D.	SBLKSR	SBLKSR	SBLKSR	
Quant. Factor	1.00	1.12	1.08	
2,4-Dinitrophenol	U	U	U	1600
4-Nitrophenol	U	U	U	1600
Dibenzofuran	U	U	160J	330
2,4-Dinitrotoluene	U	U	U	330
Diethylphthalate	U	U	U	330
4-Chlorophenyl-phenylether	U	U	U	330
Fluorene	U	U	220J	330
4-Nitroaniline	U	U	U	1600
4,6-Dinitro-2-methylphenol	U	U	U	1600
N-Nitrosodiphenylamine (1)	U	U	U	330
4-Bromophenyl-phenylether	U	U	U	330
Hexachlorobenzene	U	U	U	330
Pentachlorophenol	U	U	U	1600
Phenanthrene	U	110J	2400	330
Anthracene	U	39J	580	330
Carbazole	U	U	260J	330
Di-n-butylphthalate	U	U	U	330
Fluoranthene	U	200J	2400	330
Pyrene	U	220J	2400	330
Butylbenzylphthalate	U	U	22J	330
3,3'-Dichlorobenzidine	U	U	U	660
Benzo(a)anthracene	U	100J	1600	330
Chrysene	U	150J	1700	330
bis(2-Ethylhexyl)phthalate	U	U	46J	330
Di-n-octylphthalate	U	U	U	330
Benzo(b)fluoranthene	U	170J	1800	330
Benzo(k)fluoranthene	U	140J	1700	330
Benzo(a)pyrene	U	120J	1100	330
Indeno(1,2,3-cd)pyrene	U	11J	86J	330
Dibenzo(a,h)anthracene	U	U	32J	330
Benzo(g,h,i)perylene	U	9J	59J	330
Date Received		09/27/01	09/27/01	
Date Extracted	10/01/01	10/01/01	10/01/01	
Date Analyzed	10/03/01	10/05/01	10/05/01	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

Soil

TABLE GC-1.0
7001-2550A
LOUREIRO ENGINEERING ASSOCIATES
8082 POLYCHLORINATED BIPHENYL'S

All values are ug/Kg dry weight basis.

Client Sample I.D.	Method Blank	2004284	2004285	Quant. Limits with no Dilution
Lab Sample I.D.	100101-B04	012550A-01	012550A-02	
Method Blank I.D.	PBLK57	PBLK57	PBLK57	
Quant. Factor	1.00	1.11	1.08	
Aroclor-1016	U	U	U	33.
Aroclor-1221	U	U	U	67.
Aroclor-1232	U	U	U	33.
Aroclor-1242	U	U	U	33.
Aroclor-1248	U	U	U	33.
Aroclor-1254	U	U	38.	33.
Aroclor-1260	U	7.7J	70.	33.
Date Received		09/27/01	09/27/01	
Date Extracted	10/01/01	10/01/01	10/01/01	
Date Analyzed	10/03/01	10/04/01	10/04/01	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

Soil

TABLE GC-1.1
7001-2550A
LOUREIRO ENGINEERING ASSOCIATES
8082 POLYCHLORINATED BIPHENYL'S

All values are ug/Kg dry weight basis.

Client Sample I.D. Lab Sample I.D. Method Blank I.D. Quant. Factor	PBLK57 QC2 100101-B04 QC2 PBLK57 1.00			Quant. Limits with no Dilution
Aroclor-1016	U			33.
Aroclor-1221	U			67.
Aroclor-1232	U			33.
Aroclor-1242	150X			33.
Aroclor-1248	U			33.
Aroclor-1254	U			33.
Aroclor-1260	170X			33.
Date Received				
Date Extracted	10/01/01			
Date Analyzed	10/03/01			

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

Soil

TABLE AS-1.0
7001-2550A
LOUREIRO ENGINEERING ASSOCIATES
RCRA METALS

All values are mg/Kg dry weight basis.

Client Sample I.D.	2004284	2004285		
Lab Sample I.D.	012550A-01	012550A-02		
Arsenic	2.9	7.9		
Barium	47.9	40.2		
Cadmium	1.0U	1.0U		
Chromium	12.0	10.		
Lead	34.9	228.		
Mercury	0.070	0.13		
Selenium	1.0U	2.0		
Silver	1.0U	1.0U		

See Appendix for qualifier definitions

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

2004284

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 2550A SAS No.: _____ SDG No.: A2550

Matrix (soil/water): SOIL Lab Sample ID: 012550A-01

% Solids: 88.2 Date Received: 09/27/01

CAS No.	Analyte	Concentration	C	Units	Q	M
	Petroleum Hydrocarbons	635.		mg/Kg		D
12408-02-5	pH	6.27		S.U.		D

Comments:

FORM I - WC

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

2004285

Lab Name: STL Contract: _____

Lab Code: STL Case No.: 2550A SAS No.: _____ SDG No.: A2550

Matrix (soil/water): SOIL Lab Sample ID: 012550A-02

% Solids: 91.9 Date Received: 09/27/01

CAS No.	Analyte	Concentration	C	Units	Q	M
	Petroleum Hydrocarbons	112.		mg/Kg		D
12408-02-5	pH	4.77		S.U.		D

Comments:

FORM I - WC

STL CONNECTICUT

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: 2004284

Lot-Sample #...:	G1J030260 - 001	Work Order #...:	ELHXJ1AC	Matrix.....:	SOLID
Date Sampled...:	09/27/01	Date Received..:	10/03/01	Instrument:	8D5
Prep Date.....:	10/08/01	Analysis Date..:	10/11/01	Units.....:	pg/g
Prep Batch #...:	1281417	Dilution Factor:	1	% Moisture:	8.0

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**0.64**	**J**		**1.000**	**0.640**
Total TCDD	**0.64**				
1,2,3,7,8-PeCDD	ND		0.57	0.500	0.000
Total PeCDD	ND		0.57		0.000
1,2,3,4,7,8-HxCDD	ND		0.88	0.100	0.000
1,2,3,6,7,8-HxCDD	ND		1.9	0.100	0.000
1,2,3,7,8,9-HxCDD	ND		1.6	0.100	0.000
Total HxCDD	**3.9**				
1,2,3,4,6,7,8-HpCDD	**37**			**0.010**	**0.370**
Total HpCDD	**65**				
OCDD	**250**			**0.001**	**0.250**
2,3,7,8-TCDF	ND	CON	0.41	0.100	0.000
Total TCDF	**2.6**				
1,2,3,7,8-PeCDF	ND		0.42	0.050	0.000
2,3,4,7,8-PeCDF	ND		0.55	0.500	0.000
Total PeCDF	ND		2.4		0.000
1,2,3,4,7,8-HxCDF	ND		1.6	0.100	0.000
1,2,3,6,7,8-HxCDF	ND		1.0	0.100	0.000
2,3,4,6,7,8-HxCDF	ND		0.85	0.100	0.000
1,2,3,7,8,9-HxCDF	ND		0.88	0.100	0.000
Total HxCDF	**7.4**				
1,2,3,4,6,7,8-HpCDF	**11**			**0.010**	**0.110**
1,2,3,4,7,8,9-HpCDF	ND		0.79	0.010	0.000
Total HpCDF	**24**				
OCDF	**18**			**0.001**	**0.018**
Total TEQ Concentration					**1.388**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	82	40 - 135
13C-1,2,3,7,8-PeCDD	86	40 - 135
13C-1,2,3,6,7,8-HxCDD	67	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	82	40 - 135
13C-OCDD	80	40 - 135
13C-2,3,7,8-TCDF	95	40 - 135
13C-1,2,3,7,8-PeCDF	93	40 - 135
13C-1,2,3,4,7,8-HxCDF	61	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	76	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.

STL CONNECTICUT

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: 2004285

Lot-Sample #...:	G1J030260 - 002	**Work Order #...:**	ELHXX1AC	**Matrix.....:**	SOLID
Date Sampled...:	09/27/01	**Date Received..:**	10/03/01	**Instrument:**	8D5
Prep Date.....:	10/08/01	**Analysis Date..:**	10/11/01	**Units.....:**	pg/g
Prep Batch #...:	1281417	**Dilution Factor:**	1	**% Moisture:**	7.4

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**120**			**1.000**	**120.000**
Total TCDD	**140**				
1,2,3,7,8-PeCDD	ND		1.4	0.500	0.000
Total PeCDD	**5.5**				
1,2,3,4,7,8-HxCDD	ND		1.5	0.100	0.000
1,2,3,6,7,8-HxCDD	**3.7**	**J**		**0.100**	**0.370**
1,2,3,7,8,9-HxCDD	**4.7**	**J**		**0.100**	**0.470**
Total HxCDD	**33**				
1,2,3,4,6,7,8-HpCDD	**48**			**0.010**	**0.480**
Total HpCDD	**92**				
OCDD	**290**			**0.001**	**0.290**
2,3,7,8-TCDF	**4.8**	**CON**		**0.100**	**0.480**
Total TCDF	**51**				
1,2,3,7,8-PeCDF	ND		2.4	0.050	0.000
2,3,4,7,8-PeCDF	**3.2**	**J**		**0.500**	**1.600**
Total PeCDF	**37**				
1,2,3,4,7,8-HxCDF	ND		2.4	0.100	0.000
1,2,3,6,7,8-HxCDF	**2.9**	**J**		**0.100**	**0.290**
2,3,4,6,7,8-HxCDF	**3.3**	**J**		**0.100**	**0.330**
1,2,3,7,8,9-HxCDF	ND		0.84	0.100	0.000
Total HxCDF	**37**				
1,2,3,4,6,7,8-HpCDF	**16**			**0.010**	**0.160**
1,2,3,4,7,8,9-HpCDF	ND		1.2	0.010	0.000
Total HpCDF	**27**				
OCDF	**20**			**0.001**	**0.020**
Total TEQ Concentration					**124.490**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	82	40 - 135
13C-1,2,3,7,8-PeCDD	88	40 - 135
13C-1,2,3,6,7,8-HxCDD	78	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	94	40 - 135
13C-OCDD	90	40 - 135
13C-2,3,7,8-TCDF	97	40 - 135
13C-1,2,3,7,8-PeCDF	99	40 - 135
13C-1,2,3,4,7,8-HxCDF	74	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	90	40 - 135

Notes:

TEF values are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.

Construction Submittals
Submittal 012
Filter Gravel for Toe Drain

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	10/30/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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☐ Reports ☐ Copy of Letter ☒ Material Submittal

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BY: Scott A. Miller

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MATERIALS SAND and STONE

10062

POUND HILL ROAD QUARRY

N. SMITHFIELD

AASHTO T-27

	1½	¾	½	#40	
	100.0	100.0	100.0	100.0	
	100.0	100.0	100.0	100.0	
	68.2	100.0	100.0	100.0	
	26.0	94.2	100.0	100.0	
	8.0	23.9	87.7	100.0	
	5.0	9.4	26.0	99.0	
	2.7	3.0	2.1	32.4	
	2.0	1.9	1.4	3.3	

AASHTO T-19

(lbs./cu. ft.)

	94.29
	93.43
	90.40
	91.41

AASHTO T-96

	B	33.75
	B	33.29

Construction Submittals
Submittal 013
Waterstop – Concrete Accessory

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	11/14/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	11/14/01	Submittal 013 – Waterstop – Concrete Accessory

THESE ARE TRANSMITTED AS INDICATED BELOW

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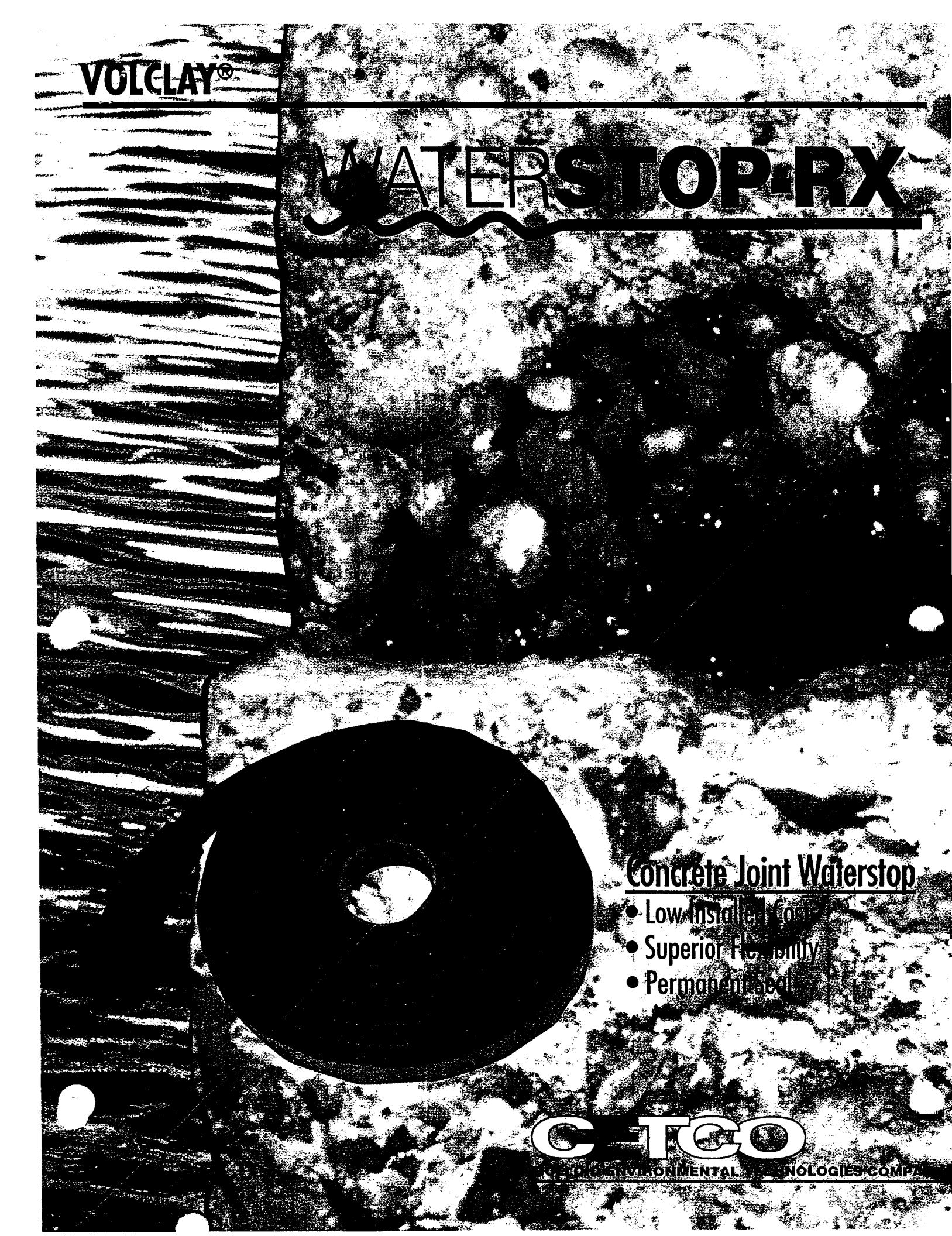
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

100 Northwest Drive • Plainville, CT 06062 • 860.747.6181 • Fax 860.747.8822 • www.loureiro.com
An Employee Owned Company

VOLCLAY®

WATERSTOP-RX



Concrete Joint Waterstop

- Low Installed Cost
- Superior Flexibility
- Permanent Seal

CETCO

AMCOL ENVIRONMENTAL TECHNOLOGIES COMPANY

WATERSTOP-RX Advantages

- *Eliminates split-forming, splices & welding, saving time & labor costs*
- *Active material seals small cracks and voids permanently*
- *Flexible lightweight product that contours irregular concrete & penetrations*

PRODUCT DESCRIPTION

WATERSTOP-RX® is a flexible strip concrete construction joint sealant that provides a permanent watertight seal by expanding upon contact with water. WATERSTOP-RX is an active bentonite/butyl rubber-based waterstop that is designed to replace conventional passive PVC dumbbell waterstops, thus eliminating the requirement of split-forming and product seam welding.

Applications include both vertical and horizontal concrete construction joints, new to existing construction, irregular surfaces, and around through-wall penetrations, such as plumbing and electrical conduit. WATERSTOP-RX is designed for both hydrostatic and non-hydrostatic conditions. However, WATERSTOP-RX is not designed, nor intended to function as an expansion joint sealant. Contact manufacturer for precast concrete applications, technical information and approval.

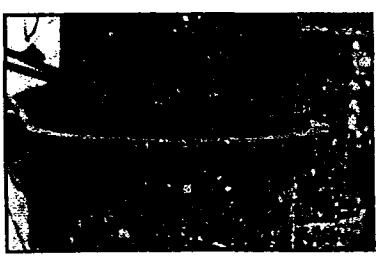
WATERSTOP-RX is manufactured in lightweight, flexible coils that can be installed in both hot and cold weather. The product is adhered to concrete, steel, and PVC (Pipes) with Volclay WB-ADHESIVE at or exceeding the required minimum distance from the exterior concrete surface. Coil ends are butted together – not overlapped – to form a continuous waterstop. In most applications WATERSTOP-RX is installed to the interior side of the outer row of steel reinforcement to allow for sufficient concrete coverage. WATERSTOP-RX should only be used in applications where the product is completely encapsulated within the concrete.

WATERSTOP-RX products are designed for structural concrete with a minimum of 3000 psi. WATERSTOP-RX 101 and WATERSTOP-RX 101T, including the RH formula of each, require a minimum of 3" (7.6cm) of concrete coverage. WATERSTOP-RX 102 and WATERSTOP-RX 102RH require a minimum concrete coverage of 2" (5cm).

RX 101 and RX 101T products are designed for vertical and horizontal reinforced concrete 8" (20cm) thick or greater with two rows of reinforcing steel. RX 102 products are designed for vertical reinforced concrete 5" (12.7cm) thick or greater; and horizontal reinforced concrete no less than 4" (10.2cm) thick. RX 102 products shall be used in concrete with one row of reinforcement, concrete curbs, planter walls, and lightweight concrete.

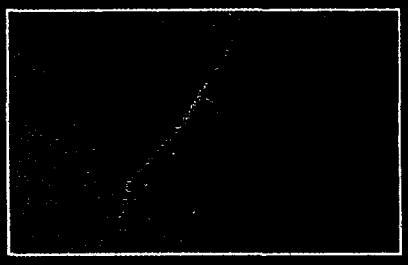
WATERSTOP-RX is not a self-adhering product. Volclay WB-ADHESIVE is required to secure WATERSTOP-RX to concrete, metal, or PVC (Pipe) surfaces. Mechanical fasteners should not be used to secure waterstop alone, but may be used in conjunction with WB-ADHESIVE.

Fast, simple installation.



Waterstop-RX at pipe penetration.

RX 101 - 3/4" X 1"
Designed for vertical & horizontal concrete 8" thick or greater.



RX 101T - 1-1/4" X 1/2"
Reinforced trapezoidal designed for shotcrete, extreme hot weather and difficult applications.

RX 102 - 3/8" X 3/4"
Designed for vertical & horizontal concrete 5-8" thick.

WARRANTY

The information and data contained herein are believed to be accurate and reliable. Specifications and other information contained herein supersede all previously printed material and are subject to change without notice.

Manufacturer warranty of installed system is available. Contact seller for terms and sample document including all limitations.

All goods sold by seller are warranted to be free from defects in material and workmanship.

The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise including but not limited to any implied warranties of merchantability or fitness.

Seller shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising from the sale, handling or use of the goods, or from any other cause relating thereto, and seller's liability hereunder in any case is expressly limited to the replacement (in the form originally shipped) of goods not complying with this agreement or at seller's election, to the repayment of, or crediting buyer with, an amount equal to the purchase price of such goods, whether such claims are for breach of warranty or negligence.

Any claim by buyer with reference to the goods sold hereunder for any cause shall be deemed waived by buyer unless submitted to seller in writing within thirty (30) days from the date buyer discovered or should have discovered, any claimed breach.

Materials should be inspected and tested by purchaser prior to their use if product quality is subject to verification after shipment. Performance guarantees are normally supplied by the applicator.

NOTE: Expansion joints shall be the responsibility of OTHERS.

Form No. WS-201 595 10M Printed in U.S.A.

Distributed By:

CONTRACTORS SUPPLY, INC.
3340 PAWTUCKET AVENUE
EAST PROVIDENCE, R.I. 02915
(401) 434-4300

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
Building Materials Group
1350 W. Shure Drive
Arlington Heights, IL 60004
847-392-5800
FAX 847-506-6195
800-527-9948

Quality from the ground up.™

1. PRODUCT NAME

VOLCLAY WATERSTOP-RX®
Bentonite Strip Waterstop System

2. MANUFACTURER

Colloid Environmental Technologies Company (CETCO)
Building Materials Group
1350 West Shure Drive
Arlington Heights, IL 60004
Phone: (847) 392-5800
Fax: (847) 506-6195
Toll Free: (800) 527-9948

3. PRODUCT DESCRIPTION

Basic Use: WATERSTOP-RX® (RX) is a flexible strip concrete construction joint sealant that provides a permanent watertight seal by expanding upon contact with water. WATERSTOP-RX is an active bentonite/ butyl rubber-based waterstop that is designed to replace conventional passive PVC dumbbell waterstops, thus eliminating the requirement of split-forming and product seam welding.

Applications include both vertical and horizontal concrete construction joints, new to existing construction, irregular surfaces, and around through-wall penetrations, such as plumbing and electrical conduit. Waterstop-RX is designed for both hydrostatic and non-hydrostatic conditions. However, WATERSTOP-RX is not designed, nor intended to function as an expansion joint sealant. Contact manufacturer for precast concrete applications, technical information and approval.

The key to WATERSTOP-RX is its sodium bentonite base. Bentonite swells when in contact with water, forming an impermeable barrier. This swelling property allows WATERSTOP-RX to form a permanent pressure seal within the concrete joint, thus eliminating water migration over or along the waterstop. In addition to forming a positive pressure seal, the product's expansion properties allow it to seal small cracks and void areas, even cracks caused later from concrete settling. WATERSTOP-RX has been successfully tested by independent testing firms to over 150 Feet (50 meters) of hydrostatic water pressure, under both continuous water emersion and wet/dry cycling.

WATERSTOP-RX is manufactured in light weight, flexible coils that can be installed in both hot and cold weather. The product is adhered to concrete, steel, and PVC (Pipes) with Volclay WB-ADHESIVE at or exceeding the required minimum distance from the exterior concrete surface. Coil ends are butted together – not overlapped – to form a continuous waterstop. In most applications WATERSTOP-RX is installed to the interior side of the outer row of steel reinforcement to allow for sufficient concrete coverage. WATERSTOP-RX should only be used in applications where the product is completely encapsulated within the concrete.

WATERSTOP-RX is extruded in three sizes and shapes (See Table 1). Each product is also produced in a Rapid Hydration (RH) formula. Rapid Hydration products are designed for high saline conditions, chemical contaminated areas, and hydrostatic pressures above 40 Feet (12 Meters). Consult manufacturer for chemical compatibility and for additional applications. The product's standard hydration rate allows for temporary protection from inclement weather prior to concrete placement.

WATERSTOP-RX 101 and 101RH are extruded in a rectangular shape measuring 1" x 3/4" x 16'8" (25mm x 19mm x 5.03m). WATERSTOP-RX 101T and 101TRH are extruded in a trapezoidal shape measuring 1-1/4" x 1/2" x 16' 8" (31mm x 12mm x 5.03m) with a reinforcing plastic scrim embedded in the top surface for high tensile strength. The patended trapezoidal shape distributes the expansive force over a greater area and allows the concrete to flow more readily over the product during placement. WATERSTOP-RX 102 and 102RH are extruded in half-circle (Cresent) shape measuring 3/4" x 3/8" x 25' (19mm x 9mm x 7.62m).

WATERSTOP-RX products are designed for structural concrete with a minimum of 3000 psi. WATERSTOP-RX 101, 101RH, 101T and 101TRH require a minimum of 3" (75mm) of concrete coverage. WATERSTOP-RX 102 and 102RH require a minimum concrete coverage of 2" (50mm).

RX 101 and RX 101T products are designed for vertical and horizontal reinforced concrete 8" (200mm) thick or greater with two rows of reinforcing steel. RX 102 products are designed for vertical reinforced concrete 5" (125mm) thick or greater; and horizontal reinforced concrete no less than 4" (100mm) thick. RX 102 products shall be used in concrete with one row of reinforcement, concrete curbs, planter walls, and light weight concrete.

TABLE 1

Product	Size	Shape	Hydration Type	Ln/Ft. Carton	Carton Weight
RX101	1" x 3/4" x 16' 8"	Rectangle	Standard	100	53lbs
RX101RH	1" x 3/4" x 16' 8"	Rectangle	Rapid	100	53lbs
RX101T	1-1/4" x 1/2" x16' 8"	Trapezoid with Poly Reinforcement	Standard	100	36lbs
RX101TRH	1-1/4" x 1/2" x16' 8"	Trapezoid with Poly Reinforcement	Rapid	100	36lbs
RX102	3/4 x 3/8 x 25'	Half Circle	Standard	150	25lbs
RX102RH	3/4 x 3/8 x 25'	Half Circle	Rapid	150	25lbs

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SPEC DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

CONTRACTORS SUPPLY, INC.
3340 PAWTUCKET AVENUE

WATERSTOP-RX is not a self-adhering product. WB-ADHESIVE is required to secure WATERSTOP-RX to concrete, metal, or PVC (Pipe) surfaces. Mechanical fasteners should not be used to secure waterstop alone, but may be used in conjunction with WB-ADHESIVE.

WB-ADHESIVE is a gray, non-flammable latex, water based adhesive. WB-ADHESIVE is formulated for easy use and high performance. Upon application, WB-ADHESIVE changes color while curing from gray to black. Install WATERSTOP-RX to cured, black adhesive within six (6) hours of turning black.

Limitations: WATERSTOP-RX is not designed, nor intended to function as an expansion joint sealant. RX-101 and RX 101T require a 3" (75mm) minimum concrete cover to the exterior concrete surface. RX 102 requires a 2" (50mm) minimum concrete cover to the exterior concrete surface.

WATERSTOP-RX should not be prehydrated by being subjected to submersion or remain in contact with water prior to concrete pour. If the product exhibits considerable swell prior to confinement in the joint, it must be replaced with new material.

In conditions where severe ground water chemical contamination exists or is expected, consult manufacturer for compatibility information and approval.

WATERSTOP-RX is not a self-adhering product. WB-ADHESIVE is used to adhere the product. Do not use WB-ADHESIVE with concrete curing compounds that contain oil or wax. Maximum storage life – 1 year. Keep cans sealed at all times when not in use. Keep from freezing in a warm, dry storage area.

Composition and Materials: WATERSTOP-RX-Physical Properties: Dark Gray/Black color, odorless, non-polluting, non-toxic, non-flammable.

Volclay WB-ADHESIVE - Physical Properties: Color – Wet (Gray); Dry (Black); Viscosity 5,500-6,500 cps. Meets all current and anticipated volatile organic compound (VOC) regulations.

Packaging: WATERSTOP-RX is available in corrugated cartons, palletized 24 cartons per pallet. Carton labels are color coded for easy product identification.

WB-ADHESIVE is available in cartons containing four (4) one-gallon cans.

4. TECHNICAL INFORMATION

Refer to Table 2 for physical properties for WATERSTOP-RX and WB-ADHESIVE.

TABLE 2

WATERSTOP-RX

Property	Test	Results
Specific Gravity	ASTM D-71	1.57
Flash Point	ASTM D93-97	365°F
Penetration	ASTM D-217	
	150 GTL	58
	300 GTL	85

WB-ADHESIVE

Property	Results
Adhesion	10.4 PSI
Viscosity	5,500-6,500 cps
Solids	46% by Weight
	45% by Volume
Lbs./Gal:	8.5
Service Temperature	33°F-120°F

5. INSTALLATION

Surface preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other debris. Do not install WATERSTOP-RX in standing water.

Application: Roller or brush apply WB-ADHESIVE a minimum of 5 mils thick, by the width of the product, over the entire surface length to receive WATERSTOP-RX. Allow adhesive to dry 10-15 minutes or until black. Temperatures below 55°F (31°C), or in damp conditions allow longer period to dry. Application rate is 400-600 linear feet (120 meters) per gallon – 100 linear feet (30 meters) per quart.

After allowing adhesive to dry black, remove release paper then firmly press the entire length of WATERSTOP-RX onto the dried adhesive. Press firmly a minimum of 15 seconds - especially at the highest coil end on vertical applications. For best results apply WATERSTOP-RX within two hours of adhesive turning black. Areas not receiving waterstop within six (6) hours shall be recoated. WB-ADHESIVE may be applied to damp surfaces, but not in free standing water.

Tightly butt coil ends together to form continuous waterstop. **(Do not overlap coil ends).** Place in maximum practicable lengths to minimize coil end joints. Where required, cut coils with sharp knife or utility blade to fit coil ends together. Pour concrete.

6. AVAILABILITY AND COST

Availability: WATERSTOP-RX and WB-ADHESIVE are available throughout the United States, and internationally through a network of CETCO distributors. Contact CETCO for the nearest distributors location.

Costs: Applied costs are dependent upon local labor rates, freight rates, currency conversions, jobsite conditions, and other relative costs. Costs are competitive with conventional waterstop materials.

7. WARRANTY

Specifications and other information contained herein supersedes all previously printed matter and are subject to change without notice.

All goods sold by seller are warranted to be free from defects in material and workmanship.

The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise, including but not limited to any implied warranties of merchantability or fitness.

Seller shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising from the sale, handling or use of goods, or form any other cause relating thereto, and seller's liability hereunder in any case is expressly limited to the replacement (in the form originally shipped) of goods not complying with this agreement or at seller's election, to the repayment of, or crediting buyer with, an amount equal to the purchase price of such goods, whether such claims are for breach of warranty or negligence.

Any claim by buyer with reference to the goods sold hereunder for any cause shall be deemed waived by buyer unless submitted to

seller in writing within thirty (30) days from the date buyer discovered or should of discovered, any claimed breach.

Materials should be inspected and tested by purchaser prior to their use if product quality is subject to verification after shipment. Performance guarantees are normally supplied by the applicator.

WATERSTOP-RX is not an expansion joint material nor should it be used as such. Expansion joints are the responsibility of others.

8. MAINTENANCE

WATERSTOP-RX - None required
WB-ADHESIVE - Keep from Freezing

9. TECHNICAL SERVICES

Complete technical services are available upon request to the manufacturer. These services include water and chemical analysis to determine product compatibility, and review of details and specifications. Modifications may be recommended when required to accommodate special conditions. The manufacturer and distributors also work with the contractor through the initial stages to assure proper installation procedures. A fee for specialized services may be negotiated with the contractor.

Consult manufacturer for current data, additional installation instructions, technical information, and comments on design conditions not covered herein.

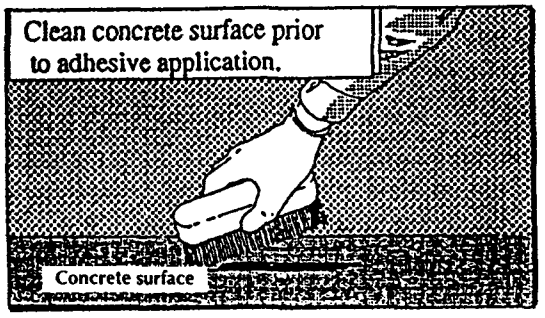
10. FILING SYSTEMS

Electronic SPEC-DATA
SPEC-DATA II
Sweet's Architectural File
Sweet's Industrial Construction File
Sweet's International Construction File
Literature available upon request from the manufacturer.

HORTON CONSTRUCTION CO., INC.
SUBMITTAL # _____
SPECIFICATION # 3250-2
☑ REVIEWED
☐ REVIEWED/SEE NOTIONS
☐ FOR PROJECT RECORDS ONLY
☐ REVISE & RESUBMIT
☐ NOT REVIEWED
☐ REJECTED
BY: D.A.M DATE: 11/8/01
NOTE: Review of this submittal does not relieve the subcontractor, equipment vendor or supplier, from compliance with ~~plans, specifications, code requirements~~ contract documents. This review does not constitute approval of this submittal.

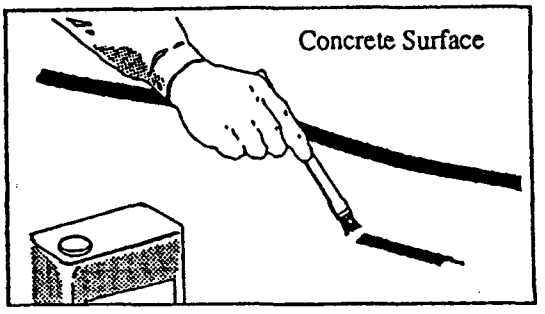
METHOD OF INSTALLATION

5 EASY STEPS



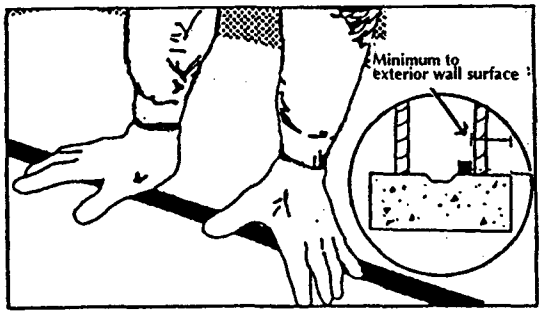
1. CLEAN

BRUSH CLEAN ALL DEBRIS, DIRT, AND ROCKS FROM DRY CONCRETE SURFACE.



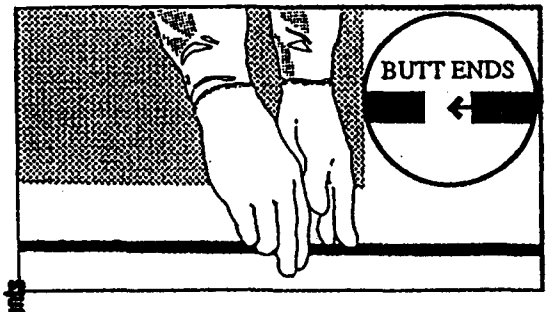
2. PRIME

APPLY A COATING OF VOLCLAY WB-ADHESIVE TO BOTH VERTICAL & HORIZONTAL SURFACES. ALLOW TO DRY BLACK.



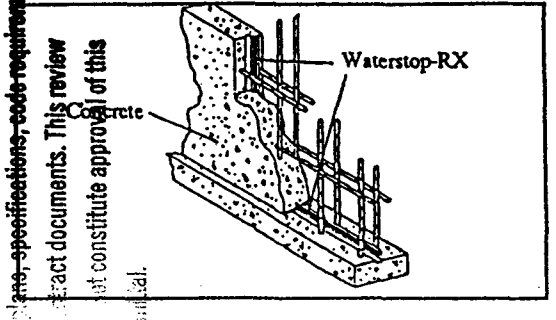
3. PLACE

REMOVE RELEASE PAPER, THEN PRESS FIRMLY AGAINST BLACK PRIMED SURFACE. A MINIMUM CONCRETE COVERAGE MUST BE MAINTAINED – 3" FOR RX101 & RX101T, 2" FOR RX102.



4. BUTT ENDS

TIGHTLY BUTT COIL ENDS TOGETHER TO FORM A CONTINUOUS WATERSTOP. DO NOT OVERLAP COIL ENDS.



5. POUR

POUR AND VIBRATE CONCRETE. DO NOT ALLOW VIBRATOR TO COME IN DIRECT CONTACT WITH WATERSTOP-RX.

WATERSTOP-RX APPLICATIONS & SECTION DETAILS

Product Applications

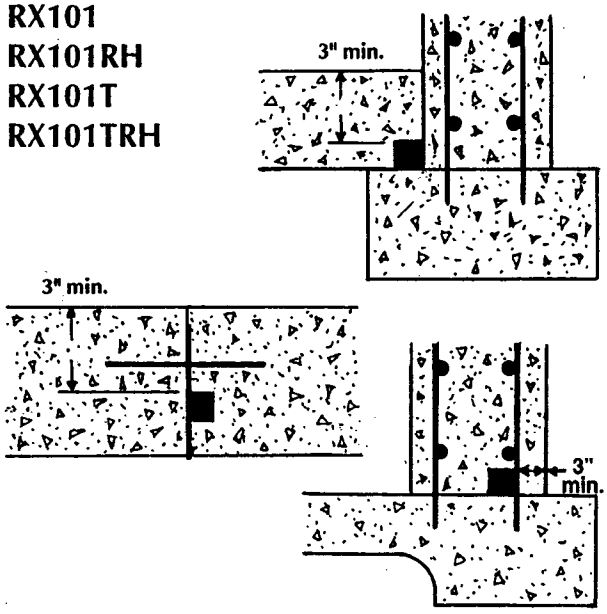
RX101, RX101RH, RX101T, RX101TRH

- Vertical and horizontal concrete 8" (200mm) thick or greater.
- Concrete with two rows of reinforcement
- High hydrostatic pressures
- Tie-back plates and penetrations

RX102, RX102RH

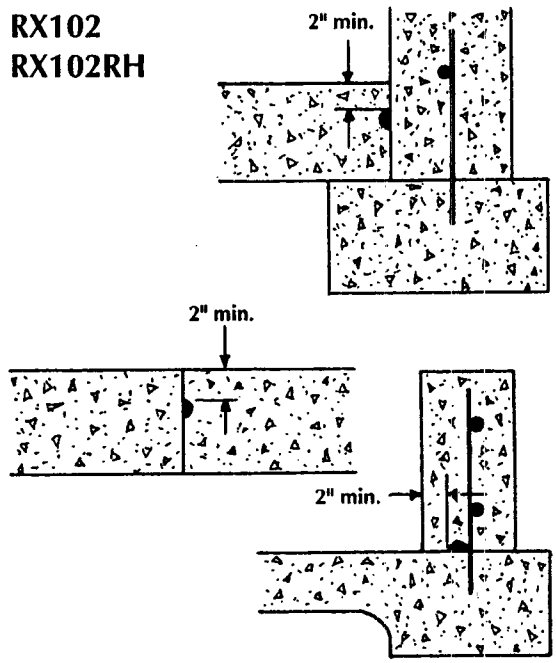
- Vertical concrete 5" (125mm) thick or greater. Horizontal concrete 4" (100mm) thick or greater
- Concrete with one row of rebar
- Slabs containing only wire mesh
- Fountains/Planter box /Curbs.

RX101
RX101RH
RX101T
RX101TRH



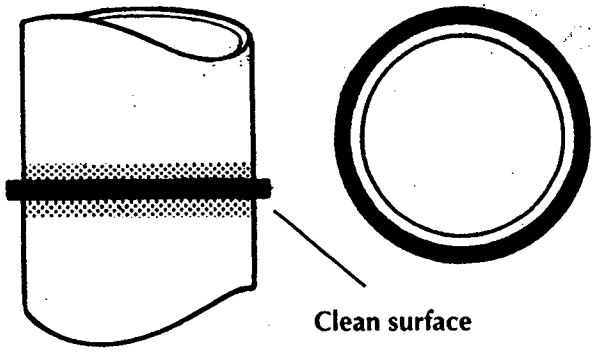
3" (75mm) min. concrete coverage

RX102
RX102RH



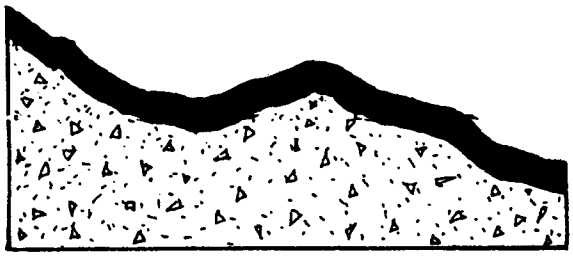
2" (50mm) min. concrete coverage

PENETRATIONS



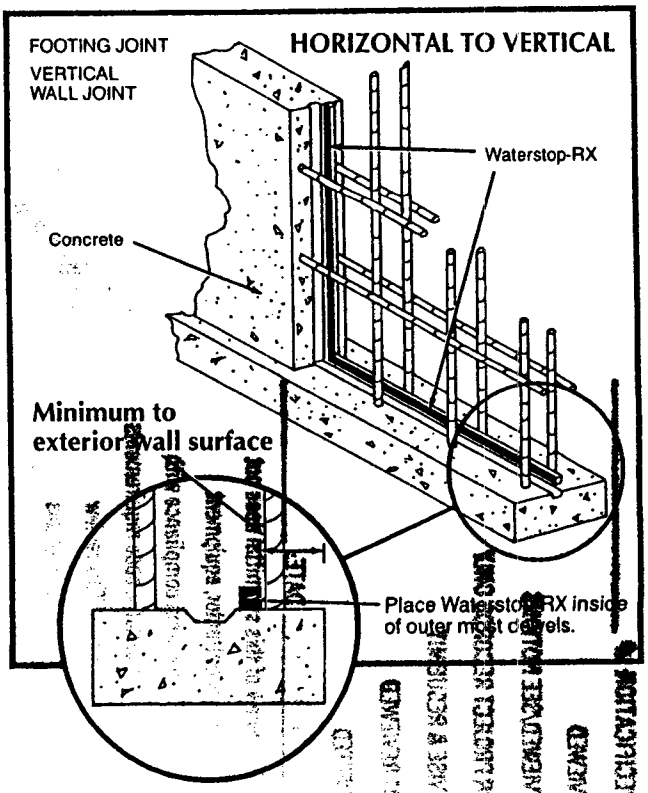
Clean surface

IRREGULAR CONCRETE



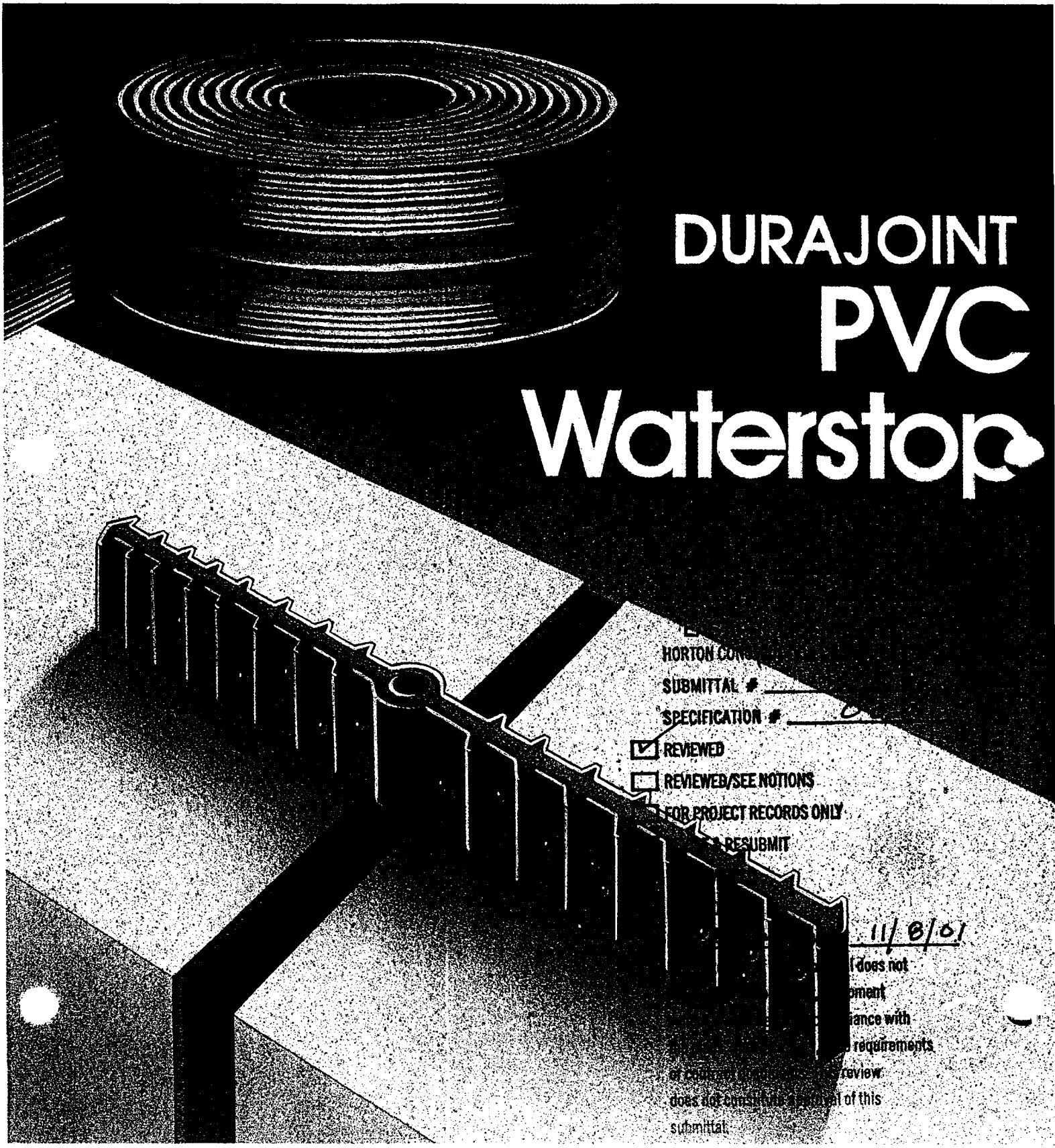
Contour Concrete

HORIZONTAL TO VERTICAL



WATERSTOP-RX is not a self adhering product. Volclay WB-ADHESIVE is required to secure RX to concrete, steel, and PVC surfaces. WATERSTOP-RX is not an expansion joint sealant. Expansion joints are the responsibility of others.

Tamms/Horn



DURAJOINT PVC Waterstop

HORTON CO
SUBMITTAL #
SPECIFICATION #
☑ REVIEWED
☐ REVIEWED/SEE NOTIONS
☐ FOR PROJECT RECORDS ONLY
☐ RESUBMIT

11/8/01

does not
ment
ance with
requirements
review
does not constitute approval of this
submittal

HORN/DURAJOINT®
PVC Waterstop

DESCRIPTION

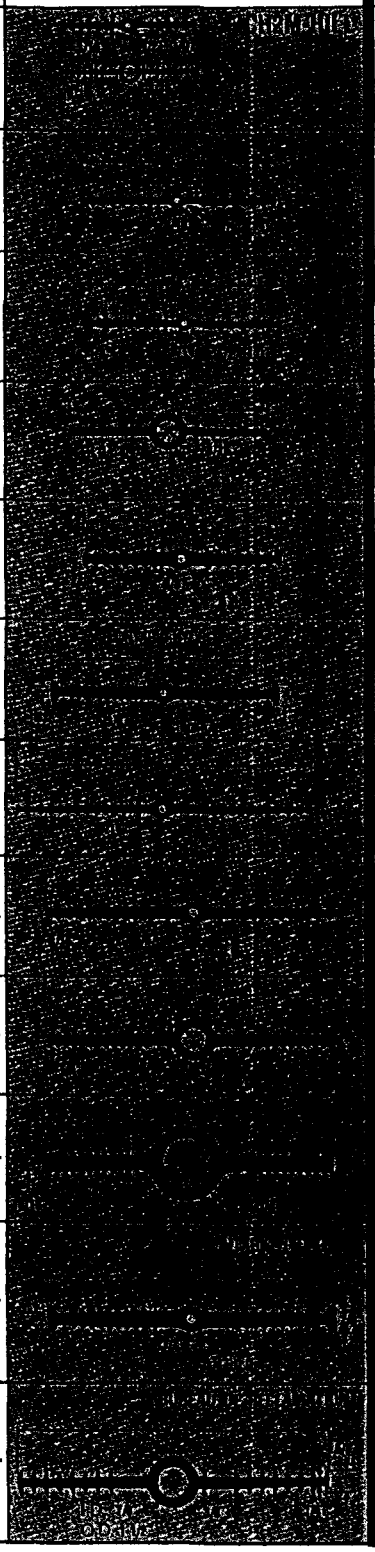
n/Durajoint® PVC Waterstop is extruded from an elastomeric astic compound consisting of virgin polyvinyl chloride and additional resins, plasticizers and stabilizers to meet or exceed the requirements and performance criteria of Corps of Engineers Specification CRD-C 572-74. An arctic grade is available on request to meet Ontario Hydro Std. M-264-81. No reclaimed or reprocessed materials are used. The finished material is gray in color.

Horn/Durajoint® PVC Waterstop is chemically inert, contains no material leachable by water, and is highly resistant to acids and alkalis, to ozone and oxygen, and to waterborne chemicals. It is fungus resistant, as tested against the specifications outlined in Mil. Std. 810B, Method 508. It will not fatigue on repeated flexure, and it retains its strength and elasticity through a temperature range from as low as minus 35°F to a high of plus 175°F.

NOTE: Head pressure ratings are for reference only. Actual ability to resist head pressure depends on the quality of concrete and placement.

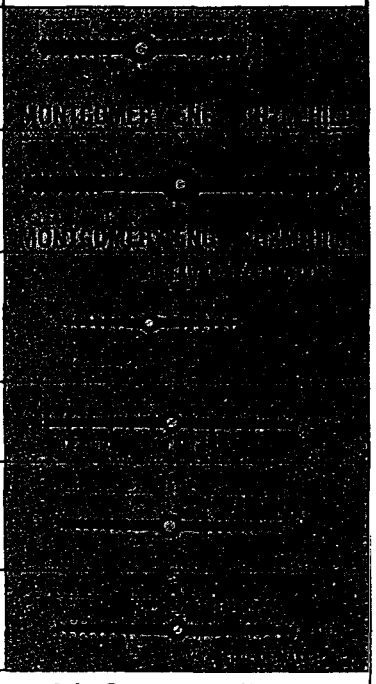
Ribbed Type with Centerbulb

	APPROX. WT. LBS. LIN. FT.	HEAD OF WATER FT.
Type 3 **Type 3A** Construction joints.	0.50 0.40	65
Type 4 Construction joints. For higher heads of water or larger movement than Type 3.	0.89	100
Type 4B Similar to Type 4, however tapered for economical but effective water stoppage.	0.70	100
Type 4C Expansion and construction joints where lateral movement is anticipated.	1.04	100
pe 5 avier duty than Type 4. Will resist displacement during concrete pour.	1.26	125
Type 5A Similar to Type 5. Recommended for small dams and hydro projects.	1.65	125
Type 6 For large expansion joints in retaining walls or roof slabs.	1.07	150
Type 7 For large heads of water–dams, major reservoirs, sewage plants or locks.	1.62	150+
Type 7C Will accommodate extra movement in both expansion and shear.	2.24	150+
Type 7F For large transverse and shear movements in major structures.	3.01	150+
Type 8 For exceptionally high heads of water and application in major structures, dams, wer houses, etc.	2.70	150+
Type 7BR Use when extra movement in both shear and expansion is expected.	2.65	150+



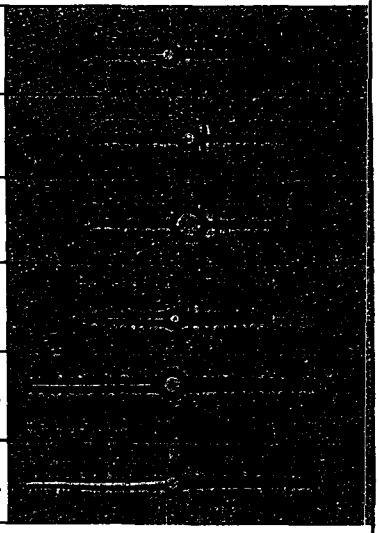
Ribbed Type with Centerbulb

	APPROX. WT. LBS. LIN. FT.	HEAD OF WATER FT.
Type 9 Extra heavy duty for higher heads of water & will resist displacement during pour.	1.64	150
Type 10 Will accommodate extra movement in both expansion and shear.	2.34	150
Type 5BR Extra heavy duty. Will also resist displacement during pour.	1.26	125
Type 31 For extra high dams.	3.18	250+
Type 7DI For larger heads of water dams, reservoirs, sewage plants or locks with larger movement.	2.1	150+
Type M3 Economical shape for use in expansion joints of 1" or less.	1.5	150



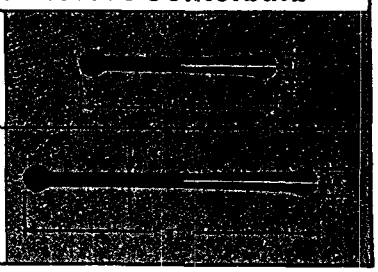
Split Ribbed Type with Centerbulb

Type 300 Same as Type 3 but has one split flange.	0.50	65
Type 400 Same as Type 4 but has one split flange.	0.89	100
Type 400C Same as Type 4C but has one split flange.	1.04	100
Type 500 Same as Type 5 but has one split flange.	1.26	125
Type 700 Same as Type 7 but has one split flange.	1.62	150+
Type 3100 For extra high dams.	3.18	250+



Dumbbell Type-Split without Centerbulb

Type DB-200 For expansion joints 1/2" or less in width.	1.54	100
Type DB-300 For expansion joints 1" or less in width.	2.21	100



USE

Horn/Durajoint® PVC Waterstop is used in portland cement concrete construction to prevent the passage of water through expansion joints or construction joints in almost every type of structure, whenever water has to be kept out or kept in, whether above, at or below grade.

Horn/Durajoint® PVC Waterstop is available in many different types and cross-sections, several of which have one split flange for use where the elimination of split form work is desired.

Ribbed with centerbulb are the most commonly used waterstops in expansion joints where movement is expected.

Ribbed Flat waterstops are ordinarily used in joints where move ment is not expected.

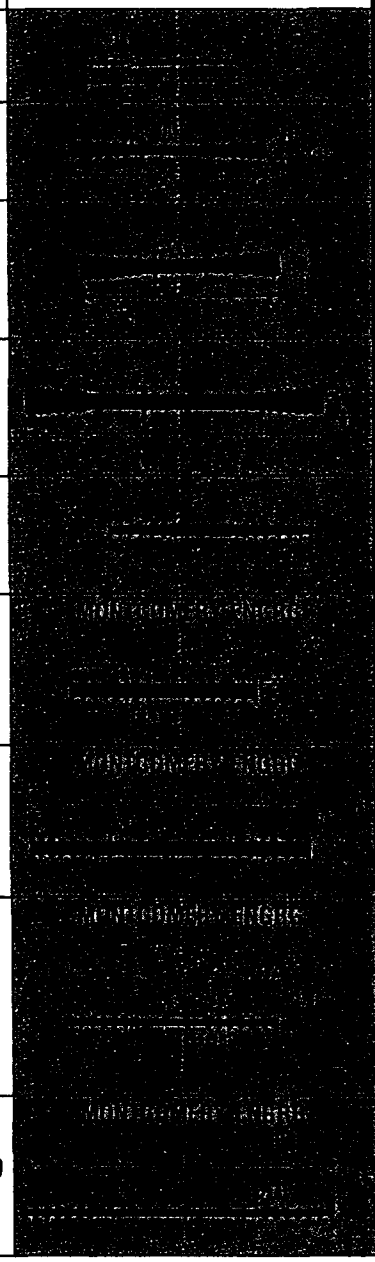
Dumbbell waterstops are primarily used in below grade joint where little or no movement is anticipated.

Dumbbell with centerbulb waterstops are designed to b where movement, even if transverse and longitudinal, r accommodated.

Baseal® waterstops are designed for ongrade installation at the bot tom of concrete slabs to prevent upward seepage of ground wate through joints, or in thin slab construction, or to waterproof joint at wall/slab junctions.

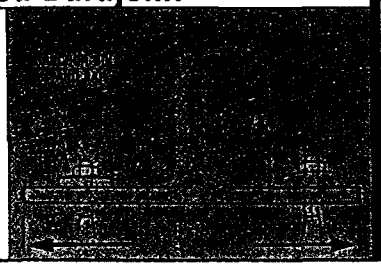
Ribbed Type without Centerbulb

	APPROX. WT. LBS. LIN. FT.	HEAD OF WATER FT.
Type 2 For construction joints.	0.39	65
Type 12 Construction joints in foundation walls and footings.	1.07	65
Type 13 Construction joints in foundation walls and footings where greater hydrostatic pressure is anticipated.	1.59	100
Type 14 For deep embedment in construction and expansion joints where shear movement is not anticipated.	2.24	150
Type 15 Construction joints in foundation walls and footings.	1.29	125
Type 11 Construction joints in foundation walls and footings where greater hydrostatic pressure is anticipated.	1.46	100
Type 11A For deep embedment in construction & expansion joints where shear movement is not anticipated.	2.14	150
Type 11B Durajoint flat ribbed waterstops are used in construction joints where little or no movement is expected. Found generally in below grade footings, walls and slabs.	0.83	100
Type 11C	1.14	150



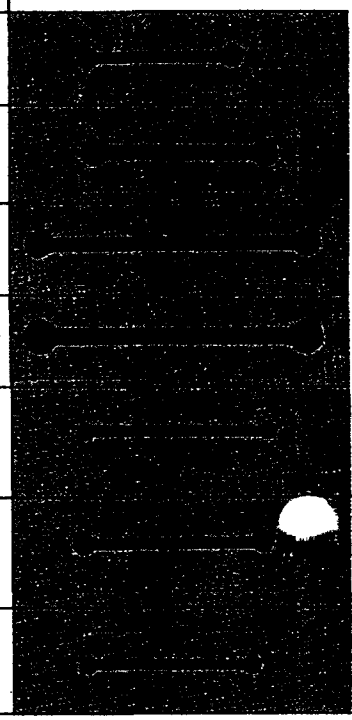
Post Applied Durajoint

Type 18 Post Applied Durajoint was designed to attach new concrete structure to existing concrete. Providing watertight joint with limited movements.	2.80	NA



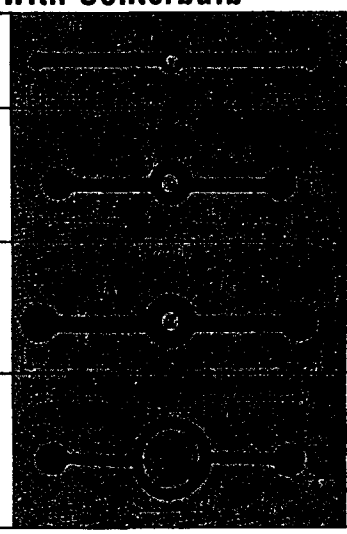
Dumbbell Type without Centerbulb

	APPROX. WT. LBS. LIN. FT.	HEAD OF WATER FT.
Type DB-1 For construction joints.	0.83	65
Type DB-2 For expansion joints 1/2" or less in width.	1.53	100
Type DB-3 For expansion joints 1" or less in width.	2.21	100
Type DB-4 For expansion joints 1" or less in width.	2.34	100
Type DB-5 For composition joints below grade where little or no movement is expected.	0.76	90
Type DB-7 Same as Type DB-5 but will take higher head of water.	0.98	100
Type DB-8 Economical shape for construction joints below grade.	0.50	65



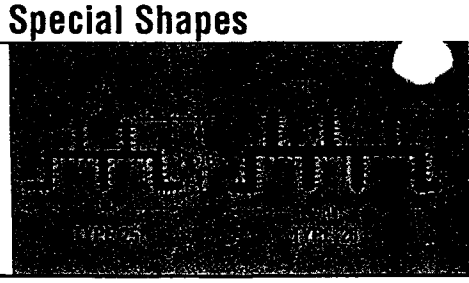
Dumbbell Type with Centerbulb

Type DB-9 For expansion joints 1" or less in width.	2.10	100
Type DB-10 For horizontal and vertical expansion joints where reinforcing steel does not allow use of 9" waterstop.	1.25	125
Type DB-6 For expansion joints up to 1-1/2" in width. Will accommodate both transverse & longitudinal movements.	2.92	150
Type DB-11 To be used in large pours with expected movements, floodwalls, large treatment plants.	3.65	150

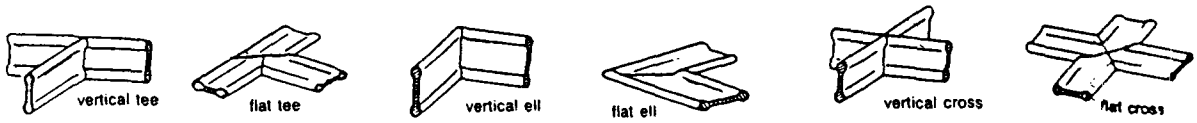


Special Shapes

Used in difficult forming areas that do not require a high head of water.	

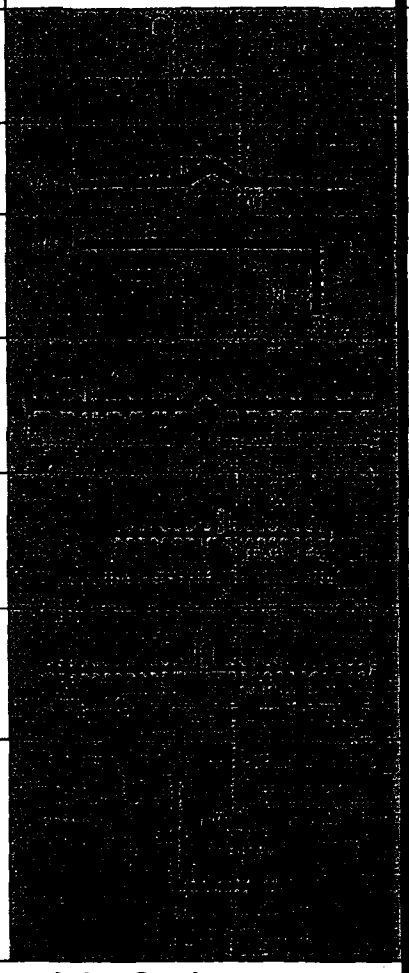


Factory Made Splices available upon request



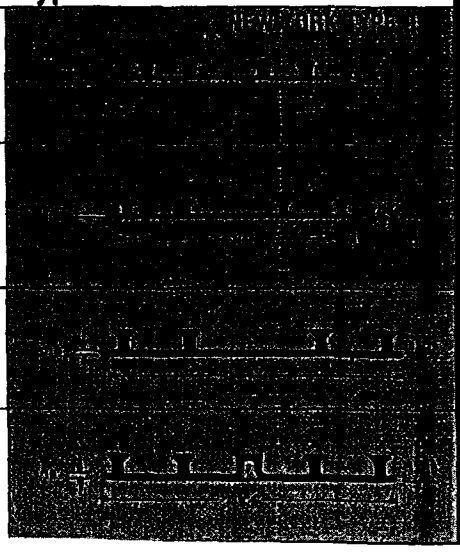
Special Shapes

	APPROX. WT. LBS. LIN. FT.	HEAD OF WATER FT.
Type 16 Bridge deck joint to meet Cal. State Hwy. Dept. specifications.	1.1	NA
Type M1 Used as construction joint in thin walls and slabs.	0.58	NA
Type M2 Bridge and highway construction joints between deck and curbing or parapet abutments.	1.7	NA
Type 17 For greater embedment in construction joints or thin walls and slabs.	1.25	50
Type 27 For construction joints on highways and bridges.	0.78	NA
Type 28 For construction joints on highways and bridges.	1.00	NA
Type 29 Used for to attach new concrete structure to existing concrete. Providing watertight construction joint with little or no movements.	0.82	NA



Baseal® Type Joint Seals

Type 66 Base seal for wall and slab construction joints.	0.83
Type 60 For construction joints in slabs and walls.	0.80
Type 61 Heavy duty for construction joints in slabs and walls.	1.51
Type 62 Heavy duty for expansion joints.	1.64



PVC Masonry Control Joint Units

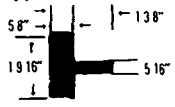
PVC Masonry Control Joint units are designed to be used with standard concrete blocks to provide a vertical joint of stress relief in concrete masonry walls, while providing adequate shear strength for lateral stability.

Control joints should be used about every 20 to 35 feet in average walls, but should not be spaced more than twice the wall height for high walls.

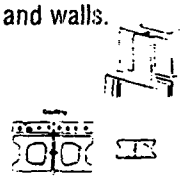
Control joint units are extruded from a specially formulated PVC Compound in 4 LF lengths.

Type 20 and Type 21 are used both in block walls and brick veneer. They are used with less expensive joint fillers and are ideal between columns and walls.

Type 20

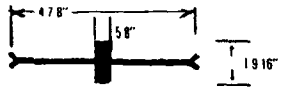


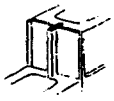
Type 21



Type 22 and Type 24 are used in 8 inch and 6 inch block walls. This configuration provides protection from foreign materials.

Type 22

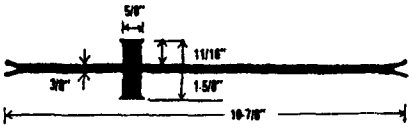


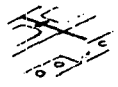


Type 24

Type 23 is used in block walls and brick veneer with the ability to provide protection against the penetration of foreign materials.

Type 23

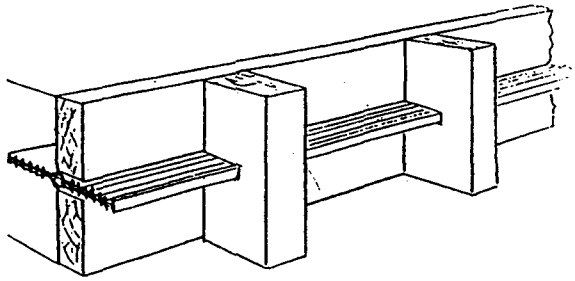




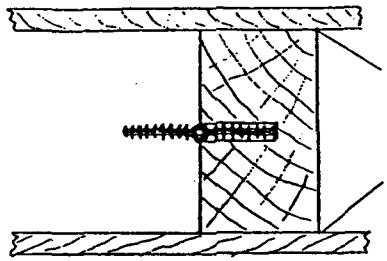
Typical Physical Properties

Tensile Strength	ASTM D-638	2000 psi
Elongation	ASTM D-638	360%
Specific Gravity	ASTM D-792	1.38
Hardness Shore A	ASTM D-2240	80 ± 5

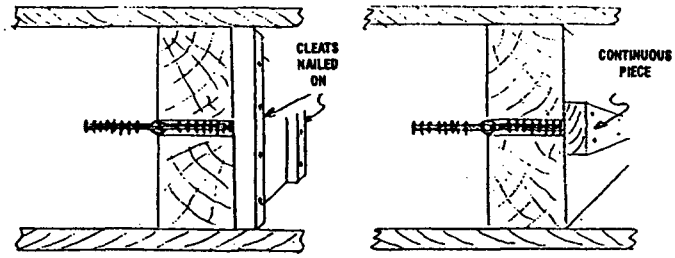
Suggested Form Construction Details For Waterstop Installation



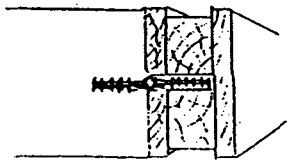
GROOVED CLEATS TO HOLD WATERSTOPS



GROOVE IN FORMWORK



DIVIDED FORMWORK



SPLIT PLANK FORM

Waterstop Installation Using End Bulb Rings

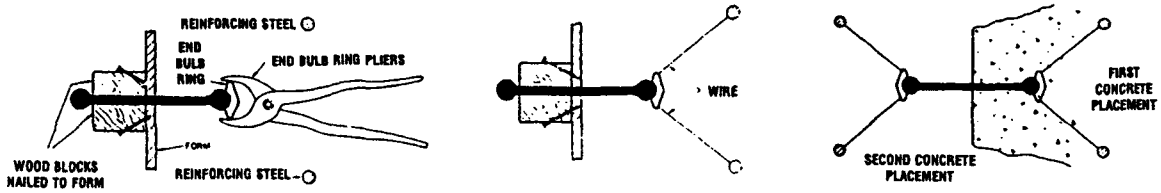
Unless waterstops are supported to resist the weight of concrete, they may be deflected and form a less effective water barrier.

This support is easily rendered by using end bulb rings and wire to tie the waterstop to the reinforcing steel.

When the waterstop is positioned in the split form, wooden blocks are nailed to one side to hold the waterstop in place until the wiring is done on the other side of the form.

An end bulb ring is clamped to the end bulb of the waterstop as shown in Figure 1. The ring should be embedded in the end bulb of the waterstop and not puncture the web. Place a ring every 12 to 18 inches.

Figure 1



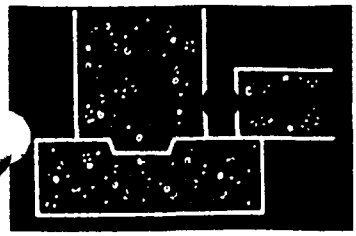
Typical Properties (PVC)

(CRD-C-572-74)

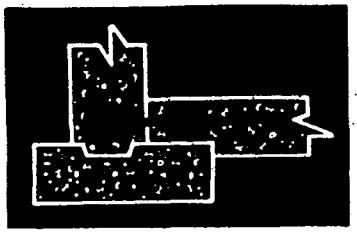
	Typical Value	Test Method
nsile Strength	2050 psi	CRD-C 573
.imate Elongation	366%	CRD-C 573
tiffness in Flexure	775 psi	CRD-C 571
Tear Resistance	380 lbs./in.	ASTM D-624
Ozone Resistance	passed	ASTM D-1149
Low Temperature Brittleness (-35°F)	No Cracking or Splitting	CRD-C 570
Accelerated Extraction		CRD-C 572
Ultimate Elongation	350%	Par 7.1
Tensile Strength	2000 psi	Par 7.1
Effects of Alkalies	Loss in Weight 0.10% Max. Gain in Weight 0.25% Max.	CRD-C 572 Par 7.2

Suggested Specification

All waterstop shall be Horn/Durajoint PVC Waterstop as manufactured by Tamms/Horn. It shall be an extrusion of virgin polyvinylchloride and additional resins, plasticizers and stabilizers, and shall meet or exceed the requirements of the Corps of Engineers specifications for PVC Waterstop. Types and dimensions of waterstop shall be those shown in the project specifications.



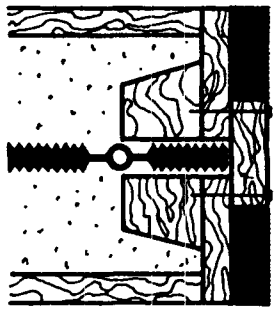
EXPANSION JOINTS



CONSTRUCTION JOINTS

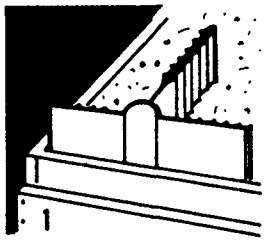
How to make keyed split forms

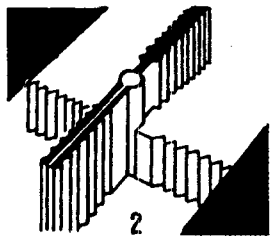
2 x 4 lumber should be chamfered and ripped, and waterstop placed between the split sections. Center the Waterstop at the edge of the 2 x 4. Three pieces are required for the bulkhead, as shown in the drawing.



How to eliminate split forms

Use HORN/DURAJOINT split ribbed waterstop with centerbulb. Spread open split flange and staple or nail to bulkhead (1). After forms from the first pour have been removed, join split flange (2) using hog rings.



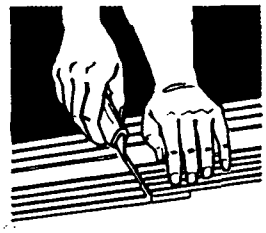


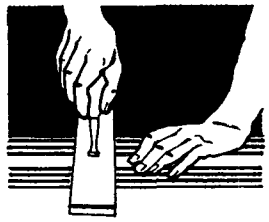
How to splice HORN/DURAJOINT PVC Waterstop

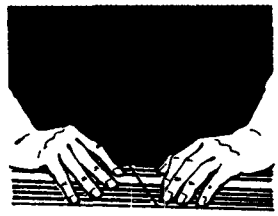
1. PVC Waterstop is spliced by cutting the two ends to be joined so that they will butt smoothly together. Use a miter box, or overlap and cut through both pieces at once.

2. Heat both ends to be joined, using an electric splicing iron, until the material melts. For best results, there should be about 1/8" of melted material at the end of each piece, but do not overheat to the point that the waterstop becomes a dark color.

3. Press the melted edges firmly together and hold for 15 to 30 seconds until the material cools. Stress should not be put on the spliced joint until the waterstop has completely cooled.







Electrical Splicing Tools

2" x 14" Iron with Teflon Cover
6' Power Cord
Weight 5 Lbs.
UL Listed, 110V 600 Watts

4-1/2" x 14" Iron with Teflon Cover
6' Power Cord
Weight 5 Lbs.
110V 600 Watts

Tamms

Customer Service Center

Distributed by:

Corporate Office
7405 Production Drive
Mentor, OH 44060
800-21-TAMMS or 800-218-2667
216-974-2399 FAX: 216-974-2388

Factory Installed "Wire Rings"

Durajoint Waterstop is available with factory installed "Wire Rings". These "Wire Rings" are installed during the extrusion process in 12 inch* intervals. Manufactured of Galvanized Metal, the "Wire Rings" help to hold the waterstop in a proper position during the placement of concrete, by fastening the rings with wire to the rebar. "Wire Rings" are available on selected shapes and sizes of waterstop. Waterstop conforms to the same specifications listed with or without "Wire Rings". For more information, please call.

*12 inch intervals are standard. Any interval can be specified/requested.

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A Division of
LAPORTE CONSTRUCTION CHEMICALS
NORTH AMERICA, INC., Mentor, OH 44060

Construction Submittals
Submittal 014
Grout Cube/Cylinder Test Results

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	11/26/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☐ Herewith ☒ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	11/26/01	Submittal 014 – Grout Cube/Cylinder Test Results

THESE ARE TRANSMITTED AS INDICATED BELOW

☐ For your use ☐ No Exceptions Taken ☐ Return _____ Corrected Prints

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Masonry Grout/Mortar Test Results

PROJECT: Allendale Dam

PROJECT#: 21165 Date: 11-6-01

Client: LEA-CIANCI

Location: _____

Number & Type of specimen cast: _____

Mason Contractor: _____

Location: Foot of DAM

Number & Type of specimen cast: 4-3x6 cyls

General Contractor: LEA CIANCI

Mortar Test

ASTM Type & Strength

Type M - 2500# psi _____

Type S - 1800 # psi _____

Type N - 750# psi _____

Portland Cement	Masonry Cement	Lime	Masonry Sand
Brand & Source			
Proportions by Volume			

Grout Test

Proportions by Weight Cubic Yard

Hand Batched

Cement: 4 Bags TYPE III PORTLAND

Sand: X 59 gls WATER

Stone: X

Ready Mix Source: MADE ON SITE

Load #: — Time of Test: —

Truck #: — Mix Duration: —

Slump ("): — Temp (° F) 65

ASTM C-109 Test Results

Specimen	Test Date	Age	Strength psi

ASTM C-1019 Test Results

Specimen	Test Date	Age	Strength osi
2 A	11-13	7	7220
2 B	12-4	28	
2 C	12-4	28	
2 D	12-4	28	

Required Strength at 28 Days: _____

Remarks: _____

Technician: _____

Required Strength at 28 days: _____

Water Added: _____

Remarks: _____

Technician: RICHARD MARIEL

Construction Submittals
Submittal 014a
Grout Cube/Cylinder Test Results –
Resubmission After 28-Day Break

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	12/12/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Masonry Grout/Mortar Test Results

PROJECT: Allendale Dam

PROJECT#: 21165 Date: 11-6-01

Client: LEA-CIANCI

Location: _____

Number & Type of specimen cast: _____

Mason Contractor: _____

Location: Foot of DAM

Number & Type of specimen cast: 4-3x6 cyls

General Contractor: LEA CIANCI

Mortar Test

ASTM Type & Strength

Type M - 2500# psi _____

Type S - 1800 # psi _____

Type N - 750# psi _____

Grout Test

Proportions by Weight Cubic Yard

Hand Batched

Cement: 4 Bags TYPE III PORTLAND

Sand: X 5 gals WATER

Stone: X

Portland Cement	Masonry Cement	Lime	Masonry Sand
Brand & Source			
Proportions by Volume			

Ready Mix Source: MADE ON SITE

Load #: — Time of Test: —

Truck #: — Mix Duration: —

Slump ("): — Temp (° F) 65

ASTM C-109 Test Results

Specimen	Test Date	Age	Strength psi

ASTM C-1019 Test Results

Specimen	Test Date	Age	Strength psi
2 A	11-13	7	7220
2 B	12-4	28	12170
2 C	12-4	28	12380
2 D	12-4	28	12310

Required Strength at 28 Days: _____

Remarks: _____

Technician: _____

Required Strength at 28 days: _____

Water Added: _____

Remarks: _____

Technician: RICHARD MARIEL

Construction Submittals
Submittal 015
Rebar Bending Diagram, Joint Filler, Joint Sealant

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	11/29/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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☐ Reports ☐ Copy of Letter ☒ Material Submittal

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

Per Section 03250, par 1.2, SD-06

THE EUCLID CHEMICAL COMPANY
19218 REDWOOD ROAD
CLEVELAND, OH 44110

(216) 531-9222
(800) 321-7628
FAX (216) 531-9596

EUCOLASTIC I

ONE PART URETHANE SEALANT

EUCOLASTIC I is a one part urethane sealant for sealing and protecting moving joints of all types.

