REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION – ADDENDUM NO. 1 REPAIR OF SHORELINE EROSION

GRATWICK-RIVERSIDE PARK SITE
NORTH TONAWANDA, NEW YORK

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GRATWICK-RIVERSIDE PARK SITE
NORTH TONAWANDA, NEW YORK

Prepared by:
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MARCH 2005
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This report is printed on recycled paper.

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1.0 INTRODUCTION

Construction of the Remedial Action for the Gratwick-Riverside Park Site was completed in June 2001. The Site is located in North Tonawanda, New York as shown on Figure 1.1. The description of the constructed remedy was presented in the report entitled "Remedial Action Construction Implementation" dated July 11, 2002. During the summer of 2002, inspections of the shoreline identified some erosion had occurred in the area immediately adjacent to the shoreline.

In October 2003, the Performing Parties (PPs) for the Gratwick-Riverside Park Site (Site) submitted the report entitled "Work Plan, Repair of Shoreline Erosion, Revision No. 1" (Work Plan), which, after incorporating the NYSDEC comments received November 5, 2003 and January 7, 2004, was approved by the NYSDEC on January 12, 2004. The purpose of the Work Plan was to present the procedures to be used to repair the erosion of topsoil that had occurred along the shoreline of the Site since completion of the Remedial Action construction. The erosion was caused by wave action during winter storms.

The purpose of this report is to document the erosion control measures that were implemented. In addition, the report also presents other repair work done at the Site to address the four punch-list items identified during the Final Inspection held on November 26, 2001. The four punch-list items were:

i) install power to the picnic shelter;

ii) reseeding of select grass areas and replacement of dead trees;

iii) placement of an additional boulder at each wet well and at the entrance gate to the meter building roadway; and

iv) replacement of hydric soil in a small area of Islet No. 1.

Based on discussions with the NYSDEC, it was decided that a more appropriate repair for item (iv) in the Islet No. 1 area was to place stone (4 to 6-inch diameter) rather than the hydric soil.

This report documents the implementation of the repairs that have been performed to address these four items and of the shoreline. The repairs were performed by L.D.C. Construction Company, Inc. (the Contractor selected in April 2003).

Construction quality control procedures and health and safety procedures followed those presented in Appendices E and F, respectively, of the document entitled "Final

(100%) Design Report, Volumes I and II, Gratwick-Riverside Park Site, North Tonawanda, New York" dated December 1998, which was approved by the New York State Department of Environmental Conservation (NYSDEC) on February 12, 1999.

2.0 SLOPED BANK STABILIZATION REPAIR

Cross-sections of the sloped bank stabilization as designed and constructed are shown on Figure 2.1. One cross-section presents the details for the shoreline area which has competent slag along the River's edge and the other where competent slag is not present. A plan view of the layout of the RA, including the sloped bank stabilization, is shown on Figure 2.2. Also shown on Figure 2.2 are the areas where erosion of the overlying topsoil had been eroded and has been repaired. It is noted that, prior to repair, the underlying gabion mat and riprap contained within the gabion mat had not been impacted and continued to prevent erosion of the underlying shoreline soil; thus protecting the constructed remedial components.

The width of the soil erosion area along the shoreline ranged from 7 to 18 feet with a total eroded area of 4,850 square yards. The eroded area typically ended on the sloped bank at an erosion face which was on the order of 12-inches high.

The repair was completed on November 22, 2004.

2.1 DESIGN OBJECTIVES

The design objectives presented in the 100% Design Report for the sloped bank stabilization were:

i) to protect the barrier wall and groundwater collection systems;

ii) to prevent erosion of the shoreline soils underlying the constructed sloped bank stabilization;

iii) to be compatible with the proposed land usage, including water access and landscaping;

iv) to minimize disturbance of the River bottom soil and the extent of work within the River; and

v) to establish wetlands along the Site shoreline.

Even in those areas where erosion of the overlying imported clean topsoil had occurred, the original sloped bank stabilization system that had been constructed under the RA had achieve the above objectives. This is based on the fact that the gabion mat and riprap were unaffected and still in place, thereby preventing erosion of the underlying shoreline soil. Furthermore, based on the observed conditions during the September 12, 2003 walkthrough, it was believed that the topsoil erosion that had occurred would be

self healing as vegetation rooted itself along the shoreline and in the adjacent river bed. None the less, NYSDEC requested that the topsoil erosion be repaired to accelerate the healing process. Due to the fact that the shoreline was healing itself prior to the implementation of this shoreline erosion plan, the NYSDEC agreed to a reduction in the number of dogwood wattles required in 2004 (62) compared to those originally estimated (92) in 2003.