PRIMARY APPLICATIONS

- Concrete construction & control joints
- Precast concrete member
- Masonry units
- Window perimeters
- Interior and exterior applications

FEATURES / BENEFITS

- Available in both gun grade (non-sag) and pourable for universal applications
- Ultraviolet stable for outdoor use
- Remains adhesively and cohesively bonded during temperature cyclic movement
- Passes accelerated weathering test for suitability in harsh environments

SPECIFICATIONS / COMPLIANCES

- EUCOLASTIC I (gun grade) meets Federal Specification TT-S-00230C, Type II, class A. This product also meets industry standard ASTM C 920-86, Type S, Grade NS, Class 25.
- EUCOLASTIC I (pourable grade) meets Federal Specification TT-S-00230C, Type I, Class A. This product also meets industry standard ASTM C 920-86, Type S, Grade P, Class 25.

PACKAGING / YIELD

EUCOLASTIC I (gun grade) is packaged in 11 oz (325 ml) tubes and 2 gal (7.6 liter) bulk units. One 11 oz (325 ml) tube yields @ 19 in^3 (34 cm^3) of product. One 2 gal (7.6 liter) bulk unit yields 462 in^3 (7571 cm^3) of product.

EUCOLASTIC I (pourable grade) is packaged in 30 oz (887 ml) tubes and 2 gal (7.6 liter) bulk units. One 30 oz (887 ml) tube yields @ 54 in^3 (884 cm^3) of product. One 2 gal (7.6 liter) bulk unit yields 462 in^3 (7571 cm^3) of product.

TECHNICAL INFORMATION

Typical Engineering Data

The following results were developed under laboratory conditions.

EUCOLASTIC I: (gun grade)

Physical Properties	Actual	Specification Requirement
Rheological properties		
@40°F (4°C)	No Flow	No Flow
@122°F (50°C)	No Deformation	No Deformation
Extrusion Rate	7 seconds	25 seconds max
Hardness	40	15-50
Weight Loss	9%	10% max
Tack Free Time	30 hours	72 hours max
Adhesion-in-Peel (<25% bond loss)		
Concrete	20-25 PLI	> 5 PLI
Aluminum	18-22 PLI	> 5 PLI
Brick	19-23 PLI	> 5 PLI

EUCOLASTIC I: (pourable grade)

Physical Properties	Actual	Specification Requirement
Rheological properties		
@40°F (4°C) or higher	Self-Leveling	Self-Leveling
Extrusion Rate	3 seconds	20 seconds max
Hardness	35	25-50
Weight Loss	5%	10% max
Tack Free Time	30 hours	72 hours max
Adhesion-in-Peel (<25% bond loss)		
Concrete	16-20 PLI	> 5 PLI
Aluminum	30-34 PLI	> 5 PLI
Granite	30-34 PLI	> 5 PLI

EUCOLASTIC I will accept normal traffic in 48 hours if curing temperature is 70°F (21°C) and 50% relative humidity. Expect complete cure within two weeks.

Appearance

EUCOLASTIC I is available in the following colors:

Gun Grade:
Standard: bronze, white, limestone and gray
Special Order*: aluminum, beige and black

Pourable Grade:
Standard: white, limestone and gray
Special Order*: beige and black
* May require two week lead time.

The following chemical resistance guide is applicable to both the gun and pourable grade.

Acids*	Concentration	Splash & Spillage	Immersion
Acetic Acid	25%	OK	OK
Butyric Acid	25%	OK	OK
Citric Acid	25%	OK	OK
Oxalic Acid	25%	OK	OK
Lactic Acid	25%	OK	OK
Hydrochloric Acid	40%	OK	OK
Hydrobromic Acid	50%	OK	OK
Phosphoric Acid	50%	OK	OK
Carbonic Acid	Any	OK	OK
Sulfuric Acid	Max. 50%	OK	OK
Muriatic Acid	40%	OK	OK
Nitric Acid	5% Max.	OK	NO
Chromic Acid	5% Max.	OK	NO
Perchloric Acid	5% Max.	OK	NO
Alkalis			
Caustic Soda	10%	OK	NO
Caustic Potash	10%	OK	NO
Sodium Hydroxide	10%	OK	NO
Potassium Hydroxide	10%	OK	NO
Calcium Hydroxide	10%	OK	NO
Ammonium Hydroxide	10%	OK	NO
Solvents			
Benzene	100%	OK	softens/swells
Toluene	100%	OK	softens/swells
Xylene	100%	OK	softens/swells
Gasoline	100%	OK	softens/swells
Mineral Spirits	100%	OK	softens/swells
Paint Thinner	100%	OK	softens/swells
Lacquer Thinner	100%	OK	softens/swells
Methylene Chloride	100%	OK	softens/swells
Ester Solvents	100%	OK	softens/swells
Acetone	100%	OK	softens/swells
Methyl Alcohol	100%	OK	softens/swells
Ethylene Glycol	30%	OK	OK
Ethyl Alcohol	100%	OK	OK
Methyl Ethyl Ketone	100%	OK	OK
Miscellaneous			
Lubricating Oil	100%	OK	OK
Diesel Fuel	100%	OK	OK
Neutral Salt Solutions	30%	OK	OK
Liquid Nitrogen	---	OK	NO
Liquid Oxygen	---	NO	NO
Liquid Ammonia	---	NO	NO
Dry Fertilizer	---	NO	NO

*This product is not designed for chemical resistance above normal room temperatures.

DIRECTIONS FOR USE

Joint Design-EUCOLASTIC I may be used in any joint designed in accordance with accepted architectural or engineering practice. Joint width should be 4 times the expected joint movement, but not less than 1/4" (6 mm).

Joint Dimensions-Width to depth ratios should be equal for joints up to 1/2" (13 mm) in width with 1/4" (6mm) being the minimum width. Keep sealant depth at 1/2" (13 mm) on widths over 1/2" (13 mm).

Surface Preparation-New concrete must be minimum of 28 days old. The joint must be clean and sound. All oil, dirt, debris, paint and any other material that could be a bond breaker must be removed. The final step in cleaning should be the complete removal of all residue with a vacuum cleaner or pressure washing.

All joint facings must possess an open surface texture with all curing compounds and sealers removed.

Priming-EUCOLASTIC PRIMER should be used to prime the joint facing when the product will be used on unusually non porous surfaces (metal, granite, etc.) or unusual applications (underwater). The EUCOLASTIC PRIMER must be ordered separately. Estimated Coverage-Primer-2400 lineal feet per gallon per 1/2" of depth of double face joint (193 lineal meters per liter per 13 mm of depth of double face joint).

Mixing-EUCOLASTIC I is a one part product and requires no pre-blending. It should be used directly from the container.

Placement-EUCOLASTIC I may easily be applied with conventional caulking equipment. Pourable and gun-grade cartridges can be used with a standard caulking gun. Horizontal joints requiring large quantities of material may be dispensed directly from the pail or a can with a pour spout.

Finishing-Although not normally required, tooling should be done immediately when necessary. Water or solvent may be used if necessary.

Curing-EUCOLASTIC I requires no special curing instructions. A skin forms on the surface within 24 hours @ 75°F (24°C) and 50% relative humidity. Total cure time should be within 2 weeks after placement.

CLEAN-UP

Tools, equipment and general clean-up can be done with EUCO SOLVENT, xylol or toluene.

PRECAUTIONS / LIMITATIONS

- Use only at temperatures above 40°F (4°C).
- Contact surfaces must be clean and dry.
- Proper joint design will affect performance.
- For a faster cure, use EUCOLASTIC II two part urethane.
- No heavy traffic until the product has cured.

Form Eucolastic I-2.95

WARRANTY: The Euclid Chemical Company ("Euclid") solely and expressly warrants that its products shall be free from defects in materials and workmanship for six (6) months from the date of purchase. Unless authorized in writing by an officer of Euclid, no other representations or statements made by Euclid or its representatives, in writing or orally, shall alter this warranty. EUCLID MAKES NO WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. If any Euclid product fails to conform with this warranty, Euclid will replace the product at no cost to Buyer. Replacement of any product shall be the sole and exclusive remedy available and buyer shall have no claim for incidental or consequential damages. Any warranty claim must be made within one (1) year from the date of the claimed breach. Euclid does not authorize anyone on its behalf to make any written or oral statements which in any way alter Euclid's installation information or instructions in its product literature or on its packaging labels. Any installation of Euclid products which fails to conform with such installation information or instructions shall void this warranty. Product demonstrations, if any, are done for illustrative purposes only and do not constitute a warranty [illegible]

For Section 03250, par 1.2, SD-06

Tamms

TECHNICAL DATA SHEET

HORNBOARD

Asphalt Impregnated Fiber Expansion Joint Filler

1. **DESCRIPTION:** HORNBOARD Asphalt Impregnated Fiber Expansion Filler is composed of tough, resilient, cellulose fibers securely bonded together with a uniform impregnation of bituminous binder and performed into strips or sheets. The material is strong but lightweight; cuts and handles easily; resists breakage. It will not extrude from the joint under normal compression and service temperatures, and does not embrittle in cold weather. Installation is easy. HORNBOARD will not twist, break or deform with ordinary handling. It cuts cleanly, places readily, stays strong and sound through many years of repeated expansion/contraction cycles.

2. **USES:** HORNBOARD is a general, multi-purpose filler for expansion joints in all types of heavy concrete construction. It is specifically engineered for commercial, industrial and public works applications.

3. **COMPOSITION AND MATERIALS:** HORNBOARD is manufactured to provide an expansion joint filler that will conform to the current and future specifications as needed.
   Designed to comply with:
   AASHTO Spec. M213-81
   ASTM Spec. D 1751-83
   Fed. Spec. H H-F-341f, Type I
   Corps of Engineers Spec. CRD C508-72
   FAA Spec. P 501-2.4 & P610-2.7 (1968)

   Values presented are typical and not necessarily referenced to create specifications.

4. **SIZES:** HORNBOARD Joint is available in the following sizes:
   Thickness: 1/4", 3/8", 1/2", 3/4", 1"
   Widths: 3" to 48" and 48" slabs
   Length: 5 ft. & 10 ft.

5. **CAUTIONS:** HORNBOARD should not be used in conjunction with polysulfide, acrylic or other polymer-base joint sealants.

6. **ENVIRONMENTAL AND SAFETY PRECAUTIONS: Industrial Use Only.** Wash hands thoroughly with soap and clean water after handling or before smoking or eating or rubbing eyes. **KEEP OUT OF REACH OF CHILDREN AND ANIMALS.** Consult Material Safety Data Sheet before using this product. EMERGENCY RESPONSE PHONE NUMBER: (800) 862-2667 TAMMS or (800) 424-9300 CHEMTREC.

7. **TECHNICAL SERVICE:** For application procedures or surface conditions not specified above, please contact:

TAMMS INDUSTRIES
3835 State Route 72, Kirkland, IL 60146
800-862-2667 FAX: 815-522-2323
www.tamms.com

WARRANTIES: Seller warrants that the Products d not infringe upon any copyright, patent, or trademark o trade secret, nor violate the proprietary information rights of any third party. Seller warrants that its Products will conform to and perform in accordance with the Products' specifications. THE FOREGOING WARRANTIES, ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE CONCERNING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. LIMITATION ON LIABILITIES: Because of the difficulty of ascertaining and measuring damages hereunder, it is agreed that, except for claims for bodily injury. Seller's liability to the Buyer or any third party, for any losses or damages, whether direct or otherwise, arising out of the purchase of Product from Seller by Buyer shall not exceed the total amount billed and billable to the Buyer for the Product hereunder. **IN NO EVENT WILL SELLER BE LIABLE FOR ANY LOSS OF PROFITS OR OTHER SPECIAL OR CONSEQUENTIAL DAMAGES, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

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HORN EXPANSION JOINT FILLERS

Quick Reference Chart

JOINT FILLER	DESCRIPTION	USE	SPECIFICATIONS	DENSITY/SIZE
HORNBOARD/ FIBER	Asphalt Impregnated Cellulose Fiber	General, Multi-Purpose Expansion Joint Filler for Concrete Sidewalks, Driveways, Highway Works.	ASTM D 1751-83 AASHTO M 213-74 FED. SPEC. HH-F-341F, TYPE I CRD C 508-72 FAA P 501-2.4	25 LB/CUF. LENGTHS: 5' and 10' THICKNESS: 1/4", 3/8", 1/2", 3/4", 1"
STANDARD CORK	Granulated Cork Bonded Together Under Heat and Pressure with Phenolic Resin	Extensively Used in Sewage Plants, Floodwalls, Filtration Plants, and in Bridge Constructions.	ASTM D 1752-67, TYPE II FED. SPEC. HH-F341F, TYPE II AASHTO M 153-70 TYPE II FAA SPEC. P501-2.4	16 LB/CUF. LENGTH: 10' THICKNESS: 1/4", 3/8", 1/2", 3/4", 1"
S. E. - CORK	Similar in Composition to Standard Cork, But is Specially Treated to Enable It to Expand 50" Beyond Original Thickness	Used Where It is Essential to Keep Joints Filled at All Times, Water & Sewage Plants, Dams, Tunnels.	ASTM D 1752 TYPE III AASHTO M 153 TYPE III FED. SPEC. HH-F-341F, TYPE II CRD C-509 TYPE III FAA P 501-2.4	24 LB/CUF. LENGTH: 10' THICKNESS: 1/2", 3/4", 1"
SPECIAL ORDER* JOINT FILLERS				
CEMENTONE®	Gray Colored High Quality Blown Sponge Rubber	Used Where Complete Resilience is Essential, and Gray Color is Specified.	ASTM D 1752-67 TYPE I AASHTO M 153-70 TYPE I FED. SPEC. HH-F-341F, TYPE II CRD C 509-70 TYPE I FAA P 501-2.5	40 LB/CUF. LENGTH: 10' THICKNESS: 1/2", 3/4", 1"
DARKTONE	Rubber Particles Bonded Together Under Heat and Pressure	Used Where Complete Resilience is Essential and the Color is Not Specified.	ASTM D 1752-67 TYPE I AASHTO M 153-70 TYPE I	35 LB/CUF. SLAB: 36" x 36" THICKNESS: 1/2", 3/4", 1"
RODOFOAM® 300	Closed Cell Non-Extruding Soft Resilient PVC Foam	Used Where Oil, Ozone, Chemicals and Weather Resistance Required.	ASTM D 1667 GRADE VE-41	5 LB/CUF. SLAB: 48" x 64" THICKNESS: 1/4", 3/8", 1/2" 3/4", 1", 2"
RODOFOAM® 327	Closed Cell Non-Extruding Semi-Rigid Resilient PVC Foam	Used Where Oil, Ozone, Chemicals, Weather and Rigid Back-up Material is Required.	ASTM D 1667 GRADE VE-45	6 LB/CUF. SLAB: 48" x 64" THICKNESS: 1/4" to 2"
RODOFOAM® II	Cellular Cross Linked Polyethylene Foam	Used for Seismic Separation Joints in Nuclear Plants and Other Critical Construction Applications.	A.C. HORN INC. SPECIFICATION	2.2 LB/CUF. SLAB: 48" x 48" THICKNESS: 1/2" to 3"
CLOSED CELL PLASTIC	Expanded Closed Cell Polyethylene Foam	Used as a Back-up Strip Under Cold Applied Joint Sealants, in Concrete Structures.	ASTM D 1752 MODIFIED	2.4 LB/CUF. LENGTH: 9' THICKNESS: 1/4" to 2"
HORNFOAM®	Similar to Closed Cell Plastic Foam with Lower Density	Used as Joint Filler in Concrete and Masonry. Compatible with Cold Applied Joint Sealants.	ASTM D 1752 MODIFIED	1.7 LB/CUF. LENGTH: 250', 200', 125' THICKNESS: 1/4", 3/8", 1/2"
STRIP-JOINT	Cellular Cross Linked Polyethylene Foam with Strip-Off Cap	Used for Swimming Pools, Water and Sewage Treatment Plants, Power Plants.	ASTM D 1752 MODIFIED	2.0 LB/CUF. LENGTH: 100', 75', 50', 8' THICKNESS: 1/4", 3/8", 1/2" 3/4", 1"
NEOFOAM	Neoprene-Ethylene Propylene Rubber	Used Where Oxidation, Ozone, Oil, Chemical, and High Temperature Resistance Required.	ASTM D 1056 SCE-43, RE-43 SUFFIX CE_1, F_2, MP	9.0 LB/CUF. SLAB: 42" x 72" THICKNESS: 1/2" to 2"
EVAFOAM	Low Density Ethylene Vinyl Acetate	Used Where Minimum Load Transfer, Maximum Ozone and Chemical Resistance Required.	A.C. HORN INC. SPECIFICATION	2.8 LB/CUF. SLAB: 46" x 84" THICKNESS: 1/2" to 3"

*Always call to verify. Due to production restraints several of the special order joint fillers will be discontinued.

TECHNICAL SERVICE: For application procedures or surface conditions not specified above, please contact:

TAMMS SERVICE GROUP • TAMMS INDUSTRIES

TAMMS INDUSTRIES
3835 State Route 72
Kirkland, IL 60146
800-862-2667
FAX: 815-522-2323
www.tamms.com

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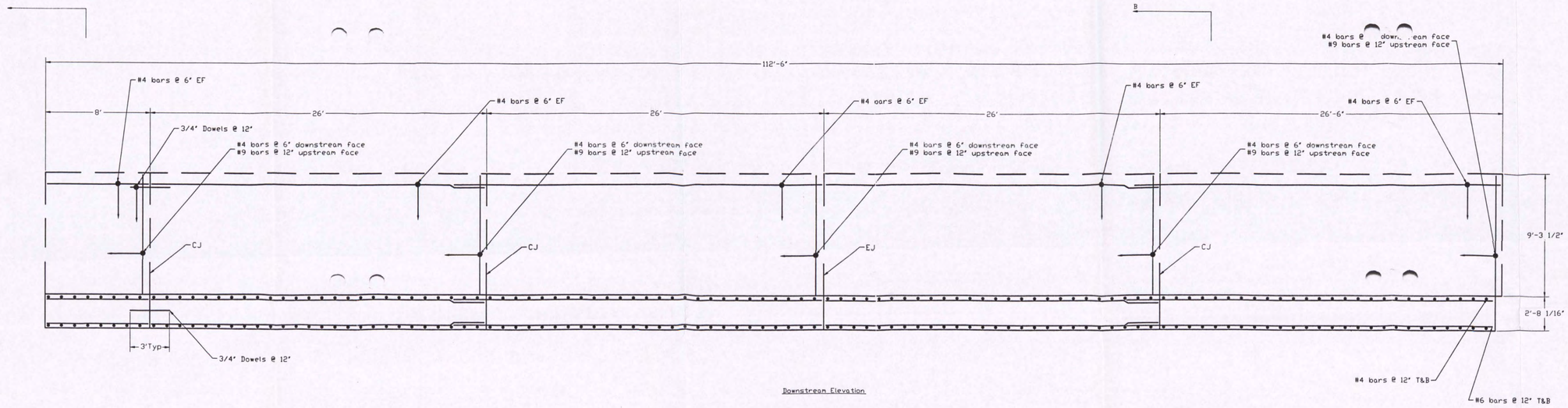
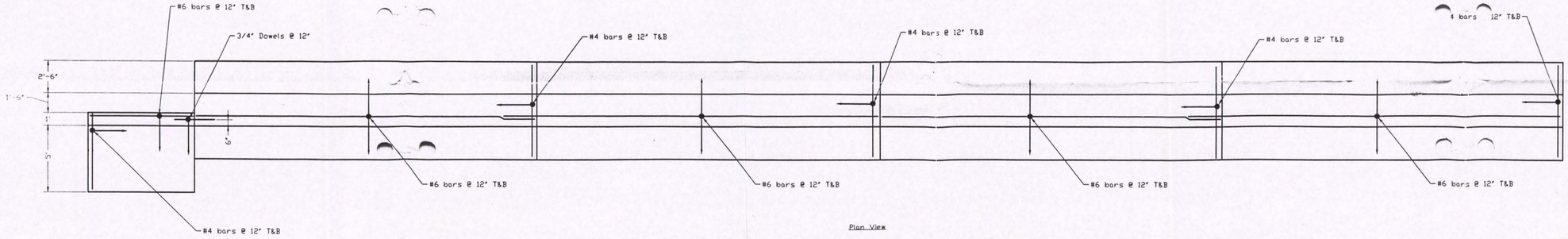
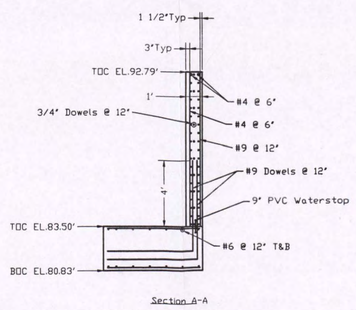


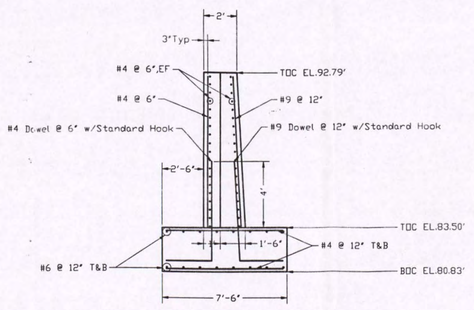
Downstream Elevation



Plan View



Section A-A



Section B-B

HORTON CONSTRUCTION CO., INC.
SUBMITTAL # 3200 - 1
SPECIFICATION # 3200

- [x] REVIEWED
- [ ] REVIEWED/SEE NOTIONS
- [ ] FOR PROJECT RECORDS ONLY
- [ ] REVISE & RESUBMIT
- [ ] NOT REVIEWED
- [ ] REJECTED

BY: DAM DATE: 11/27/01

NOTE: Review of this submittal does not relieve the subcontractor, equipment vendor or supplier, from compliance with the plans, specifications, code requirements or contract documents. This review does not constitute approval of this submittal.

DRAWN BY: DAM	DATE: 11/26/01
	SCALE: Not To Scale

HORTON CONSTRUCTION
39 EDMUND STREET
E. PROVIDENCE, R.I. 02914
PH. (401) 438-4582

DRAWING TITLE: Allendale Dam Rebar

AREA	JOB NO.
	01-070

	DWG. NO.	REV.
D	01-070-01	

Construction Submittals
Submittal 016
Form Liner

TRANSMITTAL

TO:	GEI Consultants	DATE	12/05/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

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2	12/05/01	Submittal 016 – Form Liner

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REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Sarah Martino, RIDEM

BY: Scott A. Miller

Architectural Concrete

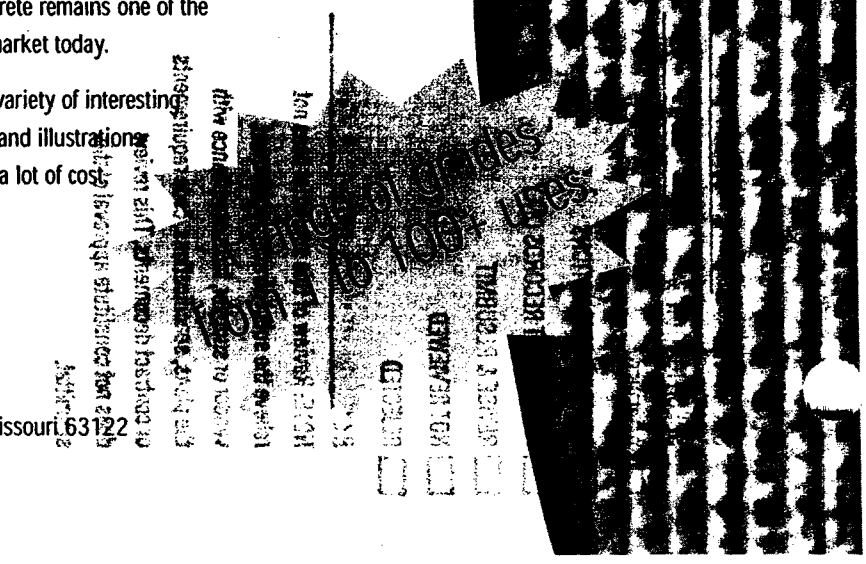
FORM LINERS

Form Follows Function

Greenstreak® Architectural Concrete Form Liners make it easy to pour interesting detail into a structure...without pouring in a lot of money.

In addition to structural integrity and low cost, concrete remains one of the most versatile building materials available on the market today.

Greenstreak concrete form liners cast concrete in a variety of interesting designs and textures...including detailed graphics and illustrations ...to add visual interest to projects without adding a lot of cost.



GREENSTREAK

3400 Tree Court Industrial Boulevard, St. Louis, Missouri 63122
Phone: 800. 325-9504 or 314. 225-9400
Fax: 800. 551-5145 or 314. 225-2049

A Concrete Reputation

Since 1950, Greenstreak has served the general and architectural concrete construction industry. Innovation, engineering and quality craftsmanship are combined to produce products of choice for the industry's owners, designers and contractors.

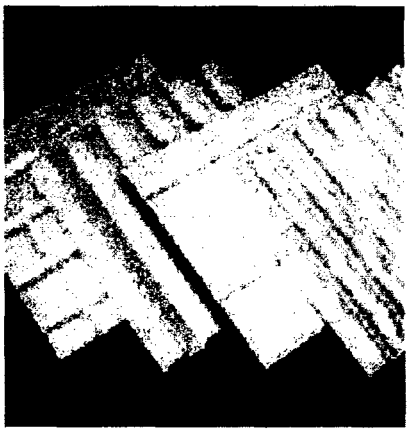
Greenstreak maintains its position of industry leadership by responding to the unique needs of our customers. Greenstreak's dedicated technical and customer service staffs are active participants in the concrete industry to take advantage of the latest technological advances, communicate with our market and analyze trends.

Centrally located, Greenstreak products are readily available through a network of quality Concrete Forming and Accessory Distributors both nationally and internationally.

The Shape of Things to Come

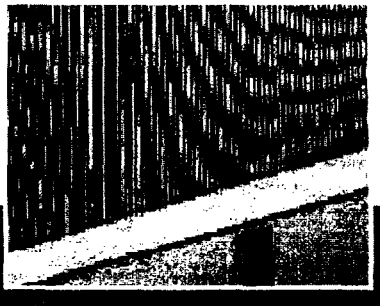
Greenstreak Form Liners are ideal for texturing tilt-up, cast-in-place and precast concrete.

Greenstreak Form Liners are attached to the forming system or casting bed prior to concrete placement. After normal placement and curing time, the form work and liner are stripped, leaving an architectural finish in the concrete.



Typical Applications Include:

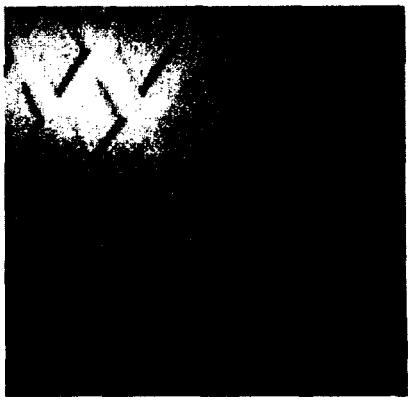
- Commercial and residential buildings
- Institutional buildings
- Parking garages
- Exposed foundations
- Water and waste water treatment facilities
- Retaining walls
- Bridges
- Transportation ports and terminals
- Sound walls
- Floodwalls
- Corporate signs and planters



Standard Patterns and Textures

Greenstreak offers over 45 standard patterns and textures. Patterns are available in a variety of sizes and depths for achieving the best visual effect. Standard patterns include:

- Trapezoidal ribs
- Fractured ribs and fins
- Exposed aggregates
- Stone, brick and block
- Wood



Custom Patterns and Graphics

Greenstreak can create a custom pattern or graphic for a one-of-a-kind architectural finish or to match an existing structure.

Greenstreak has responded to the recent trend in casting custom graphics and illustrations in concrete. Greenstreak can create graphics in form liners to compliment a structure, reflect a local community or communicate a message.

Greenstreak can also help blend new construction with architectural finishes in existing structures. Call Greenstreak when your project requires customization. See page 7 for more information about custom form liners.

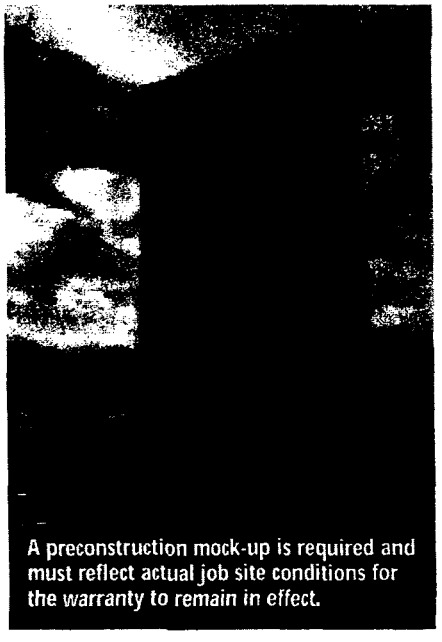
Casting Cost Effectively

Greenstreak Form Liners are available in several grades to economically cast an architectural finish in both large and small budget projects and can be used with any forming system or method. Different grades are interchangeable on projects; some liners may need to be backed to compensate for variations in thickness from grade to grade.

GRADE	MATERIAL TYPE	DES CRIPTION
UNI-CAST®	Rigid Polymer (HIPS)	A single use form liner ideal for tilt-up panels and cast-in-place construction requiring cut-outs for doors, windows, utilities, etc. Nominal 4' x 10' sheets.
MULTI-CAST®	Rigid Polymer (ABS)	Intermediate use form liner, designed for 2-10 uses under normal job site conditions. Primarily used for cast-in-place applications. Nominal 4' x 10' sheets.
DURA-CAST®	Rigid Polymer (ABS)	Intermediate use form liner, designed for 10-25 uses under normal job site conditions. Used for cast-in-place and gang forming applications. Nominal 4' x 10' sheets.
SUPER-CAST™	Elastomeric (Urethane compound)	High use form liner, designed for up to 40 uses under normal job site conditions. Used for gang forming, cast-in-place and precast applications. Liner sizes vary from 8' max. width to 32' max. length.
ULTRA-CAST™	Elastomeric (Urethane)	High use form liner, designed for 100+ uses under normal job site conditions. Used for very large gang forming, cast-in-place and precast applications. Liner sizes vary from 8' max. width to 32' max. length.

Important Factors to Remember

- Pre-construction mock-up is required and must reflect actual job site conditions for warranty to remain in effect.
- Some deeper patterns require back-up strips. Liners requiring back-up strips are noted in the profile section.
- Listed form liner dimensions are nominal. Changes in temperature can cause the liner to expand or contract. Allow for dimensional variations in the design and installation.
- All form liners are UV stabilized, however, protect liners from over exposure to direct sunlight.
- Rigid Polymer liners will become more rigid at temperatures below 25°F. Use extra care under these conditions.
- Rigid Polymer liners are NOT recommended for precast.
- Type 3 concrete with accelerators create high heat during cure which could damage Rigid Polymer form liners.
- Rustication strips are recommended at the liner joints that do not blend with the pattern.
- Use Greenstreak No. 7000 Form Release.
- UNI-CAST® does NOT require a release agent.
- Use one concrete supplier for uniformity of color and texture.
- Place concrete with an elephant trunk to minimize aggregate segregation.
- Vibrate concrete to eliminate lift lines and minimize air voids.
- Clean the liner between castings with a mild detergent and scrub brush.
- Consult Greenstreak for further specification information.
- See ACI 303R-91 "Guide to Cast-In-Place Architectural Concrete" for further recom-



A preconstruction mock-up is required and must reflect actual job site conditions for the warranty to remain in effect.

Form Liner Patterns and Textures

Greenstreak Form Liners are available in a variety of patterns and textures and most are offered in at least three different grades. Please consult Greenstreak to determine the most suitable liner for your application and forming technique.

Not all Greenstreak patterns are shown in this catalog. Call Greenstreak for additional pattern details or if you would like us to create a custom pattern or design.

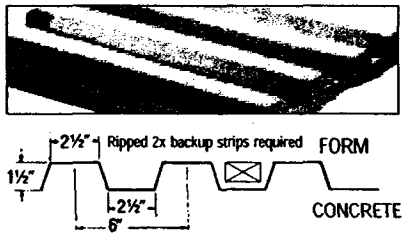
☒ This symbol is shown on profile drawings for patterns requiring back-up strips in Rigid Polymer grades. The back-up strip is necessary to prevent deep reveals from deflecting due to form pressures. Other patterns may require back-up strips, results of the pre-construction mock-up shall dictate necessity.

"All dimensions nominal

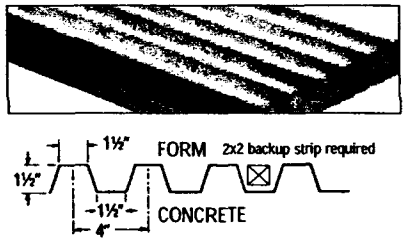
RIBBED DESIGNS

Not all patterns are shown in this catalog.

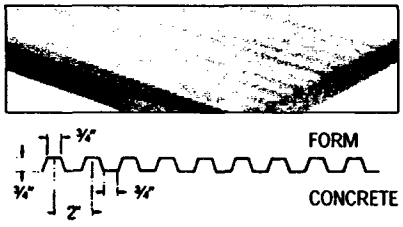
No. 301
4' x 9'-11" Sheets • **Trapezoid**



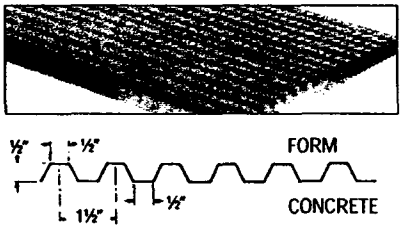
No. 302
4' x 10' Sheets • **Trapezoid**



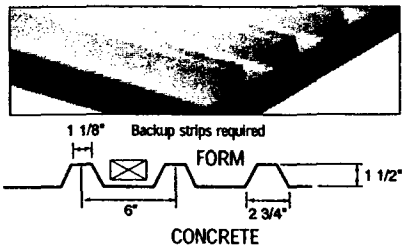
No. 304
4' x 10' Sheets • **Trapezoid**



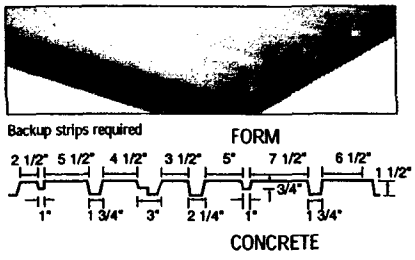
No. 305
4' x 10' Sheets • **Trapezoid**



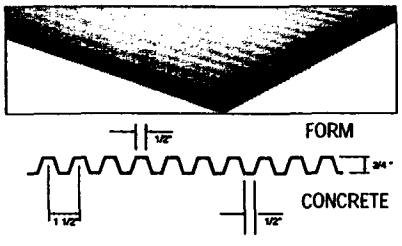
No. 308
4' x 10' Sheets • **Trapezoid**



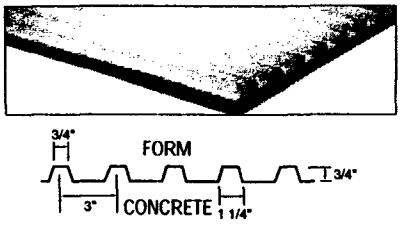
No. 309
4' x 10' Sheets • **Trapezoid**



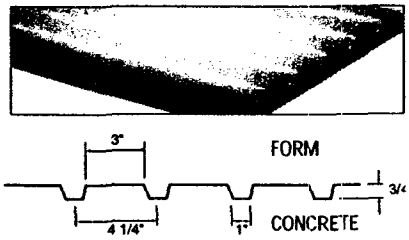
No. 312
4' x 10' Sheets • **Trapezoid**



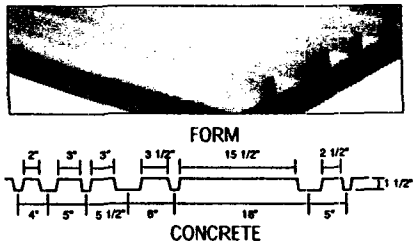
No. 333
4' x 10' Sheets • **Trapezoid**



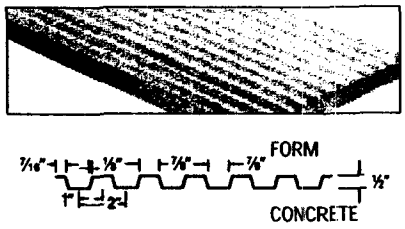
No. 334
3'-10-3/4" x 10' Sheets • **Trapezoid**



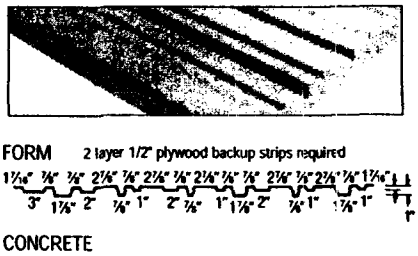
No. 335
4' x 10' Sheets • **Trapezoid**



No. 339
4' x 9'-10" Sheets • **Trapezoid**



No. 353
4' x 9'-10" Sheets
Random Parallel Reveals

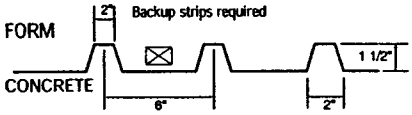


☒ This symbol is shown on profile drawings for patterns requiring back-up strips in Rigid Polymer grades. The back-up strip is necessary to prevent deep reveals from deflecting due to form pressures. Other patterns may require back-up strips, results of the pre-construction mock-up shall dictate necessity.

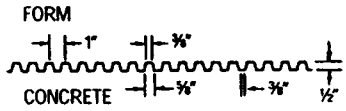
All dimensions nominal

RIBBED DESIGNS

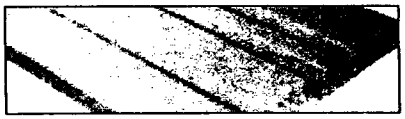
No. 359
4' x 9'-6" Sheets • **Trapezoid**

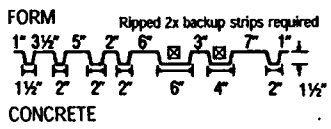


No. 361
4' x 9'-10" Sheets • **Trapezoid**



No. 362
4' x 9'-10" Sheets • **AZ D.O.T. Random Reveal**



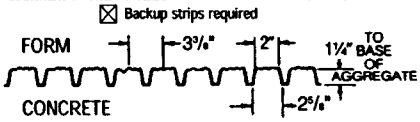


AGGREGATE DESIGN

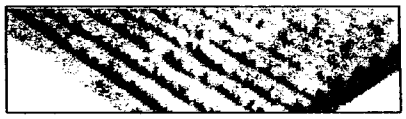
No. 360
4' x 10' Sheets • **River Bed Aggregate**

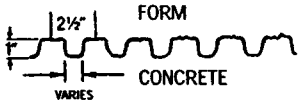
AGGREGATE & FRACTURED DESIGNS

No. 347
(Optional closed or open ends)
3'-11-1/4" x 9'-10" Sheets
Trapezoid with Aggregate Face

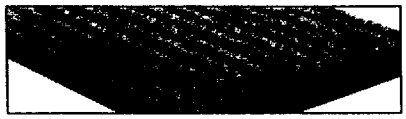


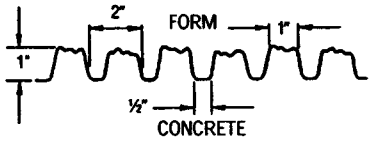
No. 366
3'-11-1/2" x 10' Sheets • **Fractured Rib**



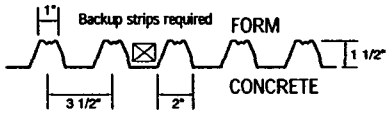


No. 367
4' x 10' Sheets • **VA D.O.T. Fractured Rib**



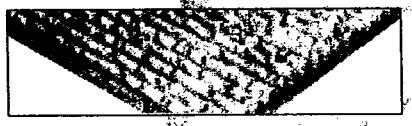


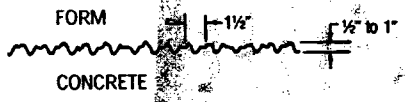
No. 368
4'-1" x 10' Sheets
Trapezoid with Aggregate Face



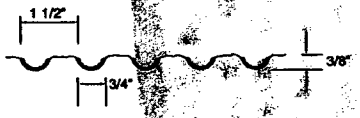
No. 369
4' x 10' Sheets
CAL TRANS Trapezoid with Aggregate Face

No. 373
4' x 10' Sheets • **Fractured Fin**





No. 374
4' x 10' Sheets • **Ri[illegible] Rope**



SHIPLAP

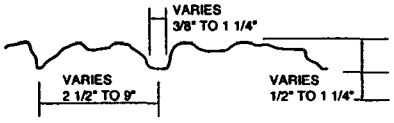
No. 357
4' x 10' Sheets • **Ship[illegible]**

☒ This symbol is shown on profile drawings for patterns requiring back-up strips in Rigid Polymer grades. The back-up strip is necessary to prevent deep reveals from deflecting due to form pressures. Other patterns may require back-up strips, results of the pre-construction mock-up shall dictate necessity.

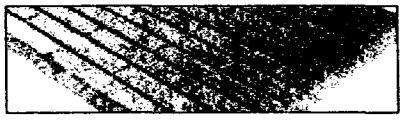
All dimensions nominal

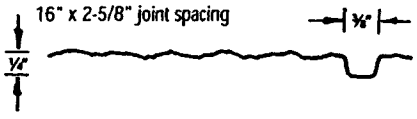
MASONRY DESIGNS

No. 330 ←
10' x 4' Sheets • **Ashlar Stone**

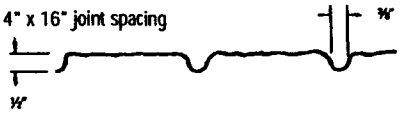


No. 336
9'-4" x 4' Sheets • **Split Face Block**

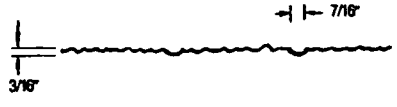


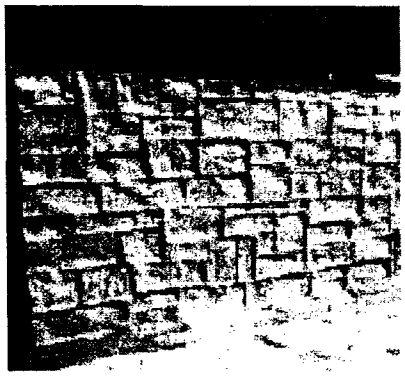


No. 337
9'-2" x 4' Sheets • **Slump Block**

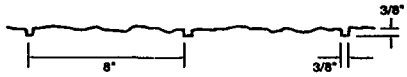


No. 338
9'-2" x 4' Sheets • **Rough Brick**

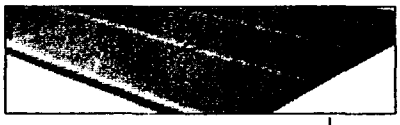


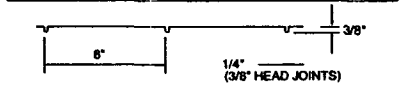


No. 341
4' x 10' Sheets • **8" x 8" Split Face Block**

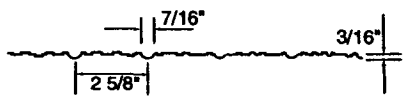


No. 365
4' x 9'-4" Sheets • **8" x 16" Cinder Block**





No. 381
10'-1" x 4' Sheets • **Shadowtex Brick**



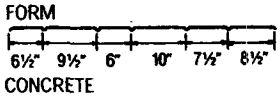
FINISH DESIGNS

No. 340
4' x 10' Sheets • **Smooth Face**

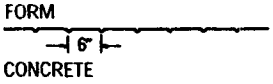
No. 349
4' x 10' Sheets • **Light Sandblast Finish**

WOOD DESIGNS

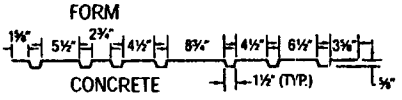
No. 344
4' x 9'-10" Sheets • **Weathered Random Boards**



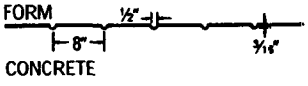
No. 346
4' x 9'-10" Sheets • **Weathered Boards**



No. 351
4' x 9' Sheets • **Random Rough Southern Yellow Pine Boards with Random Reveals**

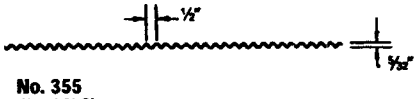


No. 363
4' x 9'-10" Sheets • **Weathered Tongue & Groove Boards**

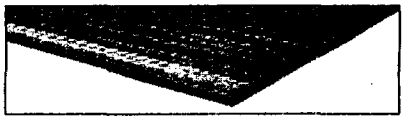


STRIATED DESIGNS

No. 354
4' x 10' Sheets
Striated Sinusoidal Wave Pattern



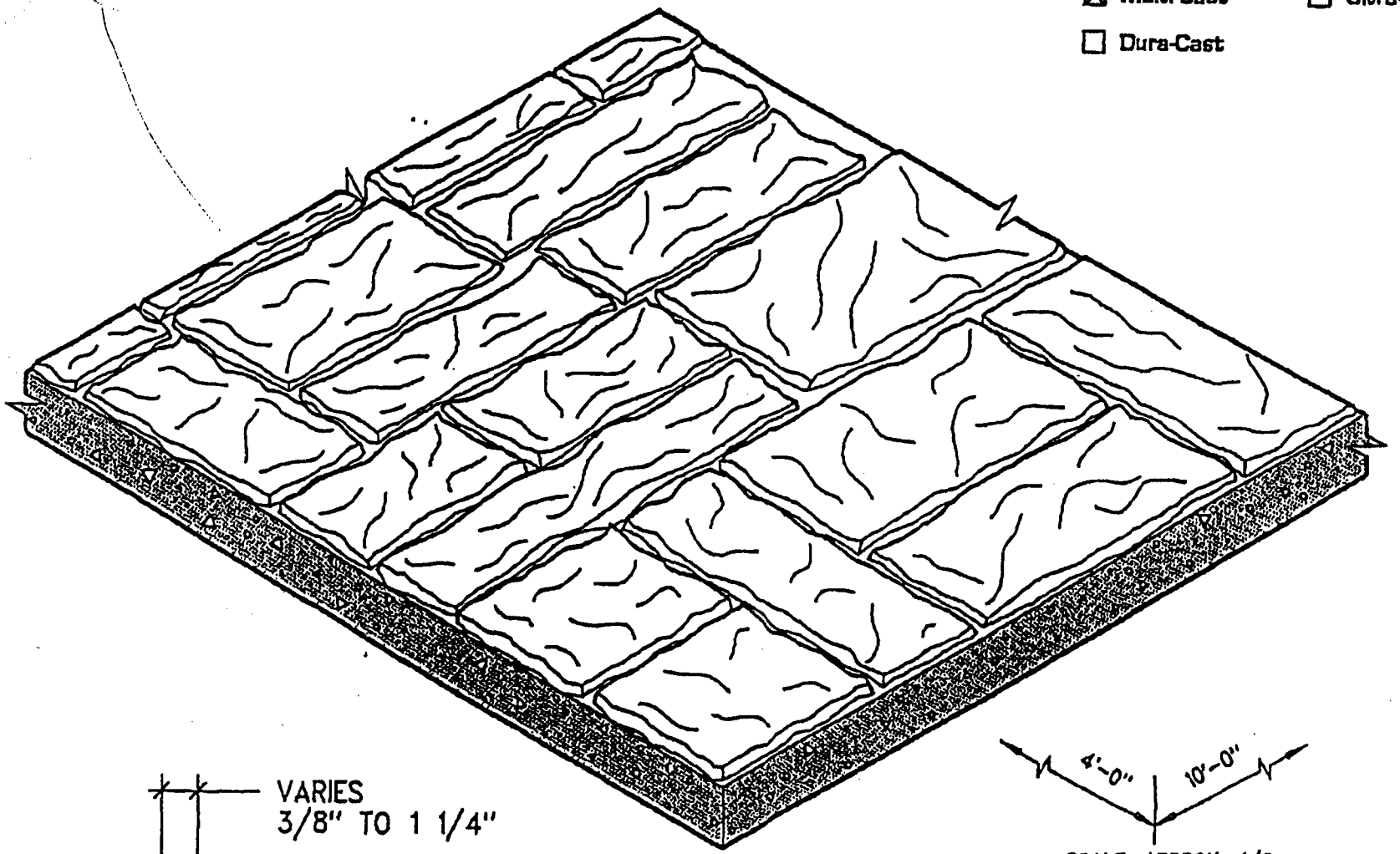
No. 355
4' x 10' Sheets
Random Striated



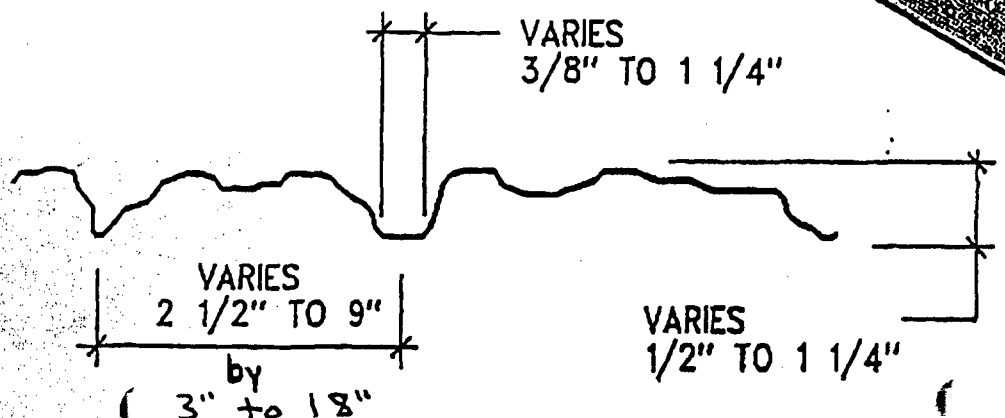
☒ Uni-Cast ☐ Super-Cast

☒ Multi-Cast ☐ Ultra-Cast

☐ Dura-Cast



SCALE: APPROX. 1/8



GREENSTREAK P.O. Box 7139, St. Louis, Mo 63177 (314) 225-9400	
FORMLINER PROFILE	
#330 ASHLAR STONE	
Date 4-26-94	Dwn FI

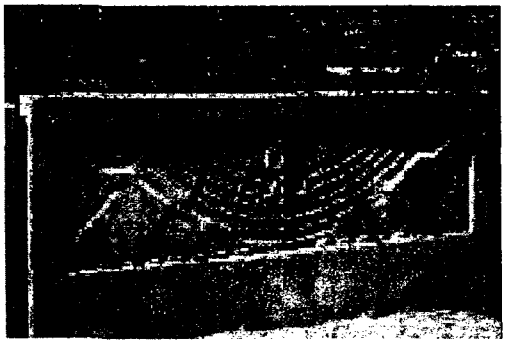
Custom Designs and Graphics in Elastomeric Form Liners

Limitless creative opportunities for cast concrete are available to architectural designers. Greenstreak can develop a custom form liner to cast patterns, graphics and illustrations in concrete structures for a truly unique finish.

Custom form liners can be used on new construction to match textures from existing or surrounding structures.

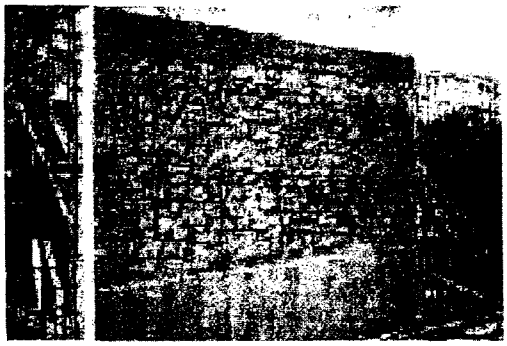
Consult Greenstreak's Technical Service Department for further information regarding custom patterns and graphics.

No. 306 Diamond

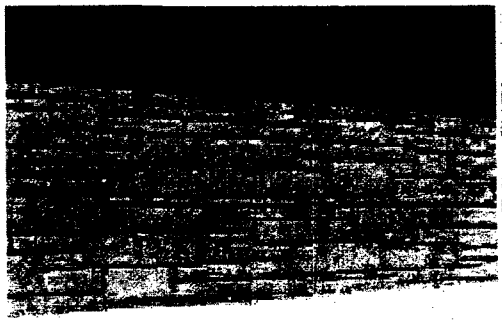


Custom Eagle Pattern

No. 332 Fixed Course Ashlar Stone



No. 328 Dry Stack Random Stone

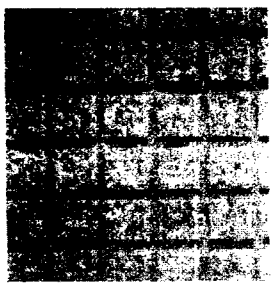


No. 331 Ashlar Stone

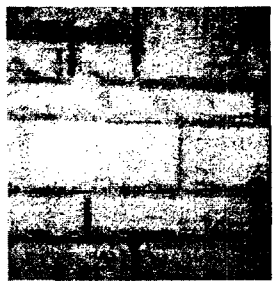
Additional Patterns Available, But Not Shown:

- No. 314 Sandstone, 16" square block
- No. 329 Running Bond Ashlar, 12" x 24" block
- No. 370 Fractured Rib, 2" centers, 3/4" valley
- No. 376 Fractured Granite
- No. 378 Random Lava Rock

No. 351 Woodgrain



No. 364 Split Face Tile



No. 379 Limestone

Form Release 7000

Form Release 7000 is specially formulated to prevent concrete from bonding to aluminum, steel, plywood and plastic forms and form liners. Form Release 7000 should be used with all reusable Greenstreak Form Liners.

Advantages

- Will not stain gray or white concrete
- Will not impair bonding ability of paints, epoxies or other coatings
- Rust inhibitors help prevent stains in concrete and deterioration of forms
- Minimizes form clean-up
- Lengthens life of wooden forms

Coverage

- 300-400% higher than most premium releases
- Steel, aluminum, plastic, high density plywood...3000-4000 ft²/ gal.
- Plywood, concrete...1000-1500 ft²/ gal.
- Rough sawn, dimensional, striated plywood...800-1000 ft²/ gal.

Technical

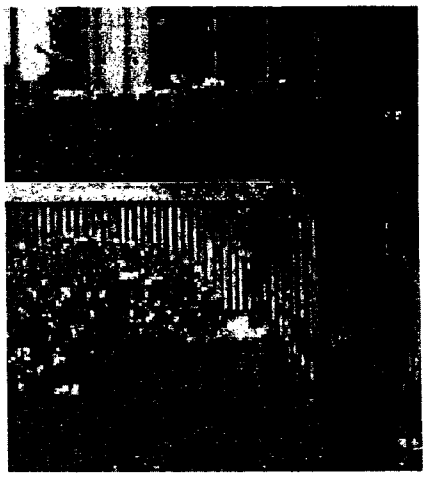
- Consists of fatty wood derivatives in a light amber clear hydrocarbon carrier
- Contains no lubricating oil, diesel oil, conventional form oil or kerosene
- Red label not required

Technical Services

Greenstreak distributors have the knowledge and ability to answer most questions. If additional information is needed, product brochures, specification sheets and technical notes are available upon request. Greenstreak engineers are available for consultation during design, specification and product installation.

The following ACI Committee Reports are also recommended:

- ACI 117 "Standard Tolerances for Concrete Construction Materials"
- ACI 301; Ch. 13 "Specifications for Structural Concrete"
- ACI 303R "Cast-In-Place Architectural Concrete"
- ACI 309; Ch. 7 "Consolidation of Concrete"
- ACI 347; Ch. 5.2. "Concrete Form Work"



Ordering Information

Lead times will vary with order quantity, pattern and production backlog. Smaller orders for popular patterns can ship the next day. Allow 4 weeks for larger orders and 6 to 12 weeks for custom patterns. Samples are available for standard patterns at no charge.

Suggested Proprietary Short Form Guide Specification

Textured architectural concrete surfaces as indicated in drawings and specifications to be formed using Greenstreak Architectural Form Liner Pattern Number _____, as manufactured by Greenstreak Plastic Products Co., Inc.; 3400 Tree Court Industrial Blvd., St. Louis, MO 63122; Phone #800-325-9504. Form Liner mock-up, storage, handling, accessories, fabrication, preparation and installation to comply with Greenstreak's written instructions and recommendations. Greenstreak shall provide a Job Site Guide with the above listed Form Liner.

A long form, 3 part master specification in CSI format is available upon request. Although proprietary, the master specification includes reference and performance standards.

Limited Warranty

GREENSTREAK warrants its products will be free from defects and will perform as stated in this literature, provided the application and construction practices used are per our recommendations and Job Site Guide instructions and provided the actual job construction duplicates mock-up materials, methods, workmanship, placement rates, form pressures, joint sealing and stripping practices. If our product does not meet the published product specifications and our customer gives notice to us before installing the product, we will replace the product without charge or refund the purchase price.

Product replacement or refund are the buyers sole remedy for breach of warranty or negligence and we will not be liable for any indirect, consequential, special or resultant damages. To the best of our knowledge, the information contained herein is accurate and reflects average test values. Final suitability of any information or material is the sole responsibility of the user.

GREENSTREAK

3400 Tree Court Industrial Boulevard, St. Louis, Missouri 63122
Phone: 800. 325-9504 or 314. 225-9400
Fax: 800. 551-5145 or 314. 225-2049

Printed in the U.S.A.
9/97

Per Spec Sec 03100, Par 1.2 SD-01

03125/GRE
BuyLine 4444

Post-it® Fax Note 7671	Date 11-7-01	# of pages ▶ 14
To DAVID M.	From DICK COLL	
Co./Dept.	Co. MACK	
Phone # 401-438-4583 x22	Phone # 617-598-0232	
Fax # 401-434-6490	Fax # 617-269-0152	

SPEC-DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

1. PRODUCT NAME

DURA-CAST®, MULTI-CAST® and UNI-CAST® Form Liners for Architectural Concrete

2. MANUFACTURER

GREENSTREAK®
3400 Tree Court Industrial Blvd.
St. Louis, MO 63122
Phone: (800) 325-9504
(314) 225-9400
FAX: (800) 551-5145
(314) 225-9854

3. PRODUCT DESCRIPTION

Basic Use: GREENSTREAK Form Liners are used for texturing tilt-up, cast-in-place or precast architectural concrete. Sheets of form liner are attached to the form work or casting bed prior to placing the concrete. Following placement and a normal curing time, the form work and liner are stripped, leaving a textured concrete surface.

Typical Applications:

- Retaining walls
- Residential and commercial buildings
- Parking garages
- Interior or exterior walls
- Exposed foundations
- Basements
- Bridges
- Sound walls
- Planters
- Spandrels and feature strips
- Signs

Limitations: Form Liner size cannot exceed 4 ft. x 10 ft. Significant undercuts are not possible. Form pressures greater than 1000 P.S.F. may deform some of the deeper patterns. Contact GREENSTREAK for specific recommendations.

The two-piece SPEC-DATA® format has been reproduced from publications copyrighted by CSI, 1964, 1965, 1966, 1967, and used by permission of The Construction Specifications Institute, Alexandria, VA 22314.

Composition and Materials:

- All GREENSTREAK Form Liners are thermoformed rigid polymer alloy sheets and are engineered for light-weight and ease of handling on the jobsite.
- All GREENSTREAK Form Liners have a hard, void-free surface that won't absorb moisture or cause discoloration.
- Form Liner sheets are trimmed straight and square to a nominal 4 ft. x 10 ft. size (See catalog for actual dimensions.)
- More than 32 standard patterns and textures are available. Custom designs will also be considered. Call GREENSTREAK for specific details.
- All patterns are available in at least two use ranges:

UNI-CAST — Single use form liner, designed for tilt-up, cast-in-place jobs with 2 ft. wide handset forms, jobs with box outs or variable panel heights and where the form liner will only be used once.

MULTI-CAST — Intermediate use form liner, designed for 2-10 uses under normal jobsite conditions. Use with gang forming for cast-in-place. Expect less reuses out of deeper patterns.

- Some patterns are available in a third use range.

DURA-CAST — High use form liner, designed for 10-25 uses under normal jobsite conditions. Use with gang forming for cast-in-place. Expect less reuses out of deeper patterns. Significantly more uses can be expected in pre-cast applications.

- UNI-CAST, MULTI-CAST and DURA-CAST form liners are interchangeable on the same job, which enables contractors to use a less expensive liner for portions of the job requiring "cut-ups" (ie, openings, sloped walls, etc.)

Pattern Selection Criterion:

- Recommend patterns with fine detail when viewed from a short distance
- Large patterns are recommended when viewed from farther away and next to roads where it is difficult to see detail from moving vehicles
- Vertical patterns are recommend

GREENSTREAK
February 1994
(Supersedes November 1992)
3
CONCRETE FORMWORK
Architectural Concrete Form Liners

ed for low and long surfaces

- On some patterns (due to their random nature) it is difficult to hide seams between form liners — use rustications or reveal strips when possible
- Fractured designs help hide defects in the concrete

tices. Failure to complete the pre-construction mock-up will void all warranties.

Trimming: Form liners will need to be custom trimmed to fit the formwork on most jobs.

- A circular handsaw with a fine-tooth panel blade and a rip fence or saw guide is recommended.

4. TECHNICAL DATA

PROPERTY	DURA-CAST®/MULTI-CAST®	UNI-CAST®
Material	ABS Alloy	HIPS Alloy
Flexural Strength-Yield (Lb./In.²)—ASTM D 790	11,000	6,800
Flexural Modulus (Lb./In.²)—ASTM D 790	330,000	300,000
Hardness—ASTM D 785	103R	68L
Abrasion Resistance (In. of Material Lost) Tabor, 1000 grams, 1000 cycles, H-22 wheels	.008	.006
Notched 1Z0D Impact (Ft. Lb./In.)—ASTM D 256	7.0	2.0
Falling Dart Impact (Ft. Lb.)—ASTM D 3029	19.0	5.0
Coefficient of Thermal Expansion (In./In.—°F x 10^{-5})—ASTM D 696	5.3	6.6
Heat Deflection Temp. (°F)—ASTM D 648	213 at 66 PSI	162 at 66 PSI
Form Liner Weight Range (Lb./Sq. Ft.)	.59–1.08	.38–.65
Release Force-Light Texture (Lb./Sq. Ft.; Perpendicular to Surface)	6	6[1]
Release Force-Deep Texture (Lb./Sq. Ft.; Perpendicular to Surface)	57	54[1]
Fastener Pull Through Strength (Lb./Fastener/ Inch of Material Thickness) Bugle Head Tek®: #8–18 x 1 in. Self Drilling Screw	2056	1263
Fastener Fatigue (No. of Cycles to Failure at 165 Lb./Fastener)	173	1

[1]Without Form Release Agent

5. INSTALLATION

Pre-Construction Mock-Up: GREENSTREAK® requires a full scale mock-up to test specific concrete mix, slump, placement rate, form pressures, joint sealing, release agents vibrating and stripping prac-

- A sharp utility knife works well for trimming lighter gauge liners.
- If a liner butts against a chamfer or reveal strip, miter the edge of the liner for a proper fit.

Mounting: Keep vertical joints plumb and in line. Horizontal joints should be kept level and in line.

- Use rustication or reveal strips when possible; with many patterns a conspicuous joint is more attractive.
- Screws or nails are recommended for mounting GREENSTREAK form liners.
- For concrete casting beds, nail or screw into wooden dowels inserted in the slab.
- Liner can be attached with common construction adhesives or double-sided foam tapes if the liner has enough smooth surface contacting the formwork.
- Some patterns require back-up strips to prevent the form liner from becoming deformed under the load.

Sealing: All form liner joints and tie holes should be sealed to prevent localized water loss and subsequent discoloration of the concrete.

- Silicone sealant is recommended for cast-in-place jobs. Once cured, it is flexible, has good adhesion and won't discolor or stick to the concrete.
- Auto-body putty is good for precast or other applications where the formwork is not flexed or moved.
- Sealant or putty on fastener heads will hide them in the finished concrete.
- Heavy duct tape or double-sided foam tape stabilizes and seals the joint when applied to the formwork side of the form liner.

Form Ties and Bar Supports:

- Tight fitting holes can be drilled or cut with a hole saw.
- For rectangular snap ties, a sharpened tie, heated with a torch, can be used to melt a close-fitting hole through the liner.
- Bar supports should always rest against the portion of the liner that is in contact with the formwork.

Concrete Mix Design and Placement Considerations Which May Affect Pattern Quality:

- For uniformity of color and texture use one concrete supplier, making sure that all ingredients come from the same sources.
- Use an elephant trunk or tremi for placing the concrete to minimize aggregate segregation.
- The concrete must be properly vibrated to eliminate lift lines and to minimize air voids.

Stripping: All GREENSTREAK® form liners are made from rigid, non-absorbing compounds that will not bond to the concrete.

- UNI-CAST® form liners do not require a release agent or bond breaker.
- MULTI-CAST® and DURA-CAST® form liners should be used with a form release agent to minimize release forces and to speed form liner clean-up between pours.

Form Liner Job Site Guide: Additional detailed installation guidelines are available for the contractor.

6. AVAILABILITY AND COST

Availability: GREENSTREAK form liners are distributed nationally and internationally through more than 250 concrete forming and accessory dealers. Contact GREENSTREAK for the name of a dealer in the area.

Lead Time: Lead times will vary with order quantity, pattern and production backlog. Smaller orders for popular patterns can ship the next day. Allow four weeks for larger orders and six weeks for custom patterns.

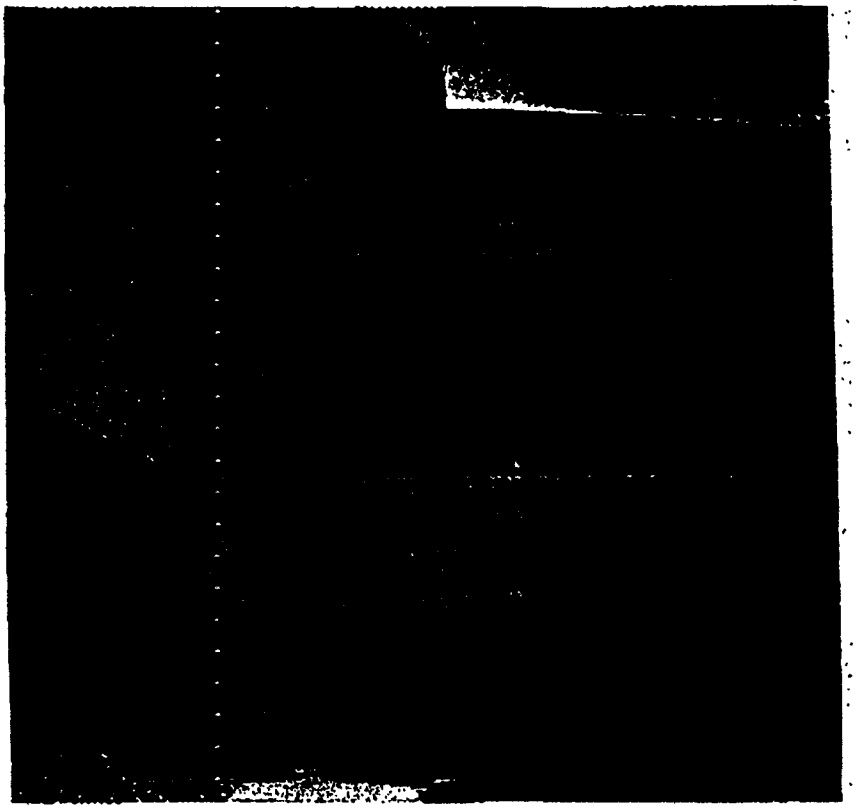
Cost: Contractor cost will vary with order quantity, pattern and choice of UNI-CAST, MULTI-CAST or DURA-CAST form liners.

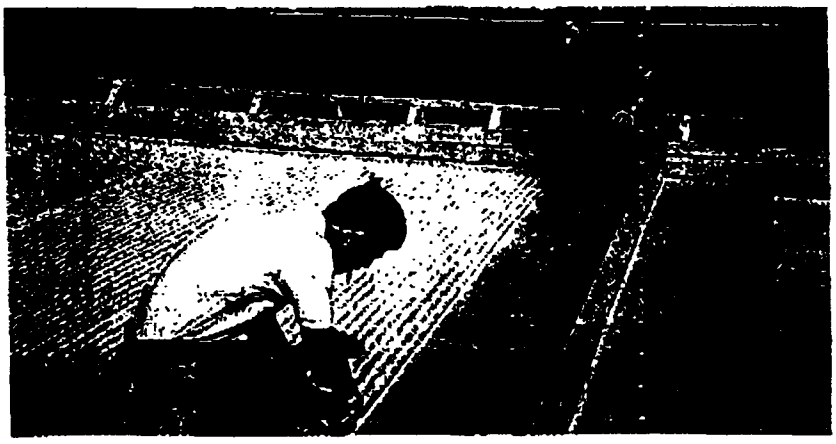
Samples: Samples are available from GREENSTREAK at no charge.

7. WARRANTY

GREENSTREAK warrants its products will be free from defects and will perform as stated in this literature, provided the application and construction practices used are per our recommendations and Job Site Guide instructions and provided the actual job construction duplicates mock-up materials, methods, workmanship, placement rates, form pressures, joint sealing and stripping practices. If our product does not meet the published product specifications and our customer gives notice to us before installing the product, we will replace the product without charge or refund the purchase price.

Product replacement or refund are the buyer's sole remedy for breach of warranty or negligence and we will not be liable for any indirect, consequential, special or resultant damages. To the best of our knowledge, the information contained herein is accurate and reflects average test values. Final suitability of any information or material is the sole responsibility of the user.





8. MAINTENANCE

Although all GREENSTREAK compounds are U.V. stabilized, protect form liners from long periods of direct sunlight.

Use of an approved release agent will minimize stripping forces and speed form cleanup between pours. Always reapply release agent before each pour.

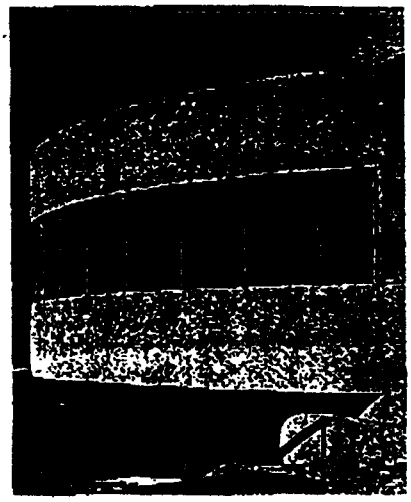
If necessary, GREENSTREAK form liners can be cleaned with household detergent and a scrub brush.

9. TECHNICAL SERVICES

GREENSTREAK distributors have the knowledge and ability to answer most questions. If additional information is needed, product brochures, 3 part specification and technical notes are available upon request. GREENSTREAK engineers are available for consultation during design, specification and product installation.

The following ACI committee reports are also recommended:

- ACI 117 "Standard Tolerances for Concrete Construction and Materials"
- ACI 301; CH.13 "Specifications for Structural Concrete"



- ACI 303R-91 "Cast-in-place Architectural Concrete"
- ACI 309; CH.7 "Consolidation of Concrete"
- ACI 347; CH.5.2 "Concrete Formwork"

GREENSTREAK® maintains a complete technical library with articles and reference manuals on form liners and architectural concrete. Call GREENSTREAK for copies.

10. FILING SYSTEMS

- SPEC-DATA®II
- Sweet's Catalog File 03100/GRE
- ARCAT Directory
- GREENSTREAK Form Liner Catalog and Job Site Guide are available upon request
- A ring binder covering all GREENSTREAK construction products is also available.
- New patterns are added on a regular basis. Please call if looking for a pattern that is not listed.

Wood Designs:

*344 Weathered 6 in. to 10 in. Random Boards
*346 Weathered 6 in. Boards
351 Random Rough Boards with Random 1 1/2 in. x 5/8 in. Deep Reveals
☆357 Smooth Shiplap Boards: 1/2 in. Deep, 6 in. Face
*363 Weathered 8 in. Boards

Masonry Designs:

*336 Split Face Block: 2 3/8 in. x 16 in. Joint Spacing
*337 Slump Block: 4 in. x 15 3/4 in. Joint Spacing
*338 Rough Brick: 2 3/4 in. x 8 1/2 in. Joint Spacing
*381 Shadowtex Brick

Ribbed Designs:

PATTERN	FOOT NOTE	DESCRIPTION	FACE (in.)	DEPTH (in.)	CENTERS (in.)
301	☆	Trapezoid	2 1/2	1 1/2	6
302	☆	Trapezoid	1 1/2	1 1/2	4
304		Trapezoid	3/4	3/4	2
305		Trapezoid	1/2	1/2	1 1/2
308		Trapezoid	1 1/8	1 1/2	6
309		Random Reveal		3/4 & 1 1/2	
312		Trapezoid	1/2	3/4	1 1/2
334		PA D.O.T. Trapezoid	3	3/4	4 1/4
335		Random Rib		1 1/2	
339		Trapezoid	7/8	1/2	2
353	☆	Random Parallel Reveals		1/2 & 1	
359		Trapezoid	1	1 1/2	6
361		Trapezoid	3/8	1/2	1
362	☆	AZ D.O.T. Random Reveal		1 1/2	

Fractured And Aggregate Designs:

PATTERN	FOOT NOTE	DESCRIPTION	FACE (in.)	DEPTH (in.)	CENTERS (in.)
347	☆	Trapezoid With Aggregate Face	2	1 1/4	3 1/16
360	*	River Bed Aggregate		3/8	
366	*	Fractured Rib	1	1	2 1/2
367		VA D.O.T. Fractured Rib	1	1	2
368	☆*	CA D.O.T. Trapezoid With Aggregate Face	7/8	1 5/8	3 1/2
373	*	Fractured Fin	3/4	3/4	1 1/2

Miscellaneous Designs:

*340 Smooth Face
*349 Light Sandblast
*354 Striated: 5/32 in. Deep x 1/2 in. Ctrs.

*Available In DURA-CAST
☆Recommended Backup Strips

CRAFTED WITH PRIDE IN U.S.A.

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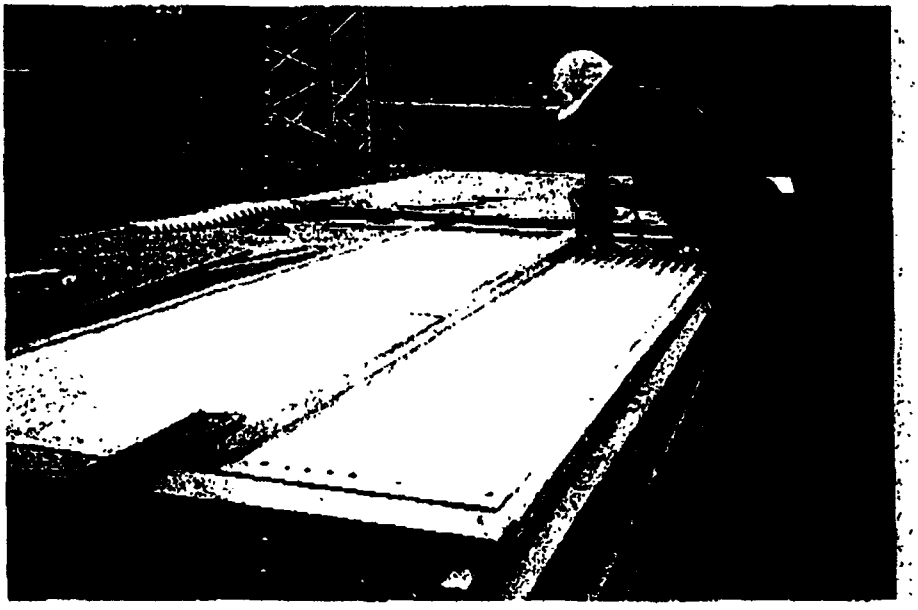
Architectural Concrete Form Liner

JOB SITE GUIDE

CONTENTS



INTRODUCTION

1. GREENSTREAK® Form Liners are thermoformed rigid polymer alloy sheets, engineered for lightweight and ease of handling on the jobsite.

2. More than 32 standard patterns and textures are available. Custom designs will also be considered. Call GREENSTREAK® for specific details.

3. All patterns are available in at least two use ranges:

UNI-CAST® – Single use form liner, designed for tilt-up or cast-in-place jobs where the form liner will only be used once.

MULTI-CAST® – Intermediate use form liner, designed for 2-10 uses under normal jobsite conditions.

Some patterns are available in a third use range:

DURA-CAST® – High use form liner, designed for 10-25 uses under normal jobsite conditions. Significantly more uses can be expected in precast applications.

4. UNI-CAST, MULTI-CAST and DURA-CAST form liners are interchangeable on the same job which enables contractors to use a less expensive liner for portions of the job requiring "cut-ups" (ie: openings, sloped walls, etc.)

5. Form Liner sheets are trimmed straight and square to a nominal 4' x 10' size (see catalog for actual dimensions.)

6. All GREENSTREAK® Form Liners have a hard, void-free surface that makes the liner easy to strip and which will not absorb moisture or cause discoloration.

7. GREENSTREAK requires a full scale preconstruction mock-up to test specific concrete mix, slump, placement rate, form pressures, joint sealing, vibrating and stripping practices. The mock-up must duplicate the materials, methods, workmanship, placement rates and form pressures that will actually be used on the job. Failure

to complete the pre-construction mock-up will void all warranties.

8. Form liners are shipped covered and banded to 4' x 10' skids. Although all GREENSTREAK form liner compounds are U.V. stabilized, the form liners should be covered if stored outside on the jobsite for long periods of time.

9. At temperatures below 25°F, the liner material will become more rigid and will lose impact strength. Use extra care under these conditions.

TRIMMING

1. Form liners will need to be custom trimmed to fit the formwork on most jobs.

2. A sturdy work table should be built and outfitted with an edge guide running in the 10' direction and an adjustable saw guide or rip fence.

3. A circular handsaw with a fine-tooth panel blade and a rip fence or saw guide is recommended. In most cases a table saw will be too awkward.

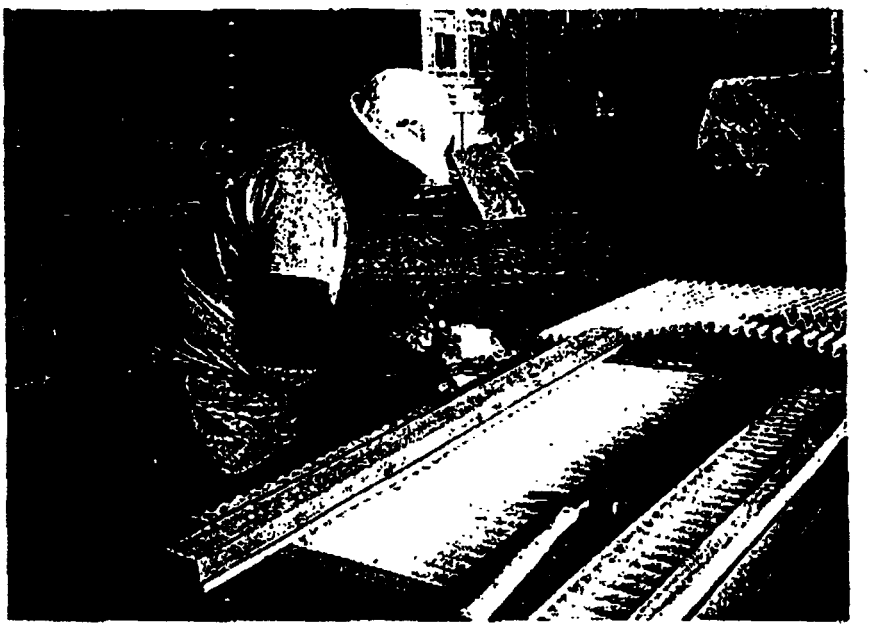
4. Use a fine tooth panel blade with a minimum set. A Carbide tipped blade with 40 or more teeth also works well.

5. A sharp utility knife works well for trimming lighter gauge liners; score the material and snap off the excess.

6. If a liner butts against a chamfer or reveal strip, miter the edge of the liner on the same angle for a proper fit.

MOUNTING

1. PLACEMENT: Keep vertical joints plumb and on the same line. Horizontal joints should be kept level and in line at the same elevation.



2. RUSTICATION OR REVEAL STRIPS are recommended at liner joints that do not blend with the pattern. In most cases a rusticated joint is easier to work with. A properly sized rustication will compliment the pattern and can enhance the overall appearance of the structure. See GREENSTREAK Architectural Form Liners Sweets Brochure for rustification and chamfer strips.

3. FORMWORK TAG: When mounting the liner, make sure that the correct side goes toward the formwork. All GREENSTREAK form liners have a tag indicating the formwork side.

4. TEMPERATURE: Form liners will expand with an increase in temperature and shrink when the temperature drops. As a rule of thumb, the liner will change 1/16" or less in 10 ft. with a 10°F change in temperature. Proper fastening minimizes form liner movement. The liner may "grow" with large increases in temperature. A fine spray of water on the liner prior to placing the concrete will cause it to shrink to its original size. The liner should be fastened during the warmest part of the day if possible.

5. FASTENER LOCATION AND SPACING: Screws or nails should be used on 12" to 24" centers that are evenly distributed over the sheet. Outer fasteners should be located within 2" of the liner edge. Attachment points should be random: a consistent nail or staple pattern may appear obvious in the finished concrete. Nailing through the peak of the form liner (valley of the concrete) will help hide fastener marks in concrete. however this practice is not generally recommended. Nailing through the valley of the form liner (concrete peak) is more practical and results in a better job. Patterns with more texture or relief require more fasteners. More nails are required than screws since screws have more holding power. Use as few fasteners as possible for UNI-CAST form liners to keep the form liner positioned. It is not necessary to firmly attach the UNI-CAST liner to the formwork.

6. SCREWS: Easy to use, screws have the best holding power and are easily removed. Bugle head self-drilling and tapping screws #8-18 x 1" are the minimum size recommended. Self-drilling and tapping, the flat head fits flush with the liner, and may be used for steel or wood forms. A screw gun with an adjustable torque setting is also recommended.

7. NAILS: Easy to install, nails feature good holding power. 7D or larger cement coated

or barbed drywall nails are recommended. A pneumatic nailer should be used with a pressure regulator.

8. STAPLES: Small staples (approx. 1/8" wide x 3/8" deep) are easy to use and easily hidden in concrete. They have much less holding power and should be used on 6" - 12" centers. Use a pneumatic stapler with pressure regulator.

9. POP RIVITS: Feature good holding power on metal forms but require more work than self-drilling screws.

10. WOODEN DOWELS: On tilt-up or precast jobs where the liner is attached to the concrete casting bed, screw or nail liner to 1/2" wooden dowels inserted in the concrete. The dowels are easy to drill out and patch when the job is complete.

11. DOUBLE COATED FOAM TAPE: On tilt-up jobs, double coated foam tape provides an easy way to secure the form liner to the casting bed. On most patterns the tape should be centered on the form liner seams. Carpet tape 1/32" - 1/16" is recommended. Both foam liner and concrete must be clean and dry.

12. HEAVY DUCT TAPE: Recommended for pre-assembling "large" liners for pre-cast or tilt-up beds, heavy duct tape may be applied to the formwork side of the liner at the joints. The liner is assembled upside down and alongside the bed and then is "rolled over" into it.

13. ABS PIPE CEMENT: May be used to glue MULTI-CAST or DURA-CAST liners together.

14. GLUES or ADHESIVES: Not recommended for mounting GREENSTREAK form liners, in most cases glues or adhesives are difficult to work with on the jobsite.

15. BACK-UP STRIPS: To prevent deflection from the pressure of concrete, form liner patterns with ribs wider than 2" should have back-up strips. The need for back-up strips can be confirmed from the mock-up pour. Wood or styrene foam insulation board (NOT Bead Board) should be used between the liner and the formwork.

16. ROUND COLUMNS: Form liners may be used to line circular column forms. The form liner pattern repeat should be a multiple of the column form circumference. Most ribbed patterns have an "accordian" effect which allows them to be slightly undersized or oversized. Tape the pieces of form liner together from the outside with heavy duct tape and slide this assembly into the column form. The ends of the liner should be taped or plugged to prevent the concrete from seeping behind the liner. The liner assembly should be stripped after the column form has been stipped.

SEALING

1. All form liner joints and tie holes should be sealed to prevent localized water loss and subsequent discoloration of the concrete. Grout leakage will make stripping difficult and may damage the liner.

2. Neutral cure silicone sealant is recommended for cast-in-place jobs. Once cured, it is flexible, has good adhesion and won't discolor or stick to the concrete.

3. Auto-body putty is good for pre-cast or other applications where the formwork is not flexed or moved.

4. ABS Pipe Cement may be used to seal MULTI-CAST or DURA-CAST liners.

5. Sealant or putty may be spackled on fastener heads to hide them in the finished concrete.

6. Heavy duct tape or double-sided foam tape stabilizes and seals the joint when applied to the formwork side of the form liner. Fiber reinforced plastic packing tape (that does not stretch in hot weather) may be used on the concrete side of the liner for tilt-up jobs. This method is quick and easy but may show up in the concrete on some patterns which may result in an unacceptable finish.

7. End plugs are not required in most cases where form liners butt against rustication strips. If necessary, trapezoidal liners may be plugged with pieces or wood or foam, ripped to fit the ends of the ribs. For irregular patterns, such as a fractured rib, the plug will be an approximate fit and the gaps may be filled with sealant. Rustication strips are easier to work with than end plugs.

FORM BOLTS, TIES AND BAR SUPPORTS

1. Tie spacing should be a multiple of the form liner panern repeat.

2. Tight fining holes may be drilled or cut with a hole saw.

3. For rectangular snap ties, a sharpened tie, heated with a torch, may be used to melt a close fitting hole through the liner.

4. Ties located in the "valley" of the concrete may be less obvious. Patching tie holes located in the "peak" of the concrete is easier.

5. Bar supports or spacers should always rest against the portion of the liner that is in contact with the form work. The leg spacing of the bar supports should match the pattern repeat of the form liner.

6. Supports and spacers should be plastic or plastic tipped to minimize rust stains on the finished concrete.

7. Some deeper patterns may deform when walked on in pre-cast and tilt-up work. When placing the bar mat, workers should walk on strips of 1/4" plywood to distribute the load on the form liner. The thin plywood is flexible enough to pull out through the bar mat. The concrete itself distributes the load during placement. If permissible, walk on the reinforcing steel rather than the liner surface.

FORM RELEASE AGENTS AND BOND BREAKERS

1. GREENSTREAK form liners are made from rigid, non-absorbing compounds that will not bond to concrete.

2. UNI-CAST form liners do not require a release agent or bond breaker.

3. Although not necessary, MULTI-CAST and DURA-CAST liners should be used with a form release agent to aid stripping and speed clean-up between pours. Many release agents will cause cracking and embrittlement. Only GREENSTREAK-approved release agents should be used. Apply a very light, uniform coating before each use.

RETARDERS

GREENSTREAK form liners can be coated with a retarder to bring out the aggregate color and texture. Retarders give more "depth" than sandblasting. Many retarder systems will cause cracking and embrittlement. Only GREENSTREAK-approved retarder systems should be used. Follow the manufacturer's recommendations carefully.

CONCRETE MIX DESIGN AND PLACEMENT

1. For uniformity of color and texture use one concrete supplier, making sure that all ingredients come from the same sources.

2. For ribbed textures the aggregate should be smaller than the width of the rib. Oversize aggregate can cause honeycombing and chipping on the ribs.

3. Use an elephant trunk or tremi for placing the concrete to minimize aggregate segregation and trapped air. Dropping the concrete directly against the liner surface may cause abrasion or deformation and result in a defect in the finished concrete.

4. Pumping the concrete into the forms from the bottom will generally reduce air voids in the surface of the concrete. This method will also raise form pressures significantly, which may damage the form liner.

5. The concrete must be properly vibrated to eliminate lift lines and to minimize air voids. External vibrators can loosen the liner from the formwork; internal vibrators are normally

used. Contact between the vibrator and liner may damage the liner. Under and over vibration may also cause defects in the surface of the concrete.

6. Proper use of a plasticizer in the mix will minimize air voids. The placement rate may have to be reduced to keep form pressures at an acceptable level.

7. High placement rates may create excessive form pressures which can deform or damage the form liner. High pour rates may also cause more air voids.

8. Foot prints, standing water and airborn dirt and debris should be removed before placing the concrete with pre-cast and tilt- up panels.

9. Elevated temperatures encountered with steam curing may harm the form liner. Contact GREENSTREAK for specific recommendations.

STRIPPING AND CLEAN-UP

1. Form work should be stripped in the *normal manner*. Shallow, smooth patterns require approximately 6 pounds per square foot to strip. Deep, rough patterns will take about 55 pounds per square foot to strip.

2. If parts of the liner pull away from the formwork, look for grout leaks or undercuts at the form liner seams and seal these areas. Add extra fasteners if necessary.

3. GREENSTREAK form liners are easily cleaned with household detergent.

FINAL FINISHING

1. RUBBING: Seams and forming defects may be removed with a stone while the concrete is green.

2. SANDBLASTING: Many jobs call for sandblasting to roughen the surface and bring out the color of aggregate. Sandblasting may also hide seams and forming defects but will not hide discoloration caused by grout leakage.

3. PATCHING: When patching tie holes or more serious forming defects, a close color match is critical. Use the same materials used in the original mix and perform several trial runs before beginning work on the structure. If in doubt, hire a consultant. Bad patches look worse than the original problem.

RECOMMENDED SERVICES

GREENSTREAK form liners are distributed nationally and internationally through more than 250 concrete forming and accessory dealers who have the knowledge and experience to answer most questions. Contact GREENSTREAK for the name of a dealer in your area.

If additional information is needed, product brochures, specification sheets and technical notes are available upon request. GREENSTREAK engineers are available for consultation with the contractor on the job site.

The following ACI committee reports are also recommended:

ACI 117 "Standard Tolerances for Concrete Construction and Materials"

ACI 301; CH.13 "Specifications for Structural Concrete"

ACI 303R "Cast-in-place Architectural Concrete"

ACI 309; CH.7 "Consolidation of Concrete"

ACI 347; CH.5.2 "Concrete Formwork"

GREENSTREAK maintains a complete technical library with articles and reference manuals on form liners and architectural concrete. Call GREENSTREAK for copies.

For more information contact GREENSTREAK at 800-325-9504 or 314-225-9400.

WARRANTY

GREENSTREAK® warrants its products will be free from defects and will perform as stated in this literature, provided the application and construction practices used are per our recommendations and Job Site Guide instructions and provided the actual job construction duplicates mock-up materials, methods, workmanship, placement rates, form pressures, joint sealing and stripping practices. If our product does not meet the published product specifications and our customer gives notice to us before installing the product, we will replace the product without charge or refund the purchase price.

Product replacement or refund are the buyer's sole remedy for breach of warranty or negligence and we will not be liable for any indirect, consequential, special or resultant damages. To the best of our knowledge, the information contained herein is accurate and reflects average test values. Final suitability of any information or material is the sole responsibility of the user.

[redacted]

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Phone: 800. 325-9504 or 314. 225-9400 • Fax: 314. 225-9854

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Printed in the U.S.A.

CRAFTED WITH PRIDE IN U.S.A.

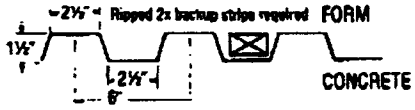
(November 1992 Supersedes February 1989)

Ribbed Design

Not all patterns are shown in this catalog

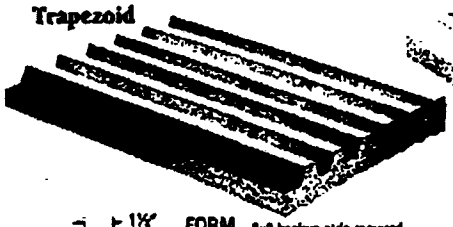
No. 301

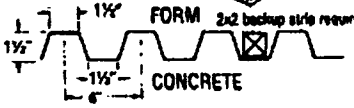
UNI-CAST® & MULTI-CAST®
4' x 9'-11" Sheets
Trapezoid



No. 302

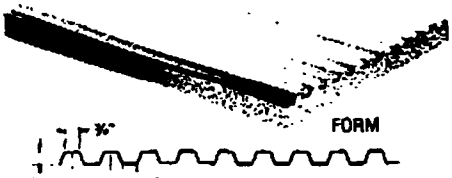
UNI-CAST & MULTI-CAST
3'11" x 10' Sheets
Trapezoid

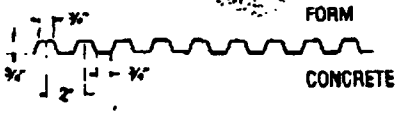




No. 304

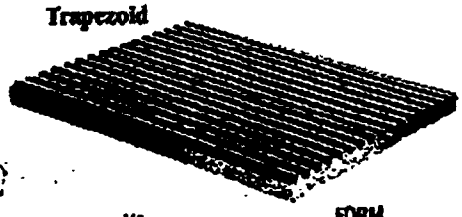
UNI-CAST & MULTI-CAST
4' x 10' Sheets
Trapezoid

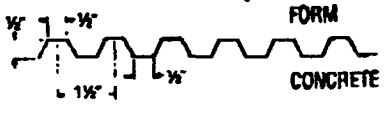




No. 305

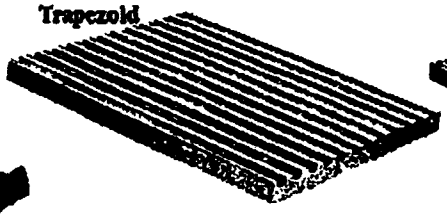
UNI-CAST & MULTI-CAST
3'-11-3/4" x 10' Sheets
Trapezoid

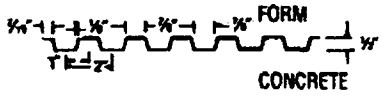




No. 339

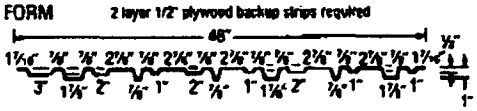
UNI-CAST & MULTI-CAST
4' x 9'-10" Sheets
Trapezoid





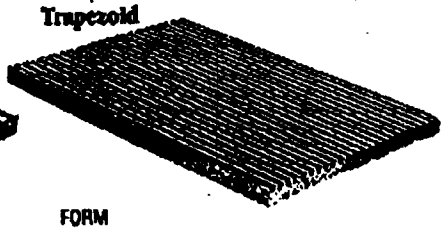
No. 353

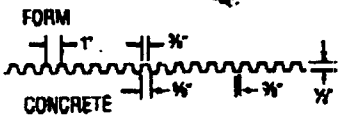
UNI-CAST & MULTI-CAST
3'-11-3/4" x 9'-10" Sheets
Random Parallel Reveals



No. 361

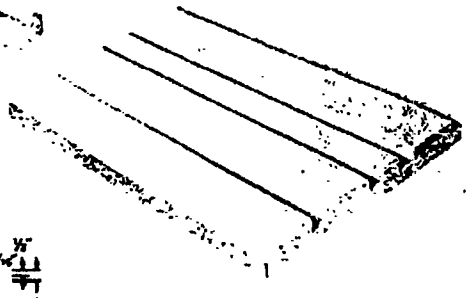
UNI-CAST & MULTI-CAST
4' x 9'-10" Sheets
Trapezoid

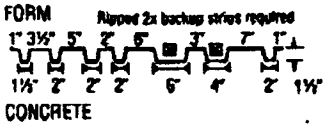


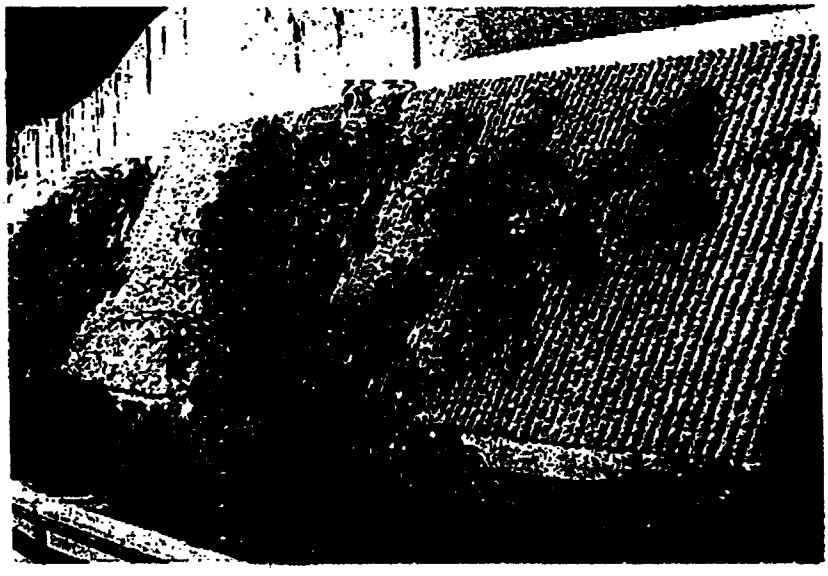


No. 362

UNI-CAST & MULTI-CAST
4' x 9'-10" Sheets
AZ D.O.T. Random Reveal





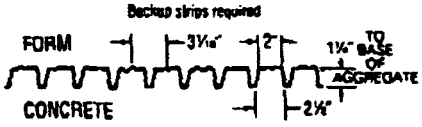


Fractured & Aggregate Designs

Not all patterns are shown in this catalog.

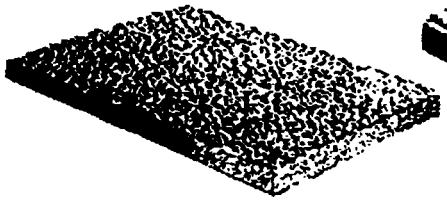
No. 347

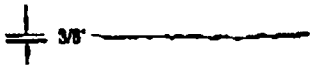
(Optional closed or open ends)
UNI-CAST® & MULTI-CAST®
3'-11-3/4" x 9'-10" Sheets
Trapezoid with Aggregate Face



No. 360

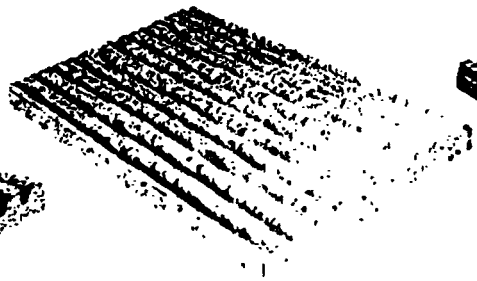
UNI-CAST, MULTI-CAST & DURA-CAST®
4' x 10' Sheets
River Bed Aggregate

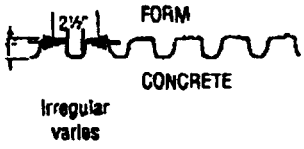




No. 366

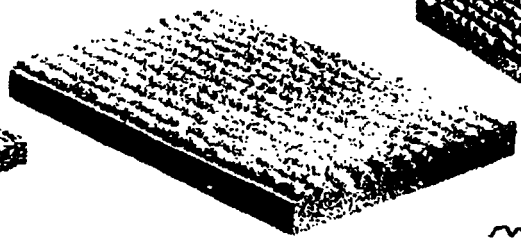
UNI-CAST, MULTI-CAST & DURA-CAST
3'-11-1/4" x 10' Sheets
Fractured Rib

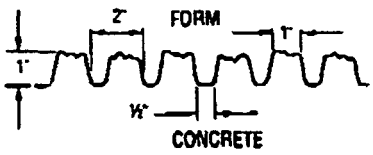




No. 367

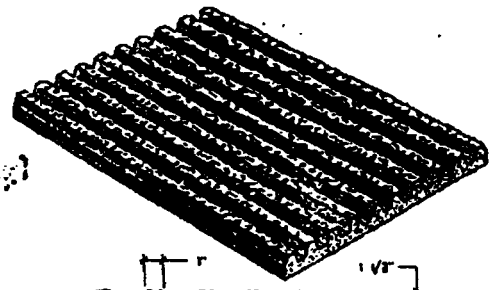
UNI-CAST & MULTI-CAST
4'-1" x 10' Sheets
VA D.O.T. Fractured Rib





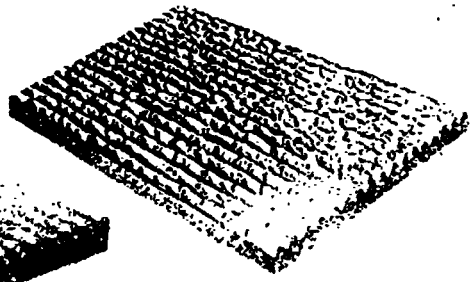
NEW No. 369

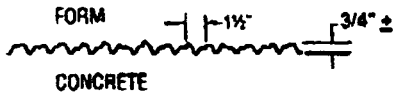
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 10' Sheets
CA DOT Trapezoid with Aggregate Face



No. 373

UNI-CAST, MULTI-CAST & DURA-CAST
4'-1/2" x 10' Sheets
Fractured Fin





Style No. 373, **St. Louis University Hospitals**
St. Louis, Missouri

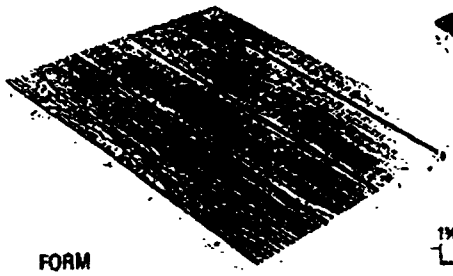
Style No. 304, **Central Mines Co.**
Earth City, Missouri

Wood Designs

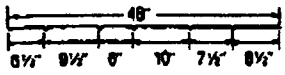
Not all patterns are shown in this catalog.

No. 344

UNI-CAST®, MULTI-CAST® & DURA-CAST®
4' x 9'-10" Sheets
Weathered Random Boards



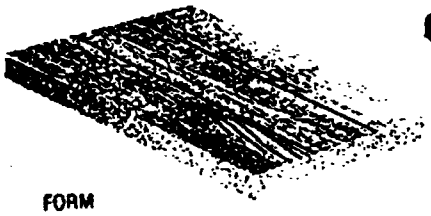
FORM



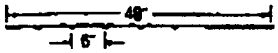
CONCRETE

No. 346

UNI-CAST, MULTI-CAST & DURA-CAST
4' x 9'-10" Sheets
Weathered Boards



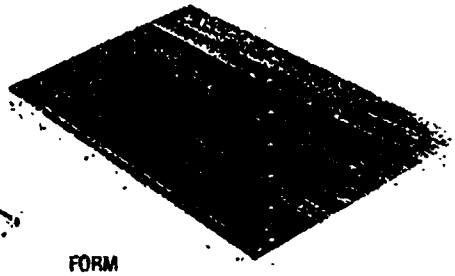
FORM



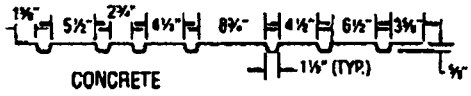
CONCRETE

No. 351

UNI-CAST & MULTI-CAST
4' x 9' Sheets
Random Rough Southern Yellow Pine Boards with Random Reveals



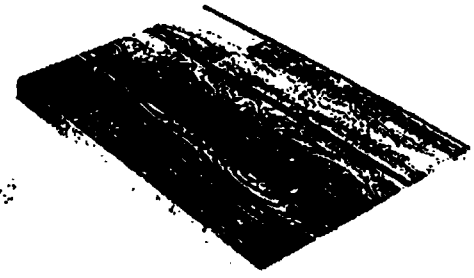
FORM



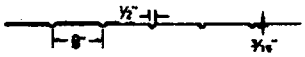
CONCRETE

No. 363

UNI-CAST, MULTI-CAST & DURA-CAST
4' x 9'-10" Sheets
Weathered Tongue & Groove Boards

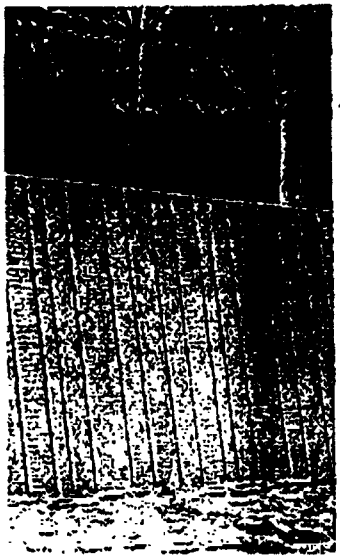


FORM



CONCRETE

Style No. 344,
The Promenade on the St. Louis Riverfront, St. Louis, Missouri



Style No. 304, **Mock-up with paint applied St. Louis, Missouri**

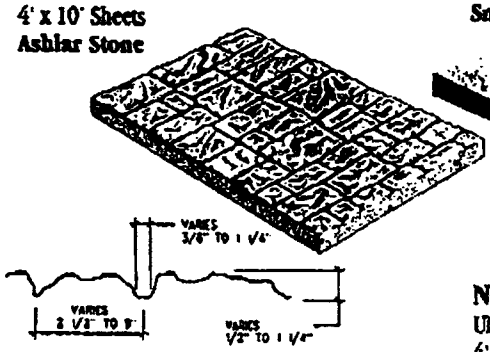
Important Factors to Remember

- Pre-construction mock-up is required by GREENSTREAK® for warranty to remain in effect.
- Although all GREENSTREAK compounds are U.V. stabilized, protect form liners from long periods of direct sunlight.
- Form Liners will become more rigid at temperatures below 25°F; use extra care under these conditions.
- GREENSTREAK Form Liners in the three use ranges are interchangeable on the same job. This allow the use of the less expensive liner for those "cut-up" areas.
- Rustication or reveal strips are recommended at the liner joints that do not blend with the pattern. A properly sized rustication will compliment the pattern and enhance the overall appearance of the structure.
- For uniformity of color and texture, use one concrete supplier, making sure all ingredients come from the same sources.
- Use an elephant trunk or tremie for placing the concrete to minimize aggregate segregation.
- The concrete must be properly vibrated to eliminate lift lines and to minimize air voids.
- Form Liners are NOT recommended for use by precasters using steam or heat induced curing beds.
- Use of an approved release agent will minimize stripping forces and speed form cleanup between pours. Always reapply release agent before each pour.
- If necessary, GREENSTREAK form liners can be cleaned with household detergent and a scrub brush.
- See ACI 303R-91 "Guide to Cast-In-Place Architectural Concrete" for recommendations on liner material, design and use.
- Type 3 concrete with accelerators create high early heat during cure which could damage form liner.

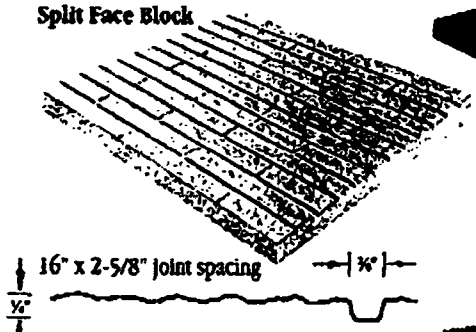
Masonry Designs

Not all patterns are shown in this catalog.

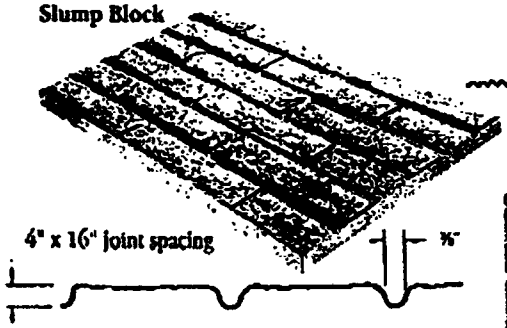
NEW **No. 330**
MULTI-CAST®
4' x 10' Sheets
Ashlar Stone



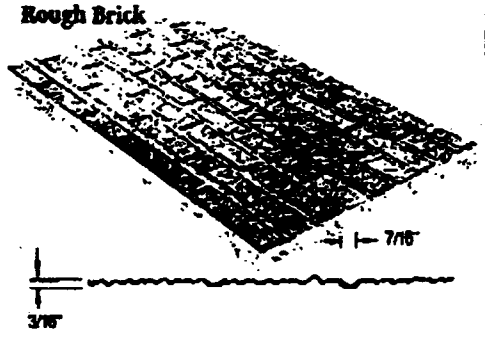
No. 336
UNI-CAST®, MULTI-CAST® & DURA-CAST®
4' x 9'-4" Sheets
Split Face Block



No. 337
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 9'-2" Sheets
Slump Block

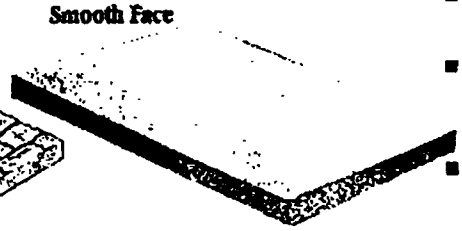


No. 338
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 9'-2" Sheets
Rough Brick



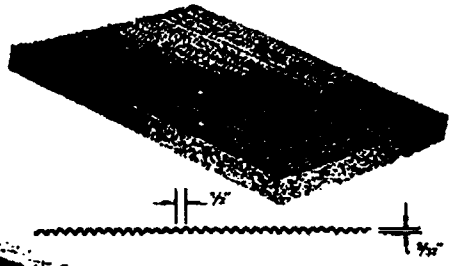
Miscellaneous Designs

No. 340
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 10' Sheets
Smooth Face



No. 349
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 10' Sheets
Light Sandblast Finish

No. 354
UNI-CAST, MULTI-CAST & DURA-CAST
4' x 10' Sheets
Striated Sinusuidal Wave Pattern



Additional Patterns Available

- **No. 308 Trapezoid:**
  1-1/8" Face x 1-1/2" DP x 6" Ctr
- **No. 309 Random Reveal:**
  3/4" and 1-1/2" DP
- **No. 312 Trapezoid:**
  3'-11-1/2" x 9-11-3/4" Sheets
  1/2" Face x 3/4" DP x 1-1/2" Ctr
- **No. 334 PA D.O.T. Trapezoid:**
  4' x 10' Sheets
  3" Face x 3/4" DP x 4-1/4" Ctr
- **No. 335 Random Rib:**
  4' x 10' Sheets
  1-1/2" DP
- **No. 357* Smooth Shiplap Boards:**
  4' x 10' Sheets
  6" x 1/2" DP
- **No. 359 Trapezoid:**
  4' x 9'-6" Sheets
  1" Trap x 1-1/2" DP x 6" Ctr
- **No. 368* CA D.O.T. Trapezoid with Aggregate Face:**
  4'-1" x 10' Sheets
  7/8" Face x 1-5/8" DP x 3-1/2" Ctr
- **No. 381 Shadowtex Brick:**
  4' x 10'-1"

Not all patterns are shown in this catalog. Standard patterns are added on a regular basis. Consult GREENSTREAK® for additional designs or custom patterns.

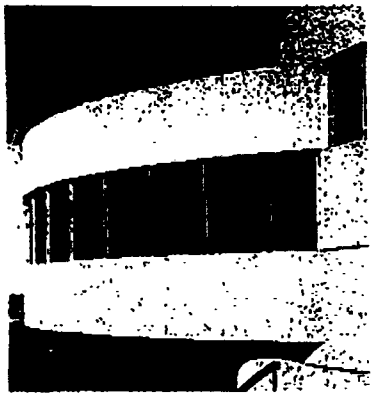
* Recommend backup strips.

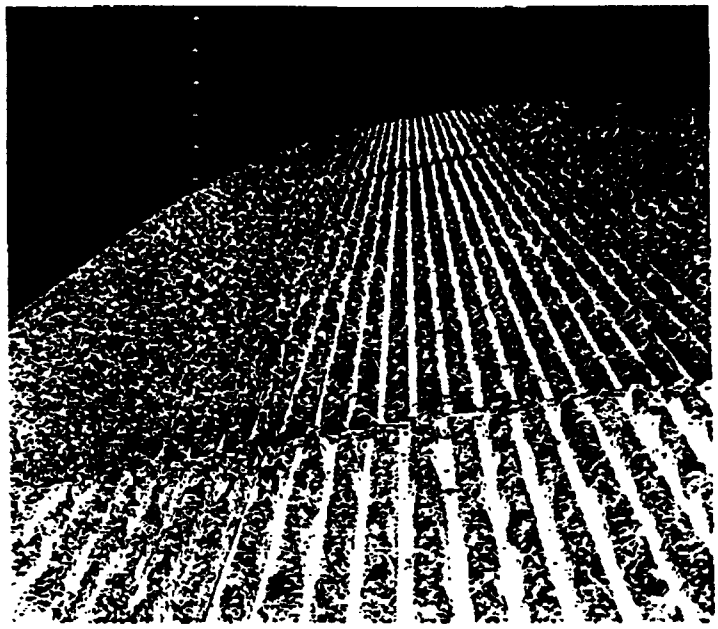
Style No. 338, Ft. Lewis, Washington

LIMITED WARRANTY

GREENSTREAK® warrants its products will be free from defects and will perform as stated in this literature, *provided the application and* construction practices used are per our recommendations and Job Site Guide instructions and provided the actual job construction duplicates mock-up materials, methods, workmanship, placement rates, form pressures, joint sealing and stripping practices. If our product does not meet the published product specifications and our customer gives notice to us before installing the product, we will replace the product without charge or refund the purchase price.

Product replacement or refund are the buyer's sole remedy for breach of warranty or negligence and we will not be liable for any indirect, consequential, special or resultant damages. To the best of our knowledge, the information contained herein is accurate and reflects average test values. Final suitability of any information or material is the sole responsibility of the user.





TECHNICAL SERVICES

GREENSTREAK distributors have the knowledge and ability to answer most questions. If additional information is needed, product brochures, specification sheets and technical notes are available upon request. GREENSTREAK engineers are *available for consultation during design, specification and product installation.*

* The following ACI committee reports are also recommended:

ACI 117 "Standard Tolerances for Concrete Construction and Materials"

ACI 301; CH.13 "Specifications for Structural Concrete"

ACI 303R "Cast-in-place Architectural Concrete"

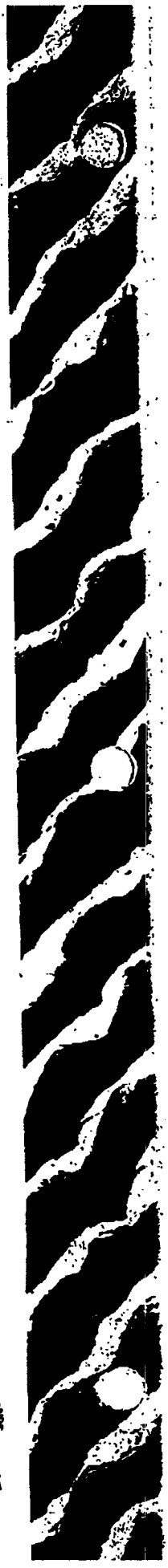
ACI 309; CH.7 "Consolidation of Concrete"

ACI 347; CH.5.2 "Concrete Formwork"

ORDERING INFORMATION

Lead times will vary with order quantity, pattern and production backlog. Smaller orders for popular patterns can ship the next day. Allow 4 weeks for larger orders and 6 weeks for custom patterns. Samples are available from GREENSTREAK at no charge.

Left and Top Right: **Truman Dam Visitor's Center**
Warsaw, Missouri



GREENSTREAK®

3400 Tree Court Industrial Blvd., St. Louis, Missouri 63122
Phone: 800. 325-9504 or 314. 225-9400 • Fax: 800. 551-5145 or 314. 225-9854

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CRAFTED WITH PRIDE IN U.S.A.

Printed in U.S.A.
10/94

Custom Form Liner Designs

GREENSTREAK® manufactures custom form liners to supplement a wide selection of standard patterns and textures.

- Specify a unique pattern or texture that best suits the structure
- Custom patterns enable architects to closely match existing structures. Typical applications include tilt-up or precast additions to existing brick buildings.
- Custom patterns may be manufactured in UNI-CAST®, MULTI-CAST® or DURA-CAST® Form Liners depending on the complexity of design.
- All new tooling is built in-house and has a standard lead time of six weeks. Tooling costs can have wide variances depending on the complexity of the pattern. Contact GREENSTREAK for more information.
- As with standard GREENSTREAK patterns, the Form Liner cannot exceed 4' x 10'. For lowest cost and best results, patterns should be in multiples of 4' x 10'.

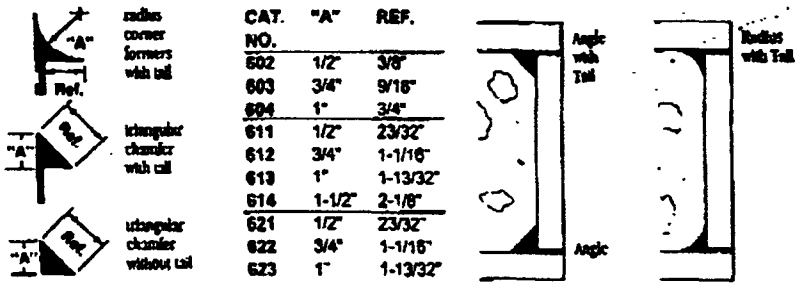
Contact GREENSTREAK to review applications in detail.

GREENSTREAK Concrete Formwork Accessories – Masterformat No. 03100

GREENSTREAK is your single-source supplier for in-stock formwork accessories including:

Chamfer Strip

- Smooth angled corner or rounded corner to rectangular columns or beams
- No rubbing, stoning, finishing required
- 10 ft. lengths standard
- 4-10 uses
- Order by "A" dimension only

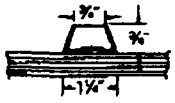


CAT. NO.	"A"	REF.
602	1/2"	3/8"
603	3/4"	9/16"
604	1"	3/4"
611	1/2"	23/32"
612	3/4"	1-1/16"
613	1"	1-13/32"
614	1-1/2"	2-1/8"
621	1/2"	23/32"
622	3/4"	1-1/16"
623	1"	1-13/32"

Rustication Strip

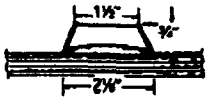
- Creates bold reveals
- Use vertically or horizontally
- Many reuses
- No form release needed
- Enhances appearance of exposed concrete
- Nails to form
- 10 ft. lengths standard
- No leakage at form

320



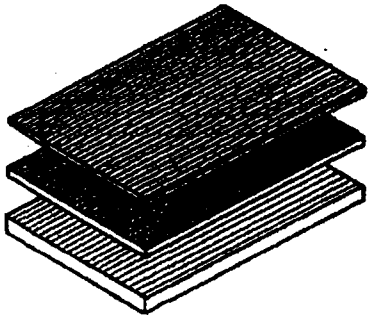
321

322



Tilt-Up Shims

CAT. NO.	SIZE T x L x W
015	1/4" x 6" x 4"
016	1/8" x 6" x 4"
017	1/16" x 6" x 4"
018	6" x 4" SHIM-PACK™
044	1/4" x 4" x 4'
045	1/8" x 4" x 4'
046	1/16" x 4" x 4"
047	4" x 4" SHIM-PACK™



Used to level tilt-up and pre-cast concrete wall panels. Leveling within 1/16 inch. 10,000 psi bearing capacity shims normally stronger than concrete. Interlocking ribs. Rockwell Hardness M20.

SUGGESTED PROPRIETARY SHORT FORM GUIDE SPECIFICATION

Architectural Concrete Formwork Liner

Textured architectural concrete surfaces as indicated in drawings and specifications to be formed using GREENSTREAK Architectural Form Liners, Pattern Number _____, as manufactured by GREENSTREAK Plastic Products Co., Inc.; 3400 Tree Court Ind. Blvd., St. Louis, MO 63122; Phone# 800-325-9504 (or 314-225-9400 in Missouri.) Form Liner mock-up, storage, handling, accessories, fabrication, preparation and installation to comply with GREENSTREAK's written instructions and recommendations.

A long form, three-part master specification in CSI format is available upon request. Although proprietary, the master specification includes reference and performance standards.

Construction Submittals
Submittal 017
Flowable Fill Mix Design and Specifications

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	1/03/01
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057
		Fax #	781-721-4073

We are sending you ☒ Herewith ☐ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

COPIES	DATE OR NO.	DESCRIPTION
1	1/3/01	Submittal 017 – Flowable Fill Mix Design and Specifications

THESE ARE TRANSMITTED AS INDICATED BELOW

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☐ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☒ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Lou Maccarone, RIDEM

BY: Scott A. Miller

PRM CONCRETE CORPORATION
400 FRENCHTOWN RD.
EAST GREENWICH, RI 02861
(401) 885-4010

CONCRETE MIX DESIGN

MIX ID : 1012 CIANCI [12] 100 PSI 01/02/02

CONTRACTOR : LEA CIANCI
PROJECT : CENTERDALE DAMN REPLACEMENT
SOURCE OF CONCRETE : PRM CONCRETE CORPORATION
CONSTRUCTION TYPE : FLOWABLE FILL
PLACEMENT : CHUTE ONLY

WEIGHTS PER CUBIC YARD (SATURATED, SURFACE-DRY)			YIELD, CU FT
ATLANTIC CEMENT TYPE II, LB	90		0.46
RIVER SAND & GRAVEL SAND, LB	2406		14.72
WATER, GAL-US (LB)	42.0	(350)	5.62
TOTAL AIR, %	23.0		6.21
		TOTAL	27.00
DARAFILL EGG AEA, OZ-US	3.0		
WATER/CEMENT RATIO, LBS/LB	3.89		
SLUMP, IN	10.00		
CONCRETE UNIT WEIGHT, PCF	105.4		

BATCH MINUS 6 GALS REPLACE ON JOB
STRENGTH 75psi +/-50psi
NOT FOR PUMPING

OK PER MIKE WALKER VIA PHONE 1/3/02

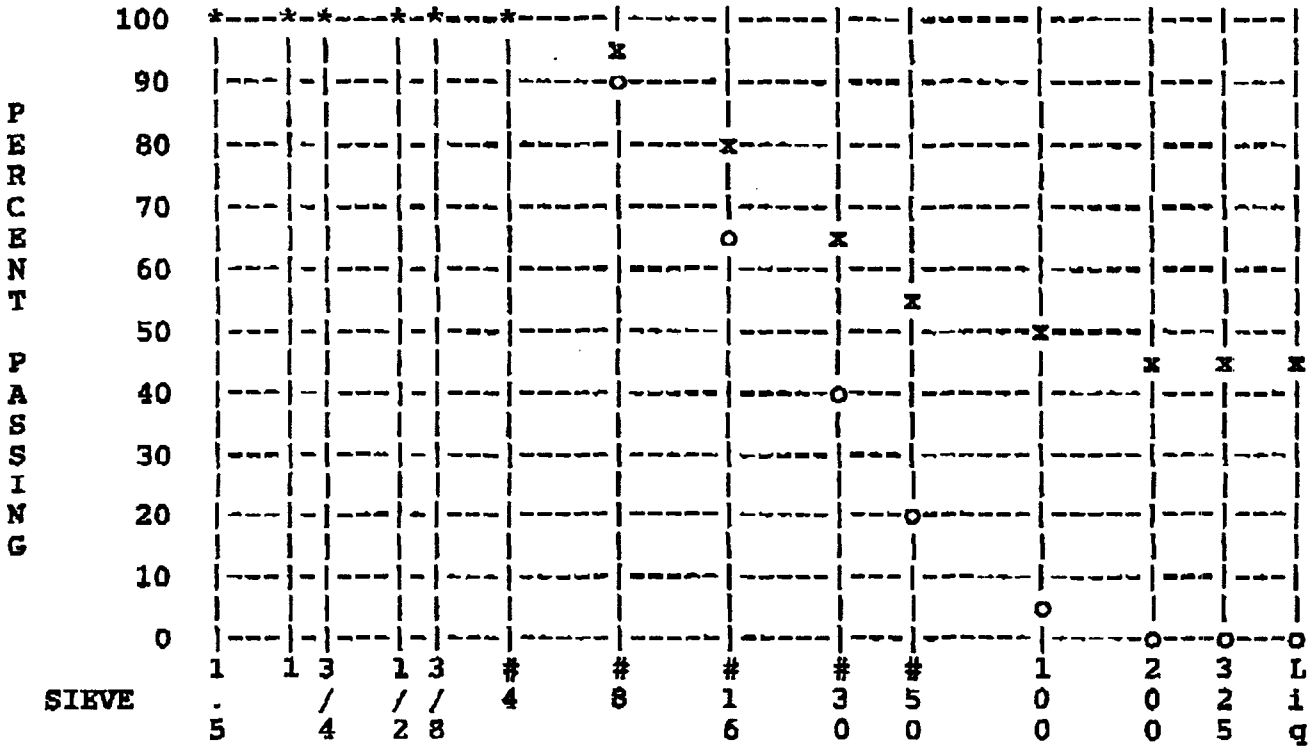
PREPARED BY :

PRM CONCRETE CORPORATION

FULL GRADATION ANALYSIS

SIEVE	SAND	PASTE	TOTAL	AGGR
1-1/2 "			100.0	100.0
1 "			100.0	100.0
3/4 "			100.0	100.0
1/2 "			100.0	100.0
3/8 "	100.0		100.0	100.0
# 4	98.0		98.9	98.0
# 8	90.0		94.5	90.0
# 16	66.0		81.5	66.0
# 30	40.0		67.3	40.0
# 50	18.0		55.3	18.0
# 100	6.0		48.8	6.0
# 200	1.0	100.0	46.0	1.0
# 325	-	99.9	45.4	-
Liquid	-	96.3	43.8	-

GRADATION CHART



x - ALL COMPONENTS o - AGGREGATES * - BOTH

Construction Submittals
Submittal 018
Rock Anchor Test Sheets

Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO:	GEI Consultants	DATE	1/29/02
	1021 Main Street	PROJECT	Centredale Manor
	Winchester, MA 01890-1970	LOCATION:	N. Providence, RI
		COMM. NO.:	15rp102.001
ATTN:	Mike Walker	PHONE #	781-721-4057

We are sending you ☒ Herewith ☐ Delivered by Hand ☐ Under Separate Cover via _____

The following items:

☐ Plans ☐ Prints ☐ Shop Drawings ☐ Specifications

☐ Reports ☐ Copy of Letter ☒ Material Submittal

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1	1/15/02	Submittal 018 – Rock Anchor Test Sheets

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☐ As Requested ☐ Amend and Resubmit ☐ Resubmit _____ Copies for _____

☒ For Review & Comment ☐ Rejected ☐ For Bids Due

☐ _____ ☐ Returned after Loan to us

REMARKS:

pc: Laureen Borochaner, USACE
Anna Krasko, USEPA
Lou Maccarone, RIDEM

BY: Scott A. Miller

TERRA DRILLING COMPANY, INC.
Geotechnical Design & Construction Specialists
ANTHONY C. BARILA, PRES.
EDWARD J. LYNCH, JR. VICE PRES.
582 MAIN STREET • HUDSON, MA 01749 • (978) 568-0351 • FAX (978) 562-4847

January 15, 2002

Mr. Scott Miller, P.E.
LEA-Cianci, Inc.
100 Northwest Dr.
Plainville, CT 06062

Reference: Allendale Dam
North Providence, RI
Submission of Test Sheets
L5

Dear Scott,

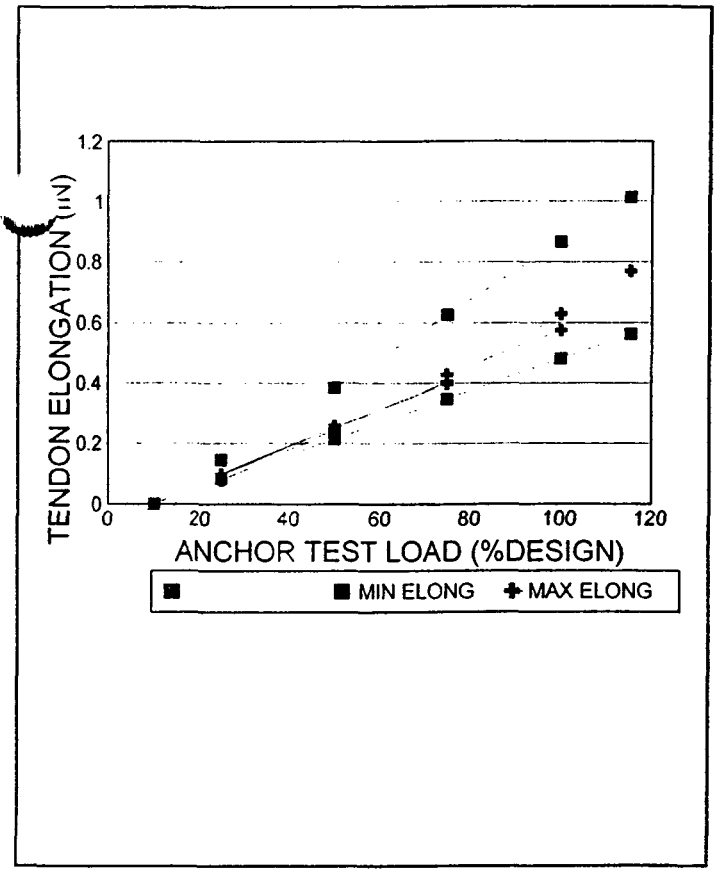
Attached, please find copies of Terra's rock anchor ("RA") test sheets for RA-1 through RA-20. All of these anchors were satisfactorily tested in accordance with the contract documents, and locked off as required.

If you should require any additional information, please do not hesitate to contact me. It has been a pleasure working with you on this project, and we look forward to working with you again in the future.

Sincerely,

TERRA DRILLING COMPANY, INC.

Robert F. Tonning, P.E.
Project Manager



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
RESS LENGTH	17	MAX LOAD	173.0 kip
		LOCK OFF	100.0 kip
AREA, 1-3/8" BAR =	**1.58**	LOCK OFF, psi:	2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 JACK SERIAL No:

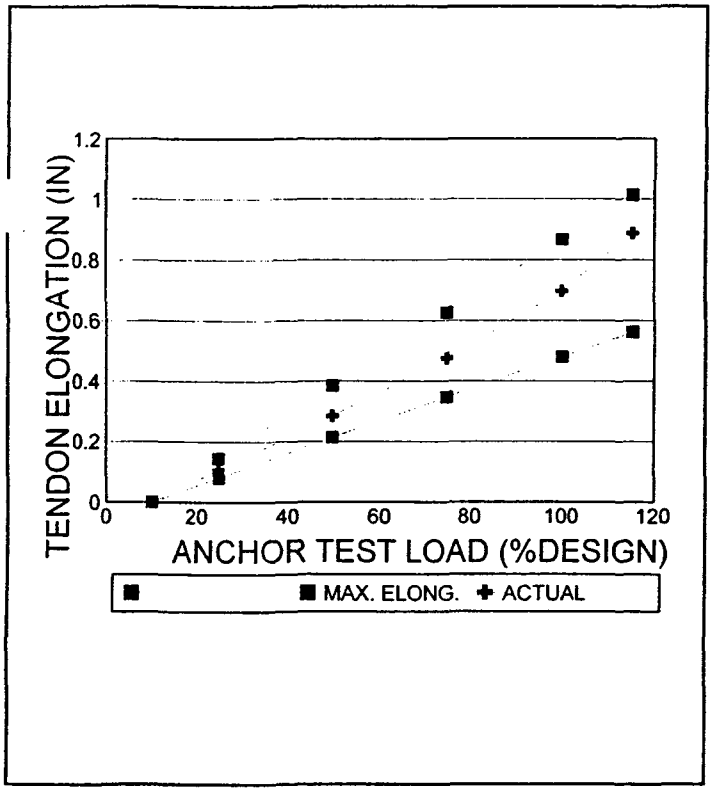
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUMM. DISPLMT (IN)	MIN DISPLMT (IN)	MAX DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.097		0.080	0.144
	353	15.0	10				
	883	37.5	25	0.075		0.080	0.144
	1765	75.0	50	0.244		0.214	0.385
	353	15.0	10				
	883	37.5	25	0.095		0.080	0.144
	1765	75.0	50	0.235		0.214	0.385
	2648	112.5	75	0.404		0.347	0.626
	353	15.0	10				
	883	37.5	25	0.096		0.080	0.144
	1765	75.0	50	0.254		0.214	0.385
	2648	112.5	75	0.397		0.347	0.626
	3530	150.0	100	0.628		0.481	0.866
	353	15.0	10				
	883	37.5	25	0.097		0.080	0.144
	1765	75.0	50	0.259		0.214	0.385
	2648	112.5	75	0.428		0.347	0.626
	3530	150.0	100	0.575		0.481	0.866
	4070	173.0	115.3	0.769		0.563	1.013

10 MINUTE HOLD TEST

1				0.787	0.000		
2				0.790	0.003		
3				0.794	0.007		
4				0.796	0.009		
5				0.797	0.010		
6				0.799	0.012		
10				0.804	0.017		
	Lift-off	2500	psi				

TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04 0.017

TERRA DRILLING CO. PERFORMANCE TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-1**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.106		0.080	0.14
	1765	75.0	50	0.284		0.214	0.385
	2648	112.5	75	0.476		0.347	0.626
	3530	150.0	100	0.697		0.481	0.866
	4070	173.0	115.3	0.887		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.905	0.000		
2				0.908	0.003		
3				0.911	0.006		
4				0.913	0.008		
5				0.914	0.009		
6				0.916	0.011		
10				0.918	0.013		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.013

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

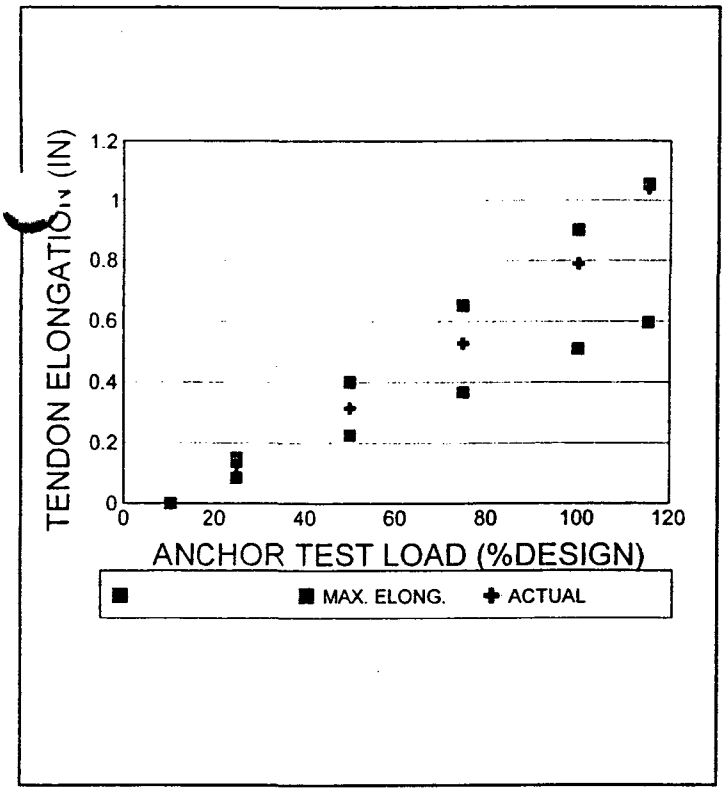
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

COMMENTS

	JOB	
TERRA DRILLING CO. PROOF TEST	**Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-2**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	18	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar:		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

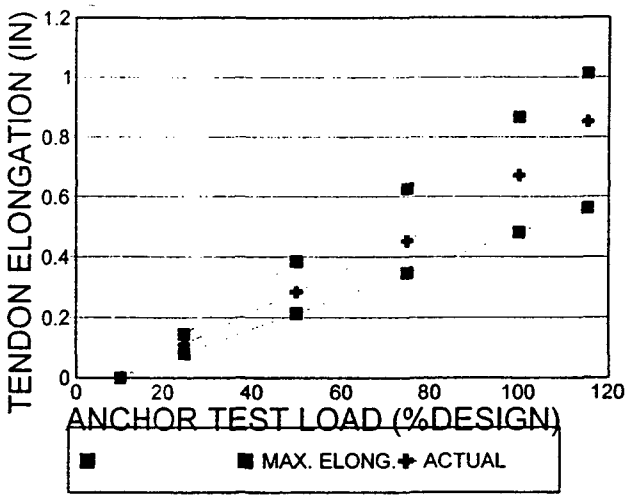
ELONGATION CRITERIA
80 %STRESS LENGTH = L1
SL - (.5) BL = L2
THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

COMMENTS

TEST RESULTS							
JACK 175 T		JACK CONV. 42.49		GAUGE NO			
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.125		0.085	0.150
	1765	75.0	50	0.315		0.226	0.401
	2648	112.5	75	0.527		0.368	0.651
	3530	150.0	100	0.789		0.509	0.902
	4070	173.0	115.3	1.040		0.596	1.055
				10 MINUTE HOLD TEST			
1				1.040	0.000		
2				1.051	0.011		
3				1.055	0.015		
4				1.059	0.019		
5				1.062	0.022		
6				1.066	0.026		
10				1.071	0.031		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.031

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-3**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.111		0.080	0.14
	1765	75.0	50	0.285		0.214	0.385
	2648	112.5	75	0.452		0.347	0.626
	3530	150.0	100	0.671		0.481	0.866
	4070	173.0	115.3	0.851		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.869	0.000		
2				0.876	0.007		
3				0.878	0.009		
4				0.881	0.012		
5				0.883	0.014		
6				0.885	0.016		
10				0.888	0.019		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.019

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL - (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

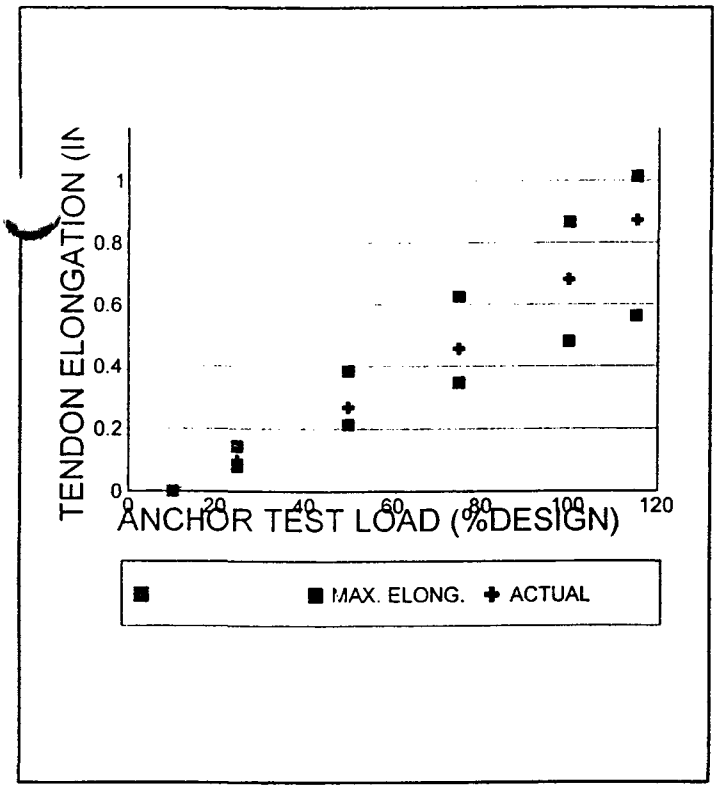
COMMENTS

TERRA DRILLING CO.
PROOF TEST

JOB
Allendale Dam
N. Providence, RI

ROCK ANCHOR TEST DATA

ANCHOR NUMBER **RA-4**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar:		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

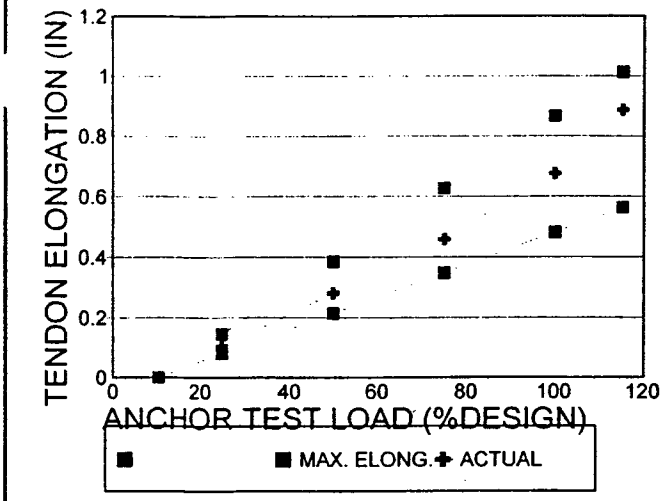
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.099		0.080	0.144
	1765	75.0	50	0.269		0.214	0.385
	2648	112.5	75	0.457		0.347	0.626
	3530	150.0	100	0.681		0.481	0.866
	4070	173.0	115.3	0.872		0.563	1.013
		10 MINUTE HOLD TEST					
1				0.902	0.000		
2				0.906	0.004		
3				0.910	0.008		
4				0.913	0.011		
5				0.915	0.013		
6				0.920	0.018		
10				0.925	0.023		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.023

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-5**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.104		0.080	0.144
	1765	75.0	50	0.280		0.214	0.385
	2648	112.5	75	0.458		0.347	0.626
	3530	150.0	100	0.676		0.481	0.866
	4070	173.0	115.3	0.886		0.563	1.013
		10 MINUTE HOLD TEST					
1				0.911	0.000		
2				0.916	0.005		
3				0.919	0.008		
4				0.925	0.014		
5				0.927	0.016		
6				0.929	0.018		
10				0.933	0.022		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.022

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

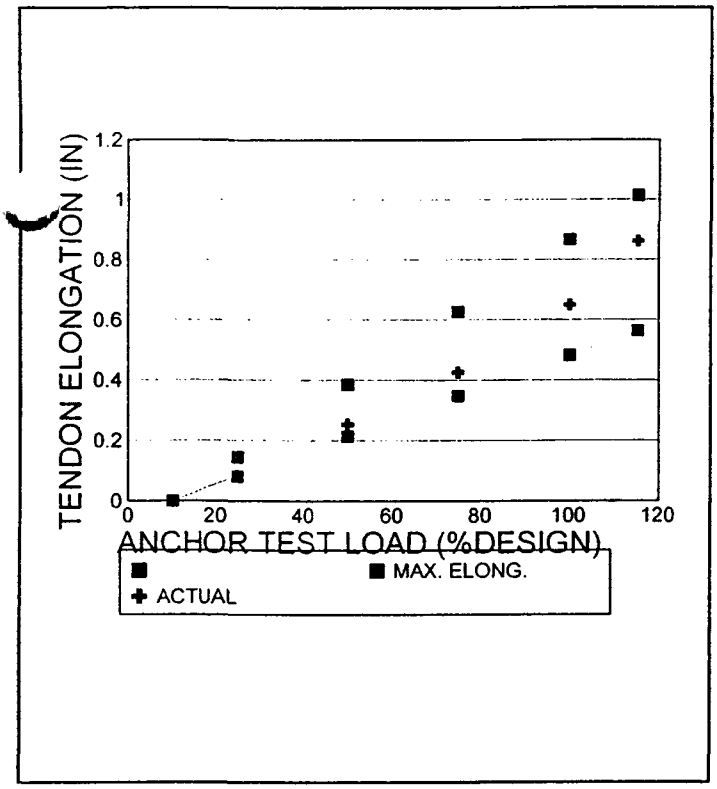
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-6**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA
80 %STRESS LENGTH = L1
SL - (.5) BL = L2
THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

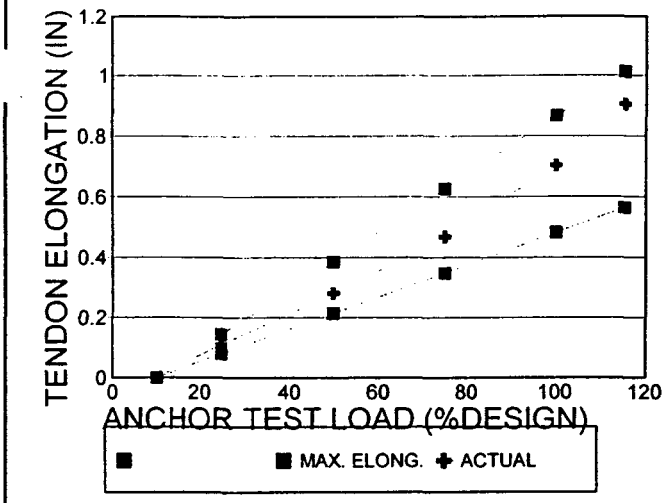
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.083		0.080	0.144
	1765	75.0	50	0.252		0.214	0.385
	2648	112.5	75	0.425		0.347	0.626
	3530	150.0	100	0.649		0.481	0.866
	4070	173.0	115.3	0.861		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.883	0.000		
2				0.886	0.003		
3				0.891	0.008		
4				0.894	0.011		
5				0.897	0.014		
6				0.901	0.018		
10				0.906	0.023		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.023

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-7**



TEST RESULTS							
JACK 175 T		JACK CONV.		42.49	GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.110		0.080	0.144
	1765	75.0	50	0.280		0.214	0.385
	2648	112.5	75	0.467		0.347	0.626
	3530	150.0	100	0.702		0.481	0.866
	4070	173.0	115.3	0.904		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.930	0.000		
2				0.933	0.003		
3				0.938	0.008		
4				0.940	0.010		
5				0.943	0.013		
6				0.945	0.015		
10				0.949	0.019		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.019

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

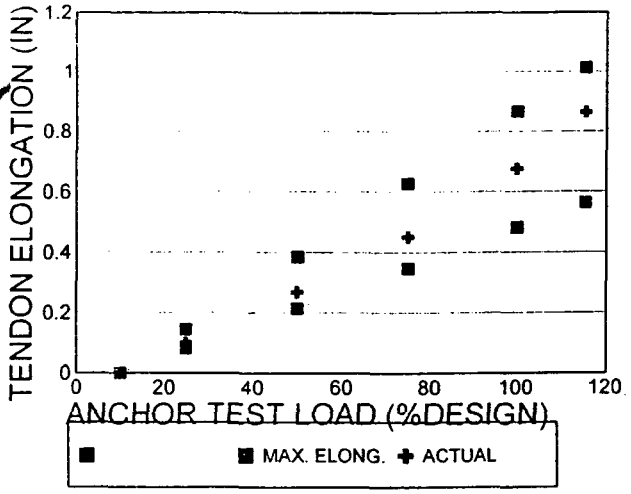
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-8**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.099		0.080	0.144
	1765	75.0	50	0.267		0.214	0.385
	2648	112.5	75	0.451		0.347	0.626
	3530	150.0	100	0.674		0.481	0.866
	4070	173.0	115.3	0.864		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.883	0.000		
2				0.886	0.003		
3				0.891	0.008		
4				0.894	0.011		
5				0.896	0.013		
6				0.898	0.015		
10				0.905	0.022		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.022

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

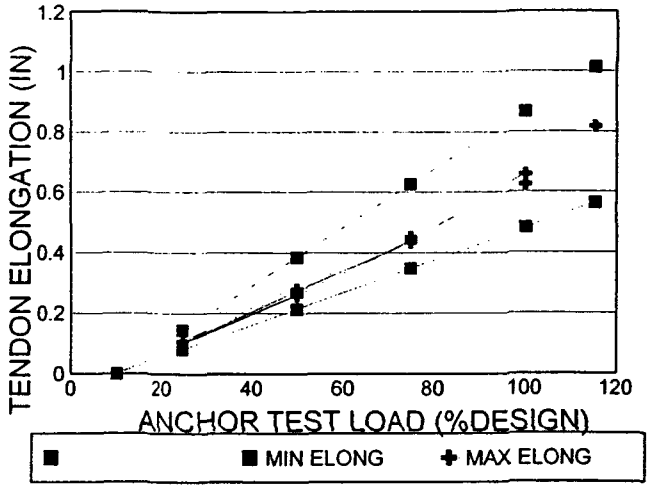
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-9**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			JACK SERIAL No:		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUMM. DISPLMT (IN)	MIN DISPLMT (IN)	MAX DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.095		0.080	0.144
	353	15.0	10				
	883	37.5	25	0.096		0.080	0.144
	1765	75.0	50	0.261		0.214	0.385
	353	15.0	10				
	883	37.5	25	0.101		0.080	0.144
	1765	75.0	50	0.258		0.214	0.385
	2648	112.5	75	0.439		0.347	0.626
	353	15.0	10				
	883	37.5	25	0.102		0.080	0.144
	1765	75.0	50	0.274		0.214	0.385
	2648	112.5	75	0.434		0.347	0.626
	3530	150.0	100	0.658		0.481	0.866
	353	15.0	10				
	883	37.5	25	0.107		0.080	0.144
	1765	75.0	50	0.278		0.214	0.385
	2648	112.5	75	0.450		0.347	0.626
	3530	150.0	100	0.624		0.481	0.866
	4070	173.0	115.3	0.816		0.563	1.013
		10 MINUTE HOLD TEST					
1				0.845	0.000		
2				0.851	0.006		
3				0.859	0.014		
4				0.874	0.029	*	
5				0.875	0.030		
6				0.877	0.032		
10				0.881	0.036		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.036

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
'RESS LENGTH	17	MAX LOAD	173.0 kip
		LOCK OFF	100.0 kip
AREA, 1-3/8" BAR =	**1.58**	LOCK OFF, psi:	2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL ÷ (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/04/02

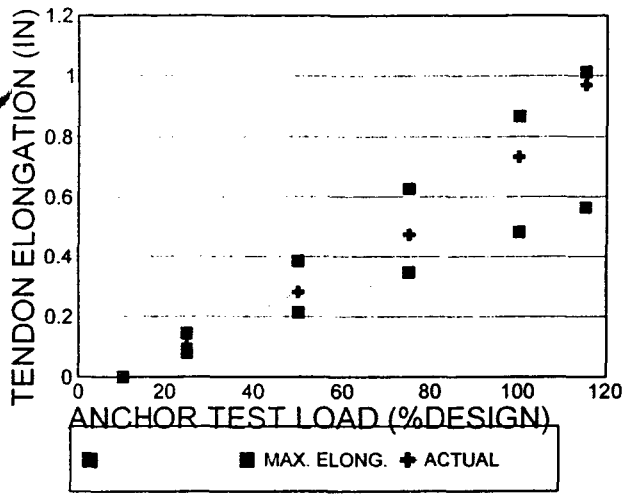
COMMENTS * Dial gage was bumped during hold test; 0.015 movement was recorded between 3 and 4 minute readings.