2.2 DESCRIPTION OF REPAIR

Work related to the repair of the sloped bank stabilization consisted of the following major tasks:

i) removal of manmade articles (plastic jugs, refuse, etc.) from the exposed riprap area;

ii) placement of medium stone over the exposed riprap gabion mats; and

iii) placement of 62 dogwood wattles in 1 cubic yard soil pods (each wattle contained four 12-inch cuttings and the soil was wrapped in burlap and covered with one layer of light stone).

During the repairs, care was taken to minimize the disruption of wetland vegetation and stalky vegetation already growing in the impacted areas.

2.2.1 AREA PREPARATION

Preparation consisted of the removal of the goose suppression reinforcing bars that were protruding from the ground surface along the shoreline. The reinforcing bars were cut off at the ground surface to minimize the damage that could occur if attempts were made to pull the bars out. In addition, larger manmade objects (e.g., tires, plastic pails, etc.) and large natural vegetation (e.g., tree trunks) were removed from the shoreline and placed on-Site for off-Site disposal by the City.

2.2.2 USE OF NATURAL DRIFT MATERIALS

In many areas along the shoreline, natural drift material (e.g., tree branches, other vegetation, etc.) had settled over the exposed riprap gabion mats. These materials were

left in place so as not to disturb the vegetation already growing in/through the materials and to provide additional structure to help bind the stone/soil in place.

2.2.3 RIPRAP PLACEMENT

Riprap placement was performed in August 2004. Medium riprap was placed on top of the exposed gabion mat/riprap using a Morooka rubber tired dump truck and a PC 120 Komatsu trackhoe. The thickness of the riprap was one rock thickness (10 to 14-inch) in the area shown on Figure 2.3. Thus, the average thickness of the riprap is approximately 12 inches.

The riprap met the NYSDOT gradation requirements for light and medium stone as provided in the specifications included as Appendix B of the Work Plan. The source quality control complied with Specification Section 02373.2.11 of the NYSDEC approved Contract Documents dated May 1999 (attached as Appendix B) of the Work Plan. The results of the quality control testing of the riprap are provided in Appendix B. All stone placement was carefully performed so as not to encroach upon areas of healthy vegetation that had nestled into the exposed riprap gabion mats.

2.2.4 DOGWOOD WATTLE PLACEMENT

The Work Plan specified that dogwood wattles would be placed at selected locations along the eroded shoreline area. The wattles consist of approximately 1 cubic yard of imported topsoil wrapped in a filter cloth material to keep the topsoil encapsulated. The topsoil was typically 1 foot thick which resulted in wattles with the following dimensions (5' x 5', 4' x 6' or 3' x 8'). The soil wattles were kept at least 3 feet from the shoreline to help preserve their integrity. Thus, the wattles were only placed in areas where there was at least a 6-foot eroded width. Sixty-two soil envelops were installed as determined based on an average placement of one wattle for every 25 feet in length of the eroded areas greater than or equal to 6-feet. The 3-foot area between the river and the wattle was filled with medium stone (see Figure 2.4).

The soil envelopes for the wattles were placed in August 2004. Because of the need to wait until the dogwood stems were dormant, the stems were not placed into the soil until November 22, 2004.

Each wattle has 4 silky dogwood stems set in the topsoil in a rectangular pattern approximately 18 inches by 18 inches square with the exposed stem ends facing out

toward the river. The topsoil was imported clean material similar to that used for the Site cap. The erosion control fabric was folded back over the top of the topsoil to complete its encapsulation. The erosion control fabric was then covered with one layer of light stone (4 to 6-inch) to help hold the topsoil and fabric in place.

The topsoil met the requirements of Specification Sections 02055.2.2 and 02055.2.4.B of the document entitled "Bid Documents" dated March 2003. The results of the quality control testing of the topsoil are provided in Appendix C.

2.2.5 VEGETATION ESTABLISHMENT

The wattles will be inspected once a week and watered as needed during the period of vegetation establishment (from planting to the start of the next winter season). The water will be obtained from either a potable source or the Niagara River.

2.3 PUNCH-LIST ITEMS

2.3.1 ORIGINAL CONTRACT

The power to the picnic shelter was installed in May/June, 2003. The power consists of 3-phase service.

The following activities were performed to address the approximately 6-foot by 6-foot area, located immediately adjacent to the large breakwater rocks at the beginning of the first islet, where the filter fabric underlying the hydric soil was exposed:

i) a layer of 4 to 6-inch rock was placed over the exposed filter fabric area; and

ii) some medium sized stones were placed at the junction between the large breakwater rocks and the portion of the first islet that runs parallel to the shoreline in order to reduce the rate of water flow through this location thereby further protecting the embayment area from possible erosion.

The replanting of dead trees and re-seeding of bare areas in the grass cover was performed July and August, 2003, respectively. The areas replanted are shown on Figure 2.2.

One additional protective boulder was placed at each wet well and at the entrance to the control building in November, 2004.

The re-seeding was performed in accordance with the requirements in the report entitled "Bid Documents – Shoreline Erosion Repair" dated March 2003 and approved by the NYSDEC on March 21, 2003. Placement of the protective boulders and the covering of the exposed filter fabric was performed at the same time as the shoreline repairs.

2.3.2 SHORELINE REPAIR

A pre-final inspection of the shoreline repair was held on November 28, 2004. The inspection identified the following new punch-list items.

i) the re-seeding of the stone and soil stockpile areas; and

ii) minor asphalt repairs at two locations on the walking path.

The reseeding and asphalt repair were completed on November 29, 2004.

3.0 SHORELINE REPAIR FINAL INSPECTION

The Final Inspection of the shoreline repair was held on December 10, 2004. The list of participants is included in Appendix D. The punch list items identified during the inspection to be completed were:

i) removal of the remaining reinforcing bars from the islets; and

ii) provision of the cost information for the erosion control fabric used to encapsulate the soil for the wattles.

The remaining reinforcing bars will be removed by the City in the spring/summer of 2005 when river water temperatures make it safe to do so. The removal will be performed as part of the O&M being performed by the City.

The cost information for the erosion control fabric was submitted to the NYSDEC on January 11, 2005.

4.0 CONCLUSIONS

All of the components of the RA, including the shoreline repair, were constructed in accordance with the NYSDEC approved design documents and approved modifications issued during progress of the works. Furthermore, all punch-list items which were identified during the Final Inspection held on November 26, 2001 for the original contract have been addressed.

The monitoring data collected at the Site since July 2001 confirm that the remedial systems are operating as designed.

5.0 CERTIFICATION

The undersigned certify, based on the information provided by CRA personnel directly responsible for related work activities, that the activities described in this report for the Gratwick-Riverside Park Remedial Program, including the Shoreline Repair, were performed in accordance with the approved design documents and approved modifications issued during progress of the work.