TERRA DRILLING CO.
PERFORMANCE TEST

JOB
Allendale Dam
N. Providence, RI

ROCK ANCHOR TEST DATA

ANCHOR NUMBER **RA-10**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar:		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA
80 %STRESS LENGTH = L1
SL + (.5) BL = L2
THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

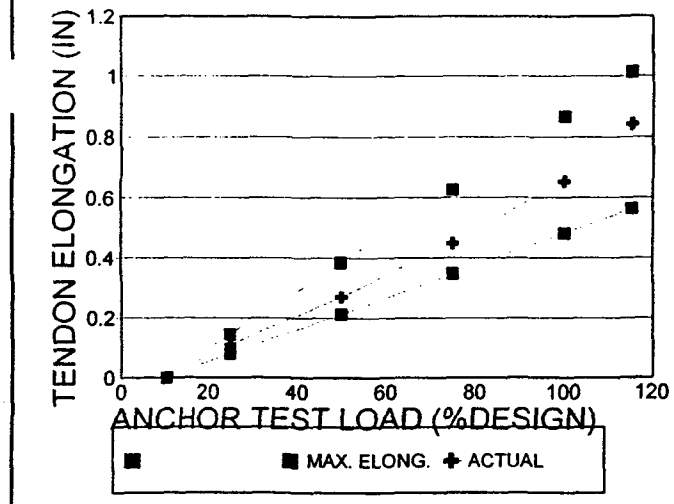
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.106		0.080	0.144
	1765	75.0	50	0.281		0.214	0.385
	2648	112.5	75	0.473		0.347	0.626
	3530	150.0	100	0.732		0.481	0.866
	4070	173.0	115.3	0.970		0.563	1.013
				10 MINUTE HOLD TEST			
1				1.000	0.000		
2				1.004	0.004		
3				1.007	0.007		
4				1.010	0.010		
5				1.014	0.014		
6				1.017	0.017		
10				1.022	0.022		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.022

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-11**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.109		0.080	0.14
	1765	75.0	50	0.271		0.214	0.385
	2648	112.5	75	0.448		0.347	0.626
	3530	150.0	100	0.653		0.481	0.866
	4070	173.0	115.3	0.841		0.563	1.013
			10 MINUTE HOLD TEST				
1				0.862	0.000		
2				0.863	0.001		
3				0.864	0.002		
4				0.869	0.007		
5				0.871	0.009		
6				0.873	0.011		
10				0.875	0.013		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.013

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

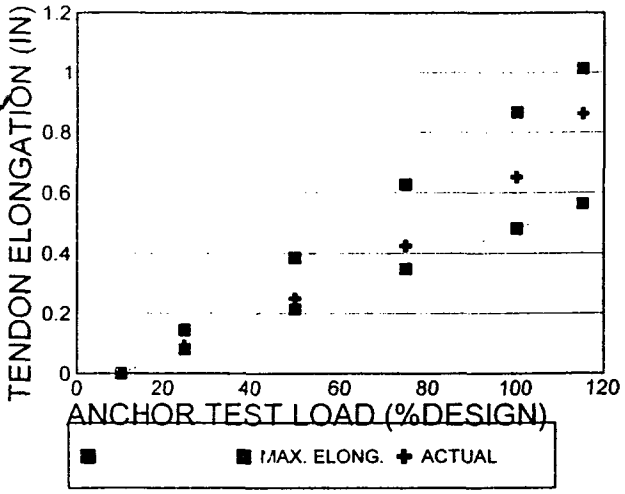
COMMENTS

TERRA DRILLING CO.
PROOF TEST

JOB
Allendale Dam
N. Providence, RI

ROCK ANCHOR TEST DATA

ANCHOR NUMBER **RA-12**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL - (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

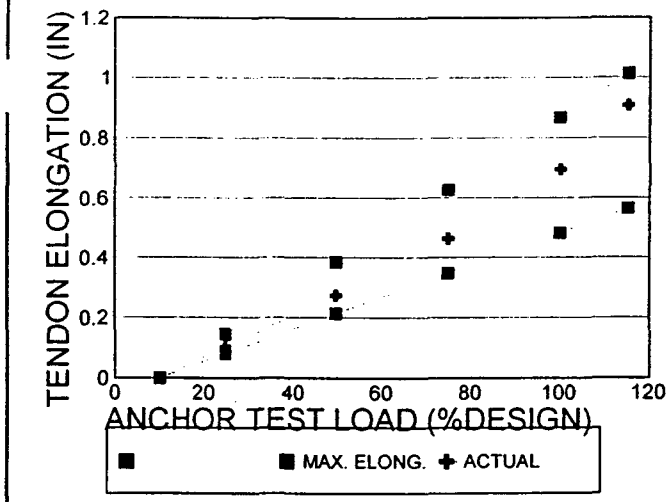
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.092		0.080	0.144
	1765	75.0	50	0.250		0.214	0.385
	2648	112.5	75	0.424		0.347	0.626
	3530	150.0	100	0.651		0.481	0.866
	4070	173.0	115.3	0.861		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.889	0.000		
2				0.891	0.002		
3				0.896	0.007		
4				0.901	0.012		
5				0.904	0.015		
6				0.906	0.017		
10				0.910	0.021		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.021

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-13**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL ÷ (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

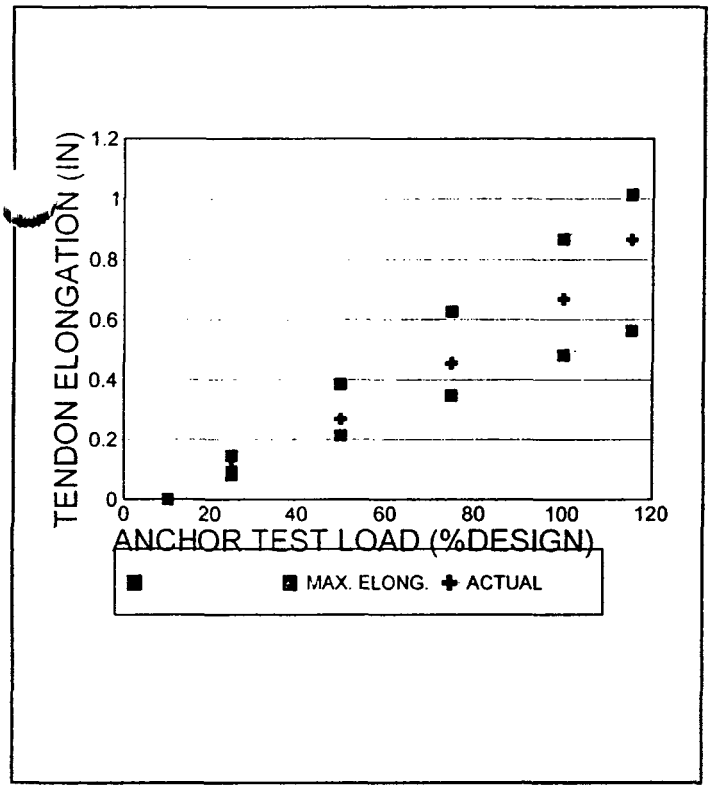
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.102		0.080	0.144
	1765	75.0	50	0.274		0.214	0.385
	2648	112.5	75	0.463		0.347	0.626
	3530	150.0	100	0.694		0.481	0.866
	4070	173.0	115.3	0.906		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.931	0.000		
2				0.932	0.001		
3				0.937	0.006		
4				0.939	0.008		
5				0.941	0.010		
6				0.944	0.013		
10				0.948	0.017		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.017

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-14**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA
80 %STRESS LENGTH = L1
SL ÷ (.5) BL = L2
THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

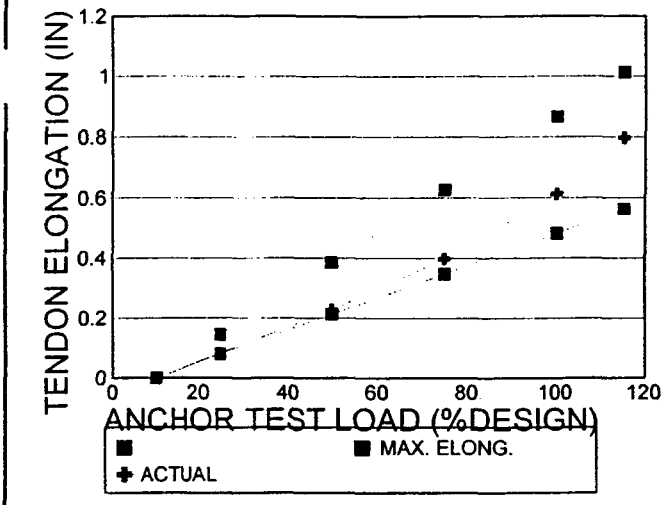
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.104		0.080	0.144
	1765	75.0	50	0.269		0.214	0.385
	2648	112.5	75	0.454		0.347	0.626
	3530	150.0	100	0.668		0.481	0.866
	4070	173.0	115.3	0.864		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.904	0.000		
2				0.908	0.004		
3				0.912	0.008		
4				0.914	0.010		
5				0.916	0.012		
6				0.918	0.014		
10				0.921	0.017		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.017

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-15**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.081		0.080	0.144
	1765	75.0	50	0.228		0.214	0.385
	2648	112.5	75	0.398		0.347	0.626
	3530	150.0	100	0.612		0.481	0.866
	4070	173.0	115.3	0.796		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.813	0.000		
2				0.815	0.002		
3				0.822	0.009		
4				0.825	0.012		
5				0.826	0.013		
6				0.827	0.014		
10				0.832	0.019		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.019

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

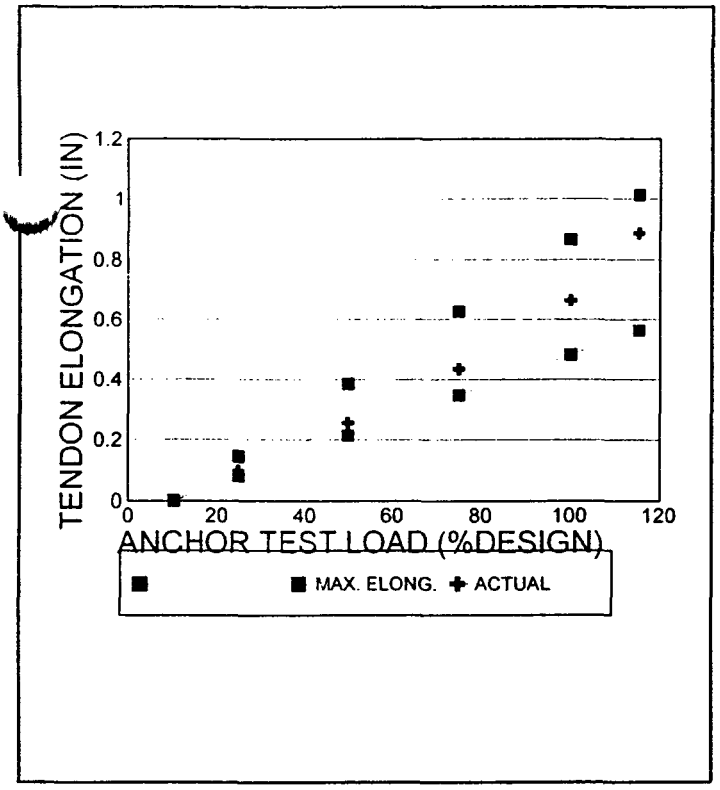
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-16**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.097		0.080	0.144
	1765	75.0	50	0.256		0.214	0.385
	2648	112.5	75	0.434		0.347	0.626
	3530	150.0	100	0.663		0.481	0.866
	4070	173.0	115.3	0.887		0.563	1.013
		10 MINUTE HOLD TEST					
1				0.903	0.000		
2				0.905	0.002		
3				0.908	0.005		
4				0.910	0.007		
5				0.912	0.009		
6				0.914	0.011		
10				0.917	0.014		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.014

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar:		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

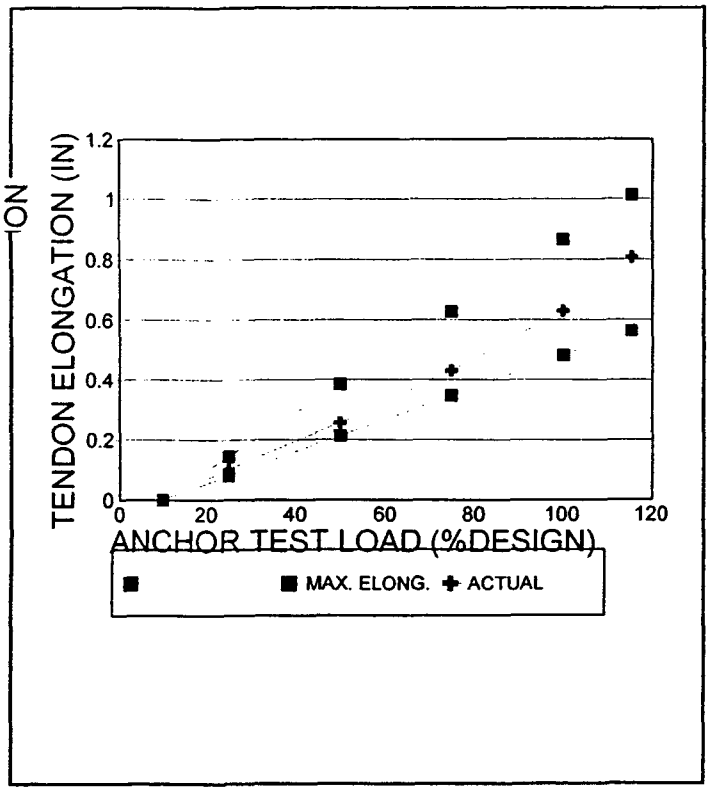
SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

	JOB	
TERRA DRILLING CO. PROOF TEST	**Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-17**



TEST RESULTS							
JACK 175 T		JACK CONV. 42.49			GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.101		0.080	0.144
	1765	75.0	50	0.257		0.214	0.385
	2648	112.5	75	0.430		0.347	0.626
	3530	150.0	100	0.629		0.481	0.866
	4070	173.0	115.3	0.807		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.827	0.000		
2				0.829	0.002		
3				0.831	0.004		
4				0.833	0.006		
5				0.835	0.008		
6				0.836	0.009		
10				0.839	0.012		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.012

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

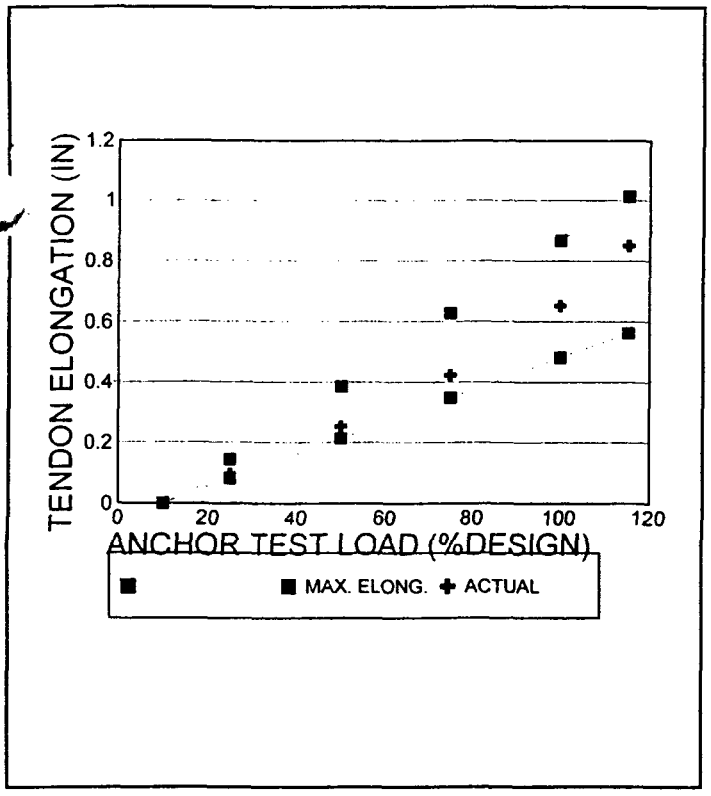
SL ÷ (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-18**



ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA
80 %STRESS LENGTH = L1
SL + (.5) BL = L2
THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

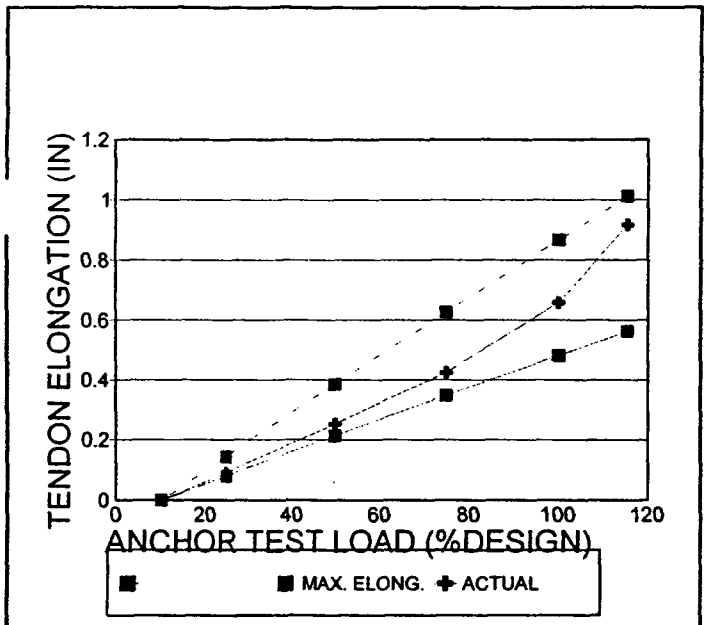
COMMENTS

TEST RESULTS

JACK 175 T JACK CONV. 42.49 GAUGE NO

TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.096		0.080	0.144
	1765	75.0	50	0.254		0.214	0.385
	2648	112.5	75	0.422		0.347	0.626
	3530	150.0	100	0.651		0.481	0.866
	4070	173.0	115.3	0.850		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.878	0.000		
2				0.880	0.002		
3				0.884	0.006		
4				0.887	0.009		
5				0.891	0.013		
6				0.892	0.014		
10				0.896	0.018		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.018

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-19**



TEST RESULTS							
JACK 175 T		JACK CONV.		42.49	GAUGE NO		
TIME	JACK PRESS (PSI)	LOAD KIPS	%DL	DIAL READ (IN)	CUM. DISPLMT (IN)	MIN. DISPLMT (IN)	MAX. DISPLMT (IN)
	353	15.0	10	0.000		0.000	0.000
	883	37.5	25	0.090		0.080	0.14
	1765	75.0	50	0.252		0.214	0.385
	2648	112.5	75	0.424		0.347	0.626
	3530	150.0	100	0.657		0.481	0.866
	4070	173.0	115.3	0.917		0.563	1.013
				10 MINUTE HOLD TEST			
1				0.932	0.000		
2				0.939	0.007		
3				0.940	0.008		
4				0.942	0.010		
5				0.944	0.012		
6				0.946	0.014		
10				0.955	0.023		
	Lift-off	2500	psi				
TOTAL MOVEMENT FROM 1 MIN TO 10 MIN < .04							0.023

ANCHOR DATA		TEST DATA	
FREE LENGTH (FL)	15	DESIGN LOAD	150.0 kip
BOND LENGTH (BL)	15	SEAT LOAD	15.0 kip
STRESS LENGTH	17	MAX LOAD	173.0 kip
1-3/8" Grade 160 bar;		**LOCK OFF**	**100.0 kip**
AREA OF BAR =	1.58		2353 psi

GROUT DATA

PRIM VOL BAGS

POST GROUT

PSI BAGS

PSI BAGS

PSI BAGS

ELONGATION CRITERIA

80 %STRESS LENGTH = L1

SL + (.5) BL = L2

THEORETICAL ELASTIC ELONGATION = PL/AE

TESTED BY MTL DATE 01/07/02

COMMENTS

TERRA DRILLING CO. PROOF TEST	JOB **Allendale Dam** N. Providence, RI	ROCK ANCHOR TEST DATA ANCHOR NUMBER **RA-20**

APPENDIX D

APPENDIX D

Environmental Data Services, Inc. Laboratory Data Validation Reports

ENVIRONMENTAL
Data Services, Inc.

September 11, 2003

Mr. David Scotti, P.G.
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

Re: Transmittal of Data Validation Report for Centredale Manor, SDG G3G250287

Dear Mr. Scotti:

Environmental Data Services, Inc. (EDS) is pleased to submit the data validation summary reports with attached Region I worksheets and annotated Form Is for the above referenced SDG.

Please contact me at (603) 226-0118 or via email at nweaver@env-data.com if you have any questions.

Sincerely,
Environmental Data Services, Inc.

Nancy Weaver
Senior Chemist

Enclosed

ENVIRONMENTAL
Data Services, Inc.

DIOXIN DATA VALIDATION REPORT
USEPA REGION I - TIER III

SDG No.: G3G250287
Laboratory: Severn Trent Laboratories, Inc., West Sacramento, CA
Site: Centredale Manor
Date: September 11, 2003
Samples:
Dioxin: 1/Soil/1028887

A Tier III validation was performed on the dioxin/furan analytical data for one soil sample collected by Loureiro Engineering Associates at the Centredale Manor Site in North Providence, Rhode Island. The sample was analyzed under EPA Method 8290 for high resolution dioxin/furans. The data were evaluated as a Tier III level in accordance with the "Region I EPA-NE Data Validation Functional Guidelines for Evaluating Dioxin/Furan Analyses", dated November 1998 and the "Region I EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses" dated December 1996 and were based on the following parameters:

*	•	Overall Evaluation of Data and Potential Usability Issues.
*	•	Data Completeness.
*	•	Preservation and Technical Holding Times.
*	•	PE Samples/Accuracy Check.
*	•	Window Defining Solution.
*	•	Initial & Continuing Calibrations.
*	•	Chromatographic Resolution.
*	•	Instrument Sensitivity Check.
*	•	Blanks.
*	•	Matrix Spike Analysis.
NA	•	Laboratory & Field Duplicate Analysis.
*	•	Internal/Clean-up/Recovery Standards.
*	•	Sample Analysis & Identification.
*	•	Sample Quantitation & Total Homologues.
*	•	Estimated Detection Limits (EDL) & Estimated Maximum Possible Concentration (EMPC).
*	•	Toxicity Equivalency (TEF) and Isomer Specificity.
NA	•	Required Sample Reruns & Second Column Confirmation.
NA	•	Dilutions.

*	=	All criteria were met for this parameter.
NA	=	Not Applicable.

6B Hills Avenue · Concord, NH 03301 · Telephone: 603-226-0118 · Fax: 603-226-0128 · www.env-data.com

Overall Evaluation of Data and Potential Usability Issues

Dioxin/Furans:

Dioxin/furan sample results were not qualified and are considered valid.

Please contact the undersigned at (603) 226-0118 if you have any questions or need further information.

Very truly yours,
Environmental Data Services, Inc.

Nancy Weaver
Senior Chemist

Attachments: Data Validation Worksheets
Annotated Form Is

DATA SUMMARY KEY
ORGANIC DATA VALIDATION

J = The associated numerical value is an estimated quantity.

R = The data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification. The R replaces the numerical value or sample quantitation limit.

U = The compound was analyzed for, but not detected. The associated numerical value is the sample quantitation limit or the adjusted sample quantitation limit.

UJ = The compound was analyzed for, but not detected. The associated numerical value is the estimated sample quantitation limit.

EB = The compound was detected in aqueous equipment blank associated soil/sediment samples.

Region I
Data Review Worksheets

Site Name: Centredale Manor
Reference Number: Loureiro Eng.

DIOXIN DATA REVIEW WORKSHEET
(LOW or HIGH RESOLUTION)

The following data package has been validated:

Lab Name Severn Trent, West Sacramento, CA
DAS/Project No. 15PR102.00
SDG No. G3G250287
No. of Samples/Matrix 1 Solid/Soil

Tech. Spec./Method No. HRGC/HRMS 8290, Dioxins/Furan
Sampling Date(s) 7/23/03
Shipping Date(s) 7/24/03
Date(s) Rec'd by Lab 7/25/03

Traffic Report Sample Nos. 1028887

Equipment Blank Nos. —
Field Duplicate Nos. —
PES Nos. —

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Dioxin/Furan Analyses, November 1998 and Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 were used to evaluate the data and/or approved modifications to the Functional Guidelines were used to evaluate the data. (Attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

The general criteria used to determine the performance were based on an examination of:

- Overall Evaluation of Data
- Data Completeness
- Preservation/Technical Holding Times
- PE Samples/Accuracy Check
- Window Defining Mix
- Initial & Continuing Calibrations
- Chromatographic Resolution
- Instrument Sensitivity Check
- Blanks
- Matrix Spike Analysis
- Laboratory & Field Duplicate Analysis
- Internal/Clean-up/Recovery Standards
- Sample Analysis & Identification
- Sample Quantitation & Total Homologues
- Estimated Detection Limit (EDL) & Estimated Maximum Possible Concentration (EMPC)
- Toxicity Equivalency Factor (TEF) & Isomer Specificity
- Required Sample Reruns & Second Column Confirmation
- Dilutions

Definition of Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Result not detected
EB - Compound detected in aqueous equipment blank associated with soil/sediment samples

Validator: Nancy Weaver

Date: 9/11/03

Region I
Data Review Worksheet - (Low and High Resolution)

I. DATA COMPLETENESS

MISSING INFORMATION	DATE LAB CONTACTED	DATE RECEIVED
all criteria were met.		

Reviewer: Nancy Weaver

Date: 9/11/03

Region I
Data Review Worksheet - (Low and High Resolution)

II. PRESERVATION AND HOLDING TIMES

Sampler: JS Company: Loureiro ENG. Contacted Yes No Date: _____

1. Circle sample numbers with exceeded contract holding times or omitted preservation.

Sample Number	Matrix	Preserved Y/N	Date Sampled	Date Extracted	Date Analyzed	Action
1028887	Soil	N	7/23/03	7/29/03	8/2/03	None

Validator: Nancy Weaver

Date: 9/11/03

11/98

Region I
Data Review Worksheet - (Low and High Resolution)

III. ACCURACY CHECK (Performance Evaluation Results) - List all analytes that are outside criteria.

SDG No 63625087 CASE/PROJECT No: 15PR102.006

Are more than one-half of the PES analytes within criteria for each parameter. (Y) N

PE Sample Number	Ampule Number	Type of PES	Matrix	Analyte	Conc	Region I EPA PES Scores*	Non-EPA PES Scores**	Samples Affected	Action
FT89J1AC	—	LCS	Solid	all analyte	all pass	60-140	—	all samples	None

* For Region I PESs indicate the Region I PES Score Report Results: Action Low; Action High; TCL MISS; TCL CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND IIIT (% Recovery Limits)

Validator: Nancy Weaver

Date: 9/11/03

Region I
Data Review Worksheets - (Low or High Resolution)

V. INITIAL AND CONTINUING CALIBRATIONS

Va. INITIAL CALIBRATION

Date of ICAL	Instrument File Name	Compound	%RSD	Ion Ratio	S/N	RT	Resolution	Samples Affected	Action
8/2/03	01AU03105	all analytes	all pass	all pass	all pass	all pass	all pass	all samples	None
8/4/03	04AU037D2	2378 TCDD	"	"	"	"	"	↓	↓
		2378 TCDF							
7/30/03	30JL03105	all analytes	↓	↓	↓	↓	↓	↓	↓
3/12/03	12MR03B7D2	2378 TCDD							
		2378 TCDF							

Comments: all criteria were met

Validator: Nancy Weaver

Date: 9/11/03

Region I
Data Review Worksheets - (Low or High Resolution)

V. INITIAL AND CONTINUING CALIBRATIONS Continued

Vb. CONTINUING CALIBRATION

Date of CCAL	Instrument File Name	Compound	%D	Ion Ratio	S/N	RT	Resolution	Samples Affected	Action
8/4/03	04AU037D2	2378-TCDF 2378-TCDD	5.1 7.2	all pass	all pass	all pass	all pass	all samples	None
8/5/03	04AU037D2	2378-TCDF 2378-TCDD	8.7 10.6	"	"	"	"	↓	↓
8/2/03	01AU031D5	all analytes	all pass	"	"	"	"		

Comments: all criteria were met

Validator: N Weaver

Date: 9/11/03

11/98

VI. COLUMN PERFORMANCE RESOLUTION CHECK

all PASS

Date:_____ ID:_____

Was the chromatographic resolution of the TCDD/TCDF isomers and the in the CCS solution for DB-5 columns calculated for each 12 hour period?

% Valley _____-TCDD/_____-TCDD_____ (QC Limit ≤ 25%)

% Valley _____-TCDF/_____-TCDF_____ (QC Limit ≤ 50%)

For DB-225 columns:

% Valley _____-TCDD/_____-TCDD_____ (QC Limit ≤ 25%)

% Valley _____-TCDF/_____-TCDF_____ (QC Limit ≤ 50%)

ACTIONS:

A. If the GC resolution criteria do not meet specifications, the positive hits will be qualified as "J". All tetras and hexas (for both dioxin and furans) will be qualified. The heptas are not believed to be affected. OCDD and OCDF are not affected as there is only one isomer in each group. No action is taken for non-detects.

B. The criteria for chromatographic resolution must be met for all standards and the reviewer must use professional judgement on the severity of the problem and its effect on the final results.

Validator: A Weaver

Date: 9/11/03

Region I
Data Review Worksheets - (Low and High Resolution)

VIIa. BLANKS ANALYSIS

Was a method blank prepared and analyzed for each matrix prior to analysis of sample? Yes [✓] No [ ]

List the blank contamination below.

Sampler: JS Company: Loureiro Eng. Contacted: Yes No Date:____

1. Laboratory: Method and Instrument Blanks

Date Extracted	Date Analyzed	Matrix	Sample No. (Blank Type)	Instrument	Compound	Conc. (units)
7/29/03	8/1/03	Soil	FT89 JIAA (MB)	HRGC/ HRMS	all Non-detect	—

2. Field: Equipment (Rinsate) Blanks

Date Extracted	Date Analyzed	Matrix	Sample No. (Blank Type)	Instrument	Compound	Conc. (units)
None Performed						

Validator: Nancy Weaver Date: 9/11/03

Data Review Worksheets - (Low and High Resolution) Continued

VIIb. BLANKS ANALYSIS

All ND

Compound	Type of Blank	Date Blank Sample/Originated	Max Conc. (units)	Action Level (units)	Samples Affected	Action

ACTIONS:

A. If no blank is run with a particular matrix, the non-detected results should be accepted without qualifying the data and the positive hits should be flagged "J". If all samples have the same hits with similar concentrati and no blank is run, professional judgment should be used to determine if all results should be rejected "R".

B. If a blank is contaminated above the specified limits, any sample hits reported as below the action level are to be reported as non-detected, and not included in the TEF calculations. All data that are not greater tha times the blank action level are to be reported as non-detected. If the detected analyte is OCDD/OCDF or a Total Homologue all data that are not greater than 10 times the blank are to be reported as non-detects.

C. If positive results are detected in aqueous equipment (rinsate) blanks and the associated non-aqueous samples, then the validator should flag (EB) those detected compounds in the associated non-aqueous sample: indicate an indeterminate amount of sampling error has potentially affected the sample results.

Validator: K Weaver

Date: 9/11/03

Region I
Data Review Worksheet - (Low and High Resolution)

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

List all MS/MSD analytes that are outside method QC acceptance criteria. 1028887

Compound	MS % Rec	MSD % Rec	RPD	Method QC Limits		Concentration			%RSD	Action
				% Rec	RPD	Unspiked Sample	MS	MSD		
				60-140	0-30					
2378-TCDD										
2378-TCDF										
12378-PeCDF										
12378-PeCDD										
23478-PeCDF										
123478-HxCDF										
123678-HxCDF										
123478-HxCDD										
123678-HxCDD										
123789-HxCDD	ok	141	ok	60-140	30					(J) Non-detc So V det.
234678-HxCDF										
123789-HxCDF										
1234678-HpCDF										
1234678-HpCDD										
1234789-HpCDF										
OCDD										
OCDF										

Default Limits: % Recovery (50-150%). RPD (50%)

ACTIONS:

If recoveries are beyond 50-150%, recheck all calculations. Professional judgment should be used to flag sample data.

Validator: L Weaver

Date: 9/11/03

IX. LABORATORY AND FIELD DUPLICATES

Was a duplicate run for each matrix? Yes [ ] No [ ]

The RPD of each analyte detected must be within the 30% of the acceptance range for aqueous and 50% for solids.

SAMPLE ID:_____ DUPLICATE ID:_____ None Performed

Compound	Sample Conc.	Sample EDL		Duplicate Conc.	Duplicate EDL		%RPD	Action
		EDL	2xEDL		EDL	2xEDL		
2378-TCDD								
2378-TCDF								
12378-PeCDF								
12378-PeCDD								
23478-PeCDF								
123478-HxCDF								
123678-HxCDF								
123478-HxCDD								
123678-HxCDD								
123789-HxCDD								
234678-HxCDF								
123789-HxCDF								
1234678-HpCDF								
1234678-HpCDD								
1234789-HpCDF								
OCDD								
OCDF								

ACTIONS:

If RPD is greater than 30% for aqueous or 50% for solids, flag all positive results "J" and non-detects "UJ". Recheck all calculations if the duplicate precision is beyond the specified range. Professional judgement should be used to ascertain effect on the final data despite sample concentration.

Validator: MWeaver

Date: 9/11/03

Region I
Data Review Worksheet - (Low or High Resolution)

Xa. RECOVERY STANDARD RESPONSE

CC3 STANDARD ID:_____ COLUMN:_____

DATE ANALYZED:_____

	13C-1,2,3,4-TCDD	13C-1,2,3,7,8,9-HxCDD
CC3 STANDARD RT/AREA COUNTS:	_____	_____

List samples associated with the CC3 standard outside the criteria: All criteria were met

Sample ID	13C-1,2,3,4-TCDD				13C-1,2,3,7,8,9-HxCDD			
	RT	Area Counts	% REC	Action	RT	Area Counts	% REC	Action

Limits:

Area Counts (-50% to + 200%)
Retention Time (± 10 Sec.)

Validator: J Weaver

Date: 9/11/03

Region I
Data Review Worksheets - (High Resolution)

Xb. INTERNAL STANDARD RECOVERY

Recovery Acceptance Criteria per Table 10 in Dioxin Validation SOP: All criteria were met

Sample Nos.												
Internal Standard	% Rec.	S/N	QC Range (%)	Action	% Rec.	S/N	QC Range (%)	Action	% Rec.	S/N	QC Range (%)	Action
$^{13}C_{12}$-2378-TCDD												
$^{13}C_{12}$-2378-TCDF												
$^{13}C_{12}$-12378-PeCDD												
$^{13}C_{12}$-12378-PeCDF												
$^{13}C_{12}$-23478-PeCDF												
$^{13}C_{12}$-123478-HxCDD												
$^{13}C_{12}$-123678-HxCDD												
$^{13}C_{12}$-123789-HxCDD												
$^{13}C_{12}$-123478-HxCDF												
$^{13}C_{12}$-123678-HxCDF												
$^{13}C_{12}$-123789-HxCDF												
$^{13}C_{12}$-234678-HxCDF												
$^{13}C_{12}$-1234678-HpCDD												
$^{13}C_{12}$-1234678-HpCDF												
$^{13}C_{12}$-1234789-HpCDF												
$^{13}C_{12}$-OCDD												
$^{13}C_{4}$-2378-TCDD												

Validator: M Weaver

Date: 9/11/03

Region I
Data Review Worksheet - (High Resolution)

XI. Sample Analysis and Identification

List any sample and analytes which did not meet identification criteria: All criteria were met

SAMPLE Nos.						
NATIVE ANALYTES	RT	S/N	Ion Ratio	RT	S/N	Ion Ratio
2378-TCDD						
2378-TCDF						
12378-PeCDF						
12378-PeCDD						
23478-PeCDF						
123478-HxCDF						
123678-HxCDF						
123478-HxCDD						
123678-HxCDD						
123789-HxCDD						
234678-HxCDF						
123789-HxCDF						
1234678-HpCDF						
1234678-HpCDD						
1234789-HpCDF						
OCDD						
OCDF						
INTERNAL STANDARDS VS. RECOVERY STANDARDS						
13C-2378-TCDD						
13C-2378-TCDF						
13C-12378-PeCDD						
13C-12378-PeCDF						
13C-123478-HxCDD						
13C-123678-HxCDD						
13C-123478-HxCDF						
13C-123678-HxCDF						
13C-123789-HxCDF						
13C-234678-HxCDF						
13C-1234678-HpCDD						
13C-1234678-HpCDF						
13C-1234789-HpCDF						
13C-OCDD						
37Cl-2378-TCDD						
RECOVERY STANDARDS						
13C-1234-TCDD						
13C-123789-HxCDD						

Validator: DWeaver

Date 9/11/03

XII. SAMPLE CALCULATION

1234678-HpCDF

$$\frac{16900860 \times 2000}{187219800 \times 10 \times 1.54 \times 0.78}$$

$$= 15 \text{ pg/g}$$

$$\text{Concentration (ng/g)} = \frac{Q_{is} \times (A_{x1} + A_{x2}) \times D}{(W \text{ or } V) \times (A_{is1} + A_{is2}) \times RRF_x}$$

$$EDL = \frac{2.5 \times Q_{is} \times (H_{x1} + H_{x2}) \times D}{(W \text{ or } V) \times (H_{is1} + H_{is2}) \times RRF_x}$$

$$EMPC = \frac{Q_{is} \times (A_{x1} + A_{x2}) \times D}{(W \text{ or } V) \times (A_{is1} + A_{is2}) \times RRF_x}$$

where:

Q_{is}	=	Quantity (ng) of appropriate internal standard added to sample before extraction.
A_{x1}/A_{x2}	=	Integrated areas of the two quantitation ions.
A_{is1}/A_{is2}	=	Integrated areas of the internal standard quantitation ions
W	=	Weight (g) of sample extracted.
V	=	Volume (L) of sample extracted.
RRF_x	=	Calculated relative response factor from the continuing calibration.
$H_{x1} + H_{x2}$	=	Peak heights of the noise for the quantitation ions.
$H_{is1} + H_{is2}$	=	Peak heights of the internal standard quantitation ions.
D	=	Dilution.

Validator: MWeaver

Date: 9/11/03

LOUREIRO ENGINEERING ASSOCIATES, P.C.

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: 1028887

Lot-Sample #...:	G3G250287 - 001	Work Order #...:	FT4QL1AC	Matrix....:	SOLID
Date Sampled...:	07/23/03	Date Received..:	07/25/03	Instrument:	1D5
Prep Date.....:	07/29/03	Analysis Date..:	08/02/03	Units.....:	pg/g
Prep Batch #...:	3210360	Dilution Factor:	1	% Moisture:	22

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	**24**		**1.3**	**1**	**24.000**
Total TCDD	**25**		**1.3**		
1,2,3,7,8-PeCDD	ND		0.71	1	0
Total PeCDD	ND		0.77		0
1,2,3,4,7,8-HxCDD	ND		0.94	0.1	0
1,2,3,6,7,8-HxCDD	ND		1.5	0.1	0
1,2,3,7,8,9-HxCDD	ND		1.6	0.1	0
Total HxCDD	ND		2.8		0
1,2,3,4,6,7,8-HpCDD	**19**		**6.4**	**0.01**	**0.190**
Total HpCDD	**33**		**6.4**		
OCDD	**140**		**13**	**0.0001**	**0.014**
2,3,7,8-TCDF	ND	CON	0.50	0.1	0
Total TCDF	**7.9**		**1.3**		
1,2,3,7,8-PeCDF	ND		0.65	0.05	0
2,3,4,7,8-PeCDF	ND		0.93	0.5	0
Total PeCDF	**7.8**		**6.4**		
1,2,3,4,7,8-HxCDF	ND		1.8	0.1	0
1,2,3,6,7,8-HxCDF	ND		1.2	0.1	0
2,3,4,6,7,8-HxCDF	ND		1.4	0.1	0
1,2,3,7,8,9-HxCDF	ND		0.45	0.1	0
Total HxCDF	**10**		**6.4**		
1,2,3,4,6,7,8-HpCDF	**15**		**6.4**	**0.01**	**0.150**
1,2,3,4,7,8,9-HpCDF	ND		0.91	0.01	0
Total HpCDF	**26**		**6.4**		
OCDF	**16**		**13**	**0.0001**	**0.002**
Total TEQ Concentration					**24.356**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	67	40 - 135
13C-1,2,3,7,8-PeCDD	64	40 - 135
13C-1,2,3,6,7,8-HxCDD	71	40 - 135
13C-1,2,3,4,6,7,8-HpCDD	82	40 - 135
13C-OCDD	77	40 - 135
13C-2,3,7,8-TCDF	66	40 - 135
13C-1,2,3,7,8-PeCDF	68	40 - 135
13C-1,2,3,4,7,8-HxCDF	69	40 - 135
13C-1,2,3,4,6,7,8-HpCDF	82	40 - 135

MW 9/11/03

LOUREIRO ENGINEERING ASSOCIATES, P.C.

Dioxins/Furans, HRGC/HRMS (8290)

Client Sample ID: 1028887

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Stockholm, Sweden, 15-18 June 1997 (Van den Berg et al., 1998).

CON Confirmation analysis.

MW
9/11/03

APPENDIX E

APPENDIX E

Annual Report for the Export of Waste Material

Loureiro Engineering Associates, Inc.

February 28, 2003

U.S. Environmental Protection Agency
Ariel Rios Building, Mail Code 2222A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Attn: Robert G. Heiss - Director, Import Export Program

RE: Annual Report
Centredale Manor Restoration Project Superfund Site
2072 – 2074 Smith Street, North Providence, Rhode Island 02911
EPA I.D. No.: RID981203755

Dear Mr. Heiss:

In correspondence dated December 19, 2001, the Environmental Protection Agency (EPA) provided Acknowledgement of Consent for the export of hazardous waste from the Centredale Manor Restoration Project Superfund Site located in North Providence, Rhode Island (Site). The export authorization was issued for the period December 18, 2001 through December 19, 2002. In accordance with the Acknowledgement of Consent and with Title 40, Code of Federal Regulations, Part 262, Subpart E, Section 262.56, an annual report summarizing all hazardous waste shipments from the Site that were exported under this authorization is required to be submitted to EPA. The attached summary table is provided as the annual report and fulfills this reporting requirement.

Copies of the manifests for each shipment of the waste are attached to the annual report. Copies of the certificates of destruction are also attached. Please contact me at (860) 747-6181, should you have any questions regarding the attached annual report or supporting documentation.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

David N. Scotti, P.G.
Project Manager

Copy to: Centredale Manor Performing Parties Group
Attachments

ANNUAL REPORT

EPA ID No.:	RID981203755

Site Information

Name:	Centredale Manor Restoration Project Superfund Site
Site Address:	2072 – 2074 Smith Street, North Providence, Rhode Island 02911
Mailing Address:	Centredale Manor Performing Parties Group c/o Swidler Berlin Shereff Friedman, LLP 3000 K Street, NW, Suite 300 Washington, DC 20007-5116 ATTN: Mr. Jerry C. Muys, Jr., Group Coordinator

Reporting Year:	December 18, 2001 – December 19, 2002

Consignee Information

Name:	Recupere Sol Inc.
Address:	Centre De Traitements Des Sols 80, Rue De Melezes Saint-Ambroise (Quebec) G7P 2N4

Waste Information

Description:	Contaminated Soil
EPA Waste Code:	F020
DOT Hazard Class	9
Transporter Name(s) / EPA ID Number(s)	Rollex Transport ltee / NYF006000053 PAGE E.T.C. Inc. / NYD986969947
Amount of Waste Shipped	314.21 tons
Number of Shipments	13 (pursuant to this notification)

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Signature _____ **Date** 2/28/03

As Agent for the Centredale Manor Performing Parties Group

Certificate of destruction

St. Ambroise May 30, 2002

Generator :	***Advisor :***
Centredale Manor Rest. Superfund Site Group c/o Swindler Berlin Shereff Friedman LLP	**Loureiro Engineers Associates Inc.**
3000 K Street, Suite 300	100, Northwest Drive
Washington DC USA	Plainville CT USA
20007	06062
Contact : Jerome Muirs	**Contact :** Scott Miller, Project Engineer

We confirm treatment of your soils at our plant located in the industrial park of Saint Ambroise. The soils were managed and treated in compliance with our Certificate of Authorization delivered by the Ministry of Environment of the Province of Québec :

Permit : Thermal treatment of PCB and other organochloride impacted soils

Delivery Dates : October 27, 1997

Permit Ref. No. : 7610-02-01-0603816
1142129

Treatment service : Thermal
Soils impacted with : Dioxins / Furans
Treatment criteria : <A In reference to the politic from the Ministry of Environment of the province of Québec

Récupère Sol File No. : 010173

Certificate Destruction : 010173.d2

Volume of Soil Treated (kg) 84070 (92.67 US Tons)

Yours truly,

Sophie Bouchard
Environment Tech.

80 des Mélèzes St., St. Ambroise, Quebec, Canada, G7P 2N4
Tel.: (418) 695-3302 Fax (418) 695-3303

received
2/20/02

Certificate of destruction

St. Ambroise February 07, 2002

Generator :	***Advisor :***
Combedale Manor Rest. Superfund Site Group c/o Swindler Berlin Shereff Friedman LLP	**Loureiro Engineers Associates Inc.**
3000 K Street, Suite 300	100, Northwest Drive
Washington DC USA	Plainville CT USA
20007	06062
Contact : Jerome Muirs	**Contact :** Scott Miller, Project Engineer

We confirm treatment of your soils at our plant located in the industrial park of Saint. Ambroise. The soils were managed and treated in compliance with our Certificate of Authorization delivered by the Ministry of Environment of the Province of Québec :

Permit : **Thermal treatment of PCB and other organochloride impacted soils**

Delivery Dates : **October 27, 1997**

Permit Ref. No. : **7610-02-01-0603816**
1142129

Treatment service : **Thermal**
Soils impacted with : **Dioxins / Furans**
Treatment criteria : **<A In reference to the politic from the Ministry of Environment of the province of Québec**

Récupère Sol File No. : 010173

Volume of Soil Treated (kg) 200980

Yours truly,

Sophie Bouchard
Environment Tech

80 des Mélèzes St., St. Ambroise, Quebec, Canada. G7P 2N4
Tel.: (418) 695-3302 Fax - (418) 695-3303

RECUPERE SOL
80, rue des Mélèzes
Saint-Ambroise
G7P 2N4
Tél: (418) 695-3302
Fax: (418) 695-3303

Réception de sol contaminé

15501 - E

BENNETT ENVIRONMENTAL INC.

Générateur (Generator)

Compagnie / Company
Centredale

No Dossier / Project No
010173

Pesée officielle (Weight ticket)

Date et heure / Date and time

Entrée / Arrival time 2002/04/03 9:48:30 AM
Sortie / Departure time 2002/04/03 11:01:25

Poids / Weight

	(kg)	(lbs)	(US/Tonne)
Gross	36640	80777	40
Tare	15760	34745	17
Net	20880	46033	23

Transporteur et produit (Transporter and product)

Compagnie / Company	Page E.T.C.	
Camionneur / Driver	John Schieble	
	1	**2**
Immatriculation / Licence No	27349PA	NA
Manifeste Canadien / Canadian Manifest	XX26503-5	NA
Manifeste Américain / US Manifest	RIH0012983	NA
Remorque / Trailor	2951B7	NA
Scellé / Seal	NA	
Boite / Bin	NA	
Type de contaminant / Contamination	PCDD/PCDF	

Remarque (Remark)

pas de date d'envoie sur le manifeste canadien

Jean-Michel Gagnon
Préposé (Operator)

John Schieble
Camionneur (Driver)

Copie 1 = Transporteur (Carrier) Copie 2 = Client (Customer) Copie 3 = Administration

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **XX26503-5**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RID981203755
Company name / Nom de l'entreprise: Centredale Manor Superfund Site
Mailing address / Adresse postale: SAME
Shipping site address / Origine de l'expédition: 2072-2074 Smith Street
City / Ville: North Providence | Province: RI | Postal code / Code postal: 02911

Intended consignee / Destinataire prévu: Recupera Sol Inc
Provincial ID No. / No d'id. provincial: 1142-129
Address / Adresse: 80 rue des Melezes
Receiving site address / Destination de l'expédition: 80 rue des Melezes
City / Ville: Saint Ambroise | Province: PQ | Postal code / Code postal: G7P 2N4

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: R-519567-3
Company name / Nom de l'entreprise: PAGE E.T.C. Inc.
Address / Adresse: 2758 Trombley Road
City / Ville: Woodsport | Prov.: NY | Postal code / Code postal: 13166
Registration No. / N° d'immatriculation:
Vehicle / Véhicule: 2734 9 PA | Prov.: NY
Trailer/Rail Car No. 1 / 1er remorque – wagon: 295187 | Prov.: NY
Trailer/Rail Car No. 2 / 2e remorque – wagon:
Point of entry / Point d'entrée: Lacolle PQ
Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 02 | Month / Mois: 04 | Day / Jour: 02
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): John Schiebe
Signature: John Schiebe
Tel. No. / N° de tél.: 800-233-2126

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RI 100 12983

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☐ Yes / Oui ☐ No / Non, complete the boxed area below / compléter la boîte ci-dessous
Company name / Nom de l'entreprise:
Address / Adresse:
City / Ville: | Province: | Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville: | Province: | Postal code / Code postal:

Date received / Date de réception — Year / Année: 02 | Month / Mois: 04 | Day / Jour: 03
Time / Heure: 9 48 ☐ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste Identification / Identification du déchet: Provincial No. (Quebec-Ontario only) / N° (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units / Unités	Classification	Packaging group / Groupe d'emballage	Packaging Contenants: No. / Nbre	Codes Int.–ext.	Quantity received / Quantité reçu	Units / Unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination Packaging Contenants Yes/Oui	Decontamination Packaging Contenants No/Non	Decontamination Vehicle/Véhicule Yes/Oui	Decontamination Vehicle/Véhicule No/Non
S	Waste, Environmentally Hazardous Substances, Solid, N.O.S. (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	N/A	UN3077	21000 kg	9	III	01	03		20880	kg	poids estimé	02				

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointes ☒ Below / Ci-dessous
Numero de Preavis 118802
In Case of Emergency Call RSI 24 HRS (418) 695-3302

Circulation no. – Quebec only / N° de circulation – Réservée au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

Date shipped / Date d'expédition — Year / Année | Month / Mois | Day / Jour
Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue — Year / Année | Month / Mois | Day / Jour

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:
Provincial ID No. / N° d'id. provincial:
Address / Adresse: | City / Ville: | Prov.:

Consignor Certification: I declare that the information contained in Part A is correct and complete.
Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Robert LEGNANT AGENT FED
Signature / Signature:
Tel. no. / N° de tél.: (860) 747-6631

Consignee Certification: I declare that the information contained in Part C is correct and complete.
Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-LUC LEGAULT
Signature / Signature:
Tel. no. / N° de tél.: 418 695-3302

MOE 04-1917 (12/01)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 277-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but may be required by state law
RID981203755	12983		

3. Generator's Name and Mailing Address
~~Centredale Manor Restoration Superfund Site Grp~~
c/o Swidler Berlin Shereff Friedman, LLP
3000 K ST. Suite 300, Washington DC 20007
202 424-7547 &(860)747-6181

4. Generator's Phone ( )

A. State Manifest Document Number: RI H 001983

B. Generator/Site Address: 2072-2074 Smith St. N. Providence RI 02911

5. Transporter 1 Company Name	6. US EPA ID Number	C. State Transporter ID/License Plate
PAGE E.T.C. Inc.	NYD986969947	295182 NY

D. Transporter's Phone: 800-233-2126

7. Transporter 2 Company Name	8. US EPA ID Number	E. State Transporter ID/License Plate

F. Transporter's Phone:

9. Designated Facility Name and Site Address	10. US EPA ID Number	G. Facility Mailing Address: Same
Recupere Sol Inc. 80 Rue De Melezes Saint Ambroise, Quebec G7P2N4	Operator Permit 1142-129	H. Facility's Phone: (418)695-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Environmentally Hazardous Substance, Solid, N.O.S., Class 9, UN3077 (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	01	DT	46000	P	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

Interim	Final	Interim	Final
a.		c.	
b.		d.	

15. Special Handling Instructions and Additional Information
In case of Emergency Call:
Transport Rollex 1-800-465-0911
Departure City/State: Champlain
Date: 4/2/02 Time: ERG# 171
Signature: John Schieble EPA Notice: 826/01

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Acknowledgement of consent and conforms to the terms of the attached EPA

Printed/Typed Name	Signature	Date (Month Day Year)
Scott Miller Agent for Centredale Manor Superfund Site	Robert Lynn AGENT FOR CEN	04 02 02

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name: JOHN Schieble	Signature: John Schieble	Date: 04 02 02
18. Transporter 2 Acknowledgement or Receipt of Materials		
Printed/Typed Name	Signature	Date

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEAN MICHEL GAGNON		04 03 02

EPA Form 8700-22 (3-84)

Copy 4: Facility Retains

GENERATOR

In the event of a spill, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 277-2797. 24 Hour (401) 277-3070

RECUPERE SOL
80, rue des Mélèzes
Saint-Ambroise
G7P 2N4
Tél: (418) 695-3302
Fax: (418) 695-3303

Réception de sol contaminé

15502 - E

BENNETT ENVIRONMENTAL INC.

Générateur (Generator)

Compagnie / Company
Centredale

No Dossier / Project No
010173

Pesée officielle (Weight ticket)

Date et heure / Date and time

Entrée / Arrival time 2002/04/03 10:08:53
Sortie / Departure time 2002/04/03 11:52:49

Poids / Weight

	(kg)	(lbs)	(US/Tonne)
Gross	35960	79278	40
Tare	14750	32518	16
Net	21210	46760	23

Transporteur et produit (Transporter and product)

Compagnie / Company	Page E.T.C.	
Camionneur / Driver	John Van Valkenburgh	
	1	**2**
Immatriculation / Licence No	2882PC	NA
Manifeste Canadien / Canadian Manifest	XX26504-3	NA
Manifeste Américain / US Manifest	RIH0003859	NA
Remorque / Trailor	2950B7	NA
Scellé / Seal	NA	
Boite / Bin	NA	
Type de contaminant / Contamination	PCDD/PCDF	

Remarque (Remark)

NA

Jean-Michel Gagnon
Préposé (Operator)

John Van Valkenburgh
Camionneur (Driver)

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **XX26504-3**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RID981203755
Company name / Nom de l'entreprise: Centredale Manor Superfund Site
Mailing address / Adresse postale: SAME — City / Ville — Province — Postal code / Code postal
Shipping site address / Origine de l'expédition: 2072-2074 Smith Street
City / Ville: North Porvidece — Province: RI — Postal code / Code postal: 02911

Intended consignee / Destinataire prévu: Recupere Sol Inc
Provincial ID No. / No d'id. provincial: 1142-129
Address / Adresse: 80 rue des Melezes
City / Ville — Province — Postal code / Code postal
Receiving site address / Destination de l'expédition: 80 rue des Melezes
City / Ville: Saint Ambroise — Province: PQ — Postal code / Code postal: G7P 2N4

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: R-519567-3
Company name / Nom de l'entreprise: PAGE E.T.C. Inc.
Address / Adresse: 2758 Trombley Road
City / Ville — Prov. — Postal code / Code postal: Weedsport NY 13166

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	2882-PC	NY
Trailer/Rail Car No. 1 / 1er remorque – wagon	2950B7	NY
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: LACOLLE
Point of exit / Point de sortie: Champlain

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 02 — Month / Mois: 04 — Day / Jour: 02
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): John E Van Valkenburgh
Signature:
Tel. No. / N° de tél.: (800) 233-2126

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RIH0003859

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous
Company name / Nom de l'entreprise:
Address / Adresse:
City / Ville — Province — Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville — Province — Postal code / Code postal:

Date received / Date de réception: Year / Année: 02 — Month / Mois: 04 — Day / Jour: 03 — Time / Heure: 1068 ☐ A.M. ☒ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units / L or kg / unités	Classification	Packaging group / Groupe d'emballage	Packaging Contenants: No. / Nbre	Packaging Contenants: Codes int.-ext.
S	Waste, Environmentally Hazardous Substances, Solid, N.O.S. (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	N/A	UN3077	Estimated 21.000	kgs	2.2	III	01	03

Quantity received / Quantité reçue	Units / L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants Yes / Oui	Packaging / Contenants No / Non	Vehicle / Véhicule Yes / Oui
21210	kg	Poids estimé	07		2	

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointes ☒ Below / Ci-dessous
Numero de Preavis 116802
In Case of Emergency Call RSI 24 HRS (418) 695-3302

Circulation no. – Quebec only / N° de circulation – Réservée au Québec

If handling code "Other" (specify) / Si code de manutention "divers" spécifier:

Date shipped / Date d'expédition: Year / Année: 02 — Month / Mois: 04 — Day / Jour: 02
Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 02 — Month / Mois: 04 — Day / Jour: 02

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:
Provincial ID No. / N° d'id. provinci
Address / Adresse — City / Ville — Prov.

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): ROBERT A. LEONARD AGENT FOR LEIN
Signature:
Tel. no. / N° de tél.: (860) 747 6631

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN MICHEL LEAHOR
Signature:
Tel. no. / N° de tél.: (418) 695-330

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 277-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755	Manifest Document No 03859	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
~~Centredale Restoration Superfund Site Grp~~
c/o Swidler Berlin Shereff Friedman, LLP
3000 K ST. Suite 300, Washington DC 20007
202 424-7547 &(860)747-6181

A. State Manifest Document Number RI H0003859

B. Generator/Site Address 2072-2074 Smith St. N. Providence RI 02911

4. Generator's Phone ( )

5. Transporter 1 Company Name: PAGE E.T.C. Inc.
6. US EPA ID Number: NYD986969947
C. State Transporter ID/License Plate: 296057 - NY
D. Transporter's Phone 800-233-2126

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter ID/License Plate
F. Transporter's Phone

9. Designated Facility Name and Site Address
Recupere Sol Inc.
80 Rue De Melezes
Saint Ambroise, Quebec G7P2N4
10. US EPA ID Number: Operator Permit 1142-129
G. Facility Mailing Address: Same
H. Facility's Phone (418)695-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Environmentally Hazardous Substance, Solid, N.O.S., Class 9, UN3077 (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	01	DT	46000	P	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. c.
b. d.

K. Handling Codes for Wastes Listed Above

Interim	Final	Interim	Final
a.		c.	
b.		d.	

15. Special Handling Instructions and Additional Information
In case of Emergency Call: Transport Reller 1-800-465-0911
Departure City/State: Date: 4/2 Time: Signature:
ERG# 171
EPA Notice:826/01

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. and conforms to the terms of the attached EPA Acknowledgement of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
Scott Miller Agent for Centredale Manor Superfund Site	AGENT FOR LEA	04 02 02

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
John E VanValkenburgh		04 02 02

18. Transporter 2 Acknowledgement or Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEANNETTE E MOON		04 02 02

GENERATOR
TRANSPORTER
FACILITY

In the event of a spill, contact the National Response Center. U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 277-2797. 24 Hour (401) 277-3070

EPA Form 8700-22 (3-84)

Copy 4: Facility Retains

RÉCUPÈRE SOL INC.
80, rue des Mélèzes
Saint-Ambroise
G7P 2N4
Tél: (418) 695-3302
Fax: (418) 695-3303

Réception de sol contaminé

15503 - E

BENNETT ENVIRONMENTAL INC.

Générateur (Generator)

Compagnie / Company
Centredale

No Dossier / Project No
010173

Pesée officielle (Weight ticket)

Date et heure / Date and time

Entrée / Arrival time 2002/04/03 10:15:32
Sortie / Departure time 2002/04/03 12:07:18

Poids / Weight

	(kg)	(lbs)	(US/Tonne)
Gross	36750	81020	41
Tare	13980	30821	15
Net	22770	50199	25

Transporteur et produit (Transporter and product)

Compagnie / Company	Page E.T.C.	
Camionneur / Driver	Fran Schieble	
	1	**2**
Immatriculation / Licence No	27339PA	NA
Manifeste Canadien / Canadian Manifest	XX26502-7	NA
Manifeste Américain / US Manifest	RIH0012982	NA
Remorque / Trailor	2938B7	NA
Scellé / Seal	NA	
Boite / Bin	NA	
Type de contaminant / Contamination	PCDD/PCDF	

Remarque (Remark)

NA

Jean-Michel Gagnon
Préposé (Operator)

Fran Schieble
Camionneur (Driver)

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **XX26502-7**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RID981203755
Company name / Nom de l'entreprise: Centredale Manor Superfund Site
Mailing address / Adresse postale: SAME
City / Ville: Province: Postal code / Code postal:
Shipping site address / Origine de l'expédition: 2072-2074 Smith Street
City / Ville: North Porvideca Province: RI Postal code / Code postal: 02911

Intended consignee / Destinataire prévu: Recupere Sol Inc
Provincial ID No. / No d'id. provincial: 1142-129
Address / Adresse: 80 rue des Melezes
City / Ville: Province: Postal code / Code postal:
Receiving site address / Destination de l'expédition: 80 rue des Melezes
City / Ville: Saint Ambroise Province: PQ Postal code / Code postal: G7P 2N4

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: R-519567-3
Company name / Nom de l'entreprise: PACE E.T.C. Inc.
Address / Adresse: 2758 Trombley Road
City / Ville: Weedsport Prov.: NY Postal code / Code postal: 13166

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	23339 PA	NY
Trailer/Rail Car No. 1 / 1er remorque – wagon	293801	NY
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Lacolle Point of exit / Point de sortie: Champlain

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 02 Month / Mois: 04 Day / Jour: 02
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): FRAN Schreible
Signature: Fran Schreible
Tel. No. / N° de tél.: 800-233-2126

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RI 4001298 2
Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous
Company name / Nom de l'entreprise:
Address / Adresse:
City / Ville: Province: Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville: Province: Postal code / Code postal:

Date received / Date de réception: Year / Année: 02 Month / Mois: 04 Day / Jour: 03 Time / Heure: 1015 ☑ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste Identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	Waste Identification / Identification du déchet: TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units / Unités	Classification	Packing group / Groupe d'emballage	Packaging Contents: No. / Nbre	Packaging Contents: Codes int.–ext.	Quantity received / Quantité reçu	Units / Unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging Contents Yes / Oui	Packaging Contents No / Non	Vehicle / Véhicule Yes / Oui
S	Waste, Environmentally Hazardous Substances, Solid, N.O.S. (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	N/A	UN3077	Approx. 21000	kg	9, 2II	II	01	03	23 1/2	pail/seau		08		2	

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointes ☒ Below / Ci-dessous
Numero de Preavis 118802
In Case of Emergency Call RSI 24 HRS (418) 695-3302

Circulation no. – Quebec only / N° de circulation – Réservée au Québec

If handling code "Other" (specify) / Si code de manutention "divers", spécifier

Date shipped / Date d'expédition: Year / Année: 02 Month / Mois: 04 Day / Jour: 02
Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 02 Month / Mois: 04 Day / Jour: 02

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire
Provincial ID No. / N° d'id. provinci
Address / Adresse: City / Ville: Prov.:

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Richard Lefrancois AGENT FOR PACE
Signature: [signature]
Tel. no. / N° de tél.: (860) 747 6631

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-MATHIEU GAGNON
Signature: [signature]
Tel. no. / N° de tél.: 695-3302

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 277-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 12982 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
Centredale Manor Restoration Superfund Site Crp
c/o Swidler Berlin Shereff Friedman, LLP
3000 K ST. Suite 300, Washington DC 20007
202 424-7547 &(860)747-6181

4. Generator's Phone ( )

A. State Manifest Document Number: RI H 0012982

B. Generator/Site Address: 2072-2074 Smith St. N. Providence RI 02911

5. Transporter 1 Company Name: PAGE E.T.C. Inc.
6. US EPA ID Number: NYD986969947
C. State Transporter ID/License Plate: 2932B7N4
D. Transporter's Phone: 800/233-2126

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter ID/License Plate
F. Transporter's Phone

9. Designated Facility Name and Site Address
Recupere Sol Inc.
80 Rue De Melezes
Saint Ambroise, Quebec G7P2N4
10. US EPA ID Number: Operator Permit 1142-129
G. Facility Mailing Address: Same
H. Facility's Phone: (418)695-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Environmentally Hazardous Substance, Solid, N.O.S., Class 9, UN3077 (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	01	DT	46,000 ES	P	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

Interim	Final	Interim	Final
a.		c.	
b.		d.	

15. Special Handling Instructions and Additional Information
In case of Emergency Call: Transport Rollex 1-800-465-0911
Departure City/State: [illegible] RI
Date: 4/1/02 Time: [illegible] ERG# 171
Signature: [signature] EPA Notice: 826/01

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.
and conforms to the terms of the attached EPA Acknowledgement of consent.

Printed/Typed Name	Signature	Date (Month Day Year)
Scott A. Miller Agent for Centredale Manor Superfund Site	[signature] AGENT FOR LEO	04 02 02

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
FRAN Schreble	[signature]	04 02 02

18. Transporter 2 Acknowledgement or Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
[illegible]	[signature]	04 03 02

EPA Form 8700-22 (3-84)

GENERATOR / TRANSPORTER / FACILITY

In the event [illegible] contact the National Response Center. U.S. Coast Guard 1-800-424-8802. For spills within RI and, contact the R.I. Department of Environmental Management (401) 277-2797. 24 Hour (401) 3070

RÉCUPÈRE SOL
80, rue des Mélèzes
Saint-Ambroise
G7P 2N4
Tél: (418) 695-3302
Fax: (418) 695-3303

Réception de sol contaminé

15504 - E

BENNETT ENVIRONMENTAL INC.

Générateur (Generator)

Compagnie / Company
Centredale

No Dossier / Project No
010173

Pesée officielle (Weight ticket)

Date et heure / Date and time

Entrée / Arrival time 2002/04/03 10:40:25
Sortie / Departure time 2002/04/03 12:10:46

Poids / Weight

	(kg)	(lbs)	(US/Tonne)
Gross	34540	76148	38
Tare	15330	33797	17
Net	19210	42351	21

Transporteur et produit (Transporter and product)

Compagnie / Company	Page E.T.C.	
Camionneur / Driver	Thomas Burridge	
	1	**2**
Immatriculation / Licence No	27347PA	NA
Manifeste Canadien / Canadian Manifest	GG84366-2	NA
Manifeste Américain / US Manifest	RIH0012984	NA
Remorque / Trailor	NA	NA
Scellé / Seal	NA	
Boite / Bin	NA	
Type de contaminant / Contamination	PCDD/PCDF	

Remarque (Remark)

NA

Jean-Michel Gagnon
Préposé (Operator)

Thomas Burridge
Camionneur (Driver)

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: GG84366-2

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: NJD981203755
Company name / Nom de l'entreprise: Centradale Manor Superfund Site
Mailing address / Adresse postale: SAME
City / Ville: | Province: | Postal code / Code postal:
Shipping site address / Origine de l'expédition: 2072-2074 Smith Street
City / Ville: North Porvidece | Province: RI | Postal code / Code postal: 02911

Intended consignee / Destinataire prévu: Recupere Sol Inc
Provincial ID No. / No d'id. provincial: 1142-129
Address / Adresse: 80 rue des Melezes
City / Ville: | Province: | Postal code / Code postal:
Receiving site address / Destination de l'expédition: 80 rue des Melezes
City / Ville: Saint Ambroise | Province: PQ | Postal code / Code postal: G7P 2N4

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: R-519567-3
Company name / Nom de l'entreprise: PAGE E.T.C. Inc.
Address / Adresse: 2758 Trombley Road
City / Ville: Weedsport | Prov.: NY | Postal code / Code postal: 13166
Vehicle / Véhicule: Registration No. / N° d'immatriculation: 27341PA | Prov.: NY
Trailer/Rail Car No. 1 / 1er remorque – wagon: 2925B7 | NY
Trailer/Rail Car No. 2 / 2e remorque – wagon:
Point of entry / Point d'entrée: LaColle | Point of exit / Point de sortie: Champlain

Carrier Certification: I declare that I have received waste as offered by the consignor in part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la section B sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Thomas Burridge
Year / Année: 02 | Month / Mois: 04 | Day / Jour: 02
Signature: Thomas Burridge
Tel. No. / N° de tél.: 800-233-2126

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: Yes / Oui ☐ No. complete the boxed area Below
Company name / Nom de l'entreprise:
Address / Adresse: | City / Ville: | Province: | Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville: | Province: | Postal code / Code postal:

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: PT 1001298H

Date received / Date de réception: Year / Année: 02 | Month / Mois: 04 | Day / Jour: 03 | Time / Heure: 10:10 | A.M. ☐ P.M. ☒

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée: Units / Unités	Quantity received / Quantité reçue: Units / Unités	Identify any shipment discrepancy problems. If necessary, / Identifier toute différence relative à l'expédition. Attach addendum if / Annexer une feuille au besoin:	Handling code / Code de manutention	Packaging / Contenants: Yes / Oui	Packaging / Contenants: No / Non	Decontamination / Décontamination: Vehicle / Véhicule: Yes / Oui
S	Waste, Environmentally Hazardous Substances, Solid, N.O.S. (2,3,7,8 Tetrachlorodibenzo-p-Dioxin)	N/A	UN3077	Approx 30000 kg	2TH-01-03					

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointe ☒ Below / Ci-dessous
Numero de Preavis 118802
In Case of Emergency Call RSI 24 HRS (418) 695-3302

Circulation no. – Quebec only / N° de circulation – Réservée au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire: | Provincial ID No. / N° d'id. provinci
Address / Adresse: | City / Ville: | Prov.:

Date shipped / Date d'expédition: Year / Année: 02 | Month / Mois: 04 | Day / Jour: 02 | Time / Heure: A.M. ☐ P.M. ☐ | Scheduled arrival date / Date d'arrivée prévue: Year / Année: 02 | Month / Mois: 04 | Day / Jour: 02

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Robert A. Lecnani (Agent Pour Allied)
Signature:
Tel. no. / N° de tél.: (860) 747 6631

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN MICHEL GAGNON
Signature:
Tel. no. / N° de tél.: 418-695-3302

MOEE 04-1917 (11/96)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 277-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755	Manifest Document No. 12984	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
Centredale Manor Restoration Superfund Site Trust
c/o Swidler Berlin Shereff Friedman, LLP
3000 K ST. Suite 300, Washington DC 20007
202 424-7547 &(860)747-6181

4. Generator's Phone ( )

A. State Manifest Document Number: RI H 0012984

B. Generator's Site Address: 2672-2674 Smith St. N. Providence RI 02911

5. Transporter 1 Company Name: PAGE E.I.C. Inc.	6. US EPA ID Number: NYD986969947	C. State Transporter ID/License Plate: NY 3/9857
7. Transporter 2 Company Name	8. US EPA ID Number	D. Transporter's Phone: 800-233-2126
		E. State Transporter ID/License Plate
9. Designated Facility Name and Site Address: Recupere Sol Inc. 80 Rue De Melezes Saint Ambroise, Quebec G7P2N4	10. US EPA ID Number: Operator Permit 1142-129	F. Transporter's Phone
		G. Facility Mailing Address: Same
		H. Facility's Phone: (418)695-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
Environmentally Hazardous Substance, Solid, N.O.S., Class 9, UN3077 (2,3,7,8 Tetrachlorodibenzo-P-Dioxin)	01	DT	EST 46000	P	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

Interim	Final	Interim	Final
a.		c.	
b.		d.	

15. Special Handling Instructions and Additional Information
In case of Emergency Call: Transport Rollex 1-800-465-0911
Departure City/State:
Date: 4/2/02 Time: ERG# 171
Signature: EPA Notice: 826/01

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled/placarded, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
and conforms to the terms of the attached EPA Acknowledgement of consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date (Month Day Year)
Scott A. Miller Agent for Centredale Manor Superfund Site	Robert H Jorgensen	04 02 02

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name: THOMAS BURRIDGE	Signature: Thomas E Burridge	Date: 04 02 02
18. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name	Signature	Date

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEAN-MICHEL GAGNON		04 03 02

EPA Form 8700-22 (3-84)

Copy 4: Facility Retains

GENERATOR

In the event of a spill, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 277-2797. 24 Hour (401) 277-3070

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14090

PESÉE OFFICIELLE

10:38:17 12-22-01 Truck# 2
Weight 36700 kg

11:29:08 12-22-01 Truck# 2

Gross 36700 kg
Tare 13520 kg
Net 23180 kg

Facturé à	
Compagnie	Centredale
Rue	
Ville / Prov.	
C.P.	
Tél.:	010173
No Dossier :	~~000126~~

Transporteur	
Compagnie	T. Potter
Conducteur	Bruno Cyr
No / Imm.	L170219
No / Bte 1	BR 56759
No / Bte 2	
No / Conn.	91152009
ou Manifeste :	BIH 0017519

Description et/ou Classification

Sol BBC

Scale # 2664
2665

Shipped 21-12-01

Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115200-9**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RID961203755
Company name / Nom de l'entreprise: CENTREDALE MANOR SUPERFUND SITE
Mailing address / Adresse postale — City / Ville — Province — Postal code / Code postal: SAME
Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET
City / Ville: NORTH PROVIDENCE — Province: RI — Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.
Provincial ID No. / No d'id. provincial: 7610 02 0106 0391 6 1142-129
Address / Adresse — City / Ville — Province — Postal code / Code postal: PQ G0V 1R0
Receiving site address / Destination de l'expédition: 80 RUE DES MELEZES
City / Ville: ST-AMBROISE (CHICOUTEQ — Province — Postal code / Code postal: G0V 1R0

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: 1145957430
Company name / Nom de l'entreprise: TRANSPORT ROLLEX LTEE (BEAUREGARD)
Address / Adresse: 910 BLVD LIONEL BOULET
City / Ville: VARENNES — Prov.: PQ — Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L170219	QC
Trailer/Rail Car No. 1 / 1er remorque – wagon	RR56759	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: ROUSES POINT — Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 — Month / Mois: 12 — Day / Jour: 21
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): ERNO CYR
Signature:
Tel. No. / N° de tél.: (450 652-4282

Reference nos. of other Manifest(s) used / N°'s de références des autres manifestes utilisés: RI H0017519

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: [X] Yes / Oui — [ ] No, complete the boxed area below / Non, compléter la boîte ci-dessous
Company name / Nom de l'entreprise:
Address / Adresse:
City / Ville — Province — Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville — Province — Postal code / Code postal:

Date received / Date de reception: Year / Année — Month / Mois — Day / Jour
Time / Heure: [ ] A.M. [ ] P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste Identification / Identification du déchet: Provincial No. / N° (Quebec–Ontario only) (Quebec–Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / unités	Classification	Packaging Groupe d'emballage	Packaging Contenants: No. Nbre	Codes Int.–ext.	Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging Contenants Yes / Oui	Packaging Contenants No / Non	Vehicle / Véhicule Yes / Oui	Vehicle / Véhicule No / Non
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	N/A	UN3077	22000	KG	9	III	01	03	23180	kg	poids estimé	07		J		
	(1,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: [ ] Attached / Ci-jointes — [X] Below / Ci-dessous
Numéro de préavis 118672
IN CASE OF EMERGENCY CALL MRT 24HR 418-695-3307

Circulation no. – Quebec only / N° de circulation – Réservé au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:
Provincial ID No. / N° d'id. provincial:
Address / Adresse — City / Ville — Prov.:

Date shipped / Date d'expédition: Year / Année: 01 — Month / Mois: 12 — Day / Jour: 21
Time / Heure: 1045 [ ] A.M. [ ] P.M.
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 01 — Month / Mois: 12 — Day / Jour: 22

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Ms Pour Le Centredale Manor
Signature: Scott McCue
Tel. no. / N° de tél.: (401) 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-LUC HEZ-GAGNON
Signature:
Tel. no / N° de tél.: 655-3702

MOE 04-1917 (06/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: RID981203755
Manifest Document No.: 17519
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SWIDLER BERLIN SHEREFF FRIEDMAN, LLP, 3000 K ST
SUITE 300 WASHINGTON D C 20007

A. State Manifest Document Number: RI H 0017519

4. Generator's Phone (202) 424-7547 and (860) 747-6181

B. Generator/Site Address: 2072-2074 PUTN STREET
PROVIDENCE, RI 02906

5. Transporter 1 Company Name: ROLLEX (LEGHORN)
6. US EPA ID Number: WYE 000002 53

C. State Transporter ID/License Plate:

7. Transporter 2 Company Name
8. US EPA ID Number

D. Transporter's Phone

E. State Transporter ID/License Plate: RR SUIS 2 RD

9. Designated Facility Name and Site Address
RECUPERE SOL INC.
80 RUE DE MELERES
SAINT AMBROSE, QUEBEC G7P2M4

10. US EPA ID Number
OPERATOR PERMIT
1142 129

F. Transporter's Phone

G. Facility Mailing Address: SAME

H. Facility's Phone: (418) 695-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID #3077	01	DT			F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

Interim	Final	Interim	Final
a.		c.	
b.		d.	