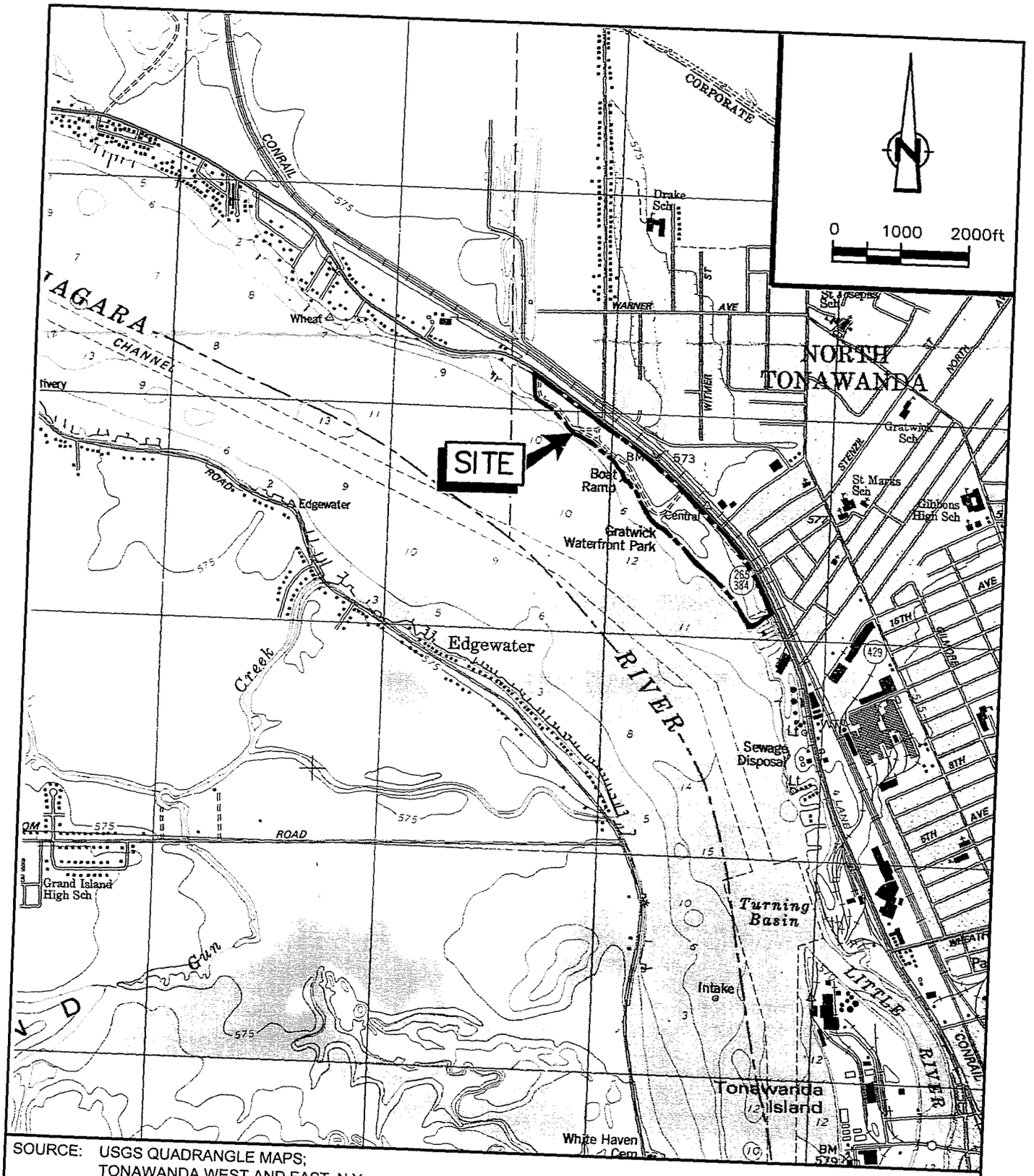
Sunil K. Mital, PE
CRA Infrastructure & Engineering, Inc.
(subsidiary of Conestoga-Rovers and Associates, Inc.)

3/29/05
Date

Klaus Schmidtke, Project Manager
Conestoga-Rovers & Associates, Ltd.

March 28, 2005
Date

FIGURES

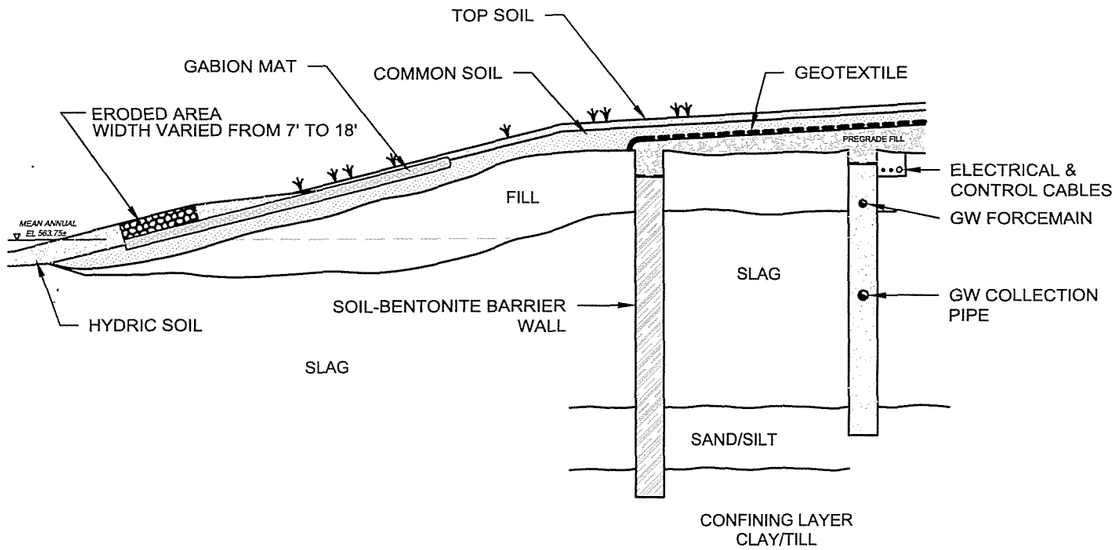


SOURCE: USGS QUADRANGLE MAPS;
TONAWANDA WEST AND EAST, N.Y.
(1980)

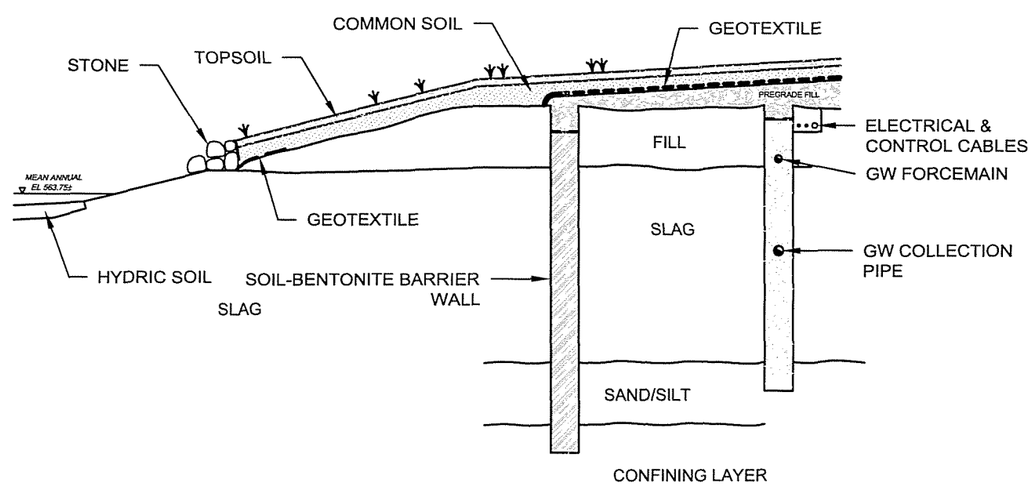
figure 1.1

REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION-ADDENDUM No. 1
SLOPED BANK STABILIZATION REPAIR

Gratwick - Riverside Park Site, North Tonawanda, New York



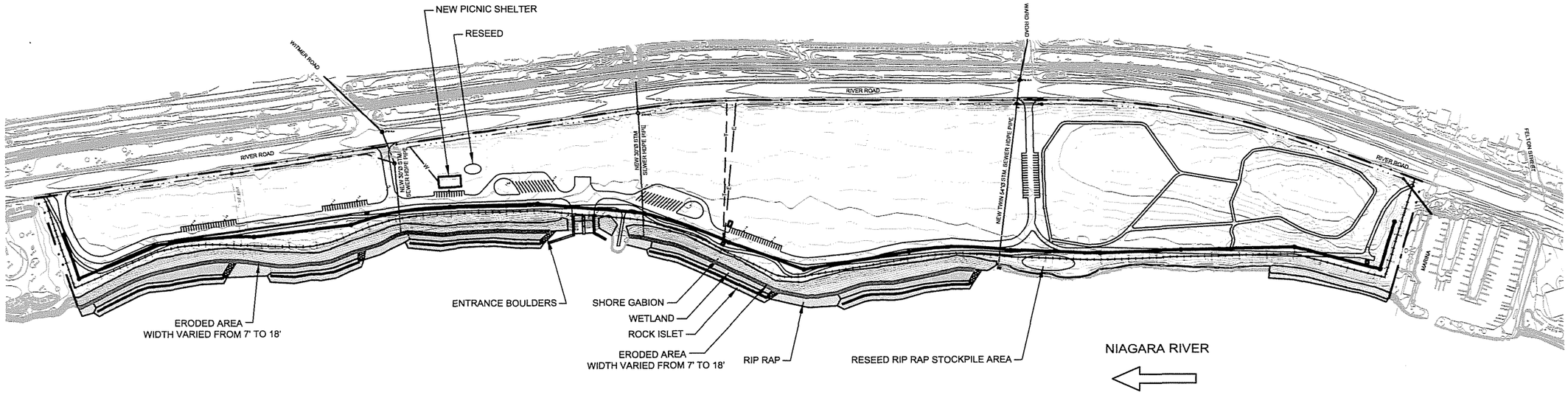
TYPICAL BARRIER SYSTEM
WITHOUT COMPETENT SLAG



TYPICAL BARRIER SYSTEM
WITH COMPETENT SLAG

figure 2.1

SLOPED BANK STABILIZATION AND BARRIER WALL/GROUNDWATER
WITHDRAWAL SYSTEM CROSS-SECTIONS
REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION-ADDENDUM No. 1
SLOPED BANK STABILIZATION REPAIR
Gratwick - Riverside Park Site, North Tonawanda, New York