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL PORT OF EXIT FROM USA
EMERGENCY RESPONSE GUIDE BOOK NUMBER 171

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
AND CONFORMS TO THE TERMS OF THE ATTACHED EPA Acknowledgment of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: SCOTT A. MILLER, "as Agent for Centredale Manor Restoration Superfund Site Group"
Signature: Scott A. Miller
Date: Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: PIERRE CYR
Signature:
Date: Month Day Year

18. Transporter 2 Acknowledgement or Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: JEAN-CLAUDE GAGNON
Signature:
Date: Month Day Year 11 20 01

EPA Form 8700-22 (3-84)

Facility

In the event ... all, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within RI ... and, contact the R.I. Department of Environmental Management (401) 222-2797, 24 Hour (401) ...

(47)

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14091

PESÉE OFFICIELLE

13:48:00 12-22-01 Truck#
Weight 36120 kg

13:55:16 12-22-01 Truck#

Gross 36120 kg
Tare 15520 kg
Net 20600 kg

Facturé à	
Compagnie	CENTREDALE
Rue	
Ville / Prov.	
C.P.	
Tél.:	
No Dossier :	010173

Transporteur	
Compagnie	TRANSPORT POLLEX
Conducteur	RENÉ COUTURE
No / Imm.	L207992
No / Bte 1	RN17803
No / Bte 2	
No / Conn.	
ou Manifeste :	911S203-03 RI # 0017513

Description et/ou Classification

SOL BPC

SEAL # ~~2662~~ 2669
~~2663~~ 2668

SHIPPED 01/12/21

Patrick Deschênes
Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115203-3**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RID981203755
Company name / Nom de l'entreprise: CENTREDALE MANOR SUPERFUND SITE
Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal: SAME
Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET
City / Ville: NORTH PROVIDENCE | Province: RI | Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.
Provincial ID No. / N° d'id. provincial: 76 16 0201 06 03 916 1142-129
Address / Adresse | City / Ville | Province | Postal code / Code postal: PQ G0V 1R0
Receiving site address / Destination de l'expédition: 80 RUE DES MELEZES
City / Ville: ST-AMBROISE (CHICOUTPQ | Province | Postal code / Code postal: G0V 1R0

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: 1145957438
Company name / Nom de l'entreprise: TRANSPORT ROLLEX LTEE (L. Poirier ltée)
Address / Adresse: 910 BLVD LIONEL BOULET
City / Ville: VARENNES | Prov.: PQ | Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L207992	QC
Trailer/Rail Car No. 1 / 1er remorque – wagon	L217803	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Lac Isham | Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Luc Couture
Signature | Tel. No. / N° de tél.: 450 652-4282

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RI H00017513
Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous
Company name / Nom de l'entreprise
Address / Adresse
City / Ville | Province | Postal code / Code postal
Receiving site address / Destination de l'expédition
City / Ville | Province | Postal code / Code postal

Date received / Date de réception — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 22 | Time / Heure: 13:48 ☐ A.M. ☒ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Québec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / unités	Classification	Packaging group / Groupe d'emballage	Packaging Containers: No. / Nbre	Codes int.-ext.	Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination Packaging Yes/Oui	Decontamination Packaging No/Non	Decontamination Vehicle Yes/Oui	Decontamination Vehicle No/Non
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	N/A	UN3077	20,000	KG	9.2	III	01	03	20 600	kg	Poids estimé	02		X		X
	(2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointes ☒ Below / Ci-dessous
Numéro du prénvis 118802
In case of emergency call RRI 24HR 418-695-7102

Circulation no. – Quebec only / N° de circulation – Réservée au Québec: 02668 02669 SAL.

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

Date shipped / Date d'expédition — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Time / Heure: 14:00 ☐ A.M. ☒ P.M.
Scheduled arrival date / Date d'arrivée prévue — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 22

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire | Provincial ID No. / N° d'id. provincial
Address / Adresse | City / Ville | Prov.

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): PATRICK DESCHÊNES
Signature: Patrick Deschênes | Tel. no. / N° de tél.: (418) 695-3302

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): AS AGENT FOR CONSIGNEE Scott McCulloch Manager Restoration Site Group
Signature | Tel. no. / N° de tél.: (418) 231-0229

MOE 04-1917 (06/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: RID981203755
Manifest Document No.: 17513
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SWIDLER, BERLIN, SHEREFF, FRIEDMAN, LLP, 3000 K ST., SUITE 300, WASHINGTON, D.C. 20007
4. Generator's Phone: (202) 424-7547 and (860) 747-6181

A. State Manifest Document Number: RI H 0017513
B. Generator/Site Address: 2072-2074 SMITH ST. NO. PROVIDENCE, RI 02904
C. State Generator ID/License No.: RI CG RJ 17903

5. Transporter 1 Company Name: TRANSPORT ROLLEX
6. US EPA ID Number: NYF000000053
D. Transporter's Phone:
E. State Transporter ID/License Plate:

7. Transporter 2 Company Name:
8. US EPA ID Number:
F. Transporter's Phone:

9. Designated Facility Name and Site Address
RECUPERE SOL INC
80 RUE DE MELEZES
SAINT AMBROSE, QUEBEC G7P2N4
10. US EPA ID Number: OPERATOR PERMIT # 1142-129
G. Facility Mailing Address:
H. Facility's Phone:

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID #3077	01	DT	00022	+	~~F020~~ F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above
a. Interim: Final; b. Interim: Final

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL
PORT OF EXIT FROM USA: DERBY LINE VT
Emergency Response Guide Book Number

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the method of treatment, storage or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.
and conforms to the terms of the attached EPA Acknowledgement of Consent.

Printed/Typed Name	Signature	Date (Month Day Year)
SCOTT A. MILLER "As Agent for Centredale Manor Restoration Superfund Site Group"	Scott A. Miller	12 21 01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Paul Coutu		12 21 01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
PATRICK DESCHÊNES	Patrick Deschênes	12 22 01

GENERATOR
TRANSPORTER
FACILITY

In the event of a spill, contact the National Response Center. U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 222-2797. 24 Hour (401) 222-3070

EPA Form 8700-22 (3-84)

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14050

PESÉE OFFICIELLE

08:26:14 12-21-01 Truck#
Weight 37470 kg

09:24:37 12-21-01 Truck#

Gross 37470 kg
Tare 17800 kg
Net 19670 kg

Facturé à	
Compagnie	Centredale
Rue	
Ville / Prov.	
C.P.	
Tél.:	
No Dossier :	010173

Transporteur	
Compagnie	T. Rollet
Conducteur	Serge Bogine t
No / Imm.	L713419
No / Bte 1	BB76133
No / Bte 2	
No / Conn.	9115886
ou Manifeste :	BTH 0017507

Description et/ou Classification

Sol BPC

Seal # 2654
2655

Shipped: 20-12-01

Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115188-6**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial: RID981203755

Company name / Nom de l'entreprise: CENTRAL'S MANOR SUPERFUND SITE

Mailing address / Adresse postale: SAME

City / Ville: Province: Postal code / Code postal:

Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET

City / Ville: NORTH PROVIDENCE Province: RI Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / No d'id. provincial: 7410 02 0106 03 F 16 1142-129

Address / Adresse: 80 RUE DES ERABLES City / Ville: ST-AMBROISE (CHICOUTIMI) Province: PQ Postal code / Code postal: G7P 2Y8

Receiving site address / Destination de l'expédition: 80 RUE DES ERABLES

City / Ville: ST-AMBROISE (CHICOUTIMI) Province: PQ Postal code / Code postal: G7P 2Y8

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial: 1145957436

Company name / Nom de l'entreprise: TRANSPORT ROLLIER LTEE

Address / Adresse: 310 BLVD LIONEL BOULET

City / Ville: VARENNES Prov.: PQ Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L213419	Qc
Trailer/Rail Car No. 1 / 1er remorque – wagon	RP76133	Qc
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Point of exit / Point de sortie: St Armand Qc

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 Month / Mois: 12 Day / Jour: 26 Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): SERGE BOZINET

Signature: Serge Bozinet Tel. no. / N° de tél.: (450) 652-4282

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Reference nos. of other Manifest(s) used / N°'s de références des autres manifestes utilisés: R1 H 061705

Provincial ID No. / N° d'id. provincial:

Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No / Non, complete the boxed area below / compléter la boîte ci-dessous

Company name / Nom de l'entreprise:

Address / Adresse: City / Ville: Province: Postal code / Code postal:

Receiving site address / Destination de l'expédition:

City / Ville: Province: Postal code / Code postal:

Date received / Date de réception: Year / Année: 01 Month / Mois: 12 Day / Jour: 31 Time / Heure: 8:26 ☒ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec–Ontario only) (Quebec–Ontario seul)	Waste identification / Identification du déchet: TDGA/PIN LTMO/NIP	Quantity shipped / Quantité expédiée	Units L or / ou kg unites	Classification	Packing group / Groupe d'emballage	Packaging Contenants: No. Nbre	Packaging Contenants: Codes int.–ext.	Quantity received / Quantité reçu	Units L or / ou kg unites	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants Yes / Oui	Packaging / Contenants No / Non	Vehicle / Véhicule Yes / Oui	Vehicle / Véhicule A
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8, TETRACHLORODIBENZO-P-DIOXIN)	N/A	UN3077	20000	KG	9.2	III	01	03	19670	kg	100 cy Haul	03		X		

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: Numéro de préavis 112002

In case of emergency call BMT 24HR 418-695-3102

☐ Attached / Ci-jointes ☒ Below / Ci-dessous

Circulation no. – Quebec only / N° de circulation – Réservée au Québec

If handling code "Other" (specify) / Si code de manutention "divers", spécifier

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire

Provincial ID No. / N° d'id. provinci

Address / Adresse: City / Ville: Prov.:

Date shipped / Date d'expédition: Year / Année: 01 Month / Mois: 12 Day / Jour: 26

Time / Heure: 9 ☒ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année: 01 Month / Mois: 12 Day / Jour: 31

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Jean "As Agent For Centremre Waste Management Site Group"

Signature: Tel. no. / N° de tél.: (401) 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-FRANÇOIS GAGNON

Signature: Tel. no. / N° de tél.: 605-370

MOE 04-1917 (06/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 17507 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law.

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
C/O SWIDLER, BERLIN, SHEREFF, FRIEDMAN, LLP, #3000 K ST
SUITE #300, WASHINGTON, DC 20007

4. Generator's Phone (202 424-7547 and (860) 747-6181

A. State Manifest Document Number: RI H 0017507

B. Generator's Site Address: 2074-2078 SMITH STREET NO. PROVIDENCE, RI 02904

5. Transporter 1 Company Name: J.R. Rollex Inc. | 6. US EPA ID Number: NYS 0060000053 | C. State Transporter ID/License Plate: RPU 193 Tc

7. Transporter 2 Company Name | 8. US EPA ID Number | D. Transporter's Phone | E. State Transporter ID/License Plate | F. Transporter's Phone

9. Designated Facility Name and Site Address
RECUPERER SOL INC
80 RUE DE MELEZES
SAINT AMBROSE, QUEBEC 67P2N4

10. US EPA ID Number: OPERATOR PERMIT # 1142120

G. Facility Mailing Address | H. Facility's Phone (418) 605-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (2,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID # 3077	01	DT	20000	Kg	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above: a. Interim / Final; b. Interim / Final; c. Interim / Final; d. Interim / Final

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL
PORT OF EXIT FROM USA: Dubuque
EMERGENCY RESPONSE GUIDE BOOK NUMBER

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and conforms to the terms of the attached EPA Acknowledgment of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date Month Day Year
SCOTT A MILLER "AS AGENT FOR CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP"	Scott Miller	

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year
SERGE BRIERE	Serge Briere	01

18. Transporter 2 Acknowledgement or Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date Month Day Year
MICHEL GAGNON		01

EPA Form 8700-22 (3-84)

In the event of ... contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within Rhode ... contact the R.I. Department of Environmental Management (401) 222-2797, 24 Hour (401) 2...

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14055

PESÉE OFFICIELLE

11:02:53 12-21-01 Truck# 1
Weight 38900 kg

11:19:19 12-21-01 Truck# 1
Gross 38900 kg
Tare 16920 kg
Net 21980 kg

Facturé à

Compagnie ~~Federal Grocote~~
Rue Centredale
Ville / Prov.
C.P.
Tél.:
No Dossier : ~~000126~~ 010173

Transporteur

Compagnie T. Pro Ited
Conducteur Sylvain Fafard
No / Imm. L207993
No / Bte 1 BP49725
No / Bte 2
No / Conn. 91151878
ou Manifeste : ~~NEANT~~ 83EH0017509

Préposé à la réception des sols

Description et/ou Classification

Sol HAP

Sealift 2651
2653

Shipped 20-12-01

Sylvain Fafard
Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115187-8**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial: RIDSU1203755

Company name / Nom de l'entreprise: CENTREVILLE BEACH SUPERFUND SITE

Mailing address / Adresse postale: SAME

City / Ville: Province: Postal code / Code postal:

Shipping site address / Origine de l'expédition: 2092-2098 SMITH STREET

City / Ville: NORTH PROVIDENCE Province: RI Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / N° d'id. provincial: 7210689010683 RC 1142-129

Address / Adresse: City / Ville: Province: Postal code / Code postal: PQ G0V 1R0

Receiving site address / Destination de l'expédition: 39 RUE DES ROCHERS

City / Ville: ST ANDROLSE (CHICOUTIMI) Province: Postal code / Code postal: G0V 1R0

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial: 110552-430

Company name / Nom de l'entreprise: TRANSPORT ROBERT LTEE

Address / Adresse: 910 BLVD LIONEL BOULET

City / Ville: VARENNES Prov.: PQ Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L207993	PQ
Trailer/Rail Car No. 1 / 1er remorque – wagon	RP 49925	PQ
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Point of exit / Point de sortie: Rock island

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 Month / Mois: 12 Day / Jour: 20 Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Sylvain Fortin

Signature: Tel. No. / N° de tél.: (450) 652-1282

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Provincial ID No. / N° d'id. provincial: H-0017506

Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise:

Address / Adresse:

City / Ville: Province: Postal code / Code postal:

Receiving site address / Destination de l'expédition:

City / Ville: Province: Postal code / Code postal:

Reference nos. of other Manifest(s) used / N°'s de références des autres manifestes utilisés:

Date received / Date de réception — Year / Année: 01 Month / Mois: 12 Day / Jour: 21 Time / Heure: 11:19 ☒ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	Waste identification / Identification du déchet: TDGA/PIN LTMO/NIP	Quantity shipped / Quantité expédiée	Units L or kg / ou kg unités	Classification	Packing group / Groupe d'emballage	Packaging / Contenants: No. Nbre	Packaging / Contenants: Codes Int.-ext.
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	N/A	UN3077	21,000,000	KG	9.2	III	01	03
	(2,3,7,8,TETRACHLORODIBENZO-P-DIOXIN)								

Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants: Yes / Oui	Packaging / Contenants: No / Non	Vehicle / Véhicule: Yes / Oui	Vehicle / Véhicule: No / Non
21980	kg	Bag collected 02			✓		

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: MANIFEST DE TRANSIT 7198852 ☐ Attached / Ci-jointes ☒ Below / Ci-dessous

In case of emergency call Phil 24HR 418-695-1302

Circulation no. – Quebec only / N° de circulation – Réservée au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:

Provincial ID No. / N° d'id. provincial:

Address / Adresse: City / Ville: Prov.:

Date shipped / Date d'expédition — Year / Année: 01 Month / Mois: 12 Day / Jour: 20 Time / Heure: 10:00 ☒ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue — Year / Année: 01 Month / Mois: 12 Day / Jour: 20

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Scott Miller "AS AGENT FOR CENTREVILLE SITE CLOSE"

Signature: Tel. no. / N° de tél.: (401) 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-YVES GAGNON

Signature: Tel. no. / N° de tél.: 418 695-3310

STATE OF RHODE ISLAND

DE RTMENT OF ENVIRONMENTAL MANAGEM

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 17506 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
C/O SANDLER, REILLY, SHERERT, FRIEDMAN, LLP, 3000 K ST.
SUITE [illegible] WASHINGTON, DC 20007
4. Generator's Phone (202 424 7547 and 860 747 6181

A. State Manifest Document Number RI H 0017506

B. Generator's Site Address 2072-2074 BROAD STREET
PROVIDENCE, RI 02904

5. Transporter 1 Company Name TRANSPORT ROLLEX | 6. US EPA ID Number NYF 006000053

C. State Transporter's ID/License Plate L20997 - [illegible]

7. Transporter 2 Company Name | 8. US EPA ID Number

D. Transporter's Phone 775-3131

9. Designated Facility Name and Site Address
Recupere Sol Inc
80 [illegible] Melexes
Saint Ambroise, QUEBEC G7P2H4 | 10. US EPA ID Number | OPERATOR PERMIT # 1142129

E. State Transporter's ID/License Plate

F. Transporter's Phone

G. Facility Mailing Address

H. Facility's Phone (418) 695-1302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	State Waste No.
a. Environmental Hazardous Substances, Solid, N.O.S. (2,3,7,8 Tetrachlorozoxibenzo-p-dioxin) Hazclass 9 UNID # 3077	01	DT	44000	LBS	F020
b. CDN 9115187-B					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-4650911
IN CASE OF EMERGENCY CALL:
PORT OF EXIT FROM USA: DERBY LINE, VT
EMERGENCY RESPONSE GUIDE BOOK NUMBER

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. and conforms to the terms of the attached EPA Acknowledgement of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: SCOTT A. MILLER "AS AGENT FOR CENTREDALE RESTORATION SUPERFUND SITE GROUP" | Signature: Scott Miller | Date: Month 12 Day 20 Year 01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Sylvain Fafard | Signature | Date: Month 12 Day 20 Year 01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: JEAN-LUC [illegible] | Signature | Date: Month 12 Day 21 Year 01

EPA Form 8700-22 (3-84)

Copy 4- Facility Retains

In the event of a spill, contact the National Response Center. U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 222-2797. 24 Hour (401) 222-3070

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14087

PESÉE OFFICIELLE

08:50:21 12-22-01 Truck# 2
Weight 37040 kg

09:44:54 12-22-01 Truck# 2

Gross 37040 kg
Tare 13390 kg
Net 23650 kg

Facturé à

Compagnie Centredale
Rue
Ville / Prov.
C.P.
Tél.:
No Dossier : 010173

Transporteur

Compagnie T. Rollet
Conducteur Hervé Drouin
No / Imm. L170216
No / Bte 1 PP49585
No / Bte 2
No / Conn. 9115195-1
ou Manifeste : ~~MH~~ H'00017518

Description et/ou Classification

Sol BPC

Sol's # 2662
2663

Shipped. 21-12-01

Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115195-1**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial: RI0981203795

Company name / Nom de l'entreprise: CENTREVILLE MANOR SUPERFUND SITE

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal: SAME

Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET

City / Ville: NORTH PROVIDENCE | Province: RI | Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / N° d'id. provincial: 1142-129

Address / Adresse | City / Ville | Province | Postal code / Code postal: 69 RUE DES ERABLES | ST-THEROISE (CHICOUTI) | PQ | J0V 1R0

Receiving site address / Destination de l'expédition: 69 RUE DES ERABLES

City / Ville: ST-THEROISE (CHICOUTI) | Province: PQ | Postal code / Code postal: J0V 1R0

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial: T1153574638

Company name / Nom de l'entreprise: TRANSPORT ROUTIER LTEE

Address / Adresse: 710 BLVD LIONEL BOULET

City / Ville: VARENNES | Prov.: PQ | Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	U70216	QC
Trailer/Rail Car No. 1 / 1re remorque – wagon	P49585	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: | Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Pierre Poirier

Signature: | Tel. No. / N° de tél.: (450) 652-4282

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RL H00017518

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Provincial ID No. / N° d'id. provincial: [X]

Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: [X] Yes / Oui | [ ] No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise:

Address / Adresse:

City / Ville | Province | Postal code / Code posta:

Receiving site address / Destination de l'expédition:

City / Ville | Province | Postal code / Code posta:

Date received / Date de réception: Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Time / Heure: 0950 | [X] A.M. [ ] P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	Waste identification / Identification du déchet: TDGA/PIN LTMO/NIP	Quantity shipped / Quantité expédiée	Units / Unités	Classification	Packing group / Groupe d'emballage	Packaging Contenants: No. / Nbre	Packaging Contenants: Codes Int.-ext.	Quantity received / Quantité reçu	Units / Unités	Identify any shipment discrepancy/ problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants: Yes / Oui	Packaging / Contenants: No / Non	Vehicle / Véhicule: Yes / Oui	Vehicle / Véhicule: No / Non
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	N/A	UN3077	22 000	KG	9, 2	III	01	03	25650	kg	20103 estimé	03		X		
	(2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: Numéro de permis 118902

[ ] Attached / Ci-jointes [ ] Below / Ci-dessous

In case of emergency call RRT 24HR 418-695-1202

Circulation no. – Quebec only / N° de circulation – Réservée au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

Date shipped / Date d'expédition: Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21

Time / Heure: [ ] A.M. [ ] P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année: 01 | Month / Mois: 12 | Day / Jour: 22

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:

Provincial ID No. / N° d'id. provinci:

Address / Adresse | City / Ville | Prov.:

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Scott M. Pour Centreville Site Group | Signature: | Tel. no. / N° de tél.: (401) 231-0227

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-MICHEL GAGNON | Signature: | Tel. / No de tél.: 465-7702

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. RIR[illegible]	Manifest Document No. 17518	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SUIDLER BERLIN SHERIFF FRIEDMAN, LLP, 3000 K ST
SUITE 300, WASHINGTON D.C. 20007

A. State Manifest Document Number: RI H 0017518

4. Generator's Phone: (202) 424-7547 and (860) 747-6181

5. Transporter 1 Company Name

6. US EPA ID Number

B. [illegible]

C. State Transporter ID/License Plate

7. Transporter 2 Company Name

8. US EPA ID Number

D. Transporter's Phone

E. State Transporter ID/License Plate

9. Designated Facility Name and Site Address
RECUPERE SOL INC
80 RUE DE MELEZES
SAINT AMBROSE, QUEBEC C7P2N4

10. US EPA ID Number
OPERATOR PERMIT #
1142-129

F. Transporter's Phone

G. Facility Mailing Address

H. Facility's Phone (418) 385-3307

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	15. Waste No.
GENERATOR a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID #3077	01	DT			[illegible] F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

	Interim	Final		Interim	Final
a.			b.		

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL PORT OF EXIT FROM USA
EMERGENCY RESPONSE GUIDE BOOK NUMBER

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. and conforms to the terms of the attached EPA Acknowledgement of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: SCOTT L. [illegible] "AS AGENT FOR CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP"
Signature: [signature]
Date: Month 12 Day 21 Year 91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month [illegible] Day [illegible] Year [illegible]

18. Transporter 2 Acknowledgement or Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: JEAN MICHEL GAGNON
Signature: [signature]
Date: Month 12 Day 20 Year 91

EPA Form 8700-22 (3-84)

Facility

In the event of [illegible] contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 222-2797, 24 Hour (401) 2[illegible]

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14073

PESÉE OFFICIELLE

08:53:20 12-22-01 Truck# 2
Weight 37140 kg

10:00:20 12-22-01 Truck# 2

Gross 37140 kg
Tare 14390 kg
Net 22760 kg

Facturé à

Compagnie Centre dale
Rue
Ville / Prov.
C.P.
Tél.:
No Dossier : 010173

Transporteur

Compagnie T. Rollet
Conducteur Patrice Chicoine
No / Imm. L 207849
No / Bte 1 RR 90742
No / Bte 2
No / Conn. 9115199-3
ou Manifeste : BIH0017515

Description et/ou Classification

Sol BPC

Sols #2656
2657

Shipped 21-12-01

Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115199-3**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial:

Company name / Nom de l'entreprise: CENTREDALE MANOR SUPERFUND SITE

Mailing address / Adresse postale | City / Ville | Province | Postal code / Code postal: SAME

Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET

City / Ville: NORTH PROVIDENCE | Province: RI | Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / No d'id. provincial: 7616020106037516 | 1142-129

Address / Adresse | City / Ville | Province | Postal code / Code postal: PO BOX 1180 | SOREL | PQ | J3P 5V1

Receiving site address / Destination de l'expédition: 80 RUE DES NELSIES

City / Ville: ST-AMBROISE (CHICOUTPQ | Province: | Postal code / Code postal: G0V 1R0

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial:

Company name / Nom de l'entreprise: TRANSPORT ROLLEX LTEE CRISCO

Address / Adresse: 910 BLVD LIONEL BOULET

City / Ville: VARENNES | Prov.: PQ | Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L207849	PQ
Trailer/Rail Car No. 1 / 1er remorque – wagon	BR90742	PQ
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Rock Island | Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): PATRICK CHICOINE

Signature: P Chicoine | Tel. No. / N° de tél.: (450 652-4282

Reference nos. of other Manifest(s) used / N°'s de références des autres manifestes utilisés: RI A 0017515

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Provincial ID No. / N° d'id. provincial:

Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: [X] Yes / Oui | [ ] No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise:

Address / Adresse:

City / Ville | Province | Postal code / Code postal:

Receiving site address / Destination de l'expédition:

City / Ville | Province | Postal code / Code postal:

Date received / Date de réception — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 22 | Time / Heure: 8:53 [X] A.M. [ ] P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMO/NIP	Quantity shipped / Quantité expédiée	Units L or kg / unités	Classification	Packaging group / Groupe d'emballage	Packaging Containers: No. / Nbre	Codes int. – ext.	Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging / Contenants Yes / Oui	Packaging / Contenants No / Non	Vehicle / Véhicule Yes / Oui	Vehicle / Véhicule No / Non
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	N/A	UN3077	22,000	KG	9.2	III	01	03	22760	kg	soil/stones	07		X		
S	(2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: [ ] Attached / Ci-jointes [X] Below / Ci-dessous

Numéro de prévis 118802

In case of emergency call PAT CHIC 418-652-4282

Circulation no. – Quebec only / N° de circulation – Réservée au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire | Provincial ID No. / N° d'id. provinci

Address / Adresse | City / Ville | Prov.

Date shipped / Date d'expédition — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Time / Heure: 9:00 [X] A.M. [ ] P.M.

Scheduled arrival date / Date d'arrivée prévue — Year / Année: 01 | Month / Mois: 12 | Day / Jour: 22

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): AGENT for Centredale Manor Superfund Site Group / Scott Miller | Signature: Scott Miller | Tel. no. / N° de tél.: (401) 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-PIERRE ENGLER | Signature: | Tel. no. / N° de tél.: 418 652-3705

EMOF 04-1917 (08/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 17515 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MOUND RESTORATION SUPERFUND SITE GROUP
c/o SWIDLER, BERLIN, SHEREFF, FRIEDMAN, LLP, 3000 K ST., SUITE 300, WASHINGTON D.C. 20007

A. State Manifest Document Number RI H 0017515

4. Generator's Phone (202) 424-7547 and (860) 747-6181

B. State Generator ID 2072-2074/SOUTH STREET RD., PROVIDENCE, RI 02904

5. Transporter 1 Company Name | 6. US EPA ID Number | C. State Transporter ID/License Plate

7. Transporter 2 Company Name | 8. US EPA ID Number | D. Transporter's Phone

9. Designated Facility Name and Site Address
RECUPERE SOL INC
80 RUE DE MELERES
SAINT AMBROISE, QUEBEC G7P2H4

10. US EPA ID Number
OPERATOR PERMIT # 1142-129

E. State Transporter ID/License Plate RR 06043

F. Transporter's Phone

G. Facility Mailing Address SAME

H. Facility's Phone (418) 889-3301

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (1,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID # 3077	01	DT			F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above
a. Interim / Final b. Interim / Final

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL
PORT OF EXIT FROM USA: Emergency Response Guide Book Number

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
and conforms to the terms of the attached EPA Acknowledgement of Consent.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford:

Printed/Typed Name	Signature	Date (Month Day Year)
Scott A. Miller "As Agent for Centredale Restoration Superfund Site Group"		12 12 01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Patrick Chesney		12 12 01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEAN-LUC HEZ GAGNON		12 12 01

GENERATOR
TRANSPORTER
FACILITY

In the event of a spill, contact the National Response Center. U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 222-2797, 24 Hour (401) 222-3070

EPA Form 8700-22 (3-84)

Facility

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14074

PESÉE OFFICIELLE

08:55:51 12-22-01 Truck# 2
Weight 37910 kg

10:22:04 12-22-01 Truck# 2

Gross 37910 kg
Tare 14540 kg
Net 23370 kg

Facturé à	
Compagnie	Centredale
Rue	
Ville / Prov.	
C.P.	
Tél.:	
No Dossier :	010173

Transporteur	
Compagnie	J. Rollen
Conducteur	Guy Poirier
No / Imm.	L170444
No / Bte 1	RN20731
No / Bte 2	
No / Conn.	9115208-2
ou Manifeste :	N/A RIH 0017510

Description et/ou Classification

Sol BPC

Seal # 2699
2706

Shipped 21-12-01

Préposé à la réception des sols

Conducteur

MANIFEST / MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115208-2**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial:

Company name / Nom de l'entreprise: CENTENNIAL MANOR SUPERFUND SITE

Mailing address / Adresse postale: JAMES — City / Ville — Province — Postal code / Code postal

Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET

City / Ville: NORTH PROVIDENCE — Province: RI — Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / No d'id. provincial: 7416 Regiek 03916 1142-129

Address / Adresse — City / Ville — Province — Postal code / Code postal: PQ G0V 1R0

Receiving site address / Destination de l'expédition: 60 RUE DES MELEZES

City / Ville: ST-AMBROISE (CRICOUT PQ — Province — Postal code / Code postal: G0V 1R0

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial:

Company name / Nom de l'entreprise: TRANSPORT ROLLEX LTEE R. Poirier Inc

Address / Adresse: 910 BLVD LIONEL BOULET

City / Ville: VARENNES — Prov.: PQ — Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L 170444	QC
Trailer/Rail Car No. 1 / 1er remorque – wagon	RN20731	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: ROUSES POINT — Point of exit / Point de sortie:

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 — Month / Mois: 12 — Day / Jour: 21

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Guy Poirier

Signature: Guy Poirier

Tel. No. / N° de tél.: (450) 652-4264

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Reference nos. of other Manifest(s) used / N°'s de références des autres manifestes utilisés: RI H 0017510

Provincial ID No. / N° d'id. provincial:

Consignee information same as Intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise:

Address / Adresse:

City / Ville — Province — Postal code / Code postal:

Receiving site address / Destination de l'expédition:

City / Ville — Province — Postal code / Code postal:

Date received / Date de réception: Year / Année: 01 — Month / Mois: 12 — Day / Jour: 22

Time / Heure: 8:55 ☒ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	Waste identification / Identification du déchet: TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / unités	Classification	Packaging group / Groupe d'emballage	Packaging Containers: No. / Type	Packaging Containers: Codes Int.–ext.	Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging Containers Yes / Oui	Decontamination / Décontamination: Packaging Containers No / Non	Decontamination / Décontamination: Vehicle / Véhicule Yes / Oui	Decontamination / Décontamination: Vehicle / Véhicule No / Non
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S	N/A	UN3077	22 000	KG	9.2	III	01	03	23370	kg	pour 2 jumi	07		X		
	(2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: Numéro de préavis 118502

In case of emergency call 1-800-24HR-411-695-1102

☐ Attached / Ci-jointes ☒ Below / Ci-dessous

Circulation no. – Quebec only / N° de circulation – Réservé au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:

Provincial ID No. / N° d'id. provincial:

Address / Adresse — City / Ville — Prov.:

Date shipped / Date d'expédition: Year / Année: 01 — Month / Mois: 12 — Day / Jour: 21

Time / Heure: 9:00 ☒ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année: 01 — Month / Mois: 12 — Day / Jour: 21

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Jon Mc Ardle "As Agent for Centennial Manor Superfund Site Grove"

Signature: Jon McArdle

Tel. no. / N° de tél.: (401) 231-0729

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-FICHET GAGNON

Signature: Jean-Fichet Gagnon

Tel. / de tél.: 45-370

MOE/OE1917 (06/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: RID981203755
Manifest Document No.: 17510
2. Page 1 of 1
Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SWIDLER, BERLIN, SHEREFF, FRIEDMAN, LLP, 3000 K ST., SUITE 300, WASHINGTON DC 20007
4. Generator's Phone (202) 424-7547 and (860) 747-6181

A. State Manifest Document Number: RI H 0017510
B. Generator/Site Address: 2072-2074 SMITH STREET NO. PROVIDENCE RI 02904
C. State Transporter ID/License Plate: RI 766
D. Transporter's Phone: 460-632-4242
E. State Transporter ID/License Plate: MN 207 31
F. Transporter's Phone:
G. Facility Mailing Address:
H. Facility's Phone: (418) 695-3302

5. Transporter 1 Company Name: TRANSPORT ROLLEX
6. US EPA ID Number: NYT 006 (0005)
7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
RECUPERE SOL INC
80 RUE DE MELEZES
SAINT AMBROSE, QUEBEC G7P2N4
10. US EPA ID Number: OPERATOR PERMIT # 1142-129

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9 UNID # 3077	01	DT	2000	K	F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

	Interim	Final		Interim	Final
a.			b.		

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL
PORT OF EXIT FROM USA: DERBY LINE VT
EMERGENCY RESPONSE GUIDE BOOK NUMBER

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.
and conforms to the terms of the attached EPA Acknowledgement of Consent.

Printed/Typed Name	Signature	Date (Month Day Year)
SCOTT A. MILLER "AS AGENT FOR CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP"	Scott A. Miller	12 21 01

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
GUY POIRIER	Guy Poirier	12 21 01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEAN-MICHEL GAGNON		12 22 01

GENERATOR

In the event of ...ll, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within RI, and, contact the R.I. Department of Environmental Management (401) 222-2797. 24 Hour (401) ...0

EPA Form 8700-22 (3-84)

Copy 4. Facility Retains

RÉCUPÈRE SOL INC.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14088

PESÉE OFFICIELLE

09:11:16 12-22-01 Truck# 2
Weight 37080 kg

10:27:05 12-22-01 Truck# 2

Gross 37080 kg
Tare 15050 kg
Net 22030 kg

Facturé à

Compagnie Centre dale
Rue
Ville / Prov.
C.P.
Tél.:
No Dossier : 010173

Transporteur

Compagnie T. Rollet
Conducteur Marc-André Bragoux
No / Imm. L199733
No / Bte 1 RN17976
No / Bte 2
No / Conn. 9115197-7
ou Manifeste : ~~[illegible]~~ RIEH00017516

Description et/ou Classification

Sol BPC

Seal # 2658
2659

Shipped 21-12-01

Préposé à la réception des sols

Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115197-7**

A Consignor (Generator) / Expéditeur (Producteur)
Provincial ID No. / N° d'id. provincial: RIP5612037755
Company name / Nom de l'entreprise: CENTENNIAL MANOR SUPERFUND SITE
Mailing address / Adresse postale: SAME
City / Ville: NORTH PROVIDENCE Province: RI Postal code / Code postal:
Shipping site address / Origine de l'expédition: 2075-2177 SMITH STREET
City / Ville: NORTH PROVIDENCE Province: RI Postal code / Code postal:

Intended consignee / Destinataire prévu: RECUPERSOL INC.
Provincial ID No. / No d'id. provincial: 7616028106 03716 1142-129
Address / Adresse: 910 BOUL LIONEL BOULET City / Ville: VARENNES Province: PQ Postal code / Code postal: J3X 1P7
Receiving site address / Destination de l'expédition: 910 BOUL LIONEL BOULET
City / Ville: VARENNES Province: PQ Postal code / Code postal: J3X 1P7

B Carrier / Transporteur
Provincial ID No. / N° d'id. provincial: 1145507438
Company name / Nom de l'entreprise: TRANSPORT ROBERT LTEE / CRSSD TRANSIT
Address / Adresse: 910 BLVD LIONEL BOULET
City / Ville: VARENNES Prov.: PQ Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L 199753	QC
Trailer/Rail Car No. 1 / 1er remorque – wagon	RD 17976	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée: Rock Island Point of exit / Point de sortie: Derby Line

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 01 Month / Mois: 12 Day / Jour: 21
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Marc André Bagaar
Signature: Marc André Bagaar
Tel. no. / N° de tél.: 450 652-4282

C Consignee (Receiver) / Destinataire (Réceptionnaire)
Provincial ID No. / N° d'id. provincial:
Consignee information same as intended Consignee in Part A. / L'information à fournir par le destinataire est la même qu'en A. ☑ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous
Company name / Nom de l'entreprise:
Address / Adresse:
City / Ville: Province: Postal code / Code postal:
Receiving site address / Destination de l'expédition:
City / Ville: Province: Postal code / Code postal:

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: R1 H 0017516

Date received / Date de réception: Year / Année: 01 Month / Mois: 12 Day / Jour: 10 Time / Heure: 911 ☑ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / ou kg unités	Classification	Packing group / Groupe d'emballage	Packaging Contenants No. Nbre	Packaging Contenants Codes int.-ext.	Quantity received / Quantité reçu	Units L or kg / unités	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination Packaging Contenants Yes / Oui	Decontamination Packaging Contenants No / Non	Decontamination Véhicule Yes / Oui	Decontamination Véhicule N
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN)	N/A	UN3077	22000	Kg	9.2	III	01	03	02030	Kg	poids estimé 02			1		1

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: 718302
In case of emergency call REA 24HR 418-695-3302
☐ Attached / Ci-jointes ☒ Below / Ci-dessous

Circulation no. – Quebec only / N° de circulation – Réservé au Québec:

If handling code "Other" (specify) / Si code de manutention "divers", spécifier:

Date shipped / Date d'expédition: Year / Année: 01 Month / Mois: 12 Day / Jour: 21 Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 01 Month / Mois: 12 Day / Jour: 22

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire:
Provincial ID No. / N° d'id. provincia:
Address / Adresse: City / Ville: Prov.:

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): Assistant Facilitateur Site Group Scott Miller
Signature: Scott Miller
Tel. no. / N° de tél.: (416) 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-LUC HEBERT GAGNON
Signature:
Tel. no. / N° de tél.: (418) 695-3302

MOE 04-1917 (06/99)

STATE OF RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 17516 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SNIDLER, BERLIN, SHEREFF, FRIEDMAN, LLP, 3000 K ST. SUITE 300, WASHINGTON, D.C. 20007

A. State Manifest Document Number RI H 0017516

B. Generator Site Address 2072-2074 BROAD STREET NO. PROVIDENCE, RI 02904

4. Generator's Phone (202) 424-7547 and (860) 747-6181

5. Transporter 1 Company Name | 6. US EPA ID Number | C. State Transporter ID/License Plate

7. Transporter 2 Company Name | 8. US EPA ID Number | D. Transporter's Phone

E. State Transporter ID/License Plate

9. Designated Facility Name and Site Address
RECUPERE SOL INC.
80 RUE DE MELEZES
SAINT AMBROSE, QUEBEC G7P2M4

10. US EPA ID Number OPERATOR PERMIT # 1142 129 | F. Transporter's Phone

G. Facility Mailing Address

H. Facility's Phone (418) 839-3302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (2,3,7,8 TETRACHLORODIBENZO-P-DIOXIN) HAZCLASS 9 UNID #3077	01	DT			F020
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

	Interim	Final		Interim	Final
a.			b.		
c.			d.		

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911
IN CASE OF EMERGENCY CALL
PORT OF EXIT FROM USA? Emergency Response Guide Book Number

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method available to me which minimizes the present and future threat to human health and the environment: or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.
and conforms to the terms of the attached EPA Acknowledgement of Consent

Printed/Typed Name: SCOTT A. MILLER "AS AGENT FOR CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP" | Signature: Scott A Miller | Date: Month 12 Day 27 Year 01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: JEAN LETCHER Co-Mgr | Signature | Date: Month 12 Day 28 Year 01

EPA Form 8700-22 (3-84)

Facility

GENERATOR | TRANSPORTER | FACILITY

In the event of a spill, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within Rhode Island, contact the R.I. Department of Environmental Management (401) 222-2797. 24 Hour (401) 222-3070

RÉCUPÈRE SOL inc.

80, rue des Mélèzes
Saint-Ambroise (Québec)
G7P 2N4

Tél.: (418) 695-3302
Fax : (418) 695-3303

No 14089

PESÉE OFFICIELLE

10:31:22 12-22-01 Truck# 2
Weight 36910 kg

11:17:07 12-22-01 Truck# 2

Gross 36910 kg
Tare 13170 kg
Net 23740 kg

Facturé à	
Compagnie	Centre dale
Rue	
Ville / Prov.	
C.P.	
Tél.:	
No Dossier :	010173

Transporteur	
Compagnie	T. Rollex
Conducteur	Andre Beauregard
No / Imm.	L170214
No / Bte 1	BD97114
No / Bte 2	
No / Conn.	9115196-9
ou Manifeste :	~~NDF3~~ BIH0017517

Description et/ou Classification

Sol BBC

Seal # 2660
2661

Shipped 21-12-01

Préposé à la réception des sols

A Beauregard
Conducteur

MANIFEST - MANIFESTE

This Manifest conforms to all Federal and Provincial transport and environmental legislation requiring manifesting.
Ce manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport, requérant un manifeste.

Manifest Reference No. / N° de référence du manifeste: **9115196-9**

A Consignor (Generator) / Expéditeur (Producteur)

Provincial ID No. / N° d'id. provincial: RI098120375S

Company name / Nom de l'entreprise: CENTREDALE MANOR SUPERFUND SITE

Mailing address / Adresse postale: SAME | City / Ville | Province | Postal code / Code postal

Shipping site address / Origine de l'expédition: 2072-2074 SMITH STREET

City / Ville: NORTH PROVIDENCE | Province: RI | Postal code / Code postal

Intended consignee / Destinataire prévu: RECUPERSOL INC.

Provincial ID No. / No d'id. provincial: 7410C20166B03516 1142-129

Address / Adresse | City / Ville | Province | Postal code / Code postal: PQ J0V 1R0

Receiving site address / Destination de l'expédition: 80 RUE DES METIERS

City / Ville: ST-JEROME (CHICOUTIMI) | Province | Postal code / Code postal: J0V 1R0

B Carrier / Transporteur

Provincial ID No. / N° d'id. provincial: 1115934138

Company name / Nom de l'entreprise: TRANSPORT ROLLEX LTEE 3117451 CANADA INC & FORTEGARD

Address / Adresse: 910 BLVD LIONEL BOULET

City / Ville: VARENNES | Prov.: PQ | Postal code / Code postal: J3X 1P7

	Registration No. / N° d'immatriculation	Prov.
Vehicle / Véhicule	L17[illegible]0214	QC
Trailer/Rail Car No. 1 / 1er remorque – wagon	RJ97114	QC
Trailer/Rail Car No. 2 / 2e remorque – wagon		

Point of entry / Point d'entrée | Point of exit / Point de sortie

Carrier Certification: I declare that I have received waste as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. / Déclaration du transporteur : J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets.

Year / Année: 21 | Month / Mois: 12 | Day / Jour: 21 | Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): A FORTEGARD

Signature | Tel. no. / N° de tél.: 450 652-4282

C Consignee (Receiver) / Destinataire (Réceptionnaire)

Provincial ID No. / N° d'id. provincial

Consignee information same as intended Consignee in Part A / L'information à fournir par le destinataire est la même qu'en A: ☒ Yes / Oui ☐ No, complete the boxed area below / Non, compléter la boîte ci-dessous

Company name / Nom de l'entreprise

Address / Adresse

City / Ville | Province | Postal code / Code postal

Receiving site address / Destination de l'expédition

City / Ville | Province | Postal code / Code postal

Reference nos. of other Manifest(s) used / N°s de références des autres manifestes utilisés: RI H0017517

Date received / Date de réception: Year / Année: 02 | Month / Mois: 12 | Day / Jour: 02 | Time / Heure: 1031 ☒ A.M. ☐ P.M.

Physical state / État physique	Shipping name of waste / Appellation réglementaire du déchet	Waste identification / Identification du déchet: Provincial No. / N° (Quebec-Ontario only) (Québec-Ontario seul)	TDGA/PIN LTMD/NIP	Quantity shipped / Quantité expédiée	Units L or kg / unités L ou kg	Classification	Packaging group / Groupe d'emballage	Packaging Containers: No. / Nbre	Codes int.-ext.	Quantity received / Quantité reçu	Units L or kg / unités L ou kg	Identify any shipment discrepancy problems. Attach addendum if necessary. / Indiquer toute différence relative à l'expédition. Annexer une feuille au besoin.	Handling code / Code de manutention	Decontamination / Décontamination: Packaging Containers Yes / Oui	Packaging Containers No / Non	Vehicle / Véhicule Yes / Oui	Vehicle / Véhicule No
S	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S	N/A	UN3077	22 000	KG	9.2	III	01	03	23 740	kg par estimation				☒		
	(2,3,7,8,TETRACHLORODIBENZO-P-DIOXIN)																

Special handling/Emergency instructions / Manutention spéciale/instructions d'urgence: ☐ Attached / Ci-jointes ☒ Below / Ci-dessous

DANGEREUX DE PERMIS 118002

In case of emergency call RSI 24HR 418-655-3702

Circulation no. – Quebec only / N° de circulation – Réservé au Québec

If handling code "Other" (specify) / Si code de manutention "divers", spécifier

If waste to be transferred, specify intended company name / Si les déchets doivent être transférés, préciser le nom du destinataire | Provincial ID No. / N° d'id. provincial

Address / Adresse | City / Ville | Prov.

Date shipped / Date d'expédition: Year / Année: 01 | Month / Mois: 12 | Day / Jour: 21 | Time / Heure: 1130 ☒ A.M. ☐ P.M.

Scheduled arrival date / Date d'arrivée prévue: Year / Année | Month / Mois | Day / Jour

Consignor Certification: I declare that the information contained in Part A is correct and complete. / Déclaration de l'expéditeur : Je déclare que tous les renseignements à la partie A sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): [illegible] Superv. de Carrefour de Manoir Restoration Site Cleanup | Signature | Tel. no. / N° de tél.: 401 231-0229

Consignee Certification: I declare that the information contained in Part C is correct and complete. / Déclaration du l'expéditeur : Je déclare que tous les renseignements à la partie C sont véridiques et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): JEAN-FRANÇOIS GAGNE

Signature | Tel. no. / N° de tél.: 645-7332

STATE OF RHODE ISLAND

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Hazardous Waste Manifest Section
235 Promenade Street, Providence, RI 02908
(401) 222-2797

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 17517 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law, but may be required by state law.

3. Generator's Name and Mailing Address
CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP
c/o SWIDLER BERLIN SHEREFF FRIEDMAN, LLP, 3000 K ST
SUITE 300, WASHINGTON D.C. 200007

A. State Manifest Document Number RI H 0017517

4. Generator's Phone (202) 424-7547 and (860) 747-6181

B. [illegible] SITE ST.
RD. PROVIDENCE, RI. 02904

5. Transporter 1 Company Name | 6. US EPA ID Number | C. State Transporter ID/License Plate

7. Transporter 2 Company Name | 8. US EPA ID Number | D. Transporter's Phone

9. Designated Facility Name and Site Address
RECUPERE SOL INC
80 RUE DE MELEZES
SAINTE AMEROSE, QUEBEC G7P2B4

10. US EPA ID Number
OPERATOR PERMIT #
1142 129

E. State Transporter ID/License Plate

F. Transporter's Phone

G. Facility Mailing Address

H. Facility's Phone (418) 699-2302

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. RECUPERE SOL INC ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID NOS (1,3,7,8 TETRACHLOROZODIBENZO-P-DIOXIN) HAZCLASS 9	01	DT			F020 [illegible]
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
a. b. c. d.

K. Handling Codes for Wastes Listed Above

	Interim	Final		Interim	Final
a.			b.		

15. Special Handling Instructions and Additional Information
TRANSPORT ROLLEX 1-800-465-0911 IN CASE OF EMERGENCY CALL PORT OF EXIT FROM USA: EMERGENCY RESPONSE GUIDE BOOK NUMBER

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. and conforms to the terms of the EPA attached
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; or, if I am a small quantity, I have made good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. acknowledgement of consent.

Printed/Typed Name	Signature	Date (Month Day Year)
SCOTT A. MILLER AS AGENT FOR CENTREDALE MANOR RESTORATION SUPERFUND SITE GROUP	Scott A. Miller	

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

18. Transporter 2 Acknowledgement or Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
JEAN-MICHEL GIROUX	[signature]	12 02 01

Facility

EPA Form 8700-22 (3-84)

GENERATOR

In the event [illegible] land, contact the R.I. Department of Environmental Management (401) 222-2797, 24 Hour (401) 70

[illegible] ill, contact the National Response Center, U.S. Coast Guard 1-800-424-8802. For spills within R[illegible]

APPENDIX F

APPENDIX F

Transportation Manifests and CWM Certificates of Disposal

Waste Management, LLC
CWM Chemical Services
1550 Balmer Road
Model City, NY 14107
Phone 716-754-0457
Fax 716-754-0211

Fax

To:	Dave Scotty	**From:**	Eileen M. Carbone
Fax:	860-747-8822	**Pages:**	
Phone:		**Date:**	11/17/2003
Re:	Centerdale	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Following is the Manifest and COD for the material received from Centerdale Manor. We only received one load from this generator.

Thank you

Eileen

NYH0638253

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please type or print. Do not staple. (Hazardous Waste Manifest 9168)

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA No. RID881203755 Manifest Doc. No. 026466
2. Page 1 of 1 — Information within heavy bold line is not required by Federal Law.

3. Generator's Name and Mailing Address: CENTREDALE MANOR RESTORATION 100 ALLENDALE SAVE NORTH PROVIDENCE RI 02911
A. NYH0638253
B. 100 ALLENDALE AVE NORTH PROVIDENCE, RI 0291

4. Generator's Telephone Number (202) 424-7541 Jerry Mays
C. State Transporter's ID
D. Transporter's Telephone 716 754-0366

5. Transporter 1 (Company Name): CWM CHEMICAL SERVICES
6. US EPA ID Number: NYD000688671
E. State Transporter's ID

7. Transporter 2 (Company Name): F.R. Trucking Corp
8. US EPA ID Number: NJN000210536
F. Transporter's Telephone 908 [illegible]

9. Designated Facility Name and Site Address: CWM CHEMICAL SERVICES, L.L.C 1550 BALMER ROAD MODEL CITY, NY 14107
10. US EPA ID Number: NYD049836679
G. State Facility ID: N/A
H. Facility Telephone 716 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ HAZARDOUS WASTE, SOLID, n.o.s. X - (CHROMIUM, LEAD), 9, NA3077, III, (F020)	001	CM	27,000	P	EPA F020
b.					STATE
c.					EPA
					STATE
d.					EPA
					STATE

J. Additional Descriptions for Materials Listed Above
a. ASSH FOD REMEDIATION DEBRIS
CV9668
b.

K. Handling Codes for Wastes Listed Above
a. c.
b. d.

15. Special Handling Instructions and Additional Information
PACKING SLIPS ATTACHED FOR CLARIFICATION EMERGENCY NUMBER-INFOTRAC 800 535-5053

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.
If I am large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a smaller generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.
Printed/Typed Name: Robert Lennan Signature: [signature] Mo. 05 Day 30 Year 02

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Mo. Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name Signature Mo. Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name Signature Mo. Day

COPY 5 - GENERATOR - MAILED BY TSD FACILITY

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental [illegible]

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
100 ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 05/31/02 as described on Hazardous Waste Manifest number NYH0638253 Sequence number 01.

Profile Number: CV9668
CWM Tracking ID: 8156092201
CWM Unit #: 1*0
Disposal Date: 06/25/02

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 232344
07/22/02

For questions please call our Customer Service Dept at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
100 ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 05/31/02 as described on Hazardous Waste Manifest number NYH0638253 Sequence number 01.

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CWM Tracking ID: 8156092201
CWM Unit #: 1*0
Disposal Date: 06/25/02

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 232344
07/22/02

For questions please call our Customer Service Dept at (800) 843-3604

APPENDIX G

APPENDIX G

GEI Design Modification for Granite Wall Abutment

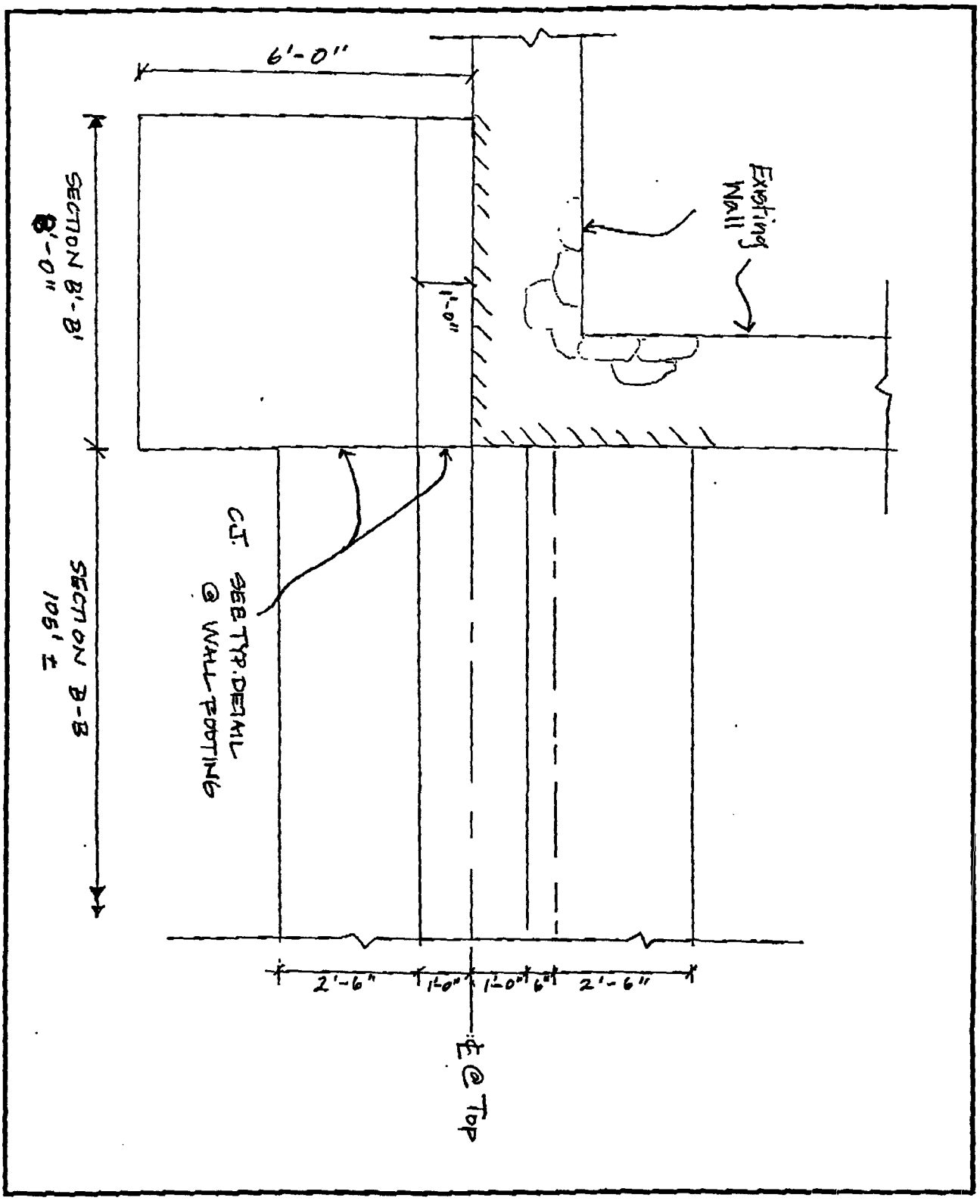
GEI Consultants, Inc.

Project 011792 Page 1

Client LEA/LCI Date Nov. 26, 2001 By M. Walker/M. Cl...

Subject Right Abutment - Detail Checked By

Approved By



PARTIAL PLAN @ RIGHT ABUTMENT

(N.T.S.)

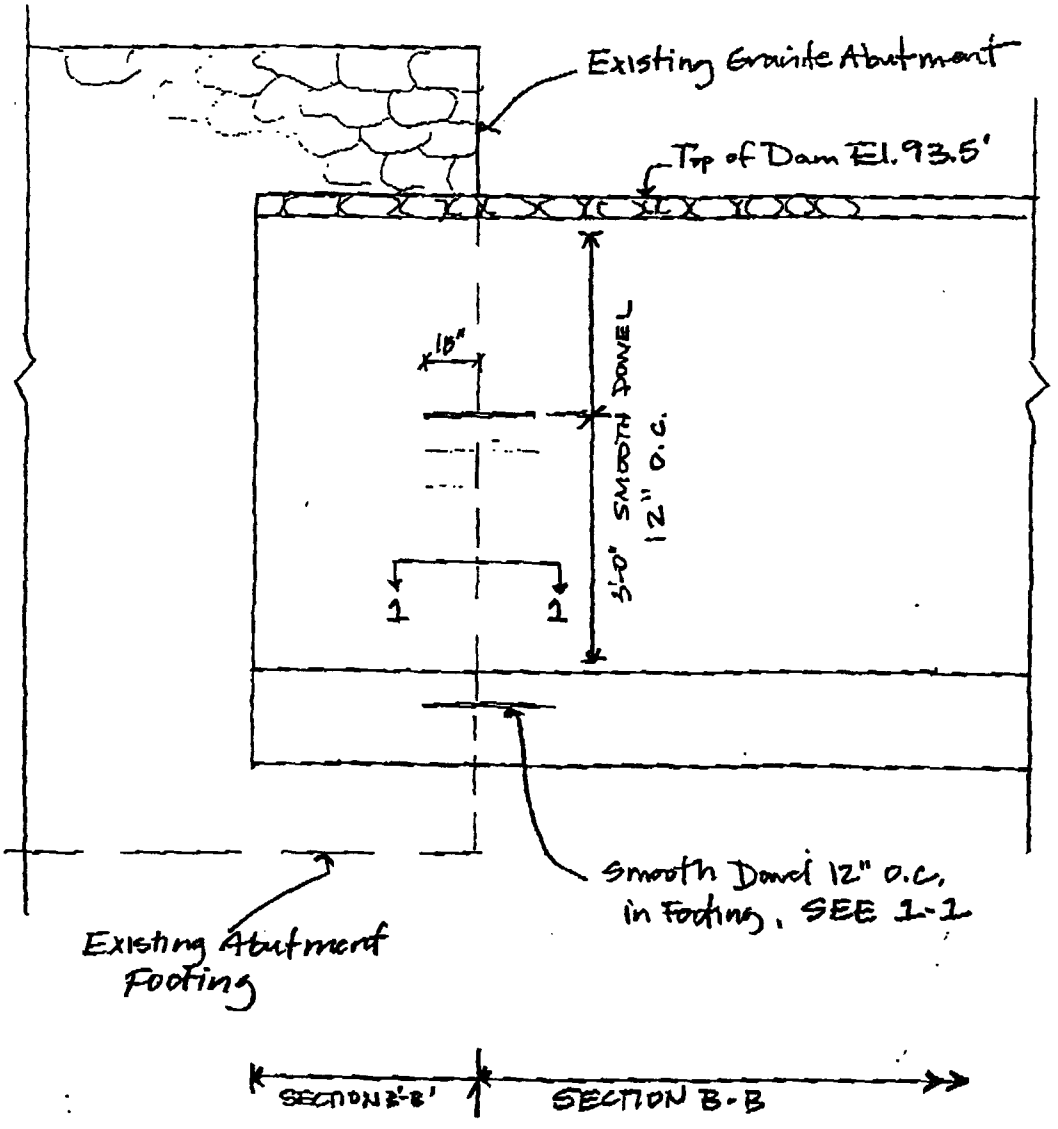
GEI Consultants, Inc.

Project 01179Z Page 2

Client LEA/LCI Date Nov. 26, 2001 By M. Walker/M.Cl.

Subject Right Abutment Detail Checked By

Approved By

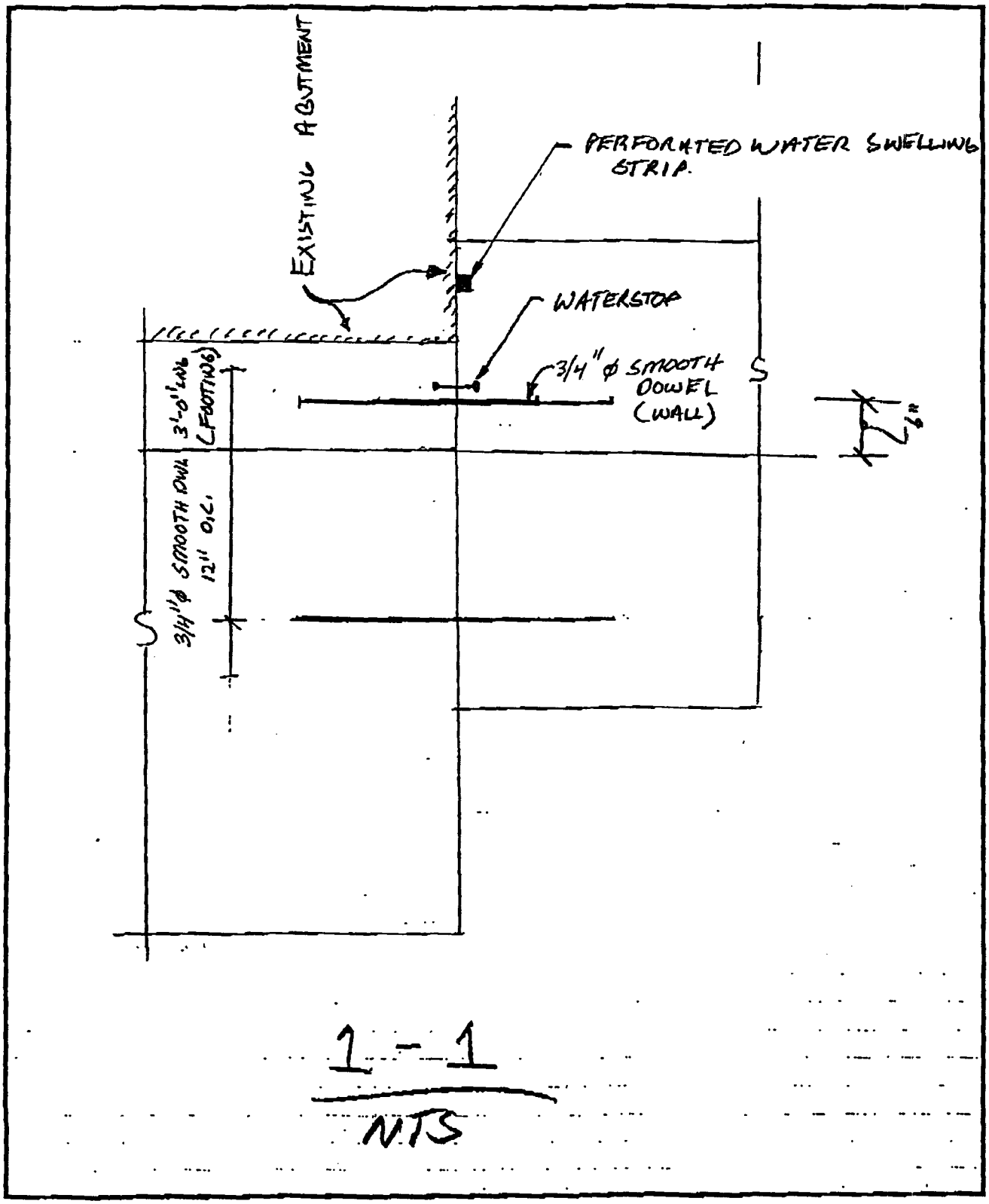


PARTIAL ELEVATION @ C.J.

(N.T.S.)

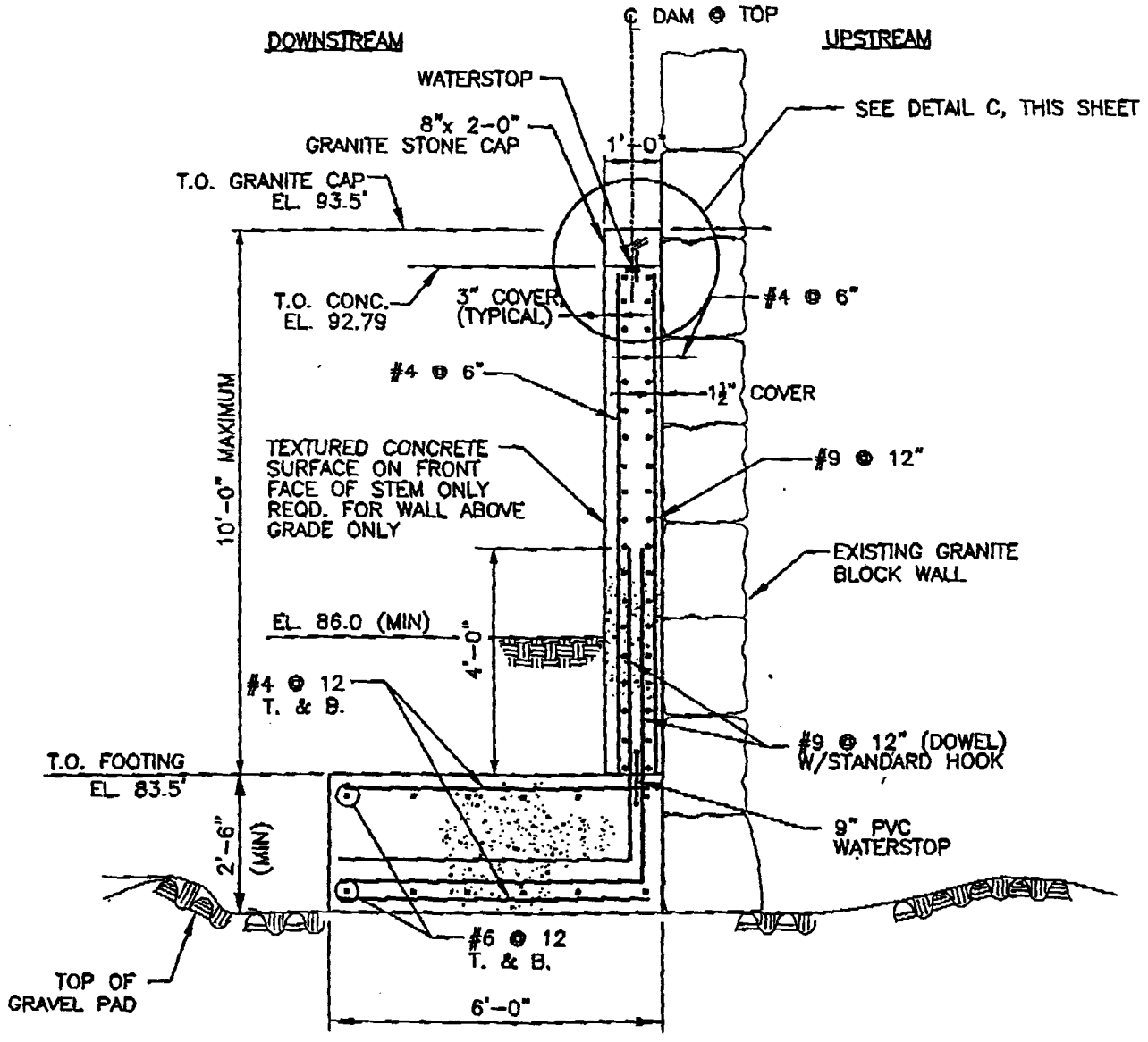
GEI Consultants, Inc.

	Project	Page	3
Client	Date	By	
Subject	Checked	By	
	Approved	By	



1 - 1

NTS



NOTE: USE SINGLE SIDE FORMS AT GRANITE WALL.

SECTION B'-B'

APPENDIX H

APPENDIX H

Briggs Engineering & Testing Inspection Reports

Briggs Engineering & Testing *A Division of PK Assoc., Inc.*				Daily Report Project: Allendale Dam Restoration Project #: 21165 Inspector: Joel Olivieri			
ARRVL:	09:30	JOB HRS.:		DATE:	12/05/01	CODE:	R17, C26
TEMP:	60F	WIND:	Low	HUMID.:	Med	SUNNY	
NO OF PAGES TO THIS REPORT:			1 of 3	NO BACKUP SHEETS TO THIS REPORT:			2

I reported to the above mentioned project site at the request of the client in order to conduct reinforcing steel and concrete inspections.

Reinforcing steel and concrete:

1. A reinforcing steel inspection was conducted today.

2. Contractor placed 45 cubic yards of 5000 PSI concrete today in which 1 set of 4 test cylinders was fabricated and stored in a bucket by job trailer.

Notified the site super of all findings. Please see the attached reports for all details.

cc: Mr. Scott A. Miller, PM, LEA-Cianci, Inc.

Approval: Asnaul H. Mahmoodi, Ph. D., P.E. Eng.

Briggs Engineering & Testing
A Division of PK Associates, Inc.

Concrete Reinforcing Steel Report

PROJECT: Allendale Dam			
PROJECT#: 21165			
INSPECTOR: Joe Olivieri			
EMP.#:	REPORT#:	DATE: 12-05-01	CODE: R17, C24
PAGE 2 OF 3			
TEMP.: H 60 L	WIND: H (L)	HUMID.: H (M) L	(SUNNY) CLOUDY

Reinforcing steel was inspected for arrangement, cleanliness and checked against working drawings and reference specifications of ACI-301 for the following items. Check marks indicate compliance. All items in non-compliance are either corrected during inspection or noted below. Inspection of mechanical connections such as "Caldwell" or "Stricon" are reported separately when performed.

Size and location:	✓	Clearance to forms:	✓
Grade Strength:	✓	Extra bars at openings:	✓
Splice Lapping:	✓	Adequate ties:	✓
Spacing:	✓	Concrete coverage:	✓
Supports:	N/A	Stirrup spacing:	N/A

Location and Drawing #: #51
Footing along existing Dam

Remarks: Checked drawings and no #'s or letter lines were noticed.

Technician Joe Olivieri **Approved**

Briggs Engineering & Testing
A Division of PK Associates, Inc.

CONCRETE PLACEMENT INSPECTION

PROJECT: Allendale Dam
PROJECT#: 21165
INSPECTOR: Josh Olivieri
DATE: 12-5-01 CODE: C26
PAGE 3 OF 3
TEMP.: H 60 ° L ° WIND.: H M (L) HUMID.: H (M) L (SUNNY) CLOUDY
Concrete Source: PRM General Contractor: LEA - CIANCI
Storage Location: Curing Box: Other: In Bucket By Trailor

Inspection completed as per ACI-301 and Contract Documents. A checklist of major items is presented. All items in non-conformance are either corrected during inspection or noted herein. Detailed inspection of reinforcing for size, quantity, grade, spacing and configuration is reported separately when performed.

Preplacement:

Weather	✓	Steel arrangement	✓
Temp.	✓	Steel clearance	✓
Forms for general requirements.	✓	Steel cleanliness	✓
Grade preparation	✓	Steel supports	N/A

Placement:

Concrete placed within limits of ASTM C-94 and Contract Documents. Non-compliance items are either corrected before placement or noted herein. Concrete sampled in accordance with ASTM C-172.

ASTM C-94 Limits			ASTM C-94 Limits		
Time Limits	✓	1-1/2 hrs. max.	Temperature	✓	50-90° F
Slump	✓	- 5"	Mixing	-	70-300 Rev.
Air Content	✓	4-7 %	Density	-	± 3 p.c.f.

Location: Footing Along Existing Dam no Line #

Remarks:

Method of Placement: Chute ____ Pump ✓ Other ____

Load No.	Arr. Time	Truck No.	No. of Yds.	Mix Duration (min.)	Conc. Temp. (°F)	Slump (in.)	Air (%)	Air Temp. (°F)	Conc. Strength Deliv.	Conc. Strength Required	CA Size	Cyl. Fabr.	Set #	Gals. added water	Unit Weight (pcf)
1	947	185	11	52					5K	5K	3/4				
2	1025	182	9	40	75	5	5.5	60	5K	5K	3/4	4	1		
3	1045	174	9	35					↓	↓	↓				
4	1112	134	9	52											
5	1120	185	7	46											
6															
7															
8															
9															
10															

Approved:

Briggs Engineering & Testing *A Division of PK Assoc., Inc.*				Daily Report Project: Allendale Dam Restoration Project #: 21165 Inspector: Joshua Melvin			
ARRVL:	01:45	JOB HRS.:	2.0	DATE:	12/07/01	CODE:	C26
TEMP:	50F	WIND:	Low	HUMID.:	Low	SUNNY	
NO OF PAGES TO THIS REPORT:			1 of 2	NO BACKUP SHEETS TO THIS REPORT:			1

I reported to the above mentioned project site at the request of the client in order to conduct a concrete inspection.

Reinforcing steel and concrete:

1. A reinforcing steel inspection was not conducted today.

2. Contractor placed 40 cubic yards of 5000 PSI concrete today in which 1 set of 4 test cylinders was fabricated and stored at trailer, under stairs.

Notified the Scott Miller of all findings. Please see the attached report for all details.

cc: Mr. Scott A. Miller, PM, LEA-Cianci, Inc.

Approval: Asnaul H. Mahmoodi, Ph. D., C. Eng.

Briggs Engineering & Testing
A Division of PK Associates, Inc

CONCRETE PLACEMENT INSPECTION

PROJECT: Allendale Dam Restoration
PROJECT#: 21160
INSPECTOR: Josh Melvin

PAGE 2 OF 2 | DATE: 12-7-01 | CODE: C26
TEMP.: H • L 50° | WIND.: H M (L) | HUMID.: H M (L) | (SUNNY) CLOUDY

Concrete Source: PRM | General Contractor: LEA-CIANCI
Storage Location: Curing Box: | Other: At trailer under Stairs

Inspection completed as per ACI-301 and Contract Documents. A checklist of major items is presented. All items in non-conformance are either corrected during inspection or noted herein. Detailed inspection of reinforcing for size, quantity, grade, spacing and configuration is reported separately when performed.

Preplacement:

Weather	✓	Steel arrangement	✓
Temp.	✓	Steel clearance	✓
Forms for general requirements.	✓	Steel cleanliness	✓
Grade preparation	✓	Steel supports	✓

Placement:

Concrete placed within limits of ASTM C-94 and Contract Documents. Non-compliance items are either corrected before placement or noted herein. Concrete sampled in accordance with ASTM C-172.

ASTM C-94 Limits			ASTM C-94 Limits		
Time Limits	✓	1-1/2 hrs. max.	Temperature	✓	50-90° F
Slump	✓	1-4 "	Mixing	-	70-300 Rev.
Air Content	✓	5-7 %	Density	-	± 3 p.c.f.

Location: Footing for Dam

Remarks: High Early Strength Mix

Method of Placement: Chute ✓ Pump _____ Other _____

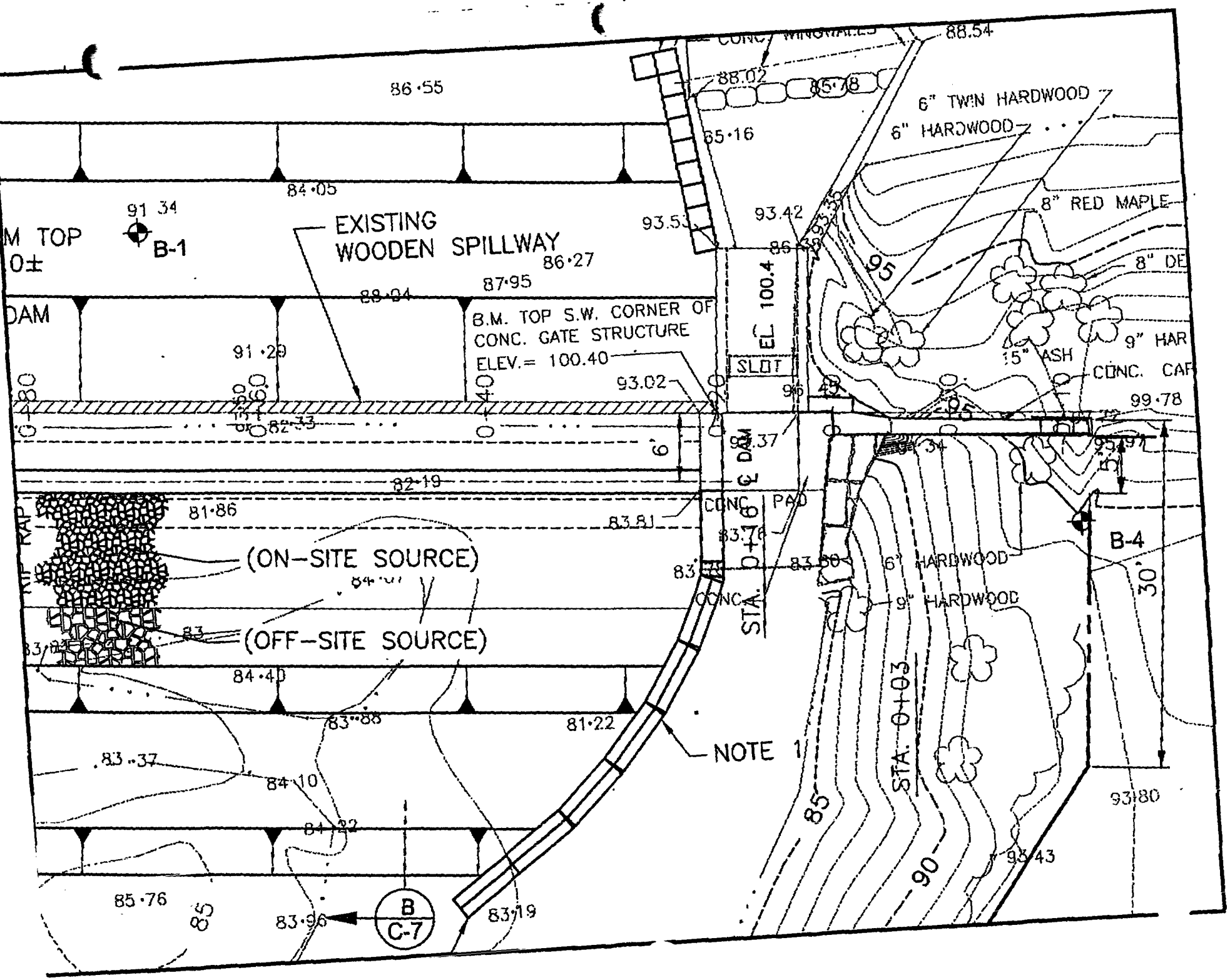
Load No.	Arr. Time	Truck No.	No. of Yds.	Mix Duration (min.)	Conc. Temp. (°F)	Slump (in.)	Air (%)	Air Temp. (°F)	Conc. Strength Deliv.	Conc. Strength Required	CA Size	Cyl. Fabr.	Set #	Gals. added water	Unit Weight (pcf)
1	2:06	183	10	45					5000	5000	3/4			5	
2	2:22	184	10	40	75	3¼	6.5	50	↓	↓	↓	4	1	5	
3	2:25	185	10	55											
4	2:55	78	10	60											
5															
6															
7															
8															
9															
10															

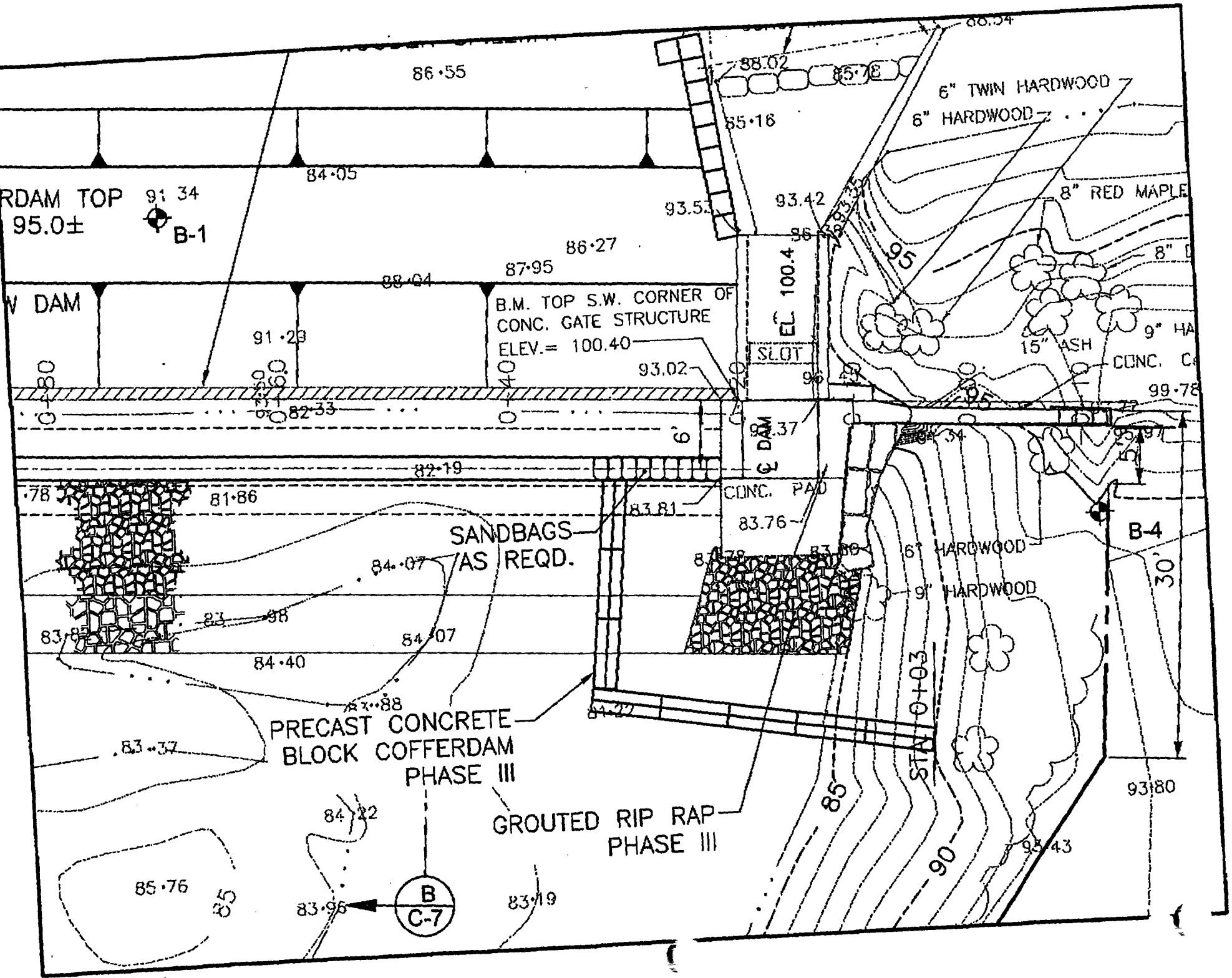
Approved:

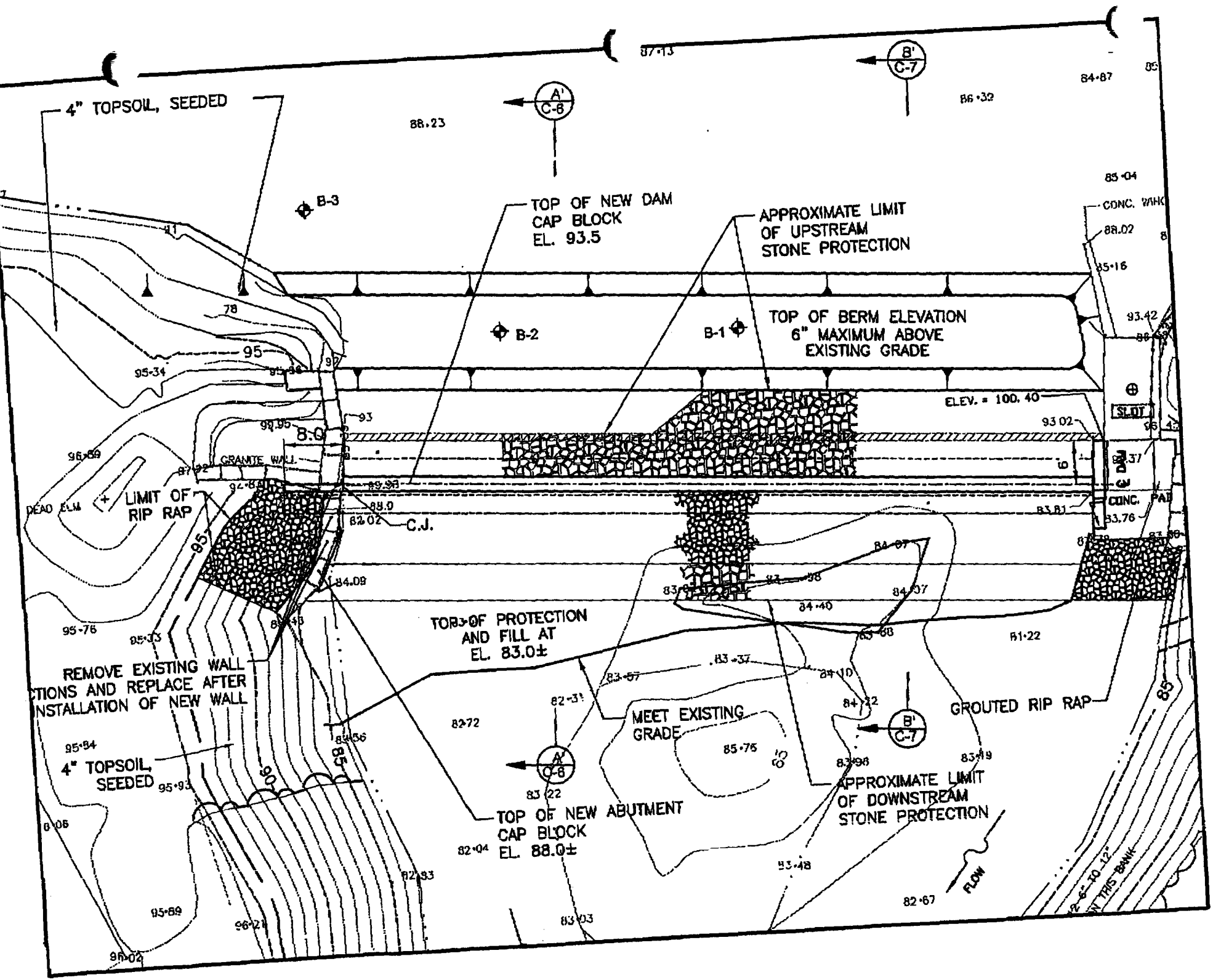
APPENDIX I

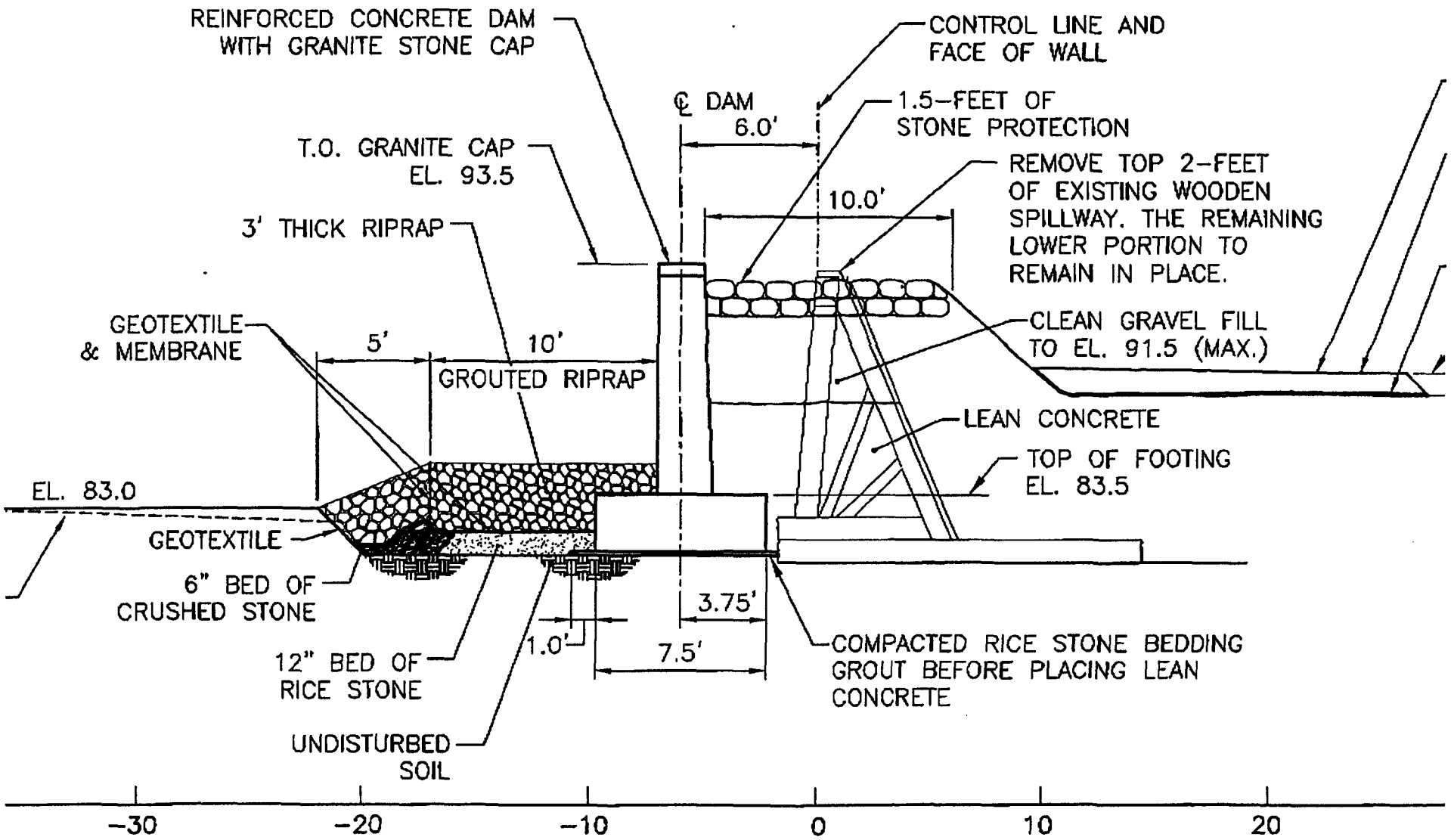
APPENDIX I

GEI Design Specifications for Toe Drain and Grouted Riprap Pad


86·55
84·05
91 34
B-1
EXISTING
WOODEN SPILLWAY
86·27
87·95
88·04
B.M. TOP S.W. CORNER OF
CONC. GATE STRUCTURE
ELEV.= 100.40
91·29
93.02
82·33
82·19
81·86
83.81
(ON-SITE SOURCE)
(OFF-SITE SOURCE)
84·40
83·88
81·22
83·37
84·10
84·22
85·76
83·96
B
C-7
83·19
NOTE 1
88.54
88.02
85·18
85·16
6" TWIN HARDWOOD
6" HARDWOOD
93.53
93.42
8" RED MAPLE
8" DE
EL. 100.4
SLOT
9" HAR
15" ASH
CONC. CAP
99·78
93.37
95·91
CONC. PAD
83.76
83·80
6" HARDWOOD
9" HARDWOOD
B-4
30'
STA. 0+16
STA. 0+03
85
90
93·80
93·43


86·55
84·05
RDAM TOP
95.0±
91 34
B-1
86·27
87·95
88·04
W DAM
B.M. TOP S.W. CORNER OF
CONC. GATE STRUCTURE
ELEV.= 100.40
91·28
82·33
82·19
81·86
SANDBAGS
AS REQD.
84·07
83·98
84·40
PRECAST CONCRETE
BLOCK COFFERDAM
PHASE III
83·37
84·22
85·76
83·96
B
C-7
83·19
GROUTED RIP RAP
PHASE III
88.02
85·16
93.53
93.42
EL 100.4
SLOT
93.02
96·43
CONC. PAD
83.81
83.76
6" TWIN HARDWOOD
6" HARDWOOD
8" RED MAPLE
15" ASH
CONC.
99·78
B-4
6" HARDWOOD
9" HARDWOOD
30'
STA 0+03
85
90
93·43
93·80


4" TOPSOIL, SEEDED
A' C-8
B' C-7
B-3
B-2
B-1
TOP OF NEW DAM CAP BLOCK EL. 93.5
APPROXIMATE LIMIT OF UPSTREAM STONE PROTECTION
TOP OF BERM ELEVATION 6" MAXIMUM ABOVE EXISTING GRADE
ELEV. = 100.40
GRANITE WALL
LIMIT OF RIP RAP
C.J.
TOP OF PROTECTION AND FILL AT EL. 83.0±
REMOVE EXISTING WALL
TIONS AND REPLACE AFTER
NSTALLATION OF NEW WALL
4" TOPSOIL, SEEDED
MEET EXISTING GRADE
GROUTED RIP RAP
TOP OF NEW ABUTMENT CAP BLOCK EL. 88.0±
APPROXIMATE LIMIT OF DOWNSTREAM STONE PROTECTION
FLOW
CONC. WALL
CONC. PAD
SLOT
DEAD ELM

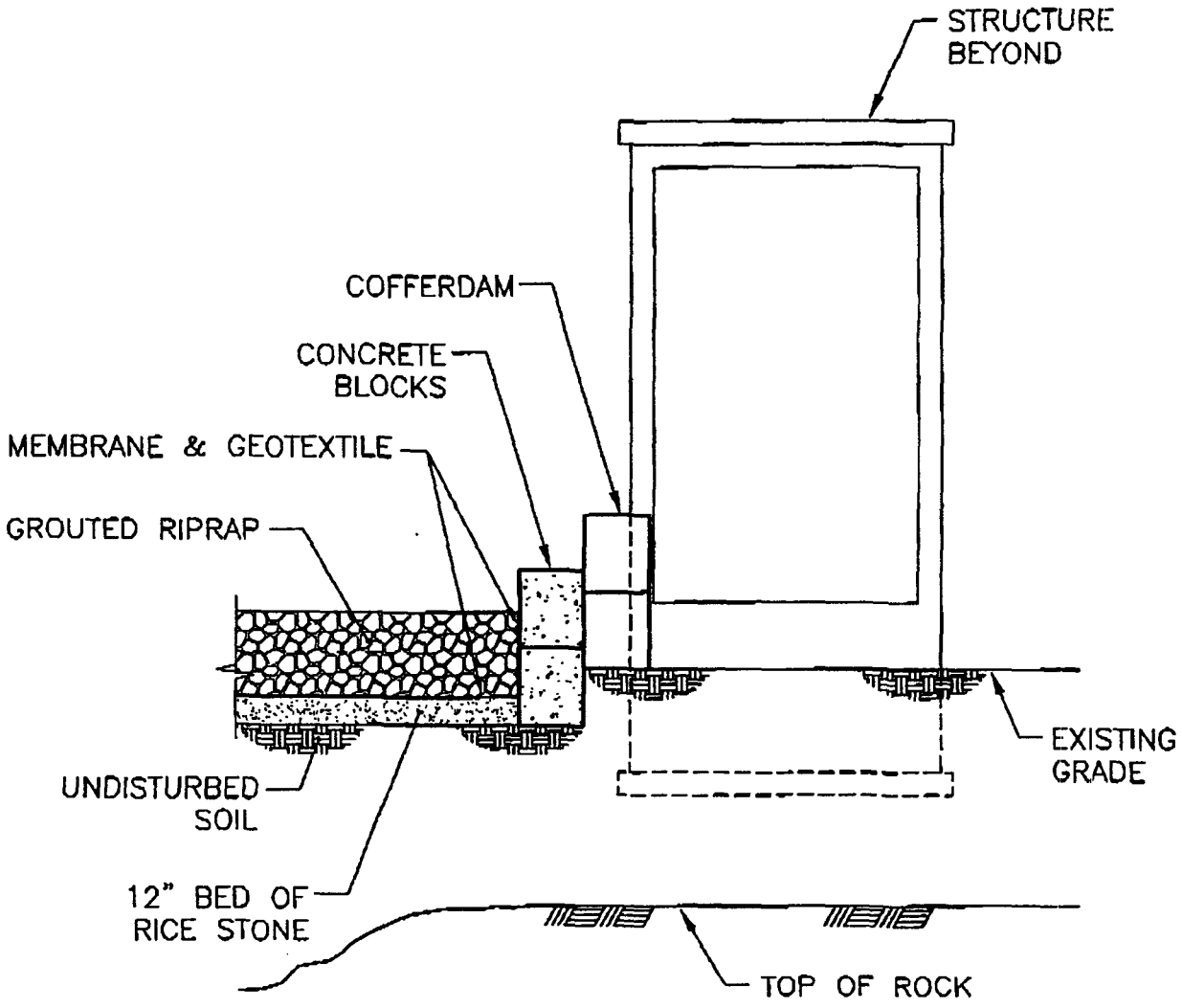


STA. 0+95

FINAL GRADING - SECTION

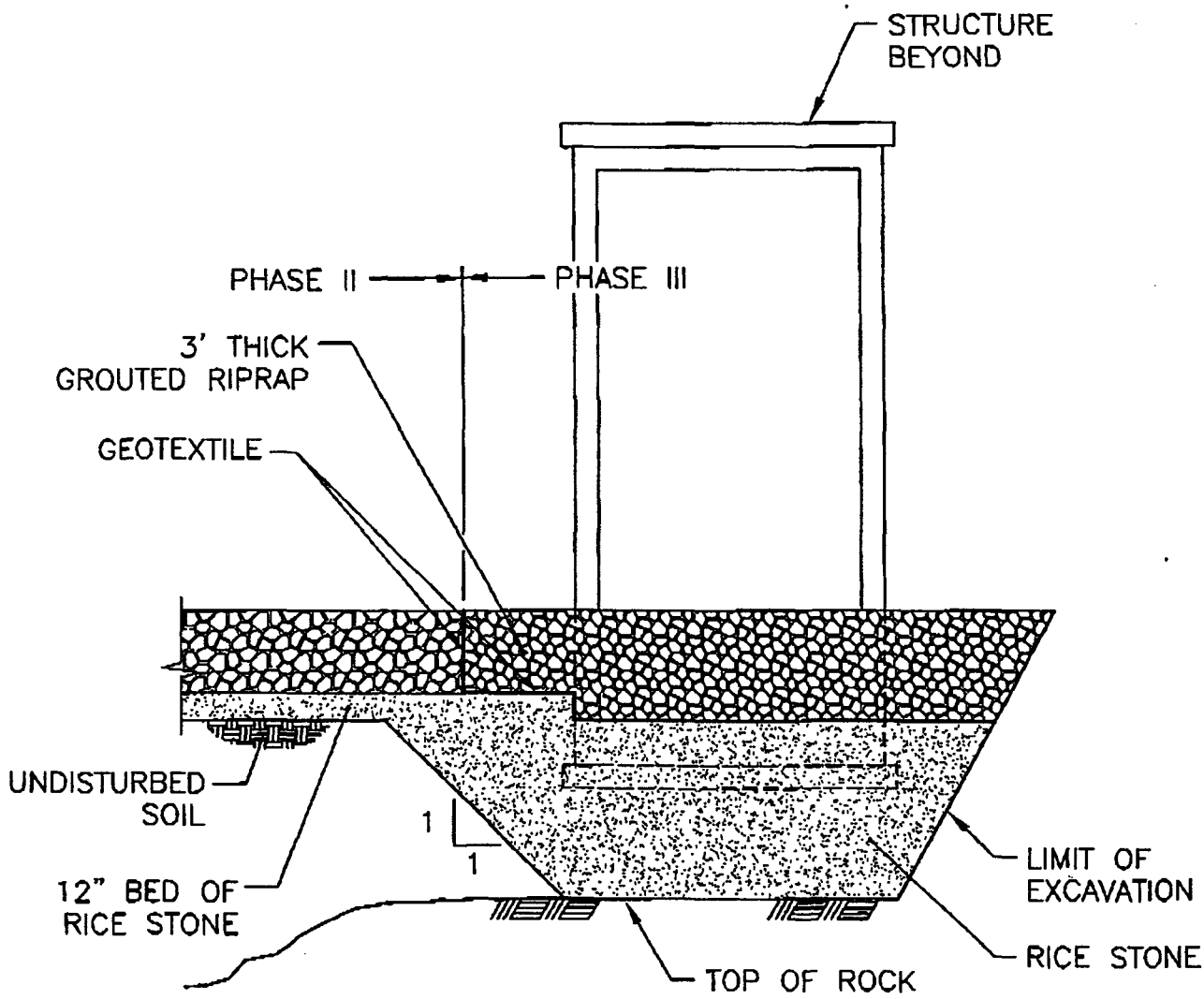
A'
C-5

SCALE: 1"= 5'



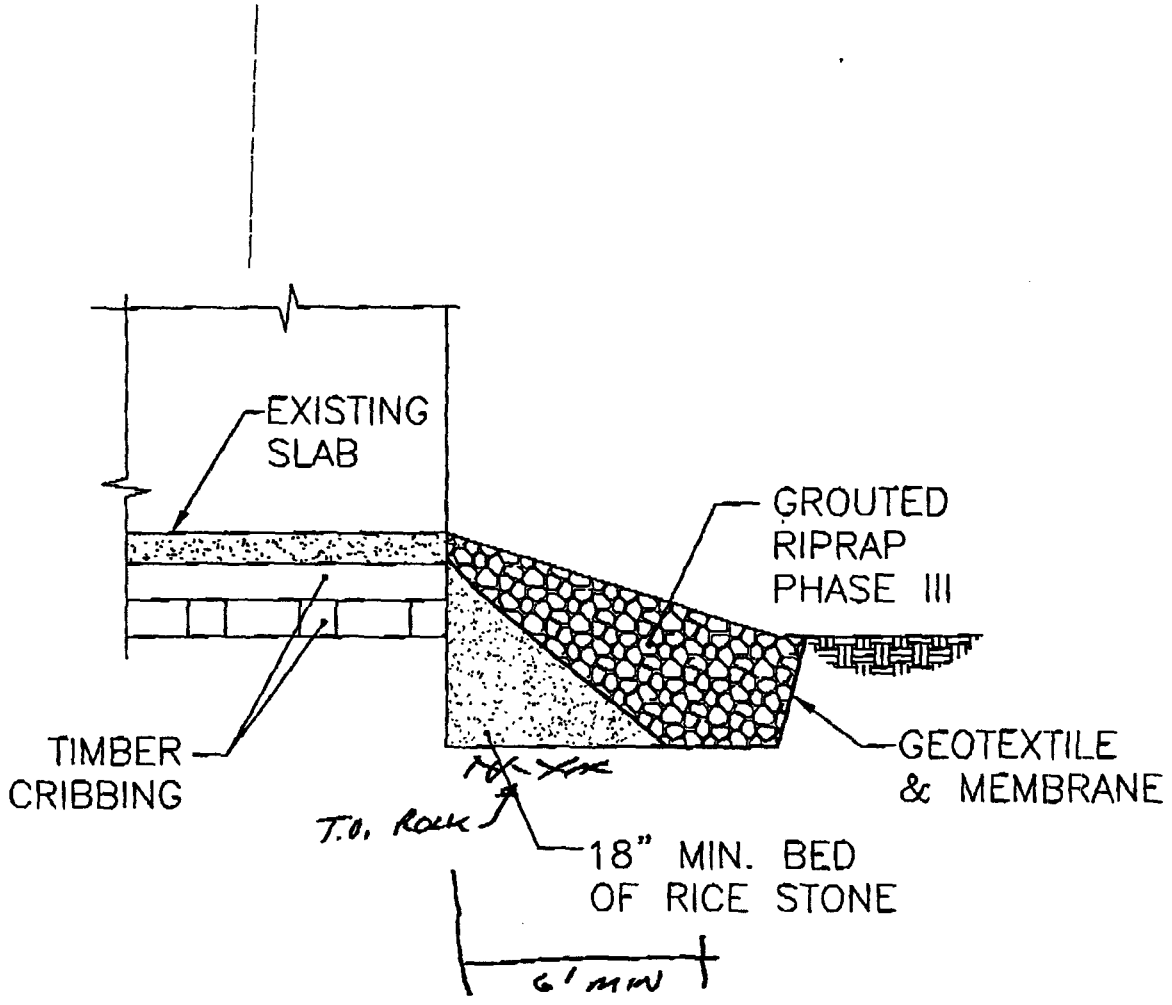
PHASE II - SECTION

SCALE: 1"= 5'



PHASE III - SECTION

SCALE: 1"= 5'



PHASE III - SECTION @ OUTLET

SCALE: 1"= 5'

APPENDIX J

APPENDIX J

Rock Anchor Bolt Installation Procedure

Memorandum

TO	Scott Miller
FROM	Mike Walker
DATE	September 21, 2001
RE	Allendale Dam: RF-4: Revised Anchor Installation Procedure.

The purpose of this memorandum is to provide revised rock anchor installation procedures for construction of Allendale Dam.

The Allendale Dam reconstruction was designed as a reinforced concrete wall anchored to bedrock using grouted rock anchors. The actual top of rock location was not known at the time of the design. Subsequent rock cores performed during construction indicate that the top of rock ranged from 4- to 10-feet below the top of the existing dam footing. We revised our dam design to found the new dam in dense soils (overburden) above the rock. The revised design requires the installation of the rock anchor through a 4 to 10-foot thick layer of dense soils. As requested we provide the following revised rock anchor installation procedure (see attached sketch).

1) Drill though natural soils to the top of rock using temporary steel casing and seat the casing into the top of rock.

2) Drill the rock bolt anchor hole in the rock.

3) Fill the anchor hole and casing with grout using tremie methods.

4) Monitor the grout level in the casing for ten minutes. If the grout level does not drop significantly, insert the anchor and pull the temporary casing. Maintain the grout head by adding grout while the casing is being removed.

5) Monitor the grout level in the open hole for thirty minutes. If significant grout loss is observed insert a PVC casing over the bolt in the hole down to the top of rock if possible and top off the grout level inside the PVC casing until the gout level stabilizes. If the grout level does not drop significantly install the next anchor.

6) Prior to placing the concrete foundation, provide a PVC sleeve around each anchor to provide a void around the anchor penetration through the concrete footing. The purpose of the void is to allow the anchor to load the soil rather than the grouted column bearing in the rock.

7) Load anchors and lock off the anchor. Grout the penetration around the anchor under the bearing plate after locking off the anchor load.

8) Test anchor load has been revised to 173 kips: Lock off load has been revised to 100 kips.

GEI Consultants, Inc.

Project	01179-2	Page	R1:2-6		
Client	LEA	Date	10/01	By	WB
Subject	ALLENDALE DAM	Checked	10/01	By	MPN
		Approved		By	

APPENDIX K

APPENDIX K

Site Inspection Documentation

Loureiro Engineering Associates, Inc.
An Employee Owned Company

April 3, 2002 Pre-Final Dam Inspection
Fieldwork for Second Administrative Order for Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

As required by Paragraph 61 of the Second Administrative Order for Removal Action (Order) and page 17 of the Statement of Work (SOW) included as Attachment A to the Order, a Pre-Final dam inspection was conducted at the Centredale Manor Restoration Project Site (Site). This inspection was performed on April 3, 2002 by Anna Krasko of EPA, Louis Maccarone of the Rhode Island Department of Environmental Management (RIDEM), Scott Michalak of the United States Army Corps of Engineers (USACE), and Scott Miller of LEA-Cianci, Inc. (LCI). The inspection was performed to identify final actions that may be necessary in closing out the field work performed as part of the reconstruction of Allendale Dam.

Based on the inspection that was conducted, the following "punch-list" provides a list of actions that are being required by EPA, USACE, and RIDEM before the field work performed as part of the reconstruction of Allendale Dam may be considered complete:

- Remove the temporary electrical drop from the former field office trailer location.
- Remove the pile of weeds and brush generated when the trailer location was prepared.
- Transport and dispose of the remaining debris requiring off-Site disposal as part of the dam reconstruction activities.
- Install the remaining piece of the sluice gate opener.
- Install a steel plate over the existing hole in the gate structure above the location of the new sluice gate.

Based on the inspection performed, no other actions are required.

Loureiro Engineering Associates, Inc.
An Employee Owned Company

June 17, 2002 Final Dam Inspection
Fieldwork for Second Administrative Order for Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

As required by Paragraph 62 of the Second Administrative Order for Removal Action (Order) and page 17 of the Statement of Work (SOW) included as Attachment A to the Order, a Final dam inspection was conducted at the Centredale Manor Restoration Project Site (Site). This inspection was performed on June 17, 2002 by Anna Krasko of EPA, Louis Maccarone of the Rhode Island Department of Environmental Management (RIDEM), Scott Michalak of the United States Army Corps of Engineers (USACE), and Scott Miller of LEA-Cianci, Inc. (LCI). The inspection was performed to verify that the "punch-list" deficiencies identified during the April 3, 2002 Pre-Final dam inspection have been corrected and that the Non-Time Critical Removal Action (NTCRA) Performance Standards have been met for the restoration of Allendale Dam.

During the inspection, it was noted that: the electrical power drop was removed; the weed pile created when the trailer was mobilized to the Site was removed; the areas along the embankments were seeded and grass was established; all remaining debris stockpiled on the containment pad was transported off-Site for proper disposal; the remaining piece of the gate opener was installed; and all equipment was removed from the Site.

Based on this final inspection, EPA acknowledged that the construction activities associated with the restoration of Allendale Dam were complete.

Loureiro Engineering Associates, Inc.
An Employee Owned Company

September 9, 2003 Pre-Final Site Inspection
Fieldwork for Second Administrative Order for Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

As required by Paragraph 61 of the Second Administrative Order for Removal Action (Order) and page 17 of the Statement of Work (SOW) included as Attachment A to the Order, a Pre-Final inspection of the areas affected by the soil and sediment removal activities was conducted at the Centredale Manor Restoration Project Site (Site). This inspection was performed on September 9, 2003 by Anna Krasko of EPA, Louis Maccarone of the Rhode Island Department of Environmental Management (RIDEM), Scott Michalak of the United States Army Corps of Engineers (USACE), and Dave Scotti of Loureiro Engineering Associates, Inc. (LEA). The inspection was performed to identify final actions that may be necessary in closing out the field work performed pursuant to the Order.

The Site inspection included an inspection of each Action Area from which soils and sediments were removed. These areas include Action Areas 2, 3, 3/4, 4, 5, 6, 7, 9, 10, 11, and 12. The Site inspection also included an inspection of the area where excavated soils and sediments were temporarily staged on the concrete containment pad. In addition, the inspection included an inspection of the earthen embankment adjacent to Allendale Dam. The embankment was inspected to assess the adequacy of the vegetative cover on the embankment soils.

Based on the inspection that was conducted, the following "punch-list" provides a list of actions that are being required by EPA, USACE, and RIDEM before the Non-Time-Critical Removal Action (NTCRA) construction for the Order may be considered complete:

- Action Area 2: Properly secure the chain-link fence surrounding the Grenier residence property. This will simply be accomplished by affixing several pieces of appropriately-gauged wire to the fence and adjoining fence post.

- Action Area 9: Provide loam and seed to a limited portion of exposed gravel within this Action Area. This will be accomplished by placing a few bags of topsoil in this area and seeding the area with grass seed.

- Concrete Containment Pad Area: Several "Hazardous Materials" warning signs were posted on the chain-link fence in this area. The signs were removed prior to departing the Site, as requested by EPA.

- Allendale Dam Earthen Embankment: EPA, USACE, and RIDEM agreed that the vegetative cover on the embankment soils on the west and east sides of Allendale Dam was

adequate. However, USACE requested that a small (approximately two-inch diameter) tree present adjacent to the sluiceway gate structure be removed. It was requested that this tree be cut at its base, and that the wound be sealed with a prune sealer to prevent the re-growth of any offshoots.

Based on the inspection performed, no other actions are required.

Loureiro Engineering Associates, Inc.
An Employee Owned Company

October 7, 2003 Final Site Inspection
Fieldwork for Second Administrative Order for Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island

As required by Paragraph 62 of the Second Administrative Order for Removal Action (Order) and page 17 of the Statement of Work (SOW) included as Attachment A to the Order, a Final inspection of the areas affected by the soil and sediment removal activities was conducted at the Centredale Manor Restoration Project Site (Site). This inspection was performed on October 7, 2003 by Anna Krasko of EPA, Louis Maccarone of the Rhode Island Department of Environmental Management (RIDEM), and David Scotti of Loureiro Engineering Associates, Inc. (LEA). The inspection was performed to verify that the "punch-list" deficiencies identified during the September 9, 2003 Pre-Final inspection have been corrected and that the Non-Time Critical Removal Action (NTCRA) Performance Standards have been met.

During the final inspection it was noted that: the chain-link fence surrounding the Grenier residence property had been properly secured by affixing several pieces of appropriately-gauged wire to the fence; loam had been placed over the limited portion of exposed gravel within Action Area 9 and growth had been re-established in this area through proper seeding; the "Hazardous Materials" warning signs posted on the chain-link fence in the area of the concrete containment pad were removed; and the tree present adjacent to the sluiceway gate structure was cut at its base and removed, and that the remaining stump was sealed with a prune sealer to prevent the re-growth of any offshoots.

Based on this final inspection, EPA acknowledged that the NTCRA construction required pursuant to the Order was complete and that the performance criteria of the NTCRA had been attained.

GEI Consultants

Memo

To: Dave Scotti/LEA

From: Steve Sarandis/Mike Walker

CC: Lee Wooten

Date: 4/5/2005

Re: Grouting at Allendale Dam

GEI Project Number – 01179-3

Jeans Waterproofing, Inc. (JWI) was on-site on Thursday October 21, 2004 to pump grout beneath the outlet structure of Allendale Dam. The purpose of the grouting was to fill potential voids beneath the outlet structure and to mitigate seepage observed flowing out of the stone wall on left side of the downstream channel. Steve Sarandis of GEI Consultants, Inc. and Mark Vance of the New England District of the Corps of Engineers were on-site to observe the grouting activities.

1. Prior to the start of the grouting activities Steve Sarandis performed a dye test to measure the time it would take for dye to flow underneath the outlet structure. Dye was placed through a one-inch pipe that was inserted into the area of an observed sinkhole on the upstream side of the dam. Dye was observed flowing out the stone wall on the left side of the downstream channel seven minutes later.
2. JWI drilled three holes through the concrete floor slab of the gate structure. Two holes were drilled upstream of the outlet gate and one hole was drilled downstream of the gate. The concrete slab was between 1.0 to 1.5 feet thick at all three locations. At all three locations JWI observed voids/soft zones greater than 2 feet below the slab while probing with a long drill bit. We observed water flowing up through the holes in the concrete slabs at all three locations. The greatest flow was observed from the hole drilled downstream of the gate. JWI set one-inch pipes with mechanical packers in all the drill holes. The holes were sealed with hydraulic cement after grouting was completed.
3. JWI used a polyurethane foam grout to fill the voids and stop the water flow beneath the outlet structure. The grout was Aqua-Tite by DeNeef Construction Chemicals Inc. The grout is a two stage product that expands up to 20 times its original volume after it has been mixed.
4. JWI started pumping grout through the upstream one-inch pipe and then worked their way to the pipes further downstream. JWI pumped a total of 90 to 100 gallons of the Aqua-Tite to fill the voids beneath the structure.
5. At the conclusion of the grouting we observed that no water was flowing out the stone wall on the left side of the downstream channel. We performed a second dye test. No dye was observed flowing out the stone wall in the downstream channel after a time period of one hour and fifteen minutes.
6. We left the site.

V:\2001jobs\00179\Allendale 10-21-04\allendaledamgrouting.doc

APPENDIX L

APPENDIX L

Geologic Boring Logs

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 01-DEL-201
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor Loureiro Engineering		**Logged by** Rob Whittaker	
Drilling Method Macro-core		**Drilling Foreman** Rob Whittaker	
Sampling Method Macro-core		**Drill Rig** Macro-core	
Groundwater Observation		**Surface Elevation** 93.82	
Depth 0.17 **at** **Hours**		**Latitude** 41d51.3645	
Depth **at** **Hours**		**Longitude** 71d29.1576	

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- V | | | 2	2108336	100		0" - 2" Grass, topsoil 2" - 24" Black-brown medium SAND, some fine Sand, some organics, wet, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 01-DEL-202
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Jon Sweeton
Drilling Method	Hand Auger	**Drilling Foreman**	Jon Sweeton
Sampling Method	Hand auger	**Drill Rig**	Hand auger
Groundwater Observation		**Surface Elevation**	93.83
Depth at **Hours**		**Latitude**	41d51.3639
Depth at **Hours**		**Longitude**	71d29.1562

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108340	80		Brownish-black sapric soil (organic "muck"), wet, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 01-DEL-203
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	93.88
Depth at **Hours**		**Latitude**	41d51.3629
Depth at **Hours**		**Longitude**	71d29.1570

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108339	80		0" - 12" Brownish-black sapric soil (organic "muck"), wet, loose. 12" - 24" Brownish-black sapric soil (organic "muck"), some medium Sand, trace coarse Sand, wet, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/22/2002 **End Date** 07/22/2002	**Boring ID** **02-DEL-201**

Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	95.94
Depth **at** **Hours**		**Latitude**	41d51.3236
Depth **at** **Hours**		**Longitude**	71d29.1322

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108332	80		0" - 2" Forest litter 2" - 24" Brown medium SAND, some fine Sand, trace coarse Sand, trace organics, trace roots, moist, dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 02-DEL-202
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor Loureiro Engineering		**Logged by** Rob Whittaker	
Drilling Method Macro-core		**Drilling Foreman** Rob Whittaker	
Sampling Method Macro-core		**Drill Rig** Macro-core	
Groundwater Observation		**Surface Elevation** 97.24	
Depth at **Hours**		**Latitude** 41d51.3226	
Depth at **Hours**		**Longitude** 71d29.1316	

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108330	75		0" - 2" Grass, roots. 2" - 12" Brown medium SAND, some fine Sand, dry, loose. 12" - 24" Dark brown medium SAND, trace fine Sand, dry, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/22/2002 **End Date** 07/22/2002	**Boring ID** **02-DEL-203**

Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	95.99
Depth at **Hours**		**Latitude**	41d51.3220
Depth at **Hours**		**Longitude**	71d29.1329

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108331	80		0" - 2" Forest litter 2" - 24" Brown medium SAND, some fine Sand, trace coarse Sand, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/22/2002 **End Date** 07/22/2002	**Boring ID** **03-DEL-101**

Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.69
Depth **at** **Hours**		**Latitude**	41d51.2871
Depth **at** **Hours**		**Longitude**	71d29.1152

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108328	80		0" - 2" Forest litter 2" - 24" Brown medium SAND, some fine Sand, some Gravel, some organics, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 03-DEL-102
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	96.39
Depth at **Hours**		**Latitude**	41d51.2864
Depth at **Hours**		**Longitude**	71d29.1142

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108327	75		0" - 2" Forest litter. 2" - 24" Grayish-brown medium SAND, some fine Sand, some Gravel, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/22/2002 **End Date** 07/22/2002	**Boring ID** **03-DEL-103**

Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.72
Depth at **Hours**		**Latitude**	41d51.2855
Depth at **Hours**		**Longitude**	71d29.1151

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108329	75		0" - 2" Forest litter, dark brown medium and fine SAND. 2" - 24" Brown medium SAND, trace fine Sand, trace Gravel, trace organics, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 03-DEL-201
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor Loureiro Engineering		**Logged by**	Rob Whittaker
Drilling Method Macro-core		**Drilling Foreman**	Rob Whittaker
Sampling Method Macro-core		**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	96.03
Depth at Hours		**Latitude**	41d51.2765
Depth at Hours		**Longitude**	71d29.1129

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108324	100		0" - 2" Forest litter 2" - 24" Brown medium SAND, some fine Sand, some organics, pieces of bitumin, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 03-DEL-202
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/22/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	98.25
Depth at **Hours**		**Latitude**	41d51.2759
Depth at **Hours**		**Longitude**	71d29.1119

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108325	75		0" - 2" Forest litter. 2" - 24" Brown medium SAND, trace fine Sand, trace Gravel, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/22/2002	**Boring ID** 03-DEL-203
LEA Commission Number 15RP102.006		**End Date** 07/22/2002	
Client Centredale Manor Performing -			
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Rob Whittaker
Drilling Method	Macro-core	**Drilling Foreman**	Rob Whittaker
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	96.65
Depth at **Hours**		**Latitude**	41d51.2749
Depth at **Hours**		**Longitude**	71d29.1128

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108326	75		0" - 2" Forest litter. 2" - 24" Brown medium SAND, some fine Sand, trace Gravel, trace organics, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor		**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **03/04DEL-101**
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.30
Depth at **Hours**		**Latitude**	41d51.2560
Depth at **Hours**		**Longitude**	71d29.1045

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108320	75		Dark brown SAND, fine grain, some medium grain, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/19/2002	**Boring ID** 03/04DEL-102
LEA Commission Number 15RP102.006		**End Date** 07/19/2002	
Client Centredale Manor Performing -			
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	96.01
Depth at **Hours**		**Latitude**	41d51.2556
Depth at **Hours**		**Longitude**	71d29.1029

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108321, 2108322	75		0" - 2" Forest litter, roots. 2" - 24" Dark brown SAND, medium grain, some fine grain Sand, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **03/04DEL-103**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.94
Depth at **Hours**		**Latitude**	41d51.2546
Depth at **Hours**		**Longitude**	71d29.1035

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108319	75		Dark brown SAND, medium grain, some fine grain Sand, some organics, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor		**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **04-DEL-201**
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.58
Depth at **Hours**		**Latitude**	41d51.2200
Depth at **Hours**		**Longitude**	71d29.0977

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108316	65		0" - 2" Forest litter. 2" - 24" Brown medium grain SAND, some fine grain Sand, trace Gravel, trace organics, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **04-DEL-202**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	95.39
Depth at **Hours**		**Latitude**	41d51.2196
Depth at **Hours**		**Longitude**	71d29.0964

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108315	75		0" - 2" Forest litter. 2" - 24" Brown medium grain SAND, some fine grain Sand, trace Gravel, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/19/2002	**Boring ID** 04-DEL-203
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/19/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.26
Depth at **Hours**		**Latitude**	41d51.2188
Depth at **Hours**		**Longitude**	71d29.0965

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108313	75		0" - 2" Forest litter. 2" - 12" Brown medium grain SAND, some fine grain Sand, some organics. 12" - 24" Dark brown medium grain SAND, some fine grain Sand, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/19/2002	**Boring ID** 05-DEL-100
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/19/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	94.52
Depth at **Hours**		**Latitude**	41d51.2001
Depth at **Hours**		**Longitude**	71d29.0907

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108311	75		0" - 2" Forest litter. 2" - 24" Brown SAND, medium grain, some fine grain Sand, trace coarse Sand, trace Gravel, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/18/2002	**Boring ID** 06-DEL-100
LEA Commission Number 15RP102.006		**End Date** 07/18/2002	
Client Centredale Manor Performing -			
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	Jason Miller
Drilling Method	Macro-core	**Drilling Foreman**	Jason Miller
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	95.35
Depth at **Hours**		**Latitude**	41d51.1520
Depth at **Hours**		**Longitude**	71d29.0609

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108295	33		0" - 6" Brown, medium to fine grain SAND and SILT, some medium to coarse Gravel, some Cobbles, trace coarse Sand. 6" - 24" Yellowish-brown fine to medium grain SAND and SILT, moist.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/18/2002 **End Date** 07/18/2002	**Boring ID** **06-DEL-200**

Drilling Contractor	Loureiro Engineering	**Logged by**	Jason Miller
Drilling Method	Macro-core	**Drilling Foreman**	Jason Miller
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	96.06
Depth at **Hours**		**Latitude**	41d51.1522
Depth at **Hours**		**Longitude**	71d29.0533

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108294	83		0" - 6" Brown medium to fine grain SAND and SILT, trace fine to medium Gravel, loose, some organic material. 6" - 24" Yellowish-brown fine to medium grain SAND and SILT, trace coarse Sand.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **07-DEL-201**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	95.45
Depth 0.17 **at**	**Hours**	**Latitude**	41d51.0481
Depth **at**	**Hours**	**Longitude**	71d28.8801

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- V | | | 2	2108306	80		0" - 2" Forest litter. 2" - 12" Dark brown SAND, medium grain, some fine grain Sand, some roots, some organics, wet, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/19/2002	**Boring ID** 07-DEL-202
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/19/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macr-core
Groundwater Observation		**Surface Elevation**	96.28
Depth at **Hours**		**Latitude**	41d51.0477
Depth at **Hours**		**Longitude**	71d28.8790

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108304	75		1" - 2" Forest litter. 2" - 24" Dark brown SAND, medium grain, some fine grain Sand, some roots, some organics, moist, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/19/2002 **End Date** 07/19/2002	**Boring ID** **07-DEL-203**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	93.15
Depth **at** **Hours**		**Latitude**	41d51.0467
Depth **at** **Hours**		**Longitude**	71d28.8794

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108305	75		0" - 2" Forest litter. 2" - 24" Dark brown SAND, medium grain, some fine grain Sand, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/16/2002	**Boring ID** 09-DEL-201
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/16/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.31
Depth at **Hours**		**Latitude**	41d50.6605
Depth at **Hours**		**Longitude**	71d28.7539

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108293	80		0" - 2" Grass, roots. 2" - 24" Dark brown SAND, medium and fine grain, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/16/2002 **End Date** 07/16/2002	**Boring ID** **09-DEL-202**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macr-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.86
Depth **at** **Hours**		**Latitude**	41d50.6605
Depth **at** **Hours**		**Longitude**	71d28.7522

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108290	80		0" - 2" Grass, roots. 2 - 24" Brown, medium and fine grain SAND and GRAVEL, moist, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/16/2002 **End Date** 07/16/2002	**Boring ID** **09-DEL-203**

Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.05
Depth **at** **Hours**		**Latitude**	41d50.6594
Depth **at** **Hours**		**Longitude**	71d28.7522

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108292	80		0" - 2" Grass, roots. 2" - 20" Brown, medium and fine grain SAND, moist, moderately dense. 20" - 24" Dark brown, medium and fine grain SAND, moist, moderately dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor		**Start Date** 07/18/2002 **End Date** 07/18/2002	**Boring ID** **10-DEL-301**
Drilling Contractor	Loureiro Engineering	**Logged by**	Jason Miller
Drilling Method	Macro-core	**Drilling Foreman**	Jason Miller
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.10
Depth 1.33 **at** **Hours**		**Latitude**	41d50.5884
Depth **at** **Hours**		**Longitude**	71d28.6718

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108297, 2108298	67		0" - 6" Black organic material. 6" - 24" Strong brown, medium to fine grain SAND and SILT, trace coarse Sand, trace fine to medium Gravel, very moist. wet at 16"	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/18/2002	**Boring ID** 10-DEL-302
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/18/2002	
Location Centredale Manor			
Drilling Contractor Loureiro Engineering		**Logged by** Jason Miller	
Drilling Method Macro-core		**Drilling Foreman** Jason Miller	
Sampling Method Macro-core		**Drill Rig** Macro-core	
Groundwater Observation		**Surface Elevation** 78.90	
Depth 0.50 **at** **Hours**		**Latitude** 41d50.5889	
Depth **at** **Hours**		**Longitude** 71d28.6709	

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | V | | 2	2108296	67		0" - 6" Strong brown, medium to fine grain SAND and SILT with organics, moist, wet at 6". 6" - 24" Strong brown, medium to fine grain SAND and SILT, trace coarse Sand, trace fine Gravel.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor	**Start Date** 07/18/2002 **End Date** 07/18/2002	**Boring ID** **10-DEL-303**

Drilling Contractor	Loureiro Engineering	**Logged by**	Jason Miller
Drilling Method	Macro-core	**Drilling Foreman**	Jason Miller
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.25
Depth **at** **Hours**		**Latitude**	41d50.5897
Depth **at** **Hours**		**Longitude**	71d28.6706

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108301	100		0" - 6" Strong brown organic material with fine grain SAND and SILT. 6" - 24" Strong brown medium to fine grain SAND and SILT, some Cobbles, trace coarse Sand, trace fine Gravel, very moist.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/16/2002	**Boring ID** 11-DEL-100
LEA Commission Number 15RP102.006			
Client Centredale Manor Performing -		**End Date** 07/16/2002	
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	78.75
Depth **at** **Hours**		**Latitude**	41d50.4413
Depth **at** **Hours**		**Longitude**	71d28.6547

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108286	75		Brown SAND, medium grain, some fine grain Sand and Gravel, some organics, roots, damp loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project **LEA Commission Number** 15RP102.006 **Client** Centredale Manor Performing - **Location** Centredale Manor		**Start Date** 07/16/2002 **End Date** 07/16/2002	**Boring ID** **12-DEL-101**
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	77.38
Depth 0.17 **at**	**Hours**	**Latitude**	41d50.3424
Depth **at**	**Hours**	**Longitude**	71d28.5944

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | 1 V	2108282	100		0" - 2" Dark brown SAND, medium grain, some fine grain Sand, some organics, saturated, loose. 2" - 12" Dark brown SAND, medium grain, some fine grain Sand and Gravel, some organics, wet, loose.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/16/2002	**Boring ID** 12-DEL-102
LEA Commission Number 15RP102.006		**End Date** 07/16/2002	
Client Centredale Manor Performing -			
Location Centredale Manor			
Drilling Contractor	Loureiro Engineering	**Logged by**	C. Scott Brown
Drilling Method	Macro-core	**Drilling Foreman**	C. Scott Brown
Sampling Method	Macro-core	**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	79.68
Depth at **Hours**		**Latitude**	41d50.3415
Depth at **Hours**		**Longitude**	71d28.5933

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | | | 2	2108283	75		Brown SAND, medium grain, some fine grain Sand and Gravel, dry, dense.	

GEOLOGIC BORING LOG

Project: Centredale Manor Restoration Project		**Start Date** 07/16/2002	**Boring ID** 12-DEL-103
LEA Commission Number 15RP102.006		**End Date** 07/16/2002	
Client Centredale Manor Performing -			
Location Centredale Manor			
Drilling Contractor Loureiro Engineering		**Logged by**	C. Scott Brown
Drilling Method Macro-core		**Drilling Foreman**	C. Scott Brown
Sampling Method Macro Core		**Drill Rig**	Macro-core
Groundwater Observation		**Surface Elevation**	77.69
Depth 1.00 **at** **Hours**		**Latitude**	41d50.3408
Depth **at** **Hours**		**Longitude**	71d28.5948

Depth	Sample Information			Soil Description	PID/FID ppm
	Sample No.	Recovery (%)	Blows /6"	Color, Primary Grain Size, Secondary Grain Sizes, Moisture, Sorting, Sphericity, Angularity, Sedimentary Structure, Density, Cohesiveness, Other	
0- | 1	2108284	80		Dark brown SAND, medium grain, some fine grain Sand, some organics, some roots, damp, loose, wet at 12".	

APPENDIX M

APPENDIX M

Bill of Lading Documentation

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 10 / 30 / 02

POINT OF ORIGINATION: **ACTION AREA** 2 **LOAD NO.** 1

ESTIMATED VOLUME: 6 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

OFFICE CONTACTS: Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 10 / 31 / 02

POINT OF ORIGINATION: **ACTION AREA** 3 North **LOAD NO.** 2

ESTIMATED VOLUME: 10 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

OFFICE CONTACTS: Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 10 / 31 / 02

POINT OF ORIGINATION: **ACTION AREA** 3 South **LOAD NO.** 3

ESTIMATED VOLUME: 10 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

OFFICE CONTACTS: Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 1 / 02

POINT OF ORIGINATION: **ACTION AREA** 6 South F 3 South **LOAD NO.** 4

ESTIMATED VOLUME: 12 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water) Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

OFFICE CONTACTS: Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 7 '02

POINT OF ORIGINATION: **ACTION AREA** 3/4 **LOAD NO.** 5

ESTIMATED VOLUME: 12 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

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Bridgeport, Connecticut
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GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 7 / 02

POINT OF ORIGINATION: **ACTION AREA** 3/4 **LOAD NO.** #6

ESTIMATED VOLUME: 12 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
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100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 8 / 02

POINT OF ORIGINATION: **ACTION AREA** 4 **LOAD NO.** #7

ESTIMATED VOLUME: 6 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

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100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 11 / 02

POINT OF ORIGINATION: **ACTION AREA** 5/7 **LOAD NO.** #8

ESTIMATED VOLUME: 10 cy

DESCRIPTION:	Contaminated Environmental Media (soil/sediment/water) Pending Analysis
DESTINATION:	Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)
TRANSPORTER:	Environmental Remediation Services, LLC 120 River Street Bridgeport, Connecticut Ph. 203.335.4947
ONSITE CONTACT:	Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108) Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)
OFFICE CONTACTS:	Loureiro Engineering Associates, Inc. 100 Northwest Drive Plainville, Connecticut 06060 David Scotti (Ph. 860.747.6181) Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)
GENERATOR:	Centredale Manor Performing Parties Group Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 13 / 02

POINT OF ORIGINATION: **ACTION AREA** 11 **LOAD NO.** # 9

ESTIMATED VOLUME: ~~10~~ 2 cy

DESCRIPTION:	Contaminated Environmental Media (soil/sediment/water) Pending Analysis
DESTINATION:	Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)
TRANSPORTER:	Environmental Remediation Services, LLC 120 River Street Bridgeport, Connecticut Ph. 203.335.4947
ONSITE CONTACT:	Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108) Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)
OFFICE CONTACTS:	Loureiro Engineering Associates, Inc. 100 Northwest Drive Plainville, Connecticut 06060 David Scotti (Ph. 860.747.6181) Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)
GENERATOR:	Centredale Manor Performing Parties Group Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 18 / 02

POINT OF ORIGINATION: **ACTION AREA** 11 **LOAD NO.** #10
12, 10

ESTIMATED VOLUME: 8 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
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Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 25 / 02

POINT OF ORIGINATION: **ACTION AREA** 10 **LOAD NO.** 11

ESTIMATED VOLUME: 10 cy

DESCRIPTION:	Contaminated Environmental Media (soil/sediment/water) Pending Analysis
DESTINATION:	Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)
TRANSPORTER:	Environmental Remediation Services, LLC 120 River Street Bridgeport, Connecticut Ph. 203.335.4947
ONSITE CONTACT:	Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108) Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)
OFFICE CONTACTS:	Loureiro Engineering Associates, Inc. 100 Northwest Drive Plainville, Connecticut 06060 David Scotti (Ph. 860.747.6181) Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)
GENERATOR:	Centredale Manor Performing Parties Group Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 11 / 26 / 02

POINT OF ORIGINATION: **ACTION AREA** 9 **LOAD NO.** 12

ESTIMATED VOLUME: 10 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

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120 River Street
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Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
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GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 12 / 4 / 02

POINT OF ORIGINATION: **ACTION AREA** 6N **LOAD NO.** 13

ESTIMATED VOLUME: 12 cy

DESCRIPTION:	Contaminated Environmental Media (soil/sediment/water) Pending Analysis
DESTINATION:	Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)
TRANSPORTER:	Environmental Remediation Services, LLC 120 River Street Bridgeport, Connecticut Ph. 203.335.4947
ONSITE CONTACT:	Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108) Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)
OFFICE CONTACTS:	Loureiro Engineering Associates, Inc. 100 Northwest Drive Plainville, Connecticut 06060 David Scotti (Ph. 860.747.6181) Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)
GENERATOR:	Centredale Manor Performing Parties Group Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

CENTREDALE MANOR
RESTORATION PROJECT
SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

Loureiro Engineering Associates, Inc.
An Employee Owned Company

BILL OF LADING

DATE: 12 / 6 / 02

POINT OF ORIGINATION: **ACTION AREA** 6N **LOAD NO.** 14

ESTIMATED VOLUME: 12 cy

DESCRIPTION: Contaminated Environmental Media (soil/sediment/water)
Pending Analysis

DESTINATION: Centredale Manor Restoration Project Superfund Site Staging Area – Containment Pad located on L. Libutti property (Plat 36 / Lot 38) Allendale Avenue, Johnston, Rhode Island (adjacent to the Johnston Asphalt, Inc. property located at 100 Allendale Avenue)

TRANSPORTER: Environmental Remediation Services, LLC
120 River Street
Bridgeport, Connecticut
Ph. 203.335.4947

ONSITE CONTACT: Jon Sweeton, Loureiro Engineering Associates, Inc. (Ph. 860.919.2108)
Brian Olsen, LEA-Cianci, Inc. (Ph. 860.250.7072)

OFFICE CONTACTS: Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06060
David Scotti (Ph. 860.747.6181)
Scott Miller (LEA-Cianci, Inc. – Ph. 860.747.6631)

GENERATOR: Centredale Manor Performing Parties Group
Coordinator: Jerry C. Muys, Jr. (Ph. 202.424.7547)

002/002

APPENDIX N

APPENDIX N

Stockpile Sampling Protocol

OVERALL GRID
COMP-C 1

Stockpile Sampling Protocol
Centredale Manor Restoration Project
North Providence, Rhode Island

Basis for Sampling:

Containment pad; assumed to contain <200 cy of soil/sediment

Contaminants of Concern:

Dioxin

Characterization Sampling:

Select six sample locations at random (see below)
Collect 6 additional samples for metals, composite six into single sample
Select 1 of 6 samples for VOCs

Approach:

Grid containment pad at two depth profiles: 1/3 depth and 2/3 depth.
Do not sample top 1/3 depth soils to eliminate non-representative soils which may have volatilized.

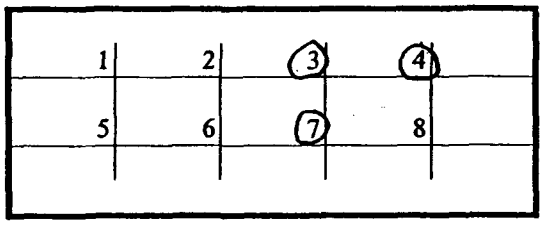
Sampling:

Total grid nodes = 16
Sample at 6 randomly selected grid nodes
Screen all six samples for VOCs
Select highest for analysis for VOCs
Composite 6 samples to a single sample for analysis for RCRA 8 metals, TPH, SVOCs, PCBs, reactivity (cyanide, sulfide), corrosivity (pH), and ignitability.

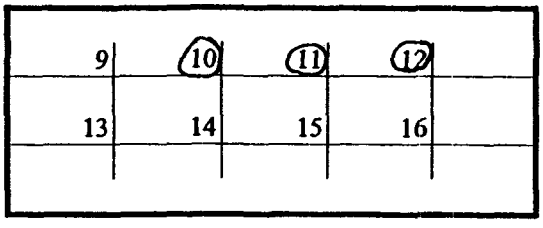
Random Integer Generator:

Node Number =	12
Node Number =	7
Node Number =	11
Node Number =	3
Node Number =	10
Node Number =	4

Therefore, sample at nodes : 12 7 11 3 10 4



Grid at 1/3 Depth



Grid at 2/3 Depth

COMP -D1

A

Stockpile Sampling Protocol
Centredale Manor Restoration Project
North Providence, Rhode Island

Basis for Sampling:

Containment pad; assumed to contain <200 cy of soil/sediment

Contaminants of Concern:

Dioxin

Characterization Sampling:

Select six sample locations at random (see below)
Collect 6 additional samples for metals, composite six into single sample
Select 1 of 6 samples for VOCs

Approach:

Grid containment pad at two depth profiles: 1/3 depth and 2/3 depth.
Do not sample top 1/3 depth soils to eliminate non-representative soils which may have volatilized.

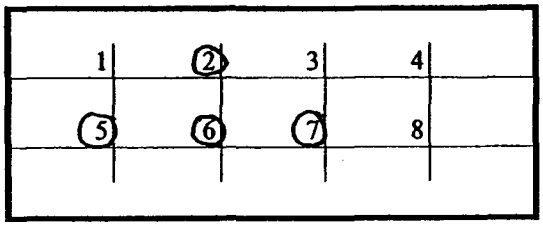
Sampling:

Total grid nodes = 16
Sample at 6 randomly selected grid nodes
Screen all six samples for VOCs
Select highest for analysis for VOCs
Composite 6 samples to a single sample for analysis for RCRA 8 metals, TPH, SVOCs, PCBs, reactivity (cyanide, sulfide), corrosivity (pH), and ignitability.

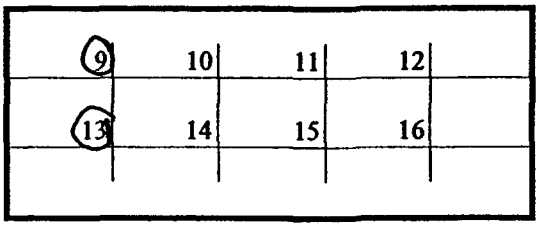
Random Integer Generator:

Node Number =	7
Node Number =	6
Node Number =	5
Node Number =	9
Node Number =	2
Node Number =	13

Therefore, sample at nodes : 7 6 5 9 2 13



Grid at 1/3 Depth



Grid at 2/3 Depth

Comp-DZ

B

Stockpile Sampling Protocol
Centredale Manor Restoration Project
North Providence, Rhode Island

Basis for Sampling:

Containment pad; assumed to contain <200 cy of soil/sediment

Contaminants of Concern:

Dioxin

Characterization Sampling:

Select six sample locations at random (see below)
Collect 6 additional samples for metals, composite six into single sample
Select 1 of 6 samples for VOCs

Approach:

Grid containment pad at two depth profiles: 1/3 depth and 2/3 depth.
Do not sample top 1/3 depth soils to eliminate non-representative soils which may have volatilized.

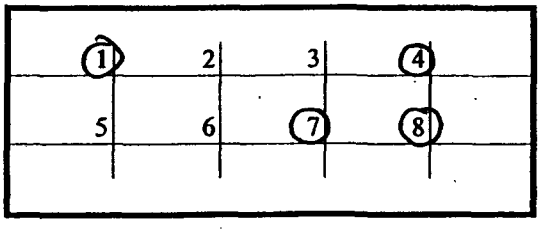
Sampling:

Total grid nodes = 16
Sample at 6 randomly selected grid nodes
Screen all six samples for VOCs
Select highest for analysis for VOCs
Composite 6 samples to a single sample for analysis for RCRA 8 metals, TPH, SVOCs, PCBs, reactivity (cyanide, sulfide), corrosivity (pH), and ignitability.

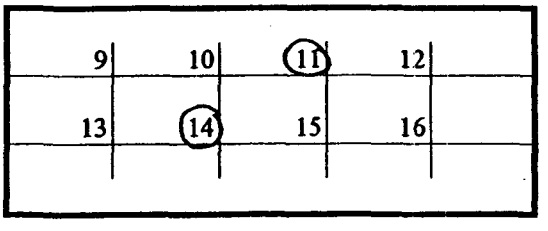
Random Integer Generator:

Node Number =	7
Node Number =	14
Node Number =	4
Node Number =	8
Node Number =	11
Node Number =	1

Therefore, sample at nodes : 7 14 4 8 11 1



Grid at 1/3 Depth



Grid at 2/3 Depth

COMP-D3

Stockpile Sampling Protocol
Centredale Manor Restoration Project
North Providence, Rhode Island

Basis for Sampling:

Containment pad; assumed to contain <200 cy of soil/sediment

Contaminants of Concern:

Dioxin

Characterization Sampling:

Select six sample locations at random (see below)
Collect 6 additional samples for metals, composite six into single sample
Select 1 of 6 samples for VOCs

Approach:

Grid containment pad at two depth profiles: 1/3 depth and 2/3 depth.
Do not sample top 1/3 depth soils to eliminate non-representative soils which may have volatilized.

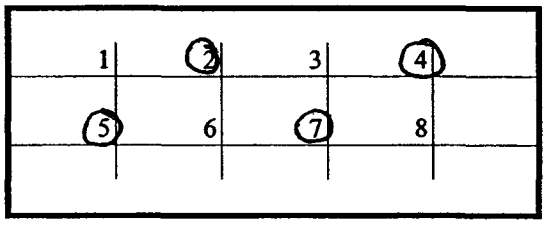
Sampling:

Total grid nodes = 16
Sample at 6 randomly selected grid nodes
Screen all six samples for VOCs
Select highest for analysis for VOCs
Composite 6 samples to a single sample for analysis for RCRA 8 metals, TPH, SVOCs, PCBs, reactivity (cyanide, sulfide), corrosivity (pH), and ignitability.

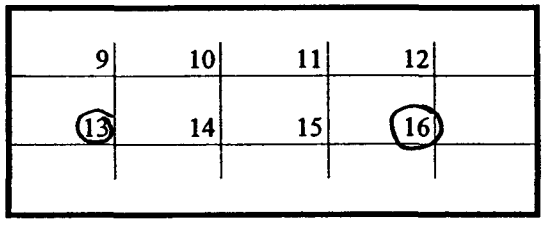
Random Integer Generator:

Node Number =	7
Node Number =	13
Node Number =	5
Node Number =	2
Node Number =	4
Node Number =	16

Therefore, sample at nodes : 7 13 5 2 4 16



Grid at 1/3 Depth



Grid at 2/3 Depth

Loureiro Engineering Associates, Inc.

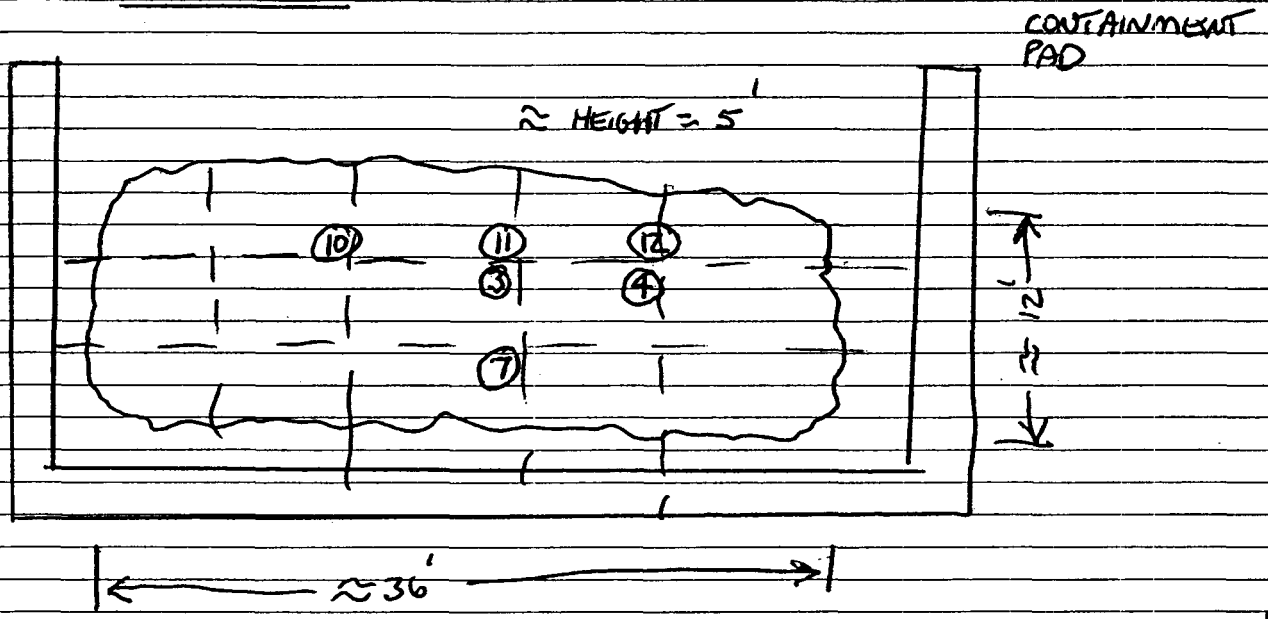
DAILY FIELD REPORT

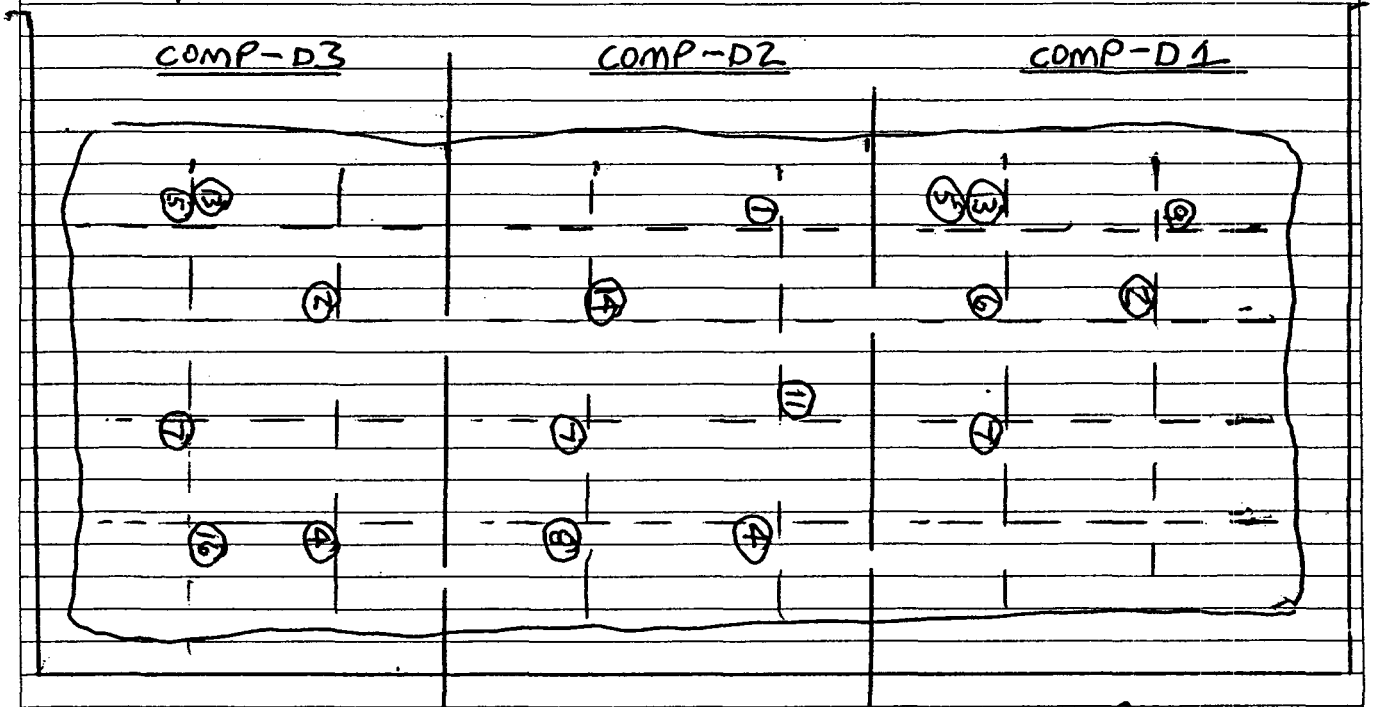
Supplemental Sheet

LEA Comm. No.	**15RP102.**	Page ____ of ____
Project	Centredale Manor Restoration Project	Date 12/10/02
Location		
Client	Centredale Manor Performing - JMuy	

Description of Site Activities

COMP-C1





Field Personnel Jon Sweeton

Signature

APPENDIX O

Non-Hazardous Waste Manifests

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 00004 | 2. Page 1 of 1

3. Generator's Name and Mailing Address
CENTERDALE MANOR C/O LEA-CIANCI (PERFORMING PARTIES GROUP)
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062

4. Generator's Phone (860) 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
US BULK TRANSPORT INC	PAD987347515	888-651-8182
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone
CWM CHEMICAL SERVICES, L.L.C. 1550 BALMER RD. MODEL CITY NY 14107	NYD049836679	(716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 46000	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information CERTIFICATE of DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract AD65298 NY
SR# _____
PLATE # AD 65298 NY
81575137

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
JON SWEETON	AS AGENT FOR CENTREDALE MANOR (PERFORMING PARTIES GROUP)	10	21	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Kevin M. Haney		10	21	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
actual load 45000 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
SHELLEY RUOFF		10	22	03

GENERATOR | TRANSPORTER | FACILITY

ORIGINAL - RETURN TO GENERATOR

CWMI

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: RID981203755
Manifest Document No.: 000.02
2. Page 1 of 1

3. Generator's Name and Mailing Address: PERFORMING PARTIES GROUP
CENTERDALE MANOR C/O LEA-CIANCI
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062
4. Generator's Phone (860 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029

5. Transporter 1 Company Name: US BULK TRANSPORT INC
6. US EPA ID Number: PAD 987347515
A. Transporter's Phone: 888-651-8182

7. Transporter 2 Company Name:
8. US EPA ID Number:
B. Transporter's Phone:

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number: NYD049836679
C. Facility's Phone: (716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 46000	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information: CERTIFICATE OF DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract
SR# _____
AB58309 NY
PLATE # AB58309 NY
8575139

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
JON SWEETON	AGENT FOR CENTREDALE MANOR PERFORMING PARTIES GROUP	07	21	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
WAYNE MATTICE	Wayne Mattice	07	21	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Actual Rec 49340 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
SHELLEY RUPP	Shelley Rupp	07	22	03

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL - RETURN TO GENERATOR

CWMI

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 000806 | 2. Page 1 of 1

3. Generator's Name and Mailing Address — PERFORMING PARTIES GROUP
CENTERDALE MANOR C/O LEA-CIANCI
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062
4. Generator's Phone (860) 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029

5. Transporter 1 Company Name: US Bulk Transport Inc. | 6. US EPA ID Number: PAD987347515 | A. Transporter's Phone AC18002 NF. 888-651-8182

7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number: NYD049836679
C. Facility's Phone (716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 44000	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information CERTIFICATE OF DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract
SR# _____
AC18002 NF.
81575141

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
JON SWEETON	AS AGENT FOR CENTREDALE MANOR PERFORMING PARTIES GROUP: [signature]	07	21	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Jerry Williams	Jerry Williams	07	21	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Actual Rec 40500 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
SHELLEY RUOPP	[signature]	07	22	03

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL - RETURN TO GENERATOR

CWMI

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: RID981203755
Manifest Document No.: 0.0.0.0.3
2. Page 1 of 1

3. Generator's Name and Mailing Address: PERFORMING PARTIES GROUP
CENTERDALE MANOR C/O LEA-CIANCI
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062
4. Generator's Phone (860) 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029

5. Transporter 1 Company Name: U.S. Bulk Transport Inc
6. US EPA ID Number: PAD987347515
A. Transporter's Phone: 888-651-8182

7. Transporter 2 Company Name:
8. US EPA ID Number:
B. Transporter's Phone:

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number: NYD049836679
C. Facility's Phone: (716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 44000	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information CERTIFICATE OF DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract AB-58310(NY
SR# _____
PLATE # AB58310 NY
8157540

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: JON SWEETON
Signature: AS AGENT FOR CENTREDALE MANOR PERFORMING PARTIES GROUP
Month Day Year: 10 7 03

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Jeffrey Hanrahan
Signature:
Month Day Year: 10 21 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

19. Discrepancy Indication Space
Actual load 46620 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: SHELLEY LUPP
Signature:
Month Day Year: 10 22 03

GENERATOR
TRANSPORTER
FACILITY

ORIGINAL - RETURN TO GENERATOR

CWMI

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 00.0.0.1 | 2. Page 1 of 1

3. Generator's Name and Mailing Address (Performing Parties Group)
CENTERDALE MANOR C/O LEA-CIANCI
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062
4. Generator's Phone (860) 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029
XY21657 PA

5. Transporter 1 Company Name: US BULK TRANSPORT (Dec.) | US EPA ID Number: PAD987347515 | A. Transporter's Phone: 8886578782

7. Transporter 2 Company Name | US EPA ID Number | B. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number | C. Facility's Phone
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107 | NYD049836679 | (716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 46600	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information CERTIFICATE OF DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract
SR# _____
PLATE XY-21657 PA
81575143

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
JON SWEETON	AS AGENT FOR CENTREDALE MANOR PERFORMING PARTIES GROUP:	10	12	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Ronald Jordan		10	12	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Actual Rec 47660 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
SHELLEY KUPP		10	22	03

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL - RETURN TO GENERATOR

CWMI

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. RID981203755 | Manifest Document No. 0.0.0.5 | 2. Page 1 of 1

3. Generator's Name and Mailing Address — PERFORMING PARTIES GROUP
CENTERDALE MANOR C/O LEA-CIANCI
100 NORTHWEST DR ATTN: DAVE SCOTTI
PLAINVILLE CT 06062
4. Generator's Phone ( ) 860 410-2976

CENTREDALE MANOR RESTORA
ALLENDALE AVE
NORTH PROVIDENCE, RI 029

5. Transporter 1 Company Name: USBULK TRANSPORT INC | 6. US EPA ID Number: PAD987347515 | A. Transporter's Phone: 888 651 8182

7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone

9. Designated Facility Name and Site Address
CWM CHEMICAL SERVICES, L.L.C.
1550 BALMER RD.
MODEL CITY NY 14107
10. US EPA ID Number: NYD049836679
C. Facility's Phone: (716)754-8231

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON REGULATED MATERIAL	001	DT	EST 46.00.0	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
a. CW9509
CONT SOIL

E. Handling Codes for Wastes Listed Above
L

15. Special Handling Instructions and Additional Information CERTIFICATE OF DISPOSAL REQUIRED
CHEMTREC Emergency Response Number (800)424-9300 WMI Contract
SR# _____
PLATE # AC95931 NY 8575146 AC95931 NY

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: JON SWEETON | Signature: AS AGENT FOR CENTREDALE MANOR PERFORMING PARTIES GROUP | Month 07 Day 21 Year 03

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: CJONATHAN TROUTNER | Signature | Month 07 Day 21 Year 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month . Day . Year .

19. Discrepancy Indication Space
Act.Rec 35160 P

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: SHELLEY RUOFF | Signature | Month 07 Day 22 Year 03

GENERATOR — TRANSPORTER — FACILITY

ORIGINAL - RETURN TO GENERATOR

APPENDIX P

APPENDIX P

CWM Certificates of Disposal

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: C/O LEA-CIANCI, DAVE SCOTTI
RID981203755
100 NORTHWEST DRIVE
PLAINVILLE CT 06062

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575143 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157514301
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250895
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575137 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157513701
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250889
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575139 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157513901
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250891
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575140 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157514001
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250892
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575141 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157514101
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250893
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

WASTE MANAGEMENT, INC.

CWM Chemical Services, L.L.C.
1550 Balmer Rd.
P.O. Box 200
Model City, N.Y. 14107
716/754-8231

Federal EPA ID: NYD049836679

CENTREDALE MANOR RESTORATION
ATTN: ENVIRONMENTAL COMPLIANCE DEPT
RID981203755
ALLENDALE AVE
NORTH PROVIDENCE RI 02911

CERTIFICATE OF DISPOSAL FOR NON-HAZARDOUS WASTE

CWM CHEMICAL SERVICES, L.L.C. has received waste material from CENTREDALE MANOR RESTORATION on 07/22/03 as described on Shipping Document number 0081575146 Sequence number 01.

Profile Number: CW9509
CWM Tracking ID: 8157514601
CWM Unit #: 1*0
Disposal Date: 07/22/03

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

RICHARD STURGES
DIVISION MANAGER
Certificate # 250898
07/23/03

For questions please call our Customer Service Dept. at (800) 843-3604

APPENDIX Q

APPENDIX Q

Certified Copy of the Declaration of Covenants and Environmental Protection/Conservation Easement Recorded in the Land Evidence Records of the Town of North Providence, Rhode Island and the Town of Johnston, Rhode Island

MOSES & AFONSO LTD

• COUNSELORS • AT • LAW •

170 WESTMINSTER STREET • SUITE 201 • PROVIDENCE • RHODE ISLAND • 02903
TELEPHONE • 401 • 453 • 3600 • FACSIMILE • 401 • 453 • 3604

Richard J. Welch
rwelch@mosesafonso.com

March 23, 2004

David N. Scotti, P.G.
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

Re: Mill at Allendale

Dear David:

Enclosed please find a copy of the Declaration of Covenants and Environmental Protection/Conservation Easement that was recorded in the land evidence records of the Town of North Providence and the Town of Johnston.

The book and page number references are:

Town of North Providence: Book 995, Pages 202-222; and

Town of Johnston: Book 1370, Pages 1-21.

Very truly yours,

Richard J. Welch

Richard J. Welch

Enclosure

wpdata/rjw/centredale/scotti 03.23.04

DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT

1. This Declaration of Covenants and Environmental Protection/Conservation Easement is made this ___ day of October, 2002, by and between THE MILL AT ALLENDALE CONDOMINIUM ("Grantor"), having an address of Woonasquatucket Avenue, North Providence, Rhode Island, and the STATE OF RHODE ISLAND ("Grantee") and its assigns and personal representatives, having an address of Rhode Island Department of Environmental Management, Office of Waste Management, 235 Promenade St., Providence, Rhode Island 02908.

WITNESSETH:

2. WHEREAS, Grantor is the owner in fee simple of a parcel of land located in the Town of North Providence, Providence County, State of Rhode Island, designated as Lot 560, Plat 13 on the 2001 tax assessor's map of the Town of North Providence in Providence County, more particularly described on Exhibit A and Schedule A of Exhibit B (Legal Description and Definition of Property), which is attached to this Instrument and made a part of this Instrument; and

3. WHEREAS, the United States Environmental Protection Agency ("EPA") has determined that the Property and certain land in close proximity to the Property contain hazardous materials and other adverse environmental conditions;

4. WHEREAS, the Property is part of the Non-Time-Critical Removal Action of the Centredale Manor Restoration Project Superfund Site ("Site"), which EPA, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. Sect. 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on March 6, 2000, and

5. WHEREAS, in an Action Memorandum dated January 18, 2001, (the "Action Memorandum"), the EPA Region 1 Director of the Office of Site Remediation & Restoration selected a "removal action" for the Site, which provides, in part, for

> "institutional controls to be used at the restored Allendale Dam in order to prevent another dam breach and the potential movement of contaminated sediments downstream. Specifically, EPA expects that a negative easement (restricting alteration of the Dam) will be obtained from the owner of the Dam and enforced by the holder of the easement until such time as the Dam is no longer considered by EPA to be necessary for meeting response action objectives at the Site."

6. WHEREAS, a Unilateral Administrative Order, numbered CERCLA Docket No. CERCLA-1-2001-0032, was issued by EPA Region 1 on March 26, 2001.

7. WHEREAS, the Respondents to the Unilateral Administrative Order are, pursuant to the terms of the Unilateral Administrative Order: to obtain from the owner of the Allendale Dam an

easement restricting alteration of the Dam, enforceable by the easement until such time as the Dam is no longer considered by EPA, after a reasonable opportunity for review and comment by the State, to be necessary for meeting response action objectives at the Site.

NOW, THEREFORE:

8. Grant: For and in consideration of the terms of the Consent Decree and other good and valuable consideration paid and the agreements and promises hereinafter set forth the receipt and sufficiency of which is hereby acknowledged, Grantor, on behalf of itself, its heirs, successors, successors-in-title, and assigns, does hereby covenant and declare that the Property shall be subject to the covenants, conditions, and restrictions on use set forth below, and does give, grant, and convey to the Grantee and the Grantee's personal representatives and assigns a) the right to enforce said use restrictions, and b) an environmental protection/conservation easement of the nature and character set forth below.

9. Covenant, Conditions, and Restrictions on Use: The following covenants, conditions, and restrictions apply to the use of the Property. They run with the land and are binding on the Grantor and Grantor's heirs, successors, successors in title, and assigns:

> No alteration, modification, or disturbance of the Dam, or activity that would in any way negatively affect the response activities at the Site, will occur without the written consent of EPA Region 1 until the Grantor is informed in writing that EPA Region 1 no longer considers this restriction to be necessary for meeting response action objectives at the Site.
>
> The Grantor, for itself and for its heirs, successors, successors-in-title, assigns, executors, and administrators, hereby covenants to and with the Grantee and its assigns, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good right, full power and lawful right to grant and convey the above covenant, condition and restriction on use, that the Property is free and clear of encumbrances, except those noted on Schedule B of Exhibit B attached hereto, that the Grantee and its assigns shall at all times hereafter peacefully and quietly have and enjoy the granted interest in the property, and that the Grantor and its heirs, successors, successors-in-title, assigns, executors and administrators shall warrant and defend the premises to the Grantee and its assigns and personal representatives forever against the lawful claims and demands of all persons.

10. Modification or Termination of Restrictions: The above covenants, conditions and restrictions on use maybe modified or terminated, in whole or in part, in writing and recorded with the Records of Land Evidence of the Town of North Providence Rhode Island, after receiving prior written consent from the EPA Region 1 after reasonable opportunity for review and comment by the State of Rhode Island. At the very latest, such covenants, conditions and restrictions on use shall be terminated when EPA notifies the Grantor, after a reasonable opportunity for review and comment

BK995PG0204

by the State of Rhode Island, that the Site does not pose a threat to human health and the environment. EPA shall review such termination at the time it reviews the Completion of Work Report submitted by Respondents pursuant to Paragraph 59 of the Unilateral Administrative Order, and if EPA decides to approve the Completion of Work Report but not terminate the above covenants, conditions and restrictions on use, EPA will explain the reasons why it believes that a threat to human health and the environment exists at that time and describe the timing and steps that will be required to terminate the above covenants, conditions and restrictions on use. If requested by the Grantor, EPA Region 1 will execute any termination or modifications of covenants, conditions and restrictions on use in recordable form. If EPA Region 1 ever assigns its interest in the above covenants, conditions and restrictions on use to the State of Rhode Island, the State of Rhode Island shall have the authority to modify or terminate this Instrument.

11. Environmental Protection/Conservation Easement: Grantor hereby grants to the Grantee, its personal representatives and assigns, an irrevocable right of access at all reasonable times to the Property with men and by equipment for the purposes of conducting any activity related to any CERCLA response activity at the Site, such as the Unilateral Administrative Order, including, but not limited to:

a) Monitoring the Work required by the Unilateral Administrative Order;

b) Verifying any data or information submitted to EPA Region 1;

c) Conducting investigations relating to contamination at or near the Site;

d) Obtaining samples;

e) Assessing the need for, planning or implementing additional response actions at or near the Site;

f) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondents or their agents, consistent with the Unilateral Administrative Order; and

g) Assessing Respondents' compliance with the Unilateral Administrative Order.

12. Reserved Rights of Grantor: Grantor hereby reserves all rights and privileges in and to the use of the Property, including the right to maintain, repair, use, operate, and replace the existing facilities on the Property, as long as the Grantor's use of the Property is not incompatible with the restrictions, rights, and easements granted in this Instrument. EPA Region 1 has found that the current use of the Property, as such use exists on the effective date of this Instrument, is compatible with the removal action and is specifically permitted. However, the permitted use does not include

BK995PG0205

any right to alter the existing improvements and facilities of the Property if such activity would disturb the removal action or be incompatible with the restrictions, rights, and easements granted in this Instrument

13. Nothing in this document shall limit or otherwise affect the rights of entry and access provided by law or regulation to EPA Region 1 or the State of Rhode Island.

14. No Public Access and Use: This Instrument does not convey a right of access or use by the general public to any portion of the Property.

15. Requirements for Conveyances: Grantor, and any person who subsequently acquires any interest in Grantor's property, including, but not limited to, by deeds, leases, and mortgages, shall give a) written notice of the Unilateral Administrative Order and this Instrument to the person or entity that will receive the conveyance (the transferee), and b) written notice to EPA Region 1 and Rhode Island Department of Environmental Management of the conveyance, including the name and address of the transferee and the date on which the Grantor gave the notice to that transferee. Such transfer shall take place only if the transferee agrees, as a part of the agreement to purchase or otherwise obtain the property that it will comply with the obligations of the Grantor to provide access to the Property and with the Declarations set forth in this Instrument. Grantor agrees to include in any Instrument conveying an interest in any portion of the Property a notice, which is in substantially the following form:

> NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT, DATED _____, RECORDED IN THE RECORDS OF LAND EVIDENCE FOR THE TOWN OF _____, RHODE ISLAND ON _____, IN BOOK _____, PAGE _____, ENFORCEABLE BY, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, THE STATE OF RHODE ISLAND, BROOK VILLAGE ASSOCIATES LIMITED PARTNERSHIP, CENTERDALE MANOR ASSOCIATES LIMITED PARTNERSHIP, NEW ENGLAND CONTAINER COMPANY, INC., EMHART INDUSTRIES, INC., AND CROWN-METRO, INC.

Within thirty (30) days of executing any such an instrument of conveyance, Grantor must provide Grantee with a true copy of the instrument of conveyance and, if it has been recorded in the public land records, its recording reference.

16. Construction Activities: Grantor shall notify and receive prior written consent from EPA and the Rhode Island Department of Environmental Management, as well as notify the Respondents listed in paragraph No. 20 of this Instrument (entitled "Notices") prior to undertaking any facility improvements or other construction activities that could disturb removal action activities (including,

but not limited to, disturbing the Allendale Dam).

17. Administrative jurisdiction: The Regional Administrator of EPA or his or her delegate shall exercise the discretion and authority granted to EPA herein. The Rhode Island Department of Environmental Management is the state agency having administrative Jurisdiction over the interests acquired by the State of Rhode Island through this Instrument. The Director of Rhode Island Department of Environmental Management or his or her delegate shall exercise the discretion and authority granted to the State herein. If the EPA or the State of Rhode Island assigns interests created by this Instrument, the discretion and authority referred to in this paragraph shall also be assigned, unless otherwise provided in the assignment document, and a document evidencing same shall be recorded with the Records of Land Evidence of the Town of North Providence, Rhode Island.

18. Enforcement: The Grantee is entitled to enforce the terms of this Instrument by resorting to specific performance or legal process. The Grantee must notify, consult and coordinate with the EPA before taking any action to enforce the terms of this Instrument. In addition to the remedies available under this Instrument, Grantee may seek any and all other remedies available at law or in equity, including CERCLA. The Grantee shall have the discretion to enforce the terms of this Instrument. Any forbearance, delay, or omission to enforce in the event of a breach of any provision of this Instrument shall not be deemed to be a waiver of a) such provision or b) of any subsequent breach of the same or any other provision, or c) of any of the rights of the Grantee under this Instrument. Grantor hereby waives any defense of laches, estoppel, or prescription against the EPA or the State of Rhode Island in any action taken to enforce the terms of this Instrument. In accordance with the Rhode Island General Laws, Title 34, Chapter 39, entitled "Conservation and Preservation Restrictions on Real Property," no provision of this Instrument shall be unenforceable on account of a) lack of privity of estate or contract, b) lack of benefit to a particular land, c) the benefit being assignable or being assigned to any governmental body or to any entity with like purposes, or d) any other doctrine of Property law which might cause the termination of the provision. The Respondents to the Unilateral Administrative Order (Brook Village Associates Limited Partnership, Centredale Manor Associates Limited Partnership, New England Container Company, Inc., Emhart Industries, Inc., and Crown-Metro, Inc.) also are entitled to enforce the terms of this Instrument. The parties further intend that the provisions of the above covenants, conditions and restrictions on use also be for the benefit of the U.S. Environmental Protection Agency ("U.S. EPA") as a third party beneficiary.

19. Notices: Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing. Such written notice shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing.

As to the EPA:

Anna Krasko
On-Scene Coordinator/Remedial Project Manager
for the Centredale Manor Restoration Project Superfund Site
United States Environmental Protection Agency Region 1
Congress St., Suite 1100 (mail code HBR)
Boston, MA 02114

As to the State:

Sarah Martino
State Project Coordinator
RIDEM
Division of Site Remediation
291 Promenade St.
Providence, RI 02908

As to the Respondents:

For Brook Village Associates Limited Partnership:
Colburn T. Cherney
Ropes & Gray
One Franklin Square
1301 K Street, NW, Suite 800 East
Washington, D.C. 20005-3333
PH 202-626-3900
FAX 202-626-3961

Howard Castleman
Murtha Cullina Roche Carens & DeGiacomo
99 High Street
Boston, MA 02110
PH 617-457-4000
FAX 617-482-3868

For Centredale Manor Associates Limited Partnership (CIS Housing Associates):
Leonard H. Freiman
Goulston & Storrs, A Professional Corporation
400 Atlantic Avenue
Boston, MA 02110-3333

PH 617-482-1776
FAX 617-574-4112

For Centredale Manor Associates-Limited Partnership (Centredale Associates):
Richard J. Welch
Moses & Afonso, Ltd.
170 Westminster Street, Suite 201
Providence, RI 02903
PH 401-453-3600
FAX 401-453-3604

Laurie Burt
Foley, Hoag & Eliot, LLP
One Post Office Square
Boston, MA 02109
PH 617-832-1000
FAX 617-832-7000

For Emhart Industries, Inc.:
Jerome C. Muys, Jr.
Swidler Berlin Shereff Friedman LLP
3000 K Street, NW, Suite 300
Washington DC 20007-5116
PH 202-424-7547
FAX 202-424-7643

For Crown-Metro, Inc.:
Knox L. Haynsworth, III
Brown, Massey, Evans, McLeod & Haynsworth, P.A.
P.O. Box 2464
Greenville, SC 29602PH 864-271-7424
FAX 864-242-6469

For New England Container Company, Inc.:

Stuart R. Deans, Esq.
Robinson & Cole LLP
Financial Centre
695 East Main Street
P.O. 10305
Stamford, CT 06904-2304

PH 203-462-7500
FAX 203-462-7599

As to Grantor:
Steven Tinker Lee 10-24-02
~~Stephen Ember~~
President of the Mill at Allendale Condominium Association
The Mill at Allendale Condominium
Woonasquatucket Avenue
North Providence, Rhode Island

Frank A. Lombardi, Esquire
1000 Smith Street
Providence, Rhode Island 02908

20. General provisions:

a) Controlling law: The Interpretation and performance of this Instrument shall be governed by the laws of the United States or, if there are no applicable federal laws, by the law of the State of Rhode Island.

b) Definitions: Any provision or term not otherwise defined in this Instrument shall have the meaning set forth in the Unilateral Administrative Order and the appendices to the Unilateral Administrative Order.

c) Liberal construction: Any general rule of construction to the contrary notwithstanding, this Instrument shall be liberally construed in favor of the grant to effect the purpose of this Instrument, the Unilateral Administrative Order and its appendices, and the policy and purpose of CERCLA. If any provision of this Instrument is found to be ambiguous, an interpretation consistent with the purpose of this Instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

d) Severability: If any provision of this Instrument, or the application of it to any person or circumstance, is found to be invalid, the finding of invalidity will not affect i) the validity of the remainder of the provisions in the Instrument, or ii) the application of such provisions to any other person or circumstances.

e) Entire Agreement: This Instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior oral understandings relating thereto, all of which are merged into this Instrument.

f) No Forfeiture: Nothing contained in this Instrument will result in a forfeiture or reversion of Grantor's title in any respect.

g) Successors: The covenants, terms, conditions, and restrictions of this Instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, successors, successors-in-title, and assigns and shall continue as a servitude running with the Property. The term "Grantor" wherever used herein, and any pronouns used in place of the term "Grantor," shall include the person and/or entity named at the beginning of this document, identified as "Grantor" and its heirs, successors, successors-in-title, personal representatives and assigns. The term "Grantee," wherever used herein, and any pronouns used in place of the term "Grantee," shall include the person and/or entity named at the beginning of this document, identified as "Grantee," and its personal representatives and assigns. The rights of the Grantee and Grantor under this Instrument are freely assignable, subject to the notice provisions contained in this Instrument. Any transferee of the fee title to the Property or any leasehold interest in the Property shall automatically be deemed, by acceptance of such interest, to have acquired such title or interest subject to the restrictions contained or referred to in this Instrument and to have agreed to execute any and all Instruments reasonably necessary to carry out the provisions of this Instrument, Consistent with the Rhode Island Code, Title 34, Chapter 39-3(c), the rights and obligations under this Instrument shall not be subject to a 30-year limitation on restrictive covenants.

h) Termination of Rights and Obligations: A party's rights and obligations under this Instrument terminate upon transfer of the party's interest in the referenced in paragraph of this Instrument or Property, except that liability for the following shall survive the transfer:

(1) acts or omissions occurring, prior to the transfer shall survive the transfer;
(2) acts or omissions contradicting the provisions and terms of this agreement;
(3) any liability resulting from exacerbation of contaminants by Grantor, its successors, assigns, lessees, or sub lessees;
(4) criminal liability; and
(5) liability for violations of local, state, or federal laws or regulations.

i) Captions: The captions in this Instrument have been inserted solely for convenience of reference and are not a part of this Instrument and shall have no effect upon the construction of this Instrument.

J) Counterparts: The parties may execute this Instrument in two or more counterparts, which shall, in the aggregate, be signed by all parties, each counterpart shall be deemed an original instrument as against any party who has signed it. In event of any disparity between the counterparts produced, the recorded counterpart shall control.

BK 995 PG 0211

k) Further Assurances: From time to time after the execution of this Instrument and without further consideration, the parties hereto will execute and deliver, or arrange for the execution and delivery of, such other instruments and take such other action or arrange for such other actions as may reasonably be requested to more effectively complete any of the transactions provided for in this Instrument.

TO HAVE AND TO HOLD unto the Grantee and the Grantee's personal representatives and assigns forever.

IN WITNESS WHEREOF, Grantor has caused this Instrument to be executed by its duly authorized representative this 24th day of October, 2002.

WITNESS: _____

THE MILL AT ALLENDALE CONDOMINIUM

By: Steven Ember
~~Stephen Ember~~, President
The Mill at Allendale Condominium Association
Steven Ember Ltd 10-24-02

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

On this 24th day of October, 2002, before me, the undersigned, a Notary Public in and for the State of Rhode Island, duly commissioned and sworn, personally appeared ~~Stephen Ember~~ Steven Ember, President, The Mill at Allendale Condominium Association of *THE MILL AT ALLENDALE CONDOMINIUM*, known by me to be the party so executing the foregoing agreement for and on behalf of THE MILL AT ALLENDAL CONDOMINIUM, and he acknowledged said Instrument, by him so executed, to be his free act and deed in said capacity and the free act and deed of THE MILL AT ALLENDALE CONDOMINIUM.

Signature
Phyllis J Giarrusso
NOTARY PUBLIC

My Commission Expires: 8/7/05

wpdata/rjw/centredale/covenants and easement

ROBIN D. PIMENTAL
TOWN OF JOHNSTON

BK995PG0212

EXHIBIT A

THE MILL AT ALLENDALE CONDOMINIUM
NORTH PROVIDENCE/JOHNSTON
RHODE ISLAND

BOOK 0219 PAGE 0132

A certain parcel of land situated in Towns of North Providence and Johnston, Providence County, State of Rhode Island, bounded and described as follows:

Beginning at a railroad spike at the intersection of the westerly sideline of Woonasquatucket Avenue and the southerly sideline of Allendale Avenue;

Thence running southeasterly along the westerly sideline of Woonasquatucket Avenue, a distance of 457.9 feet;

Thence turning an interior angle of 172° 20' and running along the westerly sideline of Woonasquatucket Avenue, a distance of 14.0 feet;

Thence turning an interior angle of 114° 21' 00" and running a distance of 95.06 feet;

Thence turning an interior angle of 152° 13' and running a distance of about 293 feet to the easterly bank of the Woonasquatucket River;

Thence turning and running southerly along the said easterly bank of the Woonasquatucket River down into Lyman Pond;

Thence turning and running westerly across the Woonasquatucket River to the westerly bank of said Woonasquatucket River;

Thence turning and running northerly along the westerly bank of said Woonasquatuchat River to the dam at the southerly end of Allendale Pond;

Thence turning and running northwesterly along the westerly bank of said Allendale Pond to the easterly property line of the Narragansett Electric Company;

Thence turning and running less northwesterly by the easterly property line of said Narragansett Electric Company to the westerly bank of the Woonasqatucket River;

Thence running northwesterly by the westerly bank of the Woonasqatucket River to the northerly property line;

Thence turning and running easterly to a stone bound of record on the easterly bank of the Woonasquatucket River;

Thence turning an interior angle of 192° 30' and running easterly, a distance of 103.21 feet to a stone bound of record;

Thence turning an interior angle of 229° 47' and running northeasterly, a distance of 278.55 feet to a stone bound of record;

Thence turning an interior angle of 130° 33' and running easterly to the easterly bank of the Woonasquatucket River;

AUG 25 '88 12:43 H M WOORE
P.2/3

BK995PG0213

BOOK 0219 PAGE 0133

Thence turning and running southerly and southeasterly along the easterly bank of the Woonasquatucket River and Allendale Pond to the southwesterly corner of land now or formerly of Ettore & M. Saravo;

Thence turning and running along eht southerly property line of land of said Saravo to land now or formerly of Eva L. Lusson;

Thence turning and running southerly to an angle point;

Thence turning an exterior angle of 78° 53' and running easterly, a distance of 49.14 feet;

Thence turning an interior angle of 94° 43" and running southeasterly, a distance of 87.97 feet to the easterly shore of Allendale Pond;

Thence turning and running southerly along the shore of said Allendale Pond to a dam;

Thence running southeasterly along the face of a wall to the southerly sideline of Allendale Avenue;

Thence turning and running easterly along the southerly sideline of said Allendale Avenue, a distance of 162.2 feet to the point of beginning as shown on a plan entitled "Compiled Plan of Land, The Mill at Allendale Condominium, North Providence/Johnston, (Rhode Island)", by Harry R. Feldman, Inc., dated August 19, 1988.

The above described parcel has the benefit of a R.O.W. and easement within Allendale Avenue, a 1/3 rod R.O.W. along the westerly bank of the Allendale Pond and a 12' wide easement north of Allendale Avenue, as shown on the plan.

The above described parcel is subject to a 20' wide perpetual R.O.W. and easement and a gas easement as shown on the plan.

AUG 26 '88 12:44 H H MOORE P.3/3

COMMONWEALTH LAND TITLE INSURANCE COMPANY
Seven Thurber Boulevard | Smithfield, RI 02917 | 401-233-2900 | fax 401-233-0099

BK995PG0214 EXHIBIT B

Commonwealth
A LANDAMERICA COMPANY

BK: 1370 PG: 13

CERTIFICATE OF TITLE

Date: October 26, 2001

To: the United States Environmental Protection Agency and the United States of America

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough search of the title to the property described in Schedule A hereof, beginning December 16, 1915, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B hereof.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $750.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____
Michael B. Mellion
Rhode Island State Counsel

BK995PG0215

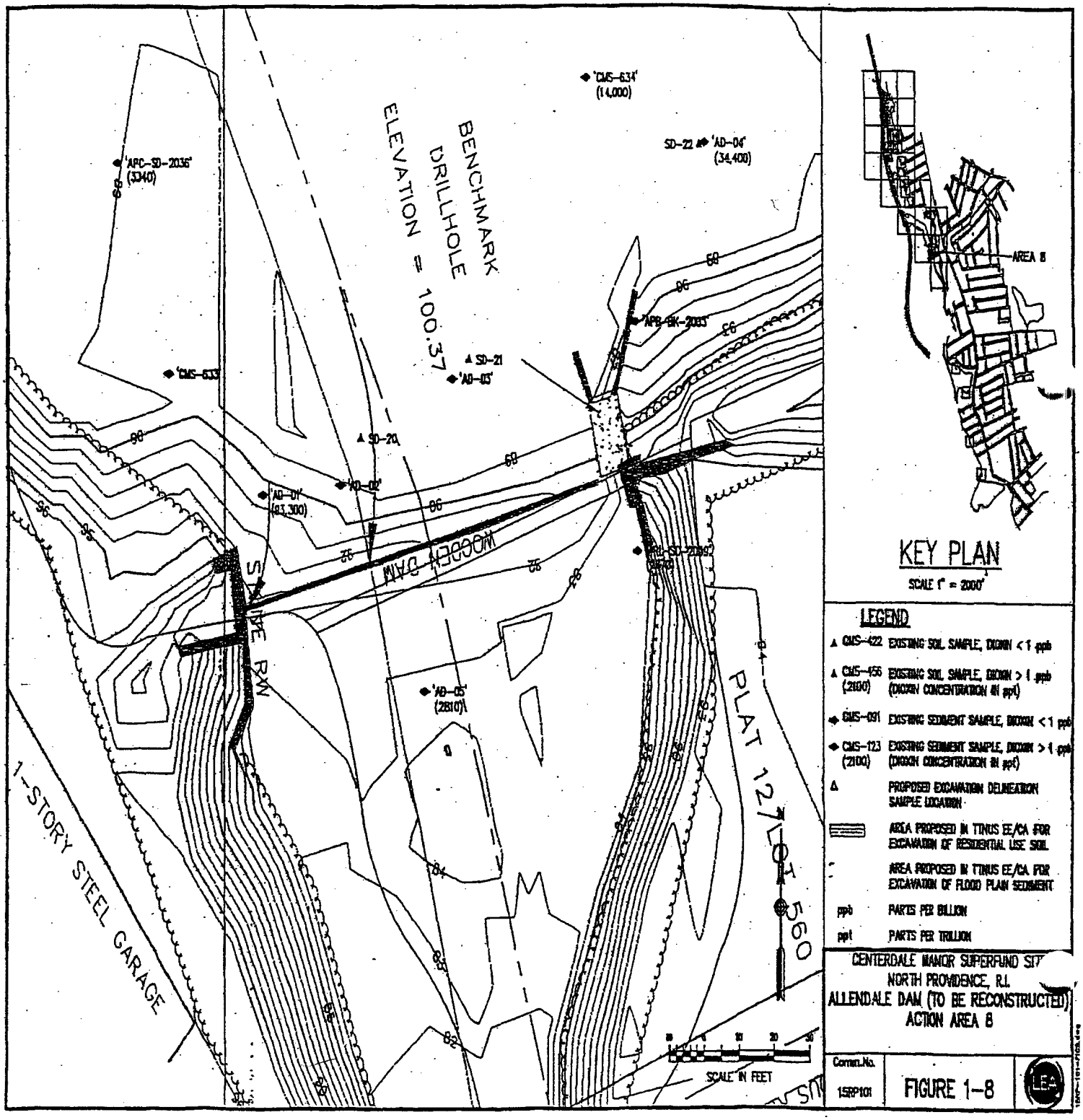
BK: 1370 PG: 14

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0216

BK: 1370 PG: 15



BK 995 PG 0217
BK: 1370 PG: 16

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Declaration of the Mill at Allendale Condominium dated August 28, 1988 and recorded in North Providence Book 184 at page 818 and in Johnston in Book 219 at page 100, as the same may be amended, and the by-laws and plats and plans recorded in connection therewith.

2. Easement from Centredale Worsted Mills to Narragansett Electric Lighting Company dated January 2, 1917 and recorded In North Providence Book 15 at page 472.

3. Easement from Allendale Company to Providence Gas Company dated August 26, 1958 and recorded in North Providence Book 53 at page 621 and in Johnston in Book 86 at page 530.

4. Rights of the City of Providence in and to Easement from Allendale Company to City of Providence dated February 13,1964 and recorded in Book 58 at page 551 in North Providence and in Johnston in Book 102 at page 230.

5. Rights over Allendale Avenue and a private way as set forth in deed to John Mondillo et als dated July 15, 1954 and recorded in Johnston Book 78 at page 408 and in deed to Henry G. Jutras et als. dated June 4,1952 and recorded in Johnston Book 75 at page 205.

Schedule B BK: 1370 PG: 17

6. Easement to Providence Telephone Company dated December 18, 1906 and recorded in Johnston Book 16 at page 398 as modified by agreement dated March 10, 1914 and recorded in Johnston Book 21 at page 477.

7. Easement to Narragansett Electric Lighting Company dated October 26,1923 and recorded in Johnston Book 37 at page 226.

8. Reservation in deed to Napoleon Paquin dated June 9,1923 and recorded in Johnston Book 36 at page 147.

9. Rights of others in and to any streets or ways abutting or crossing the insured, but not limited to, those streets shown on a plat entitled "Plat of house lots surveyed and plotted by Samuel B. Cushing and Co. August 1871 upon the estate of Obadiah Olney, deceased", which plat is recorded on North Providence Plat Card 47.

10. Rights of others (including any rights of flowage) in and to the Woonasquatucket River

11. Rights, if any, of the property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond in and to the waters of the Lyman Pond or Lymansville Pond or Allendale Pond and in and to the bed thereof; also boating and fishing rights of property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond or the stream of water leading thereto and therefrom.

12. Zoning Agreement with the Town of North Providence in North Providence Book 171 at page 342.

13. Easement to Narragansett Electric Company In Book 182 at page 787 Survey entitled -Compiled Plan of Land North Providence/Johnston (Rhode Island) dated August 14, 1986 and prepared by Harry R. Feldman, Inc." discloses raceway on premises.

14. Tax Sale Deed recorded in Johnston Book 429 at page 276

15. Any questions arising from the fact that the deeds to Units 106-109, 111-121, 206-211, 215, 217-219, 221, 406-419, 422 and 425 have not been recorded in Johnston.

CERTIFICATE OF TITLE
UPDATED FROM ORIGINAL CERTIFICATE DATED OCTOBER 26, 2001

Date: December 5, 2003

To: the United States Environmental Protection Agency and the United States of America

Our File No. 276407

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough updated search of the title to the property described in Schedule A hereof, beginning October 26, 2001, the date of its prior Certificate of Title, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is still indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B of the Certificate of Title dated October 16, 2001, and except the additional matters as shown in Schedule B hereof found during the period of this updated search.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $350.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____

Michael B. Mellion
Rhode Island State Counsel

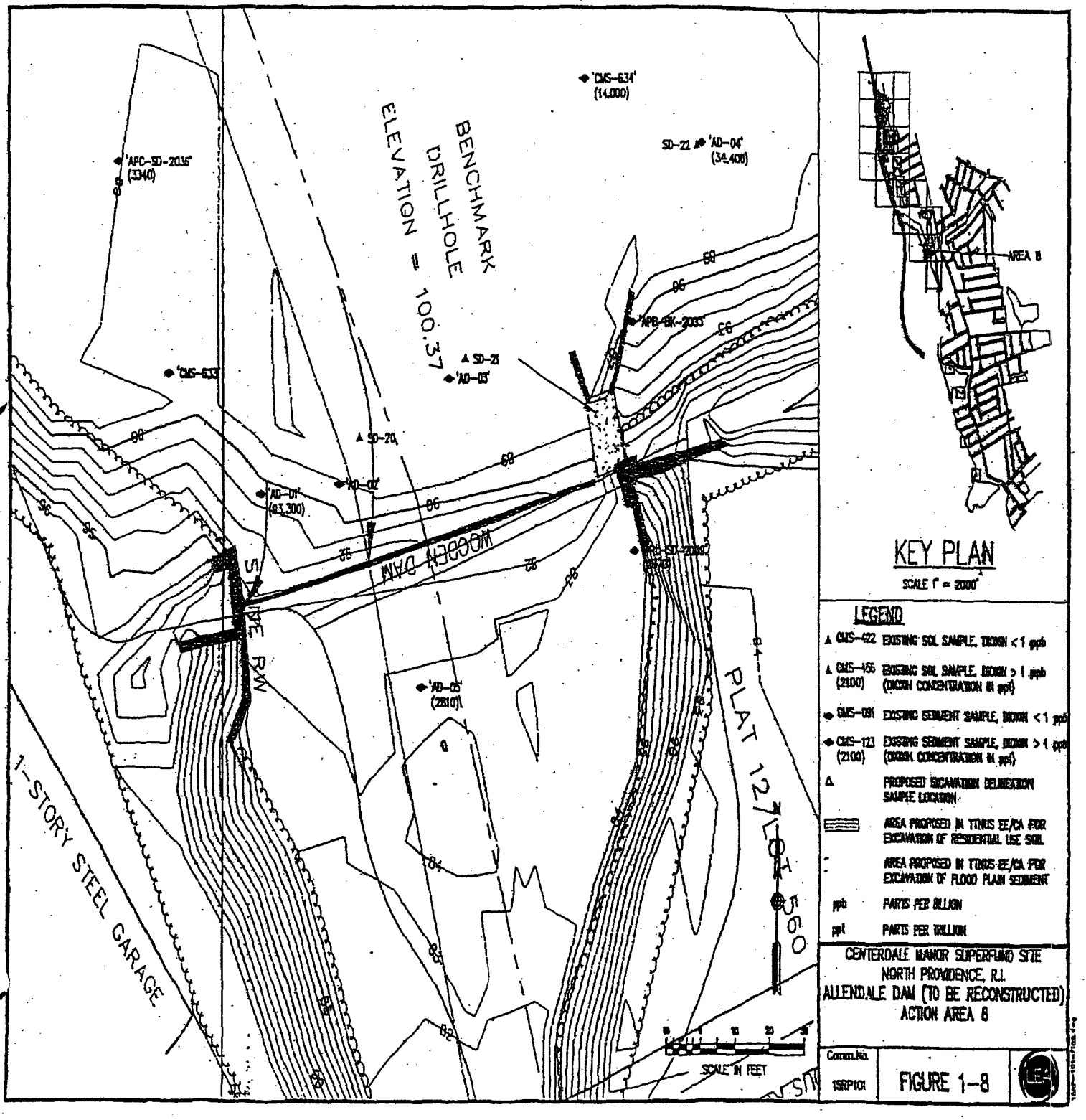
BK: 1370 PG: 19
BK995PG0220

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0221

BK: 1370 PG: 20



COMMONWEALTH LAND TITLE INSURANCE COMPANY

CERTIFICATE OF TITLE
December 5, 2003
Page 3

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Terms and conditions of Access Agreement dated February 6, 2002 by and between by and between The Mill at Allendale Condominium Association and CoxCom, Inc., d/b/a Cox Communications New England, as evidenced by Memorandum of Agreement recorded May 16, 2002 at 9:05 A.M. in Book 656 at Page 83.

2. Insignificant Alteration - Permit issued by the Rhode Island Department of Environmental Management dated October 1, 2003 and recorded October 10, 2003 at 2:40 P.M. in Book 933 at Page 242.

RECEIVED FOR RECORD
North Providence, R.I. MAR 11 2004
10:15 o'clock A M
Witness:
Maryann Desrosiers
Town Clerk

ROBIN D. PIMENTAL
TOWN OF JOHNSTON
TOWN CLERK
03/11/2004 10:45:33AM

2/84

MOSES & AFONSO LTD

• COUNSELORS • AT • LAW •

170 WESTMINSTER STREET • SUITE 201 • PROVIDENCE • RHODE ISLAND • 02903
TELEPHONE • 401 • 453 • 3600 • FACSIMILE • 401 • 453 • 3604

Richard J. Welch
rwelch@mosesafonso.com

March 23, 2004

David N. Scotti, P.G.
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

Re: Mill at Allendale

Dear David:

Enclosed please find a copy of the Declaration of Covenants and Environmental Protection/Conservation Easement that was recorded in the land evidence records of the Town of North Providence and the Town of Johnston.

The book and page number references are:

Town of North Providence: Book 995, Pages 202-222; and

Town of Johnston: Book 1370, Pages 1-21.

Very truly yours,

Richard J. Welch

Richard J. Welch

Enclosure

wpdata/rjw/centredale/scotti 03.23.04

DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT

1. This Declaration of Covenants and Environmental Protection/Conservation Easement is made this ___ day of October, 2002, by and between THE MILL AT ALLENDALE CONDOMINIUM ("Grantor"), having an address of Woonasquatucket Avenue, North Providence, Rhode Island, and the STATE OF RHODE ISLAND ("Grantee") and its assigns and personal representatives, having an address of Rhode Island Department of Environmental Management, Office of Waste Management, 235 Promenade St., Providence, Rhode Island 02908.

WITNESSETH:

2. WHEREAS, Grantor is the owner in fee simple of a parcel of land located in the Town of North Providence, Providence County, State of Rhode Island, designated as Lot 560, Plat 13 on the 2001 tax assessor's map of the Town of North Providence in Providence County, more particularly described on Exhibit A and Schedule A of Exhibit B (Legal Description and Definition of Property), which is attached to this Instrument and made a part of this Instrument; and

3. WHEREAS, the United States Environmental Protection Agency ("EPA") has determined that the Property and certain land in close proximity to the Property contain hazardous materials and other adverse environmental conditions;

4. WHEREAS, the Property is part of the Non-Time-Critical Removal Action of the Centredale Manor Restoration Project Superfund Site ("Site"), which EPA, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. Sect. 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on March 6, 2000, and

5. WHEREAS, in an Action Memorandum dated January 18, 2001, (the "Action Memorandum"), the EPA Region 1 Director of the Office of Site Remediation & Restoration selected a "removal action" for the Site, which provides, in part, for

> "institutional controls to be used at the restored Allendale Dam in order to prevent another dam breach and the potential movement of contaminated sediments downstream. Specifically, EPA expects that a negative easement (restricting alteration of the Dam) will be obtained from the owner of the Dam and enforced by the holder of the easement until such time as the Dam is no longer considered by EPA to be necessary for meeting response action objectives at the Site."

6. WHEREAS, a Unilateral Administrative Order, numbered CERCLA Docket No. CERCLA-1-2001-0032, was issued by EPA Region 1 on March 26, 2001.

7. WHEREAS, the Respondents to the Unilateral Administrative Order are, pursuant to the terms of the Unilateral Administrative Order: to obtain from the owner of the Allendale Dam an

easement restricting alteration of the Dam, enforceable by the easement until such time as the Dam is no longer considered by EPA, after a reasonable opportunity for review and comment by the State, to be necessary for meeting response action objectives at the Site.

NOW, THEREFORE:

8. Grant: For and in consideration of the terms of the Consent Decree and other good and valuable consideration paid and the agreements and promises hereinafter set forth the receipt and sufficiency of which is hereby acknowledged, Grantor, on behalf of itself, its heirs, successors, successors-in-title, and assigns, does hereby covenant and declare that the Property shall be subject to the covenants, conditions, and restrictions on use set forth below, and does give, grant, and convey to the Grantee and the Grantee's personal representatives and assigns a) the right to enforce said use restrictions, and b) an environmental protection/conservation easement of the nature and character set forth below.

9. Covenant, Conditions, and Restrictions on Use: The following covenants, conditions, and restrictions apply to the use of the Property. They run with the land and are binding on the Grantor and Grantor's heirs, successors, successors in title, and assigns:

> No alteration, modification, or disturbance of the Dam, or activity that would in any way negatively affect the response activities at the Site, will occur without the written consent of EPA Region 1 until the Grantor is informed in writing that EPA Region 1 no longer considers this restriction to be necessary for meeting response action objectives at the Site.
>
> The Grantor, for itself and for its heirs, successors, successors-in-title, assigns, executors, and administrators, hereby covenants to and with the Grantee and its assigns, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good right, full power and lawful right to grant and convey the above covenant, condition and restriction on use, that the Property is free and clear of encumbrances, except those noted on Schedule B of Exhibit B attached hereto, that the Grantee and its assigns shall at all times hereafter peacefully and quietly have and enjoy the granted interest in the property, and that the Grantor and its heirs, successors, successors-in-title, assigns, executors and administrators shall warrant and defend the premises to the Grantee and its assigns and personal representatives forever against the lawful claims and demands of all persons.

10. Modification or Termination of Restrictions: The above covenants, conditions and restrictions on use maybe modified or terminated, in whole or in part, in writing and recorded with the Records of Land Evidence of the Town of North Providence Rhode Island, after receiving prior written consent from the EPA Region 1 after reasonable opportunity for review and comment by the State of Rhode Island. At the very latest, such covenants, conditions and restrictions on use shall be terminated when EPA notifies the Grantor, after a reasonable opportunity for review and comment

by the State of Rhode Island, that the Site does not pose a threat to human health and the environment. EPA shall review such termination at the time it reviews the Completion of Work Report submitted by Respondents pursuant to Paragraph 59 of the Unilateral Administrative Order, and if EPA decides to approve the Completion of Work Report but not terminate the above covenants, conditions and restrictions on use, EPA will explain the reasons why it believes that a threat to human health and the environment exists at that time and describe the timing and steps that will be required to terminate the above covenants, conditions and restrictions on use. If requested by the Grantor, EPA Region 1 will execute any termination or modifications of covenants, conditions and restrictions on use in recordable form. If EPA Region 1 ever assigns its interest in the above covenants, conditions and restrictions on use to the State of Rhode Island, the State of Rhode Island shall have the authority to modify or terminate this Instrument.

11. Environmental Protection/Conservation Easement: Grantor hereby grants to the Grantee, its personal representatives and assigns, an irrevocable right of access at all reasonable times to the Property with men and by equipment for the purposes of conducting any activity related to any CERCLA response activity at the Site, such as the Unilateral Administrative Order, including, but not limited to:

a) Monitoring the Work required by the Unilateral Administrative Order;

b) Verifying any data or information submitted to EPA Region 1;

c) Conducting investigations relating to contamination at or near the Site;

d) Obtaining samples;

e) Assessing the need for, planning or implementing additional response actions at or near the Site;

f) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondents or their agents, consistent with the Unilateral Administrative Order; and

g) Assessing Respondents' compliance with the Unilateral Administrative Order.

12. Reserved Rights of Grantor: Grantor hereby reserves all rights and privileges in and to the use of the Property, including the right to maintain, repair, use, operate, and replace the existing facilities on the Property, as long as the Grantor's use of the Property is not incompatible with the restrictions, rights, and easements granted in this Instrument. EPA Region 1 has found that the current use of the Property, as such use exists on the effective date of this Instrument, is compatible with the removal action and is specifically permitted. However, the permitted use does not include

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any right to alter the existing improvements and facilities of the Property if such activity would disturb the removal action or be incompatible with the restrictions, rights, and easements granted in this Instrument

13. Nothing in this document shall limit or otherwise affect the rights of entry and access provided by law or regulation to EPA Region 1 or the State of Rhode Island.

14. No Public Access and Use: This Instrument does not convey a right of access or use by the general public to any portion of the Property.

15. Requirements for Conveyances: Grantor, and any person who subsequently acquires any interest in Grantor's property, including, but not limited to, by deeds, leases, and mortgages, shall give a) written notice of the Unilateral Administrative Order and this Instrument to the person or entity that will receive the conveyance (the transferee), and b) written notice to EPA Region 1 and Rhode Island Department of Environmental Management of the conveyance, including the name and address of the transferee and the date on which the Grantor gave the notice to that transferee. Such transfer shall take place only if the transferee agrees, as a part of the agreement to purchase or otherwise obtain the property that it will comply with the obligations of the Grantor to provide access to the Property and with the Declarations set forth in this Instrument. Grantor agrees to include in any Instrument conveying an interest in any portion of the Property a notice, which is in substantially the following form:

> NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT, DATED _____, RECORDED IN THE RECORDS OF LAND EVIDENCE FOR THE TOWN OF _____, RHODE ISLAND ON _____, IN BOOK _____, PAGE _____, ENFORCEABLE BY, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, THE STATE OF RHODE ISLAND, BROOK VILLAGE ASSOCIATES LIMITED PARTNERSHIP, CENTERDALE MANOR ASSOCIATES LIMITED PARTNERSHIP, NEW ENGLAND CONTAINER COMPANY, INC., EMHART INDUSTRIES, INC., AND CROWN-METRO, INC.

Within thirty (30) days of executing any such an instrument of conveyance, Grantor must provide Grantee with a true copy of the instrument of conveyance and, if it has been recorded in the public land records, its recording reference.

16. Construction Activities: Grantor shall notify and receive prior written consent from EPA and the Rhode Island Department of Environmental Management, as well as notify the Respondents listed in paragraph No. 20 of this Instrument (entitled "Notices") prior to undertaking any facility improvements or other construction activities that could disturb removal action activities (including,

but not limited to, disturbing the Allendale Dam).

17. Administrative jurisdiction: The Regional Administrator of EPA or his or her delegate shall exercise the discretion and authority granted to EPA herein. The Rhode Island Department of Environmental Management is the state agency having administrative Jurisdiction over the interests acquired by the State of Rhode Island through this Instrument. The Director of Rhode Island Department of Environmental Management or his or her delegate shall exercise the discretion and authority granted to the State herein. If the EPA or the State of Rhode Island assigns interests created by this Instrument, the discretion and authority referred to in this paragraph shall also be assigned, unless otherwise provided in the assignment document, and a document evidencing same shall be recorded with the Records of Land Evidence of the Town of North Providence, Rhode Island.

18. Enforcement: The Grantee is entitled to enforce the terms of this Instrument by resorting to specific performance or legal process. The Grantee must notify, consult and coordinate with the EPA before taking any action to enforce the terms of this Instrument. In addition to the remedies available under this Instrument, Grantee may seek any and all other remedies available at law or in equity, including CERCLA. The Grantee shall have the discretion to enforce the terms of this Instrument. Any forbearance, delay, or omission to enforce in the event of a breach of any provision of this Instrument shall not be deemed to be a waiver of a) such provision or b) of any subsequent breach of the same or any other provision, or c) of any of the rights of the Grantee under this Instrument. Grantor hereby waives any defense of laches, estoppel, or prescription against the EPA or the State of Rhode Island in any action taken to enforce the terms of this Instrument. In accordance with the Rhode Island General Laws, Title 34, Chapter 39, entitled "Conservation and Preservation Restrictions on Real Property," no provision of this Instrument shall be unenforceable on account of a) lack of privity of estate or contract, b) lack of benefit to a particular land, c) the benefit being assignable or being assigned to any governmental body or to any entity with like purposes, or d) any other doctrine of Property law which might cause the termination of the provision. The Respondents to the Unilateral Administrative Order (Brook Village Associates Limited Partnership, Centredale Manor Associates Limited Partnership, New England Container Company, Inc., Emhart Industries, Inc., and Crown-Metro, Inc.) also are entitled to enforce the terms of this Instrument. The parties further intend that the provisions of the above covenants, conditions and restrictions on use also be for the benefit of the U.S. Environmental Protection Agency ("U.S. EPA") as a third party beneficiary.

19. Notices: Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing. Such written notice shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing.

As to the EPA:

Anna Krasko
On-Scene Coordinator/Remedial Project Manager
for the Centredale Manor Restoration Project Superfund Site
United States Environmental Protection Agency Region 1
Congress St., Suite 1100 (mail code HBR)
Boston, MA 02114

As to the State:

Sarah Martino
State Project Coordinator
RIDEM
Division of Site Remediation
291 Promenade St.
Providence, RI 02908

As to the Respondents:

For Brook Village Associates Limited Partnership:
Colburn T. Cherney
Ropes & Gray
One Franklin Square
1301 K Street, NW, Suite 800 East
Washington, D.C. 20005-3333
PH 202-626-3900
FAX 202-626-3961

Howard Castleman
Murtha Cullina Roche Carens & DeGiacomo
99 High Street
Boston, MA 02110
PH 617-457-4000
FAX 617-482-3868

For Centredale Manor Associates Limited Partnership (CIS Housing Associates):
Leonard H. Freiman
Goulston & Storrs, A Professional Corporation
400 Atlantic Avenue
Boston, MA 02110-3333

PH 617-482-1776
FAX 617-574-4112

For Centredale Manor Associates-Limited Partnership (Centredale Associates):
Richard J. Welch
Moses & Afonso, Ltd.
170 Westminster Street, Suite 201
Providence, RI 02903
PH 401-453-3600
FAX 401-453-3604

Laurie Burt
Foley, Hoag & Eliot, LLP
One Post Office Square
Boston, MA 02109
PH 617-832-1000
FAX 617-832-7000

For Emhart Industries, Inc.:
Jerome C. Muys, Jr.
Swidler Berlin Shereff Friedman LLP
3000 K Street, NW, Suite 300
Washington DC 20007-5116
PH 202-424-7547
FAX 202-424-7643

For Crown-Metro, Inc.:
Knox L. Haynsworth, III
Brown, Massey, Evans, McLeod & Haynsworth, P.A.
P.O. Box 2464
Greenville, SC 29602PH 864-271-7424
FAX 864-242-6469

For New England Container Company, Inc.:

Stuart R. Deans, Esq.
Robinson & Cole LLP
Financial Centre
695 East Main Street
P.O. 10305
Stamford, CT 06904-2304

PH 203-462-7500
FAX 203-462-7599

As to Grantor:
Steven Tinker Ledl 10-24-02
~~Stephen Ember~~
President of the Mill at Allendale Condominium Association
The Mill at Allendale Condominium
Woonasquatucket Avenue
North Providence, Rhode Island

Frank A. Lombardi, Esquire
1000 Smith Street
Providence, Rhode Island 02908

20. General provisions:

a) Controlling law: The Interpretation and performance of this Instrument shall be governed by the laws of the United States or, if there are no applicable federal laws, by the law of the State of Rhode Island.

b) Definitions: Any provision or term not otherwise defined in this Instrument shall have the meaning set forth in the Unilateral Administrative Order and the appendices to the Unilateral Administrative Order.

c) Liberal construction: Any general rule of construction to the contrary notwithstanding, this Instrument shall be liberally construed in favor of the grant to effect the purpose of this Instrument, the Unilateral Administrative Order and its appendices, and the policy and purpose of CERCLA. If any provision of this Instrument is found to be ambiguous, an interpretation consistent with the purpose of this Instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

d) Severability: If any provision of this Instrument, or the application of it to any person or circumstance, is found to be invalid, the finding of invalidity will not affect i) the validity of the remainder of the provisions in the Instrument, or ii) the application of such provisions to any other person or circumstances.

e) Entire Agreement: This Instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior oral understandings relating thereto, all of which are merged into this Instrument.

f) No Forfeiture: Nothing contained in this Instrument will result in a forfeiture or reversion of Grantor's title in any respect.

g) Successors: The covenants, terms, conditions, and restrictions of this Instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, successors, successors-in-title, and assigns and shall continue as a servitude running with the Property. The term "Grantor" wherever used herein, and any pronouns used in place of the term "Grantor," shall include the person and/or entity named at the beginning of this document, identified as "Grantor" and its heirs, successors, successors-in-title, personal representatives and assigns. The term "Grantee," wherever used herein, and any pronouns used in place of the term "Grantee," shall include the person and/or entity named at the beginning of this document, identified as "Grantee," and its personal representatives and assigns. The rights of the Grantee and Grantor under this Instrument are freely assignable, subject to the notice provisions contained in this Instrument. Any transferee of the fee title to the Property or any leasehold interest in the Property shall automatically be deemed, by acceptance of such interest, to have acquired such title or interest subject to the restrictions contained or referred to in this Instrument and to have agreed to execute any and all Instruments reasonably necessary to carry out the provisions of this Instrument, Consistent with the Rhode Island Code, Title 34, Chapter 39-3(c), the rights and obligations under this Instrument shall not be subject to a 30-year limitation on restrictive covenants.

h) Termination of Rights and Obligations: A party's rights and obligations under this Instrument terminate upon transfer of the party's interest in the referenced in paragraph of this Instrument or Property, except that liability for the following shall survive the transfer:

(1) acts or omissions occurring, prior to the transfer shall survive the transfer;
(2) acts or omissions contradicting the provisions and terms of this agreement;
(3) any liability resulting from exacerbation of contaminants by Grantor, its successors, assigns, lessees, or sub lessees;
(4) criminal liability; and
(5) liability for violations of local, state, or federal laws or regulations.

i) Captions: The captions in this Instrument have been inserted solely for convenience of reference and are not a part of this Instrument and shall have no effect upon the construction of this Instrument.

J) Counterparts: The parties may execute this Instrument in two or more counterparts, which shall, in the aggregate, be signed by all parties, each counterpart shall be deemed an original instrument as against any party who has signed it. In event of any disparity between the counterparts produced, the recorded counterpart shall control.

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k) Further Assurances: From time to time after the execution of this Instrument and without further consideration, the parties hereto will execute and deliver, or arrange for the execution and delivery of, such other instruments and take such other action or arrange for such other actions as may reasonably be requested to more effectively complete any of the transactions provided for in this Instrument.

TO HAVE AND TO HOLD unto the Grantee and the Grantee's personal representatives and assigns forever.

IN WITNESS WHEREOF, Grantor has caused this Instrument to be executed by its duly authorized representative this 24th day of October, 2002.

WITNESS: _____

THE MILL AT ALLENDALE CONDOMINIUM

By: Steven Ember

~~Stephen~~ Steven ~~Ember~~, President
The Mill at Allendale Condominium Association

Steven Ember Ltd 10-24-02

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

On this 24th day of October, 2002, before me, the undersigned, a Notary Public in and for the State of Rhode Island, duly commissioned and sworn, personally appeared ~~Stephen Ember~~ Steven Ember, President, The Mill at Allendale Condominium Association of THE MILL AT ALLENDALE CONDOMINIUM, known by me to be the party so executing the foregoing agreement for and on behalf of THE MILL AT ALLENDAL CONDOMINIUM, and he acknowledged said Instrument, by him so executed, to be his free act and deed in said capacity and the free act and deed of THE MILL AT ALLENDALE CONDOMINIUM.

Signature
Phyllis J Giarrusso
NOTARY PUBLIC

My Commission Expires: 8/7/05

wpdata/rjw/centredale/covenants and easement

ROBIN D. PIMENTAL
TOWN OF JOHNSTON

BK995PG0212

EXHIBIT A

THE MILL AT ALLENDALE CONDOMINIUM BOOK 0219 PAGE 0132
NORTH PROVIDENCE/JOHNSTON
RHODE ISLAND

A certain parcel of land situated in Towns of North Providence and Johnston, Providence County, State of Rhode Island, bounded and described as follows:

Beginning at a railroad spike at the intersection of the westerly sideline of Woonasquatucket Avenue and the southerly sideline of Allendale Avenue;

Thence running southeasterly along the westerly sideline of Woonasquatucket Avenue, a distance of 457.9 feet;

Thence turning an interior angle of 172° 20' and running along the westerly sideline of Woonasquatucket Avenue, a distance of 14.0 feet;

Thence turning an interior angle of 114° 21' 00" and running a distance of 95.06 feet;

Thence turning an interior angle of 152° 13' and running a distance of about 293 feet to the easterly bank of the Woonasquatucket River;

Thence turning and running southerly along the said easterly bank of the Woonasquatucket River down into Lyman Pond;

Thence turning and running westerly across the Woonasquatucket River to the westerly bank of said Woonasquatucket River;

Thence turning and running northerly along the westerly bank of said Woonasquatucket River to the dam at the southerly end of Allendale Pond;

Thence turning and running northwesterly along the westerly bank of said Allendale Pond to the easterly property line of the Narragansett Electric Company;

Thence turning and running less northwestarly by the easterly property line of said Narragansett Electric Company to the westerly bank of the Woonasqatucket River;

Thence running northwesterly by the westerly bank of the Woonasqatucket River to the noctherly property line;

Thence turning and running easterly to a stone bound of record on the easterly bank of the Woonasquatucket River;

Thence turning an interior angle of 192° 30' and running easterly, a distance of 103.21 feet to a stone bound of record;

Thence turning an interior angle of 229° 47' and running northeasterly, a distance of 278.55 feet to a stone bound of record;

Thence turning an interior angle of 130° 33' and running easterly to the easterly bank of the Woonasquatucket River;

AUG 26 '98 12:43 H M MOORE

BK995PG0213

BOOK0219 PAGE 0133

Thence turning and running southerly and southeasterly along the easterly bank of the Woonasquatucket River and Allendale Pond to the southwesterly corner of land now or formerly of Ettore & M. Saravo;

Thence turning and running along aht southerly property line of land of said Saravo to land now or formerly of Eva L. Lusson;

Thence turning and running southerly to an angle point;

Thence turning an exterior angle of 78° 53' and running easterly, a distance of 49.14 feet;

Thence turning an interior angle of 94° 43" and running southeasterly, a distance of 87.97 feet to the easterly shore of Allendale Pond;

Thence turning and running southerly along the shore of said Allendale Pond to a dam;

Thence running southeasterly along the face of a wall to the southerly sideline of Allendale Avenue;

Thence turning and running easterly along the southerly sideline of said Allendale Avenue, a distance of 162.2 feet to the point of beginning as shown on a plan entitled "Compiled Plan of Land, The Mill at Allendale Condominium, North Providence/Johnston, (Rhode Island)", by Harry R. Feldman, Inc., dated August 19, 1988.

The above described parcel has the benefit of a R.O.W. and easement within Allendale Avenue, a 1/3 rod R.O.W. along the westerly bank of the Allendale Pond and a 12' wide easement north of Allendale Avenue, as shown on the plan.

The above described parcel is subject to a 20' wide perpetual R.O.W. and easement and a gas easement as shown on the plan.

AUG 26 '88 12:44 H M MOORE P.3/3

COMMONWEALTH LAND TITLE INSURANCE COMPANY
Seven Thurber Boulevard | Smithfield, RI 02917 | 401-233-2900 | fax 401-233-0099

BK995PG0214 EXHIBIT B

Commonwealth
A LANDAMERICA COMPANY

BK: 1370 PG: 13

CERTIFICATE OF TITLE

Date: October 26, 2001

To: the United States Environmental Protection Agency and the United States of America

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough search of the title to the property described in Schedule A hereof, beginning December 16, 1915, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B hereof.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $750.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____
Michael B. Mellen
Rhode Island State Counsel

BK995PG0215

BK: 1370 PG: 14

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

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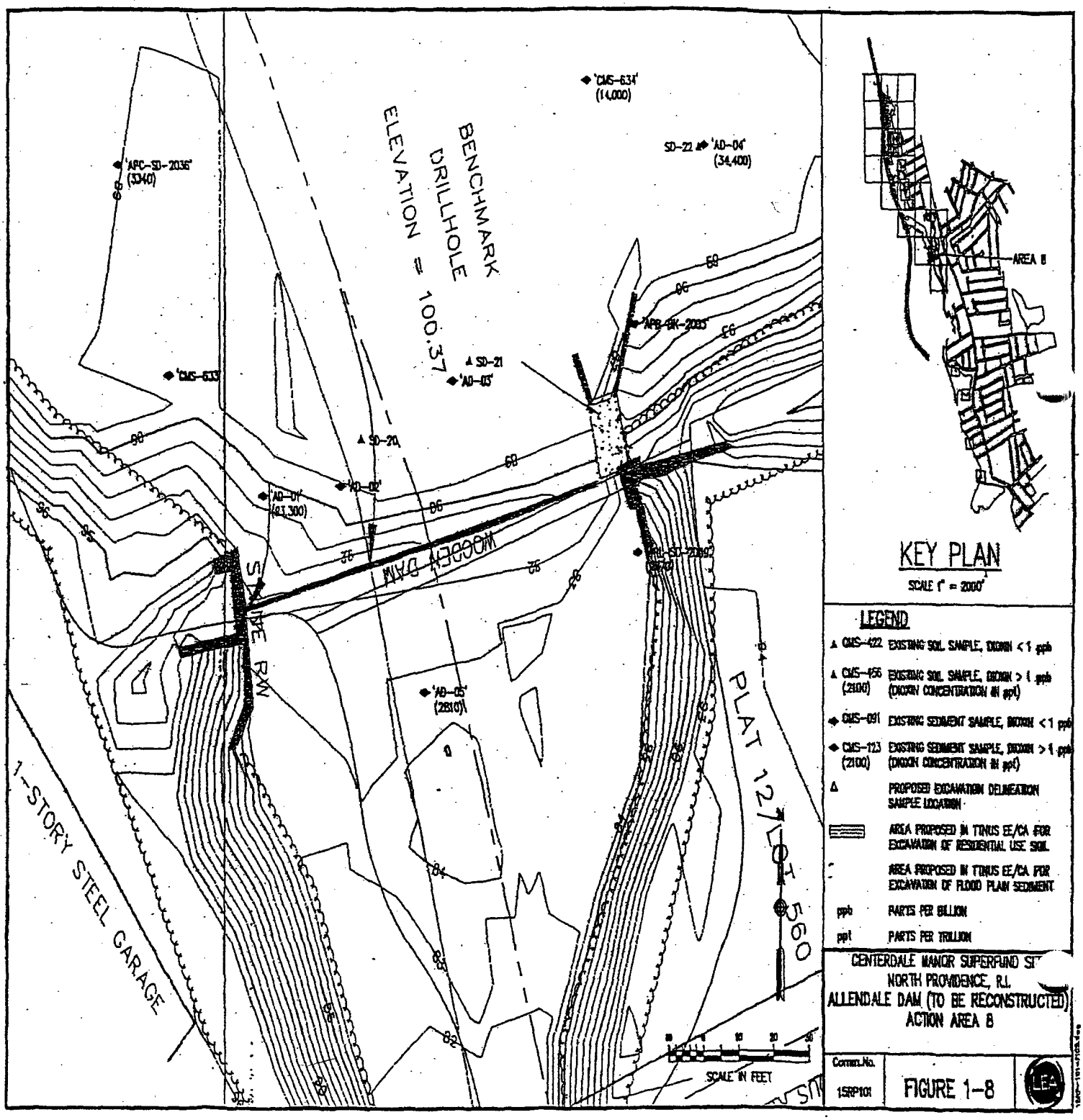
BK: 1370 PG: 15



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BK= 1370 PG= 16

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Declaration of the Mill at Allendale Condominium dated August 28, 1988 and recorded in North Providence Book 184 at page 818 and in Johnston in Book 219 at page 100, as the same may be amended, and the by-laws and plats and plans recorded in connection therewith.

2. Easement from Centredale Worsted Mills to Narragansett Electric Lighting Company dated January 2, 1917 and recorded In North Providence Book 15 at page 472.

3. Easement from Allendale Company to Providence Gas Company dated August 26, 1958 and recorded in North Providence Book 53 at page 621 and in Johnston in Book 86 at page 530.

4. Rights of the City of Providence in and to Easement from Allendale Company to City of Providence dated February 13,1964 and recorded in Book 58 at page 551 in North Providence and in Johnston in Book 102 at page 230.

5. Rights over Allendale Avenue and a private way as set forth in deed to John Mondillo et als dated July 15, 1954 and recorded in Johnston Book 78 at page 408 and in deed to Henry G. Jutras et als. dated June 4,1952 and recorded in Johnston Book 75 at page 205.

Schedule B BK: 1370 PG: 17

6. Easement to Providence Telephone Company dated December 18, 1906 and recorded in Johnston Book 16 at page 398 as modified by agreement dated March 10, 1914 and recorded in Johnston Book 21 at page 477.

7. Easement to Narragansett Electric Lighting Company dated October 26,1923 and recorded in Johnston Book 37 at page 226.

8. Reservation in deed to Napoleon Paquin dated June 9,1923 and recorded in Johnston Book 36 at page 147.

9. Rights of others in and to any streets or ways abutting or crossing the insured, but not limited to, those streets shown on a plat entitled "Plat of house lots surveyed and plotted by Samuel B. Cushing and Co. August 1871 upon the estate of Obadiah Olney, deceased", which plat is recorded on North Providence Plat Card 47.

10. Rights of others (including any rights of flowage) in and to the Woonasquatucket River

11. Rights, if any, of the property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond in and to the waters of the Lyman Pond or Lymansville Pond or Allendale Pond and in and to the bed thereof; also boating and fishing rights of property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond or the stream of water leading thereto and therefrom.

12. Zoning Agreement with the Town of North Providence in North Providence Book 171 at page 342.

13. Easement to Narragansett Electric Company In Book 182 at page 787 Survey entitled -Compiled Plan of Land North Providence/Johnston (Rhode Island) dated August 14, 1986 and prepared by Harry R. Feldman, Inc." discloses raceway on premises.

14. Tax Sale Deed recorded in Johnston Book 429 at page 276

15. Any questions arising from the fact that the deeds to Units 106-109, 111-121, 206-211, 215, 217-219, 221, 406-419, 422 and 425 have not been recorded in Johnston.

CERTIFICATE OF TITLE
UPDATED FROM ORIGINAL CERTIFICATE DATED OCTOBER 26, 2001

Date: December 5, 2003

To: the United States Environmental Protection Agency and the United States of America

Our File No. 276407

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough updated search of the title to the property described in Schedule A hereof, beginning October 26, 2001, the date of its prior Certificate of Title, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is still indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B of the Certificate of Title dated October 16, 2001, and except the additional matters as shown in Schedule B hereof found during the period of this updated search.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $350.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____

Michael B. Mellion
Rhode Island State Counsel

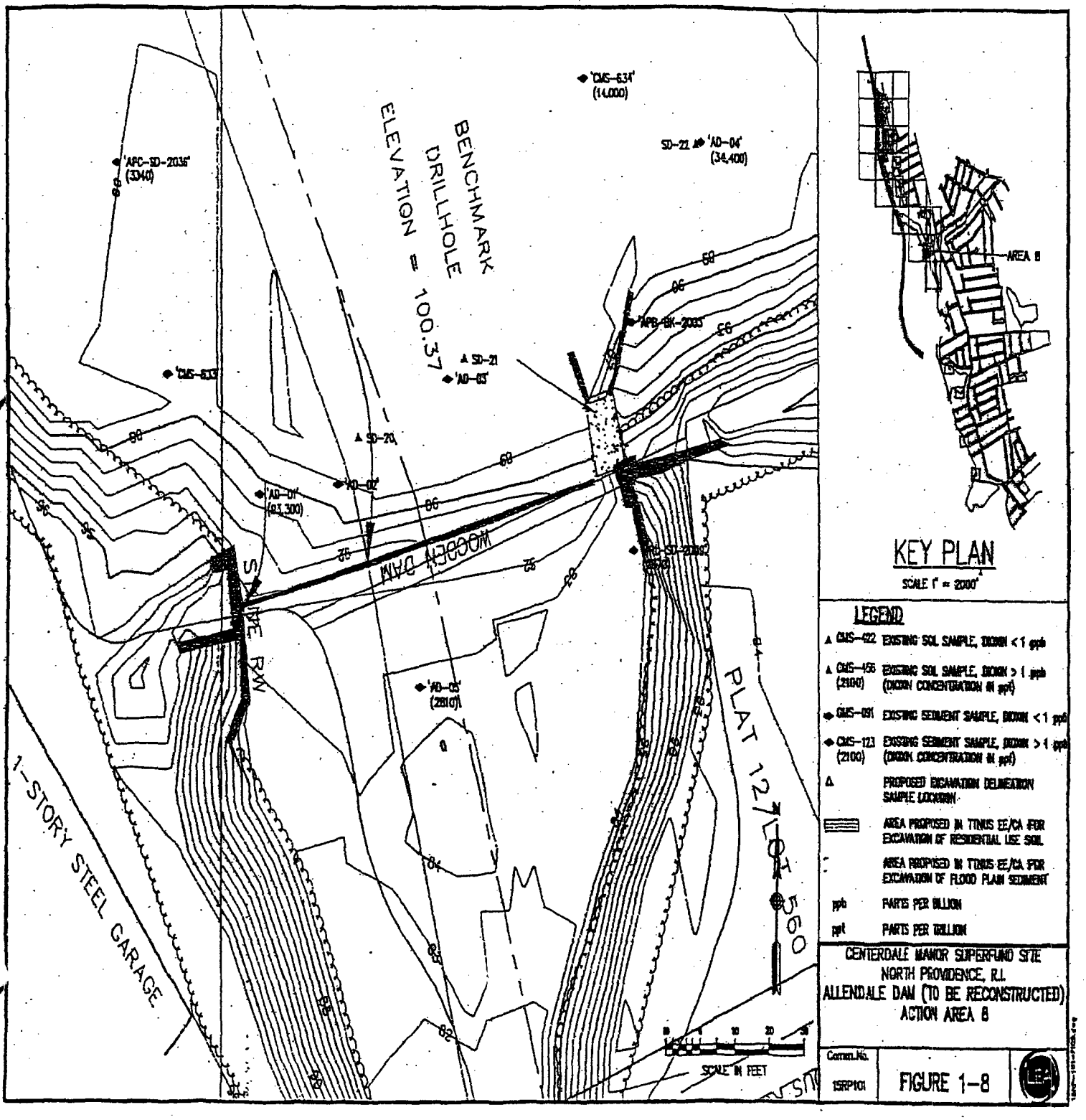
BK: 1370 PG: 19
BK995PG0220

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0221

BK: 1370 PG: 20



COMMONWEALTH LAND TITLE INSURANCE COMPANY

CERTIFICATE OF TITLE
December 5, 2003
Page 3

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Terms and conditions of Access Agreement dated February 6, 2002 by and between by and between The Mill at Allendale Condominium Association and CoxCom, Inc., d/b/a Cox Communications New England, as evidenced by Memorandum of Agreement recorded May 16, 2002 at 9:05 A.M. in Book 656 at Page 83.

2. Insignificant Alteration - Permit issued by the Rhode Island Department of Environmental Management dated October 1, 2003 and recorded October 10, 2003 at 2:40 P.M. in Book 933 at Page 242.

RECEIVED FOR RECORD
North Providence, R.I. MAR 11 2004
10:15 o'clock A M
Witness:
Maryann Georgetos
Town Clerk

ROBIN D. PIMENTAL
TOWN OF JOHNSTON
TOWN CLERK
03/11/2004 10:45:33AM

2/84

MOSES & AFONSO LTD

• COUNSELORS • AT • LAW •

170 WESTMINSTER STREET • SUITE 201 • PROVIDENCE • RHODE ISLAND • 02903
TELEPHONE • 401 • 453 • 3600 • FACSIMILE • 401 • 453 • 3604

Richard J. Welch
rwelch@mosesafonso.com

March 23, 2004

David N. Scotti, P.G.
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

Re: Mill at Allendale

Dear David:

Enclosed please find a copy of the Declaration of Covenants and Environmental Protection/Conservation Easement that was recorded in the land evidence records of the Town of North Providence and the Town of Johnston.

The book and page number references are:

Town of North Providence: Book 995, Pages 202-222; and

Town of Johnston: Book 1370, Pages 1-21.

Very truly yours,

Richard J. Welch

Richard J. Welch

Enclosure

wpdata/rjw/centredale/scotti 03.23.04

DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT

1. This Declaration of Covenants and Environmental Protection/Conservation Easement is made this ___ day of October, 2002, by and between THE MILL AT ALLENDALE CONDOMINIUM ("Grantor"), having an address of Woonasquatucket Avenue, North Providence, Rhode Island, and the STATE OF RHODE ISLAND ("Grantee") and its assigns and personal representatives, having an address of Rhode Island Department of Environmental Management, Office of Waste Management, 235 Promenade St., Providence, Rhode Island 02908.

WITNESSETH:

2. WHEREAS, Grantor is the owner in fee simple of a parcel of land located in the Town of North Providence, Providence County, State of Rhode Island, designated as Lot 560, Plat 13 on the 2001 tax assessor's map of the Town of North Providence in Providence County, more particularly described on Exhibit A and Schedule A of Exhibit B (Legal Description and Definition of Property), which is attached to this Instrument and made a part of this Instrument; and

3. WHEREAS, the United States Environmental Protection Agency ("EPA") has determined that the Property and certain land in close proximity to the Property contain hazardous materials and other adverse environmental conditions;

4. WHEREAS, the Property is part of the Non-Time-Critical Removal Action of the Centredale Manor Restoration Project Superfund Site ("Site"), which EPA, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. Sect. 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on March 6, 2000, and

5. WHEREAS, in an Action Memorandum dated January 18, 2001, (the "Action Memorandum"), the EPA Region 1 Director of the Office of Site Remediation & Restoration selected a "removal action" for the Site, which provides, in part, for

> "institutional controls to be used at the restored Allendale Dam in order to prevent another dam breach and the potential movement of contaminated sediments downstream. Specifically, EPA expects that a negative easement (restricting alteration of the Dam) will be obtained from the owner of the Dam and enforced by the holder of the easement until such time as the Dam is no longer considered by EPA to be necessary for meeting response action objectives at the Site."

6. WHEREAS, a Unilateral Administrative Order, numbered CERCLA Docket No. CERCLA-1-2001-0032, was issued by EPA Region 1 on March 26, 2001.

7. WHEREAS, the Respondents to the Unilateral Administrative Order are, pursuant to the terms of the Unilateral Administrative Order: to obtain from the owner of the Allendale Dam an

easement restricting alteration of the Dam, enforceable by the easement until such time as the Dam is no longer considered by EPA, after a reasonable opportunity for review and comment by the State, to be necessary for meeting response action objectives at the Site.

NOW, THEREFORE:

8. Grant: For and in consideration of the terms of the Consent Decree and other good and valuable consideration paid and the agreements and promises hereinafter set forth the receipt and sufficiency of which is hereby acknowledged, Grantor, on behalf of itself, its heirs, successors, successors-in-title, and assigns, does hereby covenant and declare that the Property shall be subject to the covenants, conditions, and restrictions on use set forth below, and does give, grant, and convey to the Grantee and the Grantee's personal representatives and assigns a) the right to enforce said use restrictions, and b) an environmental protection/conservation easement of the nature and character set forth below.

9. Covenant, Conditions, and Restrictions on Use: The following covenants, conditions, and restrictions apply to the use of the Property. They run with the land and are binding on the Grantor and Grantor's heirs, successors, successors in title, and assigns:

> No alteration, modification, or disturbance of the Dam, or activity that would in any way negatively affect the response activities at the Site, will occur without the written consent of EPA Region 1 until the Grantor is informed in writing that EPA Region 1 no longer considers this restriction to be necessary for meeting response action objectives at the Site.
>
> The Grantor, for itself and for its heirs, successors, successors-in-title, assigns, executors, and administrators, hereby covenants to and with the Grantee and its assigns, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good right, full power and lawful right to grant and convey the above covenant, condition and restriction on use, that the Property is free and clear of encumbrances, except those noted on Schedule B of Exhibit B attached hereto, that the Grantee and its assigns shall at all times hereafter peacefully and quietly have and enjoy the granted interest in the property, and that the Grantor and its heirs, successors, successors-in-title, assigns, executors and administrators shall warrant and defend the premises to the Grantee and its assigns and personal representatives forever against the lawful claims and demands of all persons.

10. Modification or Termination of Restrictions: The above covenants, conditions and restrictions on use maybe modified or terminated, in whole or in part, in writing and recorded with the Records of Land Evidence of the Town of North Providence Rhode Island, after receiving prior written consent from the EPA Region 1 after reasonable opportunity for review and comment by the State of Rhode Island. At the very latest, such covenants, conditions and restrictions on use shall be terminated when EPA notifies the Grantor, after a reasonable opportunity for review and comment

by the State of Rhode Island, that the Site does not pose a threat to human health and the environment. EPA shall review such termination at the time it reviews the Completion of Work Report submitted by Respondents pursuant to Paragraph 59 of the Unilateral Administrative Order, and if EPA decides to approve the Completion of Work Report but not terminate the above covenants, conditions and restrictions on use, EPA will explain the reasons why it believes that a threat to human health and the environment exists at that time and describe the timing and steps that will be required to terminate the above covenants, conditions and restrictions on use. If requested by the Grantor, EPA Region 1 will execute any termination or modifications of covenants, conditions and restrictions on use in recordable form. If EPA Region 1 ever assigns its interest in the above covenants, conditions and restrictions on use to the State of Rhode Island, the State of Rhode Island shall have the authority to modify or terminate this Instrument.

11. Environmental Protection/Conservation Easement: Grantor hereby grants to the Grantee, its personal representatives and assigns, an irrevocable right of access at all reasonable times to the Property with men and by equipment for the purposes of conducting any activity related to any CERCLA response activity at the Site, such as the Unilateral Administrative Order, including, but not limited to:

a) Monitoring the Work required by the Unilateral Administrative Order;

b) Verifying any data or information submitted to EPA Region 1;

c) Conducting investigations relating to contamination at or near the Site;

d) Obtaining samples;

e) Assessing the need for, planning or implementing additional response actions at or near the Site;

f) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondents or their agents, consistent with the Unilateral Administrative Order; and

g) Assessing Respondents' compliance with the Unilateral Administrative Order.

12. Reserved Rights of Grantor: Grantor hereby reserves all rights and privileges in and to the use of the Property, including the right to maintain, repair, use, operate, and replace the existing facilities on the Property, as long as the Grantor's use of the Property is not incompatible with the restrictions, rights, and easements granted in this Instrument. EPA Region 1 has found that the current use of the Property, as such use exists on the effective date of this Instrument, is compatible with the removal action and is specifically permitted. However, the permitted use does not include

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any right to alter the existing improvements and facilities of the Property if such activity would disturb the removal action or be incompatible with the restrictions, rights, and easements granted in this Instrument

13. Nothing in this document shall limit or otherwise affect the rights of entry and access provided by law or regulation to EPA Region 1 or the State of Rhode Island.

14. No Public Access and Use: This Instrument does not convey a right of access or use by the general public to any portion of the Property.

15. Requirements for Conveyances: Grantor, and any person who subsequently acquires any interest in Grantor's property, including, but not limited to, by deeds, leases, and mortgages, shall give a) written notice of the Unilateral Administrative Order and this Instrument to the person or entity that will receive the conveyance (the transferee), and b) written notice to EPA Region 1 and Rhode Island Department of Environmental Management of the conveyance, including the name and address of the transferee and the date on which the Grantor gave the notice to that transferee. Such transfer shall take place only if the transferee agrees, as a part of the agreement to purchase or otherwise obtain the property that it will comply with the obligations of the Grantor to provide access to the Property and with the Declarations set forth in this Instrument. Grantor agrees to include in any Instrument conveying an interest in any portion of the Property a notice, which is in substantially the following form:

> NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT, DATED _____, RECORDED IN THE RECORDS OF LAND EVIDENCE FOR THE TOWN OF _____, RHODE ISLAND ON _____, IN BOOK _____, PAGE _____, ENFORCEABLE BY, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, THE STATE OF RHODE ISLAND, BROOK VILLAGE ASSOCIATES LIMITED PARTNERSHIP, CENTERDALE MANOR ASSOCIATES LIMITED PARTNERSHIP, NEW ENGLAND CONTAINER COMPANY, INC., EMHART INDUSTRIES, INC., AND CROWN-METRO, INC.

Within thirty (30) days of executing any such an instrument of conveyance, Grantor must provide Grantee with a true copy of the instrument of conveyance and, if it has been recorded in the public land records, its recording reference.

16. Construction Activities: Grantor shall notify and receive prior written consent from EPA and the Rhode Island Department of Environmental Management, as well as notify the Respondents listed in paragraph No. 20 of this Instrument (entitled "Notices") prior to undertaking any facility improvements or other construction activities that could disturb removal action activities (including,

but not limited to, disturbing the Allendale Dam).

17. Administrative jurisdiction: The Regional Administrator of EPA or his or her delegate shall exercise the discretion and authority granted to EPA herein. The Rhode Island Department of Environmental Management is the state agency having administrative Jurisdiction over the interests acquired by the State of Rhode Island through this Instrument. The Director of Rhode Island Department of Environmental Management or his or her delegate shall exercise the discretion and authority granted to the State herein. If the EPA or the State of Rhode Island assigns interests created by this Instrument, the discretion and authority referred to in this paragraph shall also be assigned, unless otherwise provided in the assignment document, and a document evidencing same shall be recorded with the Records of Land Evidence of the Town of North Providence, Rhode Island.

18. Enforcement: The Grantee is entitled to enforce the terms of this Instrument by resorting to specific performance or legal process. The Grantee must notify, consult and coordinate with the EPA before taking any action to enforce the terms of this Instrument. In addition to the remedies available under this Instrument, Grantee may seek any and all other remedies available at law or in equity, including CERCLA. The Grantee shall have the discretion to enforce the terms of this Instrument. Any forbearance, delay, or omission to enforce in the event of a breach of any provision of this Instrument shall not be deemed to be a waiver of a) such provision or b) of any subsequent breach of the same or any other provision, or c) of any of the rights of the Grantee under this Instrument. Grantor hereby waives any defense of laches, estoppel, or prescription against the EPA or the State of Rhode Island in any action taken to enforce the terms of this Instrument. In accordance with the Rhode Island General Laws, Title 34, Chapter 39, entitled "Conservation and Preservation Restrictions on Real Property," no provision of this Instrument shall be unenforceable on account of a) lack of privity of estate or contract, b) lack of benefit to a particular land, c) the benefit being assignable or being assigned to any governmental body or to any entity with like purposes, or d) any other doctrine of Property law which might cause the termination of the provision. The Respondents to the Unilateral Administrative Order (Brook Village Associates Limited Partnership, Centredale Manor Associates Limited Partnership, New England Container Company, Inc., Emhart Industries, Inc., and Crown-Metro, Inc.) also are entitled to enforce the terms of this Instrument. The parties further intend that the provisions of the above covenants, conditions and restrictions on use also be for the benefit of the U.S. Environmental Protection Agency ("U.S. EPA") as a third party beneficiary.

19. Notices: Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing. Such written notice shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing.

As to the EPA:

Anna Krasko
On-Scene Coordinator/Remedial Project Manager
for the Centredale Manor Restoration Project Superfund Site
United States Environmental Protection Agency Region 1
Congress St., Suite 1100 (mail code HBR)
Boston, MA 02114

As to the State:

Sarah Martino
State Project Coordinator
RIDEM
Division of Site Remediation
291 Promenade St.
Providence, RI 02908

As to the Respondents:

For Brook Village Associates Limited Partnership:
Colburn T. Cherney
Ropes & Gray
One Franklin Square
1301 K Street, NW, Suite 800 East
Washington, D.C. 20005-3333
PH 202-626-3900
FAX 202-626-3961

Howard Castleman
Murtha Cullina Roche Carens & DeGiacomo
99 High Street
Boston, MA 02110
PH 617-457-4000
FAX 617-482-3868

For Centredale Manor Associates Limited Partnership (CIS Housing Associates):
Leonard H. Freiman
Goulston & Storrs, A Professional Corporation
400 Atlantic Avenue
Boston, MA 02110-3333

PH 617-482-1776
FAX 617-574-4112

For Centredale Manor Associates-Limited Partnership (Centredale Associates):
Richard J. Welch
Moses & Afonso, Ltd.
170 Westminster Street, Suite 201
Providence, RI 02903
PH 401-453-3600
FAX 401-453-3604

Laurie Burt
Foley, Hoag & Eliot, LLP
One Post Office Square
Boston, MA 02109
PH 617-832-1000
FAX 617-832-7000

For Emhart Industries, Inc.:
Jerome C. Muys, Jr.
Swidler Berlin Shereff Friedman LLP
3000 K Street, NW, Suite 300
Washington DC 20007-5116
PH 202-424-7547
FAX 202-424-7643

For Crown-Metro, Inc.:
Knox L. Haynsworth, III
Brown, Massey, Evans, McLeod & Haynsworth, P.A.
P.O. Box 2464
Greenville, SC 29602PH 864-271-7424
FAX 864-242-6469

For New England Container Company, Inc.:

Stuart R. Deans, Esq.
Robinson & Cole LLP
Financial Centre
695 East Main Street
P.O. 10305
Stamford, CT 06904-2304

PH 203-462-7500
FAX 203-462-7599

As to Grantor:
Steven Timber Lee 10-24-02
Stephen Ember
President of the Mill at Allendale Condominium Association
The Mill at Allendale Condominium
Woonasquatucket Avenue
North Providence, Rhode Island

Frank A. Lombardi, Esquire
1000 Smith Street
Providence, Rhode Island 02908

20. General provisions:

a) Controlling law: The Interpretation and performance of this Instrument shall be governed by the laws of the United States or, if there are no applicable federal laws, by the law of the State of Rhode Island.

b) Definitions: Any provision or term not otherwise defined in this Instrument shall have the meaning set forth in the Unilateral Administrative Order and the appendices to the Unilateral Administrative Order.

c) Liberal construction: Any general rule of construction to the contrary notwithstanding, this Instrument shall be liberally construed in favor of the grant to effect the purpose of this Instrument, the Unilateral Administrative Order and its appendices, and the policy and purpose of CERCLA. If any provision of this Instrument is found to be ambiguous, an interpretation consistent with the purpose of this Instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

d) Severability: If any provision of this Instrument, or the application of it to any person or circumstance, is found to be invalid, the finding of invalidity will not affect i) the validity of the remainder of the provisions in the Instrument, or ii) the application of such provisions to any other person or circumstances.

e) Entire Agreement: This Instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior oral understandings relating thereto, all of which are merged into this Instrument.

f) No Forfeiture: Nothing contained in this Instrument will result in a forfeiture or reversion of Grantor's title in any respect.

g) Successors: The covenants, terms, conditions, and restrictions of this Instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, successors, successors-in-title, and assigns and shall continue as a servitude running with the Property. The term "Grantor" wherever used herein, and any pronouns used in place of the term "Grantor," shall include the person and/or entity named at the beginning of this document, identified as "Grantor" and its heirs, successors, successors-in-title, personal representatives and assigns. The term "Grantee," wherever used herein, and any pronouns used in place of the term "Grantee," shall include the person and/or entity named at the beginning of this document, identified as "Grantee," and its personal representatives and assigns. The rights of the Grantee and Grantor under this Instrument are freely assignable, subject to the notice provisions contained in this Instrument. Any transferee of the fee title to the Property or any leasehold interest in the Property shall automatically be deemed, by acceptance of such interest, to have acquired such title or interest subject to the restrictions contained or referred to in this Instrument and to have agreed to execute any and all Instruments reasonably necessary to carry out the provisions of this Instrument, Consistent with the Rhode Island Code, Title 34, Chapter 39-3(c), the rights and obligations under this Instrument shall not be subject to a 30-year limitation on restrictive covenants.

h) Termination of Rights and Obligations: A party's rights and obligations under this Instrument terminate upon transfer of the party's interest in the referenced in paragraph of this Instrument or Property, except that liability for the following shall survive the transfer:

(1) acts or omissions occurring, prior to the transfer shall survive the transfer;
(2) acts or omissions contradicting the provisions and terms of this agreement;
(3) any liability resulting from exacerbation of contaminants by Grantor, its successors, assigns, lessees, or sub lessees;
(4) criminal liability; and
(5) liability for violations of local, state, or federal laws or regulations.

i) Captions: The captions in this Instrument have been inserted solely for convenience of reference and are not a part of this Instrument and shall have no effect upon the construction of this Instrument.

J) Counterparts: The parties may execute this Instrument in two or more counterparts, which shall, in the aggregate, be signed by all parties, each counterpart shall be deemed an original instrument as against any party who has signed it. In event of any disparity between the counterparts produced, the recorded counterpart shall control.

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k) Further Assurances: From time to time after the execution of this Instrument and without further consideration, the parties hereto will execute and deliver, or arrange for the execution and delivery of, such other instruments and take such other action or arrange for such other actions as may reasonably be requested to more effectively complete any of the transactions provided for in this Instrument.

TO HAVE AND TO HOLD unto the Grantee and the Grantee's personal representatives and assigns forever.

IN WITNESS WHEREOF, Grantor has caused this Instrument to be executed by its duly authorized representative this 24th day of October, 2002.

WITNESS: _____

THE MILL AT ALLENDALE CONDOMINIUM

By: Steven Ember

~~Stephen Ember~~, President
The Mill at Allendale Condominium Association

Steven Ember Ltd 10-24-02

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

On this 24th day of October, 2002, before me, the undersigned, a Notary Public in and for the State of Rhode Island, duly commissioned and sworn, personally appeared ~~Stephen Ember~~ Steven Ember, President, The Mill at Allendale Condominium Association of THE MILL AT ALLENDALE CONDOMINIUM, known by me to be the party so executing the foregoing agreement for and on behalf of THE MILL AT ALLENDAL CONDOMINIUM, and he acknowledged said Instrument, by him so executed, to be his free act and deed in said capacity and the free act and deed of THE MILL AT ALLENDALE CONDOMINIUM.

Signature
Phyllis J Giarrusso
NOTARY PUBLIC

My Commission Expires: 8/7/05

wpdata/rjw/centredale/covenants and easement

ROBIN D. PIMENTAL
TOWN OF JOHNSTON

BK995PG0212

EXHIBIT A

THE MILL AT ALLENDALE CONDOMINIUM
NORTH PROVIDENCE/JOHNSTON
RHODE ISLAND

BOOK 0219 PAGE 0132

A certain parcel of land situated in Towns of North Providence and Johnston, Providence County, State of Rhode Island, bounded and described as follows:

Beginning at a railroad spike at the intersection of the westerly sideline of Woonasquatucket Avenue and the southerly sideline of Allendale Avenue;

Thence running southeasterly along the westerly sideline of Woonasquatucket Avenue, a distance of 457.9 feet;

Thence turning an interior angle of 172° 20' and running along the westerly sideline of Woonasquatucket Avenue, a distance of 14.0 feet;

Thence turning an interior angle of 114° 21' 00" and running a distance of 95.06 feet;

Thence turning an interior angle of 152° 13' and running a distance of about 293 feet to the easterly bank of the Woonasquatucket River;

Thence turning and running southerly along the said easterly bank of the Woonasquatucket River down into Lyman Pond;

Thence turning and running westerly across the Woonasquatucket River to the westerly bank of said Woonasquatucket River;

Thence turning and running northerly along the westerly bank of said Woonasquatucket River to the dam at the southerly end of Allendale Pond;

Thence turning and running northwesterly along the westerly bank of said Allendale Pond to the easterly property line of the Narragansett Electric Company;

Thence turning and running less northwesterly by the easterly property line of said Narragansett Electric Company to the westerly bank of the Woonasqatucket River;

Thence running northwesterly by the westerly bank of the Woonasqatucket River to the northerly property line;

Thence turning and running easterly to a stone bound of record on the easterly bank of the Woonasquatucket River;

Thence turning an interior angle of 192° 30' and running easterly, a distance of 103.21 feet to a stone bound of record;

Thence turning an interior angle of 229° 47' and running northeasterly, a distance of 278.55 feet to a stone bound of record;

Thence turning an interior angle of 130° 33' and running easterly to the easterly bank of the Woonasquatucket River;

AUG 26 '98 12:43 H M MOORE

Thence turning and running southerly and southeasterly along the easterly bank of the Woonasquatucket River and Allendale Pond to the southwesterly corner of land now or formerly of Ettore & M. Saravo;

Thence turning and running along aht southerly property line of land of said Saravo to land now or formerly of Eva L. Lusson;

Thence turning and running southerly to an angle point;

Thence turning an exterior angle of 78° 53' and running easterly, a distance of 49.14 feet;

Thence turning an interior angle of 94° 43" and running southeasterly, a distance of 87.97 feet to the easterly shore of Allendale Pond;

Thence turning and running southerly along the shore of said Allendale Pond to a dam;

Thence running southeasterly along the face of a wall to the southerly sideline of Allendale Avenue;

Thence turning and running easterly along the southerly sideline of said Allendale Avenue, a distance of 162.2 feet to the point of beginning as shown on a plan entitled "Compiled Plan of Land, The Mill at Allendale Condominium, North Providence/Johnston, (Rhode Island)", by Harry R. Feldman, Inc., dated August 19, 1988.

The above described parcel has the benefit of a R.O.W. and easement within Allendale Avenue, a 1/3 rod R.O.W. along the westerly bank of the Allendale Pond and a 12' wide easement north of Allendale Avenue, as shown on the plan.

The above described parcel is subject to a 20' wide perpetual R.O.W. and easement and a gas easement as shown on the plan.

AUG 26 '88 12:44 H H MOORE P.3/3

COMMONWEALTH LAND TITLE INSURANCE COMPANY
Seven Thurber Boulevard | Smithfield, RI 02917 | 401-233-2900 | fax 401-233-0099

BK995PG0214 EXHIBIT B

Commonwealth
A LANDAMERICA COMPANY

BK: 1370 PG: 13

CERTIFICATE OF TITLE

Date: October 26, 2001

To: the United States Environmental Protection Agency and the United States of America

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough search of the title to the property described in Schedule A hereof, beginning December 16, 1915, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B hereof.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $750.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____
Michael B. Mellion
Rhode Island State Counsel

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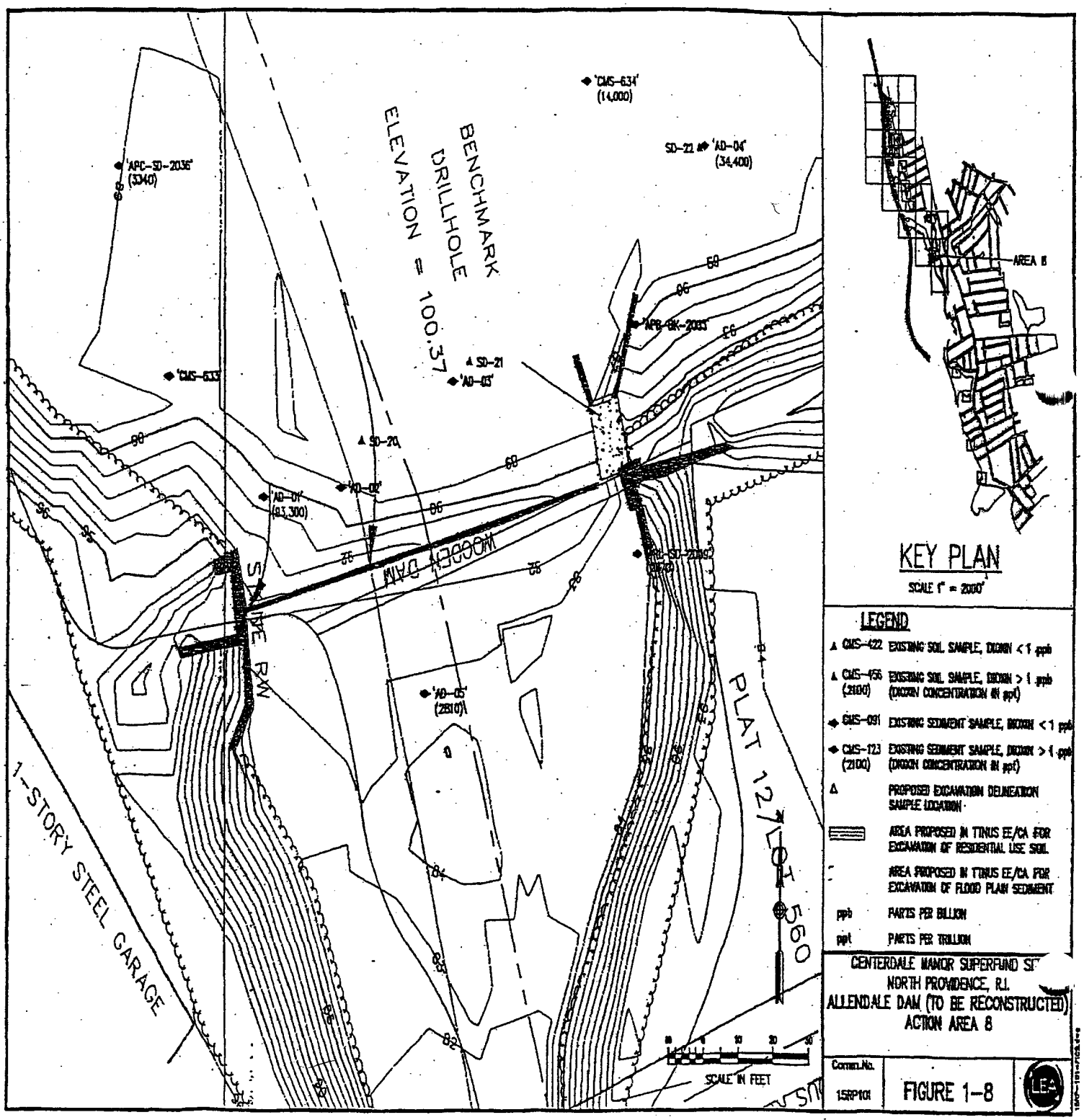
BK: 1370 PG: 14

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0216

BK: 1370 PG: 15



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Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Declaration of the Mill at Allendale Condominium dated August 28, 1988 and recorded in North Providence Book 184 at page 818 and in Johnston in Book 219 at page 100, as the same may be amended, and the by-laws and plats and plans recorded in connection therewith.

2. Easement from Centredale Worsted Mills to Narragansett Electric Lighting Company dated January 2, 1917 and recorded In North Providence Book 15 at page 472.

3. Easement from Allendale Company to Providence Gas Company dated August 26, 1958 and recorded in North Providence Book 53 at page 621 and in Johnston in Book 86 at page 530.

4. Rights of the City of Providence in and to Easement from Allendale Company to City of Providence dated February 13,1964 and recorded in Book 58 at page 551 in North Providence and in Johnston in Book 102 at page 230.

5. Rights over Allendale Avenue and a private way as set forth in deed to John Mondillo et als dated July 15, 1954 and recorded in Johnston Book 78 at page 408 and in deed to Henry G. Jutras et als. dated June 4,1952 and recorded in Johnston Book 75 at page 205.

Schedule B BK: 1370 PG: 17

6. Easement to Providence Telephone Company dated December 18, 1906 and recorded in Johnston Book 16 at page 398 as modified by agreement dated March 10, 1914 and recorded in Johnston Book 21 at page 477.

7. Easement to Narragansett Electric Lighting Company dated October 26,1923 and recorded in Johnston Book 37 at page 226.

8. Reservation in deed to Napoleon Paquin dated June 9,1923 and recorded in Johnston Book 36 at page 147.

9. Rights of others in and to any streets or ways abutting or crossing the insured, but not limited to, those streets shown on a plat entitled "Plat of house lots surveyed and plotted by Samuel B. Cushing and Co. August 1871 upon the estate of Obadiah Olney, deceased", which plat is recorded on North Providence Plat Card 47.

10. Rights of others (including any rights of flowage) in and to the Woonasquatucket River

11. Rights, if any, of the property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond in and to the waters of the Lyman Pond or Lymansville Pond or Allendale Pond and in and to the bed thereof; also boating and fishing rights of property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond or the stream of water leading thereto and therefrom.

12. Zoning Agreement with the Town of North Providence in North Providence Book 171 at page 342.

13. Easement to Narragansett Electric Company In Book 182 at page 787 Survey entitled -Compiled Plan of Land North Providence/Johnston (Rhode Island) dated August 14, 1986 and prepared by Harry R. Feldman, Inc." discloses raceway on premises.

14. Tax Sale Deed recorded in Johnston Book 429 at page 276

15. Any questions arising from the fact that the deeds to Units 106-109, 111-121, 206-211, 215, 217-219, 221, 406-419, 422 and 425 have not been recorded in Johnston.

CERTIFICATE OF TITLE
UPDATED FROM ORIGINAL CERTIFICATE DATED OCTOBER 26, 2001

Date: December 5, 2003

To: the United States Environmental Protection Agency and the United States of America

Our File No. 276407

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough updated search of the title to the property described in Schedule A hereof, beginning October 26, 2001, the date of its prior Certificate of Title, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is still indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B of the Certificate of Title dated October 16, 2001, and except the additional matters as shown in Schedule B hereof found during the period of this updated search.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $350.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____

Michael B. Mellion
Rhode Island State Counsel

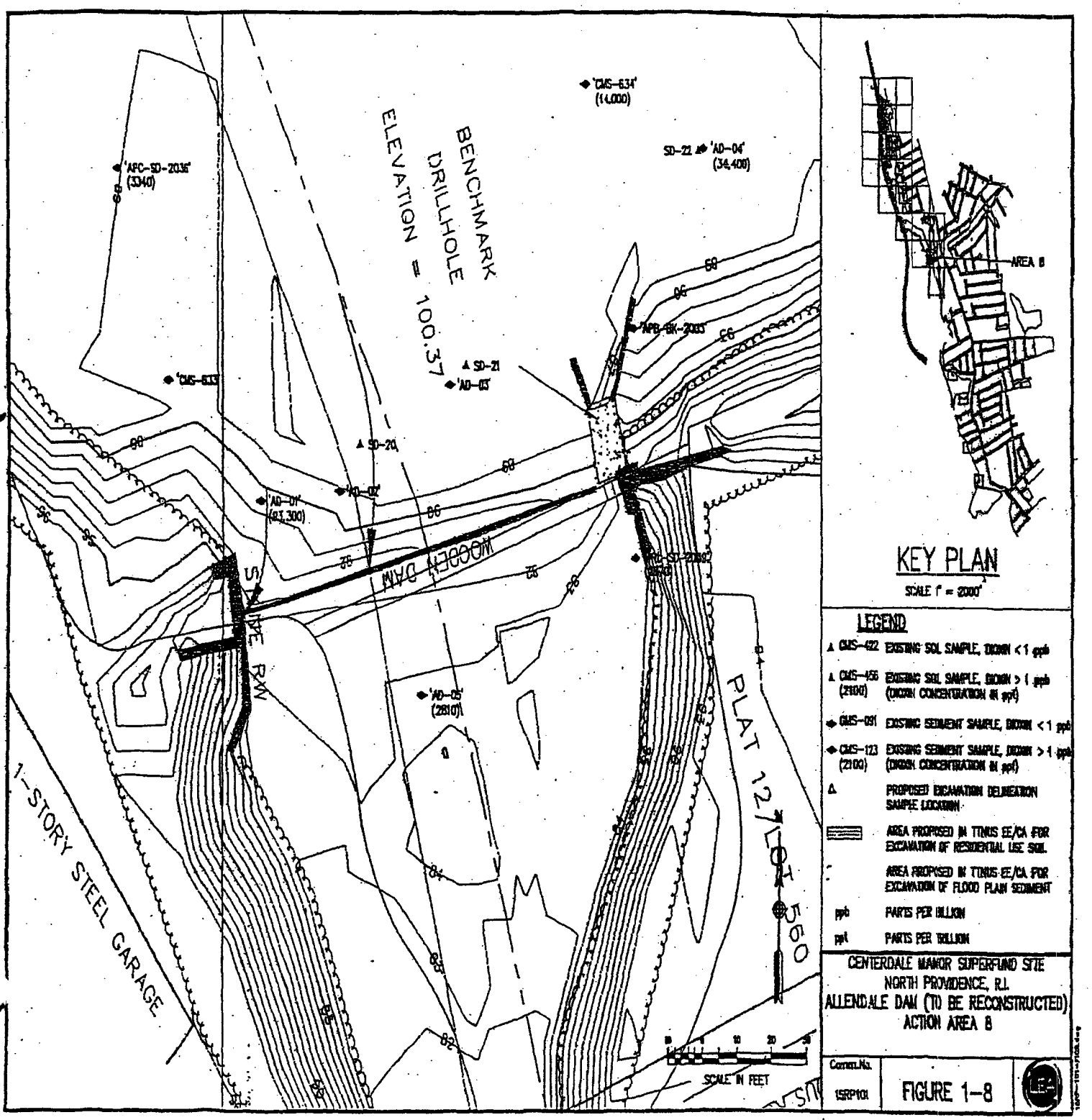
COMMONWEALTH LAND TITLE INSURANCE COMPANY

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0221

BK= 1370 PG= 20



CENTERDALE MANOR SUPERFUND SITE
NORTH PROVIDENCE, R.I.
ALLENDALE DAM (TO BE RECONSTRUCTED)
ACTION AREA B

Contract No. 1SRP101

FIGURE 1-8

COMMONWEALTH LAND TITLE INSURANCE COMPANY

CERTIFICATE OF TITLE
December 5, 2003
Page 3

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Terms and conditions of Access Agreement dated February 6, 2002 by and between by and between The Mill at Allendale Condominium Association and CoxCom, Inc., d/b/a Cox Communications New England, as evidenced by Memorandum of Agreement recorded May 16, 2002 at 9:05 A.M. in Book 656 at Page 83.

2. Insignificant Alteration - Permit issued by the Rhode Island Department of Environmental Management dated October 1, 2003 and recorded October 10, 2003 at 2:40 P.M. in Book 933 at Page 242.

RECEIVED FOR RECORD
North Providence, R.I. MAR 11 2004
10:15 o'clock A M
Witness:
Maryann Douglas
Town Clerk

ROBIN D. PIMENTAL
TOWN OF JOHNSTON
TOWN CLERK
03/11/2004 10:45:33AM

2/84

MOSES & AFONSO LTD

• COUNSELORS • AT • LAW •

170 WESTMINSTER STREET • SUITE 201 • PROVIDENCE • RHODE ISLAND • 02903
TELEPHONE • 401 • 453 • 3600 • FACSIMILE • 401 • 453 • 3604

Richard J. Welch
rwelch@mosesafonso.com

March 23, 2004

David N. Scotti, P.G.
Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

Re: Mill at Allendale

Dear David:

Enclosed please find a copy of the Declaration of Covenants and Environmental Protection/Conservation Easement that was recorded in the land evidence records of the Town of North Providence and the Town of Johnston.

The book and page number references are:

Town of North Providence: Book 995, Pages 202-222; and

Town of Johnston: Book 1370, Pages 1-21.

Very truly yours,

Richard J. Welch

Richard J. Welch

Enclosure

wpdata/rjw/centredale/scotti 03.23.04

DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT

1. This Declaration of Covenants and Environmental Protection/Conservation Easement is made this ___ day of October, 2002, by and between THE MILL AT ALLENDALE CONDOMINIUM ("Grantor"), having an address of Woonasquatucket Avenue, North Providence, Rhode Island, and the STATE OF RHODE ISLAND ("Grantee") and its assigns and personal representatives, having an address of Rhode Island Department of Environmental Management, Office of Waste Management, 235 Promenade St., Providence, Rhode Island 02908.

WITNESSETH:

2. WHEREAS, Grantor is the owner in fee simple of a parcel of land located in the Town of North Providence, Providence County, State of Rhode Island, designated as Lot 560, Plat 13 on the 2001 tax assessor's map of the Town of North Providence in Providence County, more particularly described on Exhibit A and Schedule A of Exhibit B (Legal Description and Definition of Property), which is attached to this Instrument and made a part of this Instrument; and

3. WHEREAS, the United States Environmental Protection Agency ("EPA") has determined that the Property and certain land in close proximity to the Property contain hazardous materials and other adverse environmental conditions;

4. WHEREAS, the Property is part of the Non-Time-Critical Removal Action of the Centredale Manor Restoration Project Superfund Site ("Site"), which EPA, pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. Sect. 9605, placed on the National Priorities List, set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on March 6, 2000, and

5. WHEREAS, in an Action Memorandum dated January 18, 2001, (the "Action Memorandum"), the EPA Region 1 Director of the Office of Site Remediation & Restoration selected a "removal action" for the Site, which provides, in part, for

> "institutional controls to be used at the restored Allendale Dam in order to prevent another dam breach and the potential movement of contaminated sediments downstream. Specifically, EPA expects that a negative easement (restricting alteration of the Dam) will be obtained from the owner of the Dam and enforced by the holder of the easement until such time as the Dam is no longer considered by EPA to be necessary for meeting response action objectives at the Site."

6. WHEREAS, a Unilateral Administrative Order, numbered CERCLA Docket No. CERCLA-1-2001-0032, was issued by EPA Region 1 on March 26, 2001.

7. WHEREAS, the Respondents to the Unilateral Administrative Order are, pursuant to the terms of the Unilateral Administrative Order: to obtain from the owner of the Allendale Dam an

easement restricting alteration of the Dam, enforceable by the easement until such time as the Dam is no longer considered by EPA, after a reasonable opportunity for review and comment by the State, to be necessary for meeting response action objectives at the Site.

NOW, THEREFORE:

8. Grant: For and in consideration of the terms of the Consent Decree and other good and valuable consideration paid and the agreements and promises hereinafter set forth the receipt and sufficiency of which is hereby acknowledged, Grantor, on behalf of itself, its heirs, successors, successors-in-title, and assigns, does hereby covenant and declare that the Property shall be subject to the covenants, conditions, and restrictions on use set forth below, and does give, grant, and convey to the Grantee and the Grantee's personal representatives and assigns a) the right to enforce said use restrictions, and b) an environmental protection/conservation easement of the nature and character set forth below.

9. Covenant, Conditions, and Restrictions on Use: The following covenants, conditions, and restrictions apply to the use of the Property. They run with the land and are binding on the Grantor and Grantor's heirs, successors, successors in title, and assigns:

> No alteration, modification, or disturbance of the Dam, or activity that would in any way negatively affect the response activities at the Site, will occur without the written consent of EPA Region 1 until the Grantor is informed in writing that EPA Region 1 no longer considers this restriction to be necessary for meeting response action objectives at the Site.
>
> The Grantor, for itself and for its heirs, successors, successors-in-title, assigns, executors, and administrators, hereby covenants to and with the Grantee and its assigns, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good right, full power and lawful right to grant and convey the above covenant, condition and restriction on use, that the Property is free and clear of encumbrances, except those noted on Schedule B of Exhibit B attached hereto, that the Grantee and its assigns shall at all times hereafter peacefully and quietly have and enjoy the granted interest in the property, and that the Grantor and its heirs, successors, successors-in-title, assigns, executors and administrators shall warrant and defend the premises to the Grantee and its assigns and personal representatives forever against the lawful claims and demands of all persons.

10. Modification or Termination of Restrictions: The above covenants, conditions and restrictions on use maybe modified or terminated, in whole or in part, in writing and recorded with the Records of Land Evidence of the Town of North Providence Rhode Island, after receiving prior written consent from the EPA Region 1 after reasonable opportunity for review and comment by the State of Rhode Island. At the very latest, such covenants, conditions and restrictions on use shall be terminated when EPA notifies the Grantor, after a reasonable opportunity for review and comment

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by the State of Rhode Island, that the Site does not pose a threat to human health and the environment. EPA shall review such termination at the time it reviews the Completion of Work Report submitted by Respondents pursuant to Paragraph 59 of the Unilateral Administrative Order, and if EPA decides to approve the Completion of Work Report but not terminate the above covenants, conditions and restrictions on use, EPA will explain the reasons why it believes that a threat to human health and the environment exists at that time and describe the timing and steps that will be required to terminate the above covenants, conditions and restrictions on use. If requested by the Grantor, EPA Region 1 will execute any termination or modifications of covenants, conditions and restrictions on use in recordable form. If EPA Region 1 ever assigns its interest in the above covenants, conditions and restrictions on use to the State of Rhode Island, the State of Rhode Island shall have the authority to modify or terminate this Instrument.

11. Environmental Protection/Conservation Easement: Grantor hereby grants to the Grantee, its personal representatives and assigns, an irrevocable right of access at all reasonable times to the Property with men and by equipment for the purposes of conducting any activity related to any CERCLA response activity at the Site, such as the Unilateral Administrative Order, including, but not limited to:

a) Monitoring the Work required by the Unilateral Administrative Order;

b) Verifying any data or information submitted to EPA Region 1;

c) Conducting investigations relating to contamination at or near the Site;

d) Obtaining samples;

e) Assessing the need for, planning or implementing additional response actions at or near the Site;

f) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondents or their agents, consistent with the Unilateral Administrative Order; and

g) Assessing Respondents' compliance with the Unilateral Administrative Order.

12. Reserved Rights of Grantor: Grantor hereby reserves all rights and privileges in and to the use of the Property, including the right to maintain, repair, use, operate, and replace the existing facilities on the Property, as long as the Grantor's use of the Property is not incompatible with the restrictions, rights, and easements granted in this Instrument. EPA Region 1 has found that the current use of the Property, as such use exists on the effective date of this Instrument, is compatible with the removal action and is specifically permitted. However, the permitted use does not include

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any right to alter the existing improvements and facilities of the Property if such activity would disturb the removal action or be incompatible with the restrictions, rights, and easements granted in this Instrument

13. Nothing in this document shall limit or otherwise affect the rights of entry and access provided by law or regulation to EPA Region 1 or the State of Rhode Island.

14. No Public Access and Use: This Instrument does not convey a right of access or use by the general public to any portion of the Property.

15. Requirements for Conveyances: Grantor, and any person who subsequently acquires any interest in Grantor's property, including, but not limited to, by deeds, leases, and mortgages, shall give a) written notice of the Unilateral Administrative Order and this Instrument to the person or entity that will receive the conveyance (the transferee), and b) written notice to EPA Region 1 and Rhode Island Department of Environmental Management of the conveyance, including the name and address of the transferee and the date on which the Grantor gave the notice to that transferee. Such transfer shall take place only if the transferee agrees, as a part of the agreement to purchase or otherwise obtain the property that it will comply with the obligations of the Grantor to provide access to the Property and with the Declarations set forth in this Instrument. Grantor agrees to include in any Instrument conveying an interest in any portion of the Property a notice, which is in substantially the following form:

> NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO THE EFFECT OF A DECLARATION OF COVENANTS AND ENVIRONMENTAL PROTECTION/CONSERVATION EASEMENT, DATED _____, RECORDED IN THE RECORDS OF LAND EVIDENCE FOR THE TOWN OF _____, RHODE ISLAND ON _____, IN BOOK _____, PAGE _____, ENFORCEABLE BY, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, THE STATE OF RHODE ISLAND, BROOK VILLAGE ASSOCIATES LIMITED PARTNERSHIP, CENTERDALE MANOR ASSOCIATES LIMITED PARTNERSHIP, NEW ENGLAND CONTAINER COMPANY, INC., EMHART INDUSTRIES, INC., AND CROWN-METRO, INC.

Within thirty (30) days of executing any such an instrument of conveyance, Grantor must provide Grantee with a true copy of the instrument of conveyance and, if it has been recorded in the public land records, its recording reference.

16. Construction Activities: Grantor shall notify and receive prior written consent from EPA and the Rhode Island Department of Environmental Management, as well as notify the Respondents listed in paragraph No. 20 of this Instrument (entitled "Notices") prior to undertaking any facility improvements or other construction activities that could disturb removal action activities (including,

but not limited to, disturbing the Allendale Dam).

17. Administrative jurisdiction: The Regional Administrator of EPA or his or her delegate shall exercise the discretion and authority granted to EPA herein. The Rhode Island Department of Environmental Management is the state agency having administrative Jurisdiction over the interests acquired by the State of Rhode Island through this Instrument. The Director of Rhode Island Department of Environmental Management or his or her delegate shall exercise the discretion and authority granted to the State herein. If the EPA or the State of Rhode Island assigns interests created by this Instrument, the discretion and authority referred to in this paragraph shall also be assigned, unless otherwise provided in the assignment document, and a document evidencing same shall be recorded with the Records of Land Evidence of the Town of North Providence, Rhode Island.

18. Enforcement: The Grantee is entitled to enforce the terms of this Instrument by resorting to specific performance or legal process. The Grantee must notify, consult and coordinate with the EPA before taking any action to enforce the terms of this Instrument. In addition to the remedies available under this Instrument, Grantee may seek any and all other remedies available at law or in equity, including CERCLA. The Grantee shall have the discretion to enforce the terms of this Instrument. Any forbearance, delay, or omission to enforce in the event of a breach of any provision of this Instrument shall not be deemed to be a waiver of a) such provision or b) of any subsequent breach of the same or any other provision, or c) of any of the rights of the Grantee under this Instrument. Grantor hereby waives any defense of laches, estoppel, or prescription against the EPA or the State of Rhode Island in any action taken to enforce the terms of this Instrument. In accordance with the Rhode Island General Laws, Title 34, Chapter 39, entitled "Conservation and Preservation Restrictions on Real Property," no provision of this Instrument shall be unenforceable on account of a) lack of privity of estate or contract, b) lack of benefit to a particular land, c) the benefit being assignable or being assigned to any governmental body or to any entity with like purposes, or d) any other doctrine of Property law which might cause the termination of the provision. The Respondents to the Unilateral Administrative Order (Brook Village Associates Limited Partnership, Centredale Manor Associates Limited Partnership, New England Container Company, Inc., Emhart Industries, Inc., and Crown-Metro, Inc.) also are entitled to enforce the terms of this Instrument. The parties further intend that the provisions of the above covenants, conditions and restrictions on use also be for the benefit of the U.S. Environmental Protection Agency ("U.S. EPA") as a third party beneficiary.

19. Notices: Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing. Such written notice shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing.

As to the EPA:

Anna Krasko
On-Scene Coordinator/Remedial Project Manager
for the Centredale Manor Restoration Project Superfund Site
United States Environmental Protection Agency Region 1
Congress St., Suite 1100 (mail code HBR)
Boston, MA 02114

As to the State:

Sarah Martino
State Project Coordinator
RIDEM
Division of Site Remediation
291 Promenade St.
Providence, RI 02908

As to the Respondents:

For Brook Village Associates Limited Partnership:
Colburn T. Cherney
Ropes & Gray
One Franklin Square
1301 K Street, NW, Suite 800 East
Washington, D.C. 20005-3333
PH 202-626-3900
FAX 202-626-3961

Howard Castleman
Murtha Cullina Roche Carens & DeGiacomo
99 High Street
Boston, MA 02110
PH 617-457-4000
FAX 617-482-3868

For Centredale Manor Associates Limited Partnership (CIS Housing Associates):
Leonard H. Freiman
Goulston & Storrs, A Professional Corporation
400 Atlantic Avenue
Boston, MA 02110-3333

PH 617-482-1776
FAX 617-574-4112

For Centredale Manor Associates-Limited Partnership (Centredale Associates):
Richard J. Welch
Moses & Afonso, Ltd.
170 Westminster Street, Suite 201
Providence, RI 02903
PH 401-453-3600
FAX 401-453-3604

Laurie Burt
Foley, Hoag & Eliot, LLP
One Post Office Square
Boston, MA 02109
PH 617-832-1000
FAX 617-832-7000

For Emhart Industries, Inc.:
Jerome C. Muys, Jr.
Swidler Berlin Shereff Friedman LLP
3000 K Street, NW, Suite 300
Washington DC 20007-5116
PH 202-424-7547
FAX 202-424-7643

For Crown-Metro, Inc.:
Knox L. Haynsworth, III
Brown, Massey, Evans, McLeod & Haynsworth, P.A.
P.O. Box 2464
Greenville, SC 29602PH 864-271-7424
FAX 864-242-6469

For New England Container Company, Inc.:

Stuart R. Deans, Esq.
Robinson & Cole LLP
Financial Centre
695 East Main Street
P.O. 10305
Stamford, CT 06904-2304

PH 203-462-7500
FAX 203-462-7599

As to Grantor:
Steven Tinker Ledl 10-24-02
Stephen Ember
President of the Mill at Allendale Condominium Association
The Mill at Allendale Condominium
Woonasquatucket Avenue
North Providence, Rhode Island

Frank A. Lombardi, Esquire
1000 Smith Street
Providence, Rhode Island 02908

20. General provisions:

a) Controlling law: The Interpretation and performance of this Instrument shall be governed by the laws of the United States or, if there are no applicable federal laws, by the law of the State of Rhode Island.

b) Definitions: Any provision or term not otherwise defined in this Instrument shall have the meaning set forth in the Unilateral Administrative Order and the appendices to the Unilateral Administrative Order.

c) Liberal construction: Any general rule of construction to the contrary notwithstanding, this Instrument shall be liberally construed in favor of the grant to effect the purpose of this Instrument, the Unilateral Administrative Order and its appendices, and the policy and purpose of CERCLA. If any provision of this Instrument is found to be ambiguous, an interpretation consistent with the purpose of this Instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

d) Severability: If any provision of this Instrument, or the application of it to any person or circumstance, is found to be invalid, the finding of invalidity will not affect i) the validity of the remainder of the provisions in the Instrument, or ii) the application of such provisions to any other person or circumstances.

e) Entire Agreement: This Instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior oral understandings relating thereto, all of which are merged into this Instrument.

f) No Forfeiture: Nothing contained in this Instrument will result in a forfeiture or reversion of Grantor's title in any respect.

g) Successors: The covenants, terms, conditions, and restrictions of this Instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, successors, successors-in-title, and assigns and shall continue as a servitude running with the Property. The term "Grantor" wherever used herein, and any pronouns used in place of the term "Grantor," shall include the person and/or entity named at the beginning of this document, identified as "Grantor" and its heirs, successors, successors-in-title, personal representatives and assigns. The term "Grantee," wherever used herein, and any pronouns used in place of the term "Grantee," shall include the person and/or entity named at the beginning of this document, identified as "Grantee," and its personal representatives and assigns. The rights of the Grantee and Grantor under this Instrument are freely assignable, subject to the notice provisions contained in this Instrument. Any transferee of the fee title to the Property or any leasehold interest in the Property shall automatically be deemed, by acceptance of such interest, to have acquired such title or interest subject to the restrictions contained or referred to in this Instrument and to have agreed to execute any and all Instruments reasonably necessary to carry out the provisions of this Instrument, Consistent with the Rhode Island Code, Title 34, Chapter 39-3(c), the rights and obligations under this Instrument shall not be subject to a 30-year limitation on restrictive covenants.

h) Termination of Rights and Obligations: A party's rights and obligations under this Instrument terminate upon transfer of the party's interest in the referenced in paragraph of this Instrument or Property, except that liability for the following shall survive the transfer:

(1) acts or omissions occurring, prior to the transfer shall survive the transfer;
(2) acts or omissions contradicting the provisions and terms of this agreement;
(3) any liability resulting from exacerbation of contaminants by Grantor, its successors, assigns, lessees, or sub lessees;
(4) criminal liability; and
(5) liability for violations of local, state, or federal laws or regulations.

i) Captions: The captions in this Instrument have been inserted solely for convenience of reference and are not a part of this Instrument and shall have no effect upon the construction of this Instrument.

J) Counterparts: The parties may execute this Instrument in two or more counterparts, which shall, in the aggregate, be signed by all parties, each counterpart shall be deemed an original instrument as against any party who has signed it. In event of any disparity between the counterparts produced, the recorded counterpart shall control.

k) Further Assurances: From time to time after the execution of this Instrument and BK 995 PG 0211
without further consideration, the parties hereto will execute and deliver, or arrange for the execution and delivery of, such other instruments and take such other action or arrange for such other actions as may reasonably be requested to more effectively complete any of the transactions provided for in this Instrument.

TO HAVE AND TO HOLD unto the Grantee and the Grantee's personal representatives and assigns forever.

IN WITNESS WHEREOF, Grantor has caused this Instrument to be executed by its duly authorized representative this 24th day of October, 2002.

WITNESS: _____

THE MILL AT ALLENDALE CONDOMINIUM

By: Steven Ember

~~Stephen~~ Ember, President
The Mill at Allendale Condominium Association

Steven Ember 10-24-02

STATE OF RHODE ISLAND

COUNTY OF PROVIDENCE

On this 24th day of October, 2002, before me, the undersigned, a Notary Public in and for the State of Rhode Island, duly commissioned and sworn, personally appeared ~~Stephen Ember~~ Steven Ember, President, The Mill at Allendale Condominium Association of THE MILL AT ALLENDALE CONDOMINIUM, known by me to be the party so executing the foregoing agreement for and on behalf of THE MILL AT ALLENDAL CONDOMINIUM, and he acknowledged said Instrument, by him so executed, to be his free act and deed in said capacity and the free act and deed of THE MILL AT ALLENDALE CONDOMINIUM.

Signature

Phyllis J Giarrusso

NOTARY PUBLIC

My Commission Expires: 8/7/05

wpdata/rjw/centredale/covenants and easement

ROBIN D. PIMENTAL
TOWN OF JOHNSTON

BK995PG0212

EXHIBIT A

THE MILL AT ALLENDALE CONDOMINIUM BOOK 0219 PAGE 0132
NORTH PROVIDENCE/JOHNSTON
RHODE ISLAND

A certain parcel of land situated in Towns of North Providence and Johnston, Providence County, State of Rhode Island, bounded and described as follows:

Beginning at a railroad spike at the intersection of the westerly sideline of Woonasquatucket Avenue and the southerly sideline of Allendale Avenue;

Thence running southeasterly along the westerly sideline of Woonasquatucket Avenue, a distance of 457.9 feet;

Thence turning an interior angle of 172° 20' and running along the westerly sideline of Woonasquatucket Avenue, a distance of 14.0 feet;

Thence turning an interior angle of 114° 21' 00" and running a distance of 95.06 feet;

Thence turning an interior angle of 152° 13' and running a distance of about 293 feet to the easterly bank of the Woonasquatucket River;

Thence turning and running southerly along the said easterly bank of the Woonasquatucket River down into Lyman Pond;

Thence turning and running westerly across the Woonasquatucket River to the westerly bank of said Woonasquatucket River;

Thence turning and running northerly along the westerly bank of said Woonasquatuchat River to the dam at the southerly end of Allendale Pond;

Thence turning and running northwesterly along the westerly bank of said Allendale Pond to the easterly property line of the Narragansett Electric Company;

Thence turning and running less northwesterly by the easterly property line of said Narragansett Electric Company to the westerly bank of the Woonasqatucket River;

Thence running northwesterly by the westerly bank of the Woonasqatucket River to the northerly property line;

Thence turning and running easterly to a stone bound of record on the easterly bank of the Woonasquatucket River;

Thence turning an interior angle of 192° 30' and running easterly, a distance of 103.21 feet to a stone bound of record;

Thence turning an interior angle of 229° 47' and running northeasterly, a distance of 278.55 feet to a stone bound of record;

Thence turning an interior angle of 130° 33' and running easterly to the easterly bank of the Woonasquatucket River;

AUG 25 '99 12:43 H M MOORE

BK 995 PG 0213

BOOK 0219 PAGE 0133

Thence turning and running southerly and southeasterly along the easterly bank of the Woonasquatucket River and Allendale Pond to the southwesterly corner of land now or formerly of Ettore & M. Saravo;

Thence turning and running along aht southerly property line of land of said Saravo to land now or formerly of Eva L. Lusson;

Thence turning and running southerly to an angle point;

Thence turning an exterior angle of 78° 53' and running easterly, a distance of 49.14 feet;

Thence turning an interior angle of 94° 43" and running southeasterly, a distance of 87.97 feet to the easterly shore of Allendale Pond;

Thence turning and running southerly along the shore of said Allendale Pond to a dam;

Thence running southeasterly along the face of a wall to the southerly sideline of Allendale Avenue;

Thence turning and running easterly along the southerly sideline of said Allendale Avenue, a distance of 162.2 feet to the point of beginning as shown on a plan entitled "Compiled Plan of Land, The Mill at Allendale Condominium, North Providence/Johnston, (Rhode Island)", by Barry R. Feldman, Inc., dated August 19, 1988.

The above described parcel has the benefit of a R.O.W. and easement within Allendale Avenue, a 1/3 rod R.O.W. along the westerly bank of the Allendale Pond and a 12' wide easement north of Allendale Avenue, as shown on the plan.

The above described parcel is subject to a 20' wide perpetual R.O.W. and easement and a gas easement as shown on the plan.

AUG 26 '98 12:44 H H MOORE P.3/3

COMMONWEALTH LAND TITLE INSURANCE COMPANY
Seven Thurber Boulevard | Smithfield, RI 02917 | 401-233-2900 | fax 401-233-0099

BK995PG0214 EXHIBIT B

Commonwealth
A LANDAMERICA COMPANY

BK: 1370 PG: 13

CERTIFICATE OF TITLE

Date: October 26, 2001

To: the United States Environmental Protection Agency and the United States of America

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough search of the title to the property described in Schedule A hereof, beginning December 16, 1915, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B hereof.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $750.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____
Michael B. Mellion
Rhode Island State Counsel

BK995PG0215

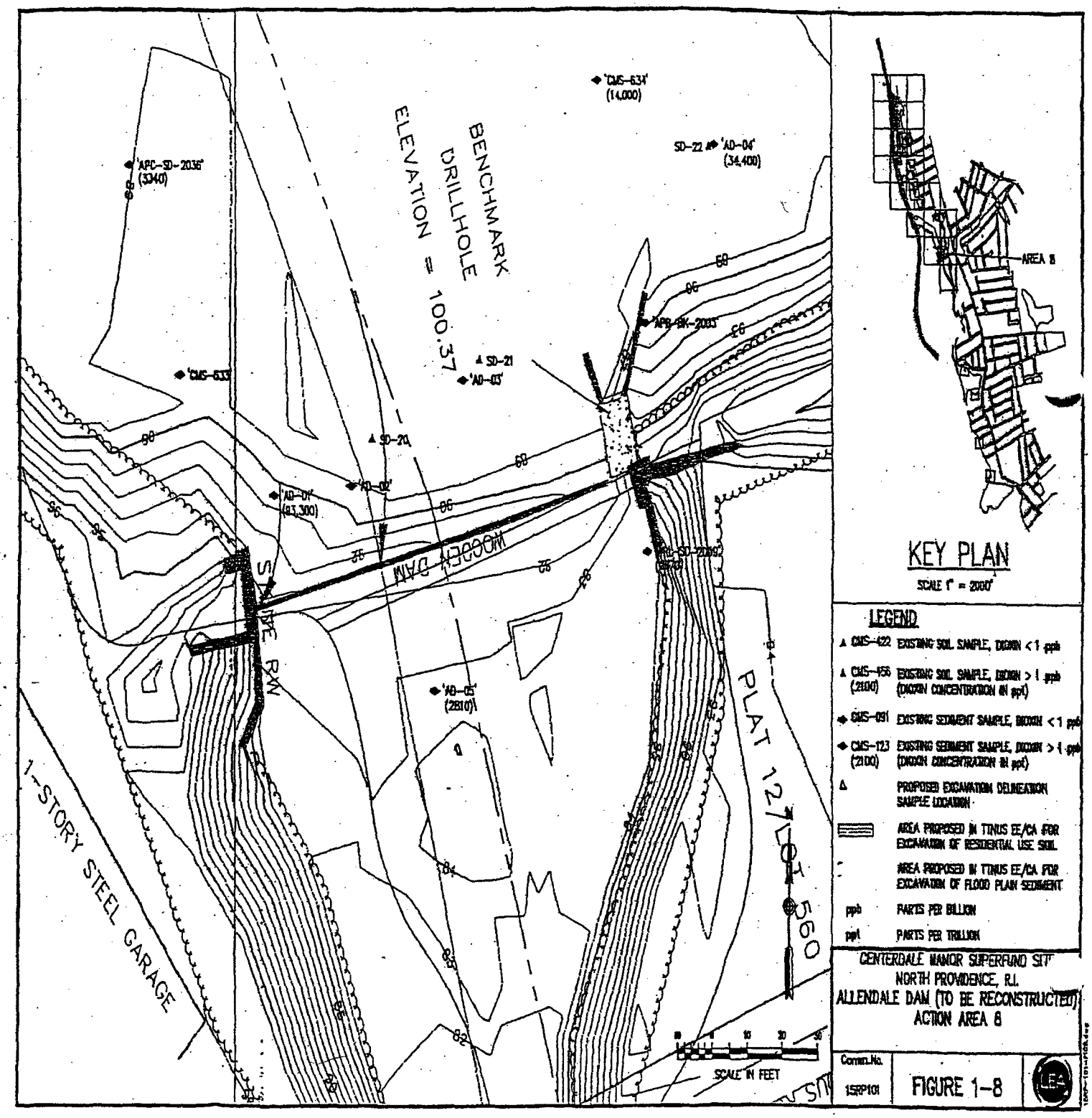
BK: 1370 PG: 14

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0216

BK: 1370 PG: 15



BK 995 PG 0217
BK: 1370 PG: 16

Schedule B

A. TAXES

Any and all unpaid real estate taxes which may encumber a unit owner's percentage interest in the Condominium's common elements.

B. WATER AND SEWER CHARGES

Any and all unpaid water and sewer charges which may encumber a unit owner's percentage interest in the Condominium's common elements.

C. MORTGAGES/LIENS

Any unit mortgages or liens of record which may encumber a unit owner's percentage interest the Condominium's common elements.

D. RESTRICTIONS/EASEMENTS/OTHER

1. Declaration of the Mill at Allendale Condominium dated August 28, 1988 and recorded in North Providence Book 184 at page 818 and in Johnston in Book 219 at page 100, as the same may be amended, and the by-laws and plats and plans recorded in connection therewith.

2. Easement from Centredale Worsted Mills to Narragansett Electric Lighting Company dated January 2, 1917 and recorded In North Providence Book 15 at page 472.

3. Easement from Allendale Company to Providence Gas Company dated August 26, 1958 and recorded in North Providence Book 53 at page 621 and in Johnston in Book 86 at page 530.

4. Rights of the City of Providence in and to Easement from Allendale Company to City of Providence dated February 13,1964 and recorded in Book 58 at page 551 in North Providence and in Johnston in Book 102 at page 230.

5. Rights over Allendale Avenue and a private way as set forth in deed to John Mondillo et als dated July 15, 1954 and recorded in Johnston Book 78 at page 408 and in deed to Henry G. Jutras et als. dated June 4,1952 and recorded in Johnston Book 75 at page 205.

Schedule B BK: 1370 PG: 17

6. Easement to Providence Telephone Company dated December 18, 1906 and recorded in Johnston Book 16 at page 398 as modified by agreement dated March 10, 1914 and recorded in Johnston Book 21 at page 477.

7. Easement to Narragansett Electric Lighting Company dated October 26,1923 and recorded in Johnston Book 37 at page 226.

8. Reservation in deed to Napoleon Paquin dated June 9,1923 and recorded in Johnston Book 36 at page 147.

9. Rights of others in and to any streets or ways abutting or crossing the insured, but not limited to, those streets shown on a plat entitled "Plat of house lots surveyed and plotted by Samuel B. Cushing and Co. August 1871 upon the estate of Obadiah Olney, deceased", which plat is recorded on North Providence Plat Card 47.

10. Rights of others (including any rights of flowage) in and to the Woonasquatucket River

11. Rights, if any, of the property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond in and to the waters of the Lyman Pond or Lymansville Pond or Allendale Pond and in and to the bed thereof; also boating and fishing rights of property owners abutting the Lyman Pond or Lymansville Pond or Allendale Pond or the stream of water leading thereto and therefrom.

12. Zoning Agreement with the Town of North Providence in North Providence Book 171 at page 342.

13. Easement to Narragansett Electric Company In Book 182 at page 787 Survey entitled -Compiled Plan of Land North Providence/Johnston (Rhode Island) dated August 14, 1986 and prepared by Harry R. Feldman, Inc." discloses raceway on premises.

14. Tax Sale Deed recorded in Johnston Book 429 at page 276

15. Any questions arising from the fact that the deeds to Units 106-109, 111-121, 206-211, 215, 217-219, 221, 406-419, 422 and 425 have not been recorded in Johnston.

CERTIFICATE OF TITLE
UPDATED FROM ORIGINAL CERTIFICATE DATED OCTOBER 26, 2001

Date: December 5, 2003

To: the United States Environmental Protection Agency and the United States of America

Our File No. 276407

Commonwealth Land Title Insurance Company, a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal office at 101 Gateway Center Parkway, Gateway One, Richmond, Virginia 23235, certifies that it has made a thorough updated search of the title to the property described in Schedule A hereof, beginning October 26, 2001, the date of its prior Certificate of Title, and hereby certifies that the title to said property, which is a common element within The Mill at Allendale Condominium, is still indefeasibly vested in fee simple of record in the record owners of the fifty-two (52) condominium units in The Mill at Allendale Condominium, each said unit owner having an undivided one fifty-second interest in said property, free and clear of all encumbrances, defects, interests, and all other matters whatsoever, either of record or otherwise known to the corporation, impairing or otherwise affecting the title to said property, except as shown in Schedule B of the Certificate of Title dated October 16, 2001, and except the additional matters as shown in Schedule B hereof found during the period of this updated search.

The maximum liability of the undersigned corporation under this Certificate of Title to the United States Environmental Protection Agency and the United States of America (and each of them), is limited to $350.00, the amount of the enclosed invoice.

In consideration of the payment of the enclosed invoice, this Certificate of Title is issued solely for the use and benefit of the United States Environmental Protection Agency and the United States of America (and each of them).

In witness whereof, Commonwealth Land Title Insurance Company has caused these presents to be signed in its name and behalf and delivered by its proper officers thereunto duly authorized, as of the date first above mentioned.

Commonwealth Land Title Insurance Company

By: _____

Michael B. Mellion
Rhode Island State Counsel

COMMONWEALTH LAND TITLE INSURANCE COMPANY

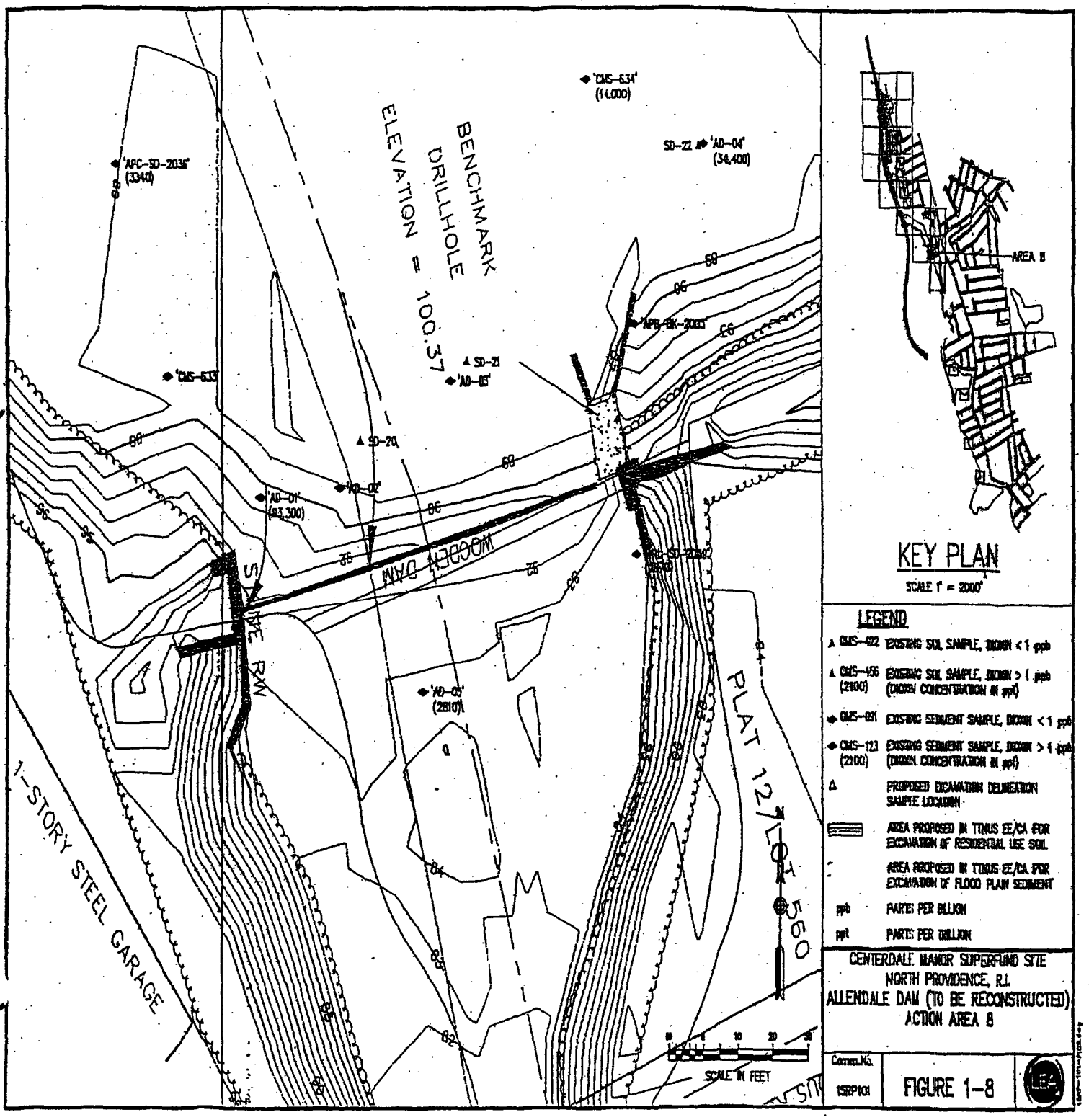
CERTIFICATE OF TITLE
December 5, 2003
Page 2

Schedule A

The Allendale Dam, so-called, situated partly in the Town of Johnston and partly in the Town of North Providence, laid out and delineated as "Wooden Dam" on that certain plan entitled, "Centerdale Manor Superfund Site North Providence, R.I. ALLENDALE DAM (TO BE RECONSTRUCTED) ACTION AREA 8)", a copy of which is attached hereto and made a part hereof.

BK995PG0221

BK: 1370 PG: 20



CENTERDALE MANOR SUPERFUND SITE
NORTH PROVIDENCE, R.I.
ALLENDALE DAM (TO BE RECONSTRUCTED)
ACTION AREA B

Contract No. 1SRP101

FIGURE 1-8

COMMONWEALTH LAND TITLE INSURANCE COMPANY

CERTIFICATE OF TITLE
December 5, 2003
Page 3

Schedule B

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D. RESTRICTIONS/EASEMENTS/OTHER

1. Terms and conditions of Access Agreement dated February 6, 2002 by and between by and between The Mill at Allendale Condominium Association and CoxCom, Inc., d/b/a Cox Communications New England, as evidenced by Memorandum of Agreement recorded May 16, 2002 at 9:05 A.M. in Book 656 at Page 83.

2. Insignificant Alteration - Permit issued by the Rhode Island Department of Environmental Management dated October 1, 2003 and recorded October 10, 2003 at 2:40 P.M. in Book 933 at Page 242.

ROBIN D. PIMENTAL
TOWN OF JOHNSTON
TOWN CLERK
03/11/2004 10:45:33AM

RECEIVED FOR RECORD
North Providence, R.I. MAR 11 2004
10:15 o'clock A M
Witness:
Maryann Douglas
Town Clerk

2/04