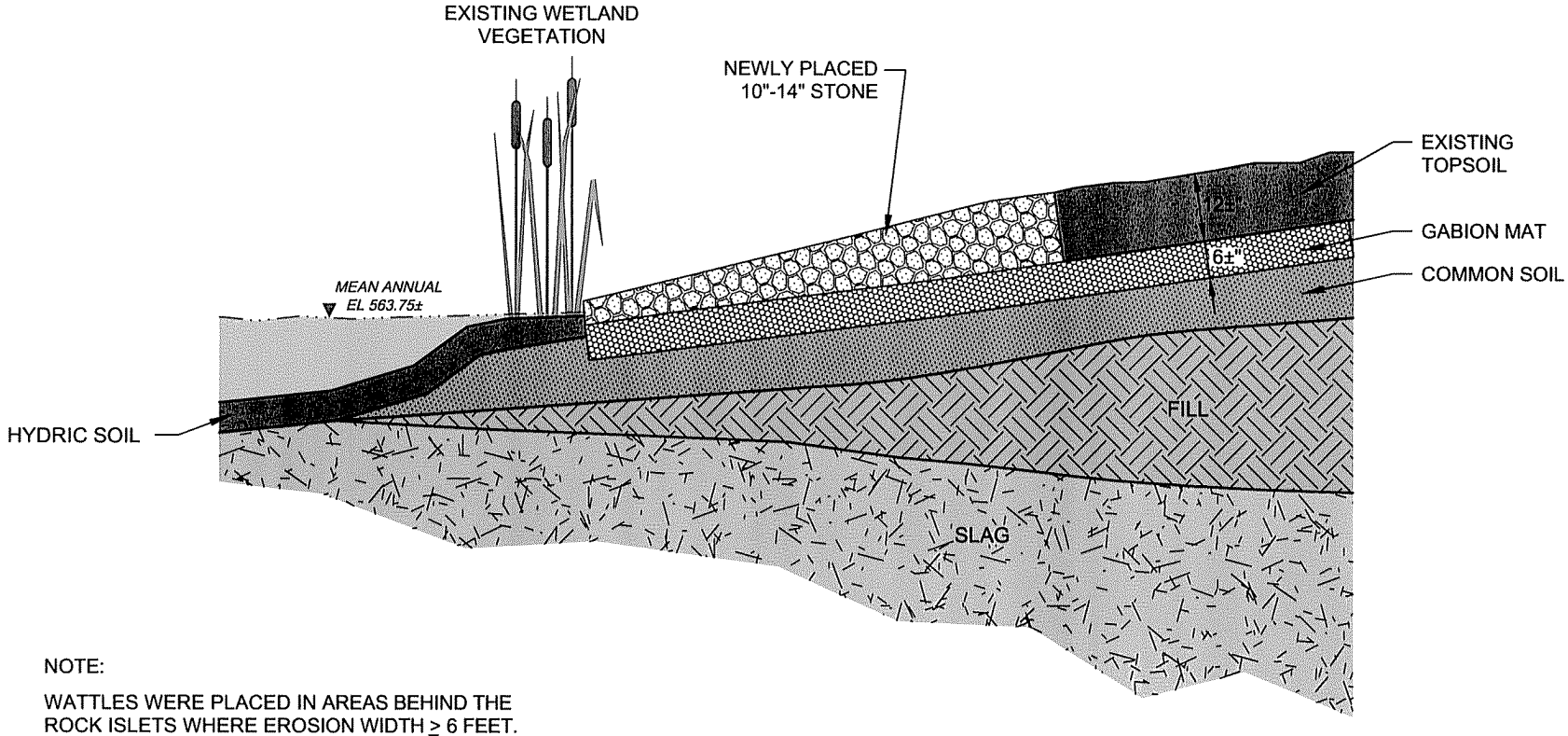


LEGEND

- POTABLE WATER SUPPLY LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND ELECTRICAL SERVICE
- BARRIER WALL
- GROUNDWATER COLLECTION SYSTEM

figure 2.2

SITE LAYOUT
REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION-ADDENDUM No. 1
SLOPED BANK STABILIZATION REPAIR
Gratwick - Riverside Park Site, North Tonawanda, New York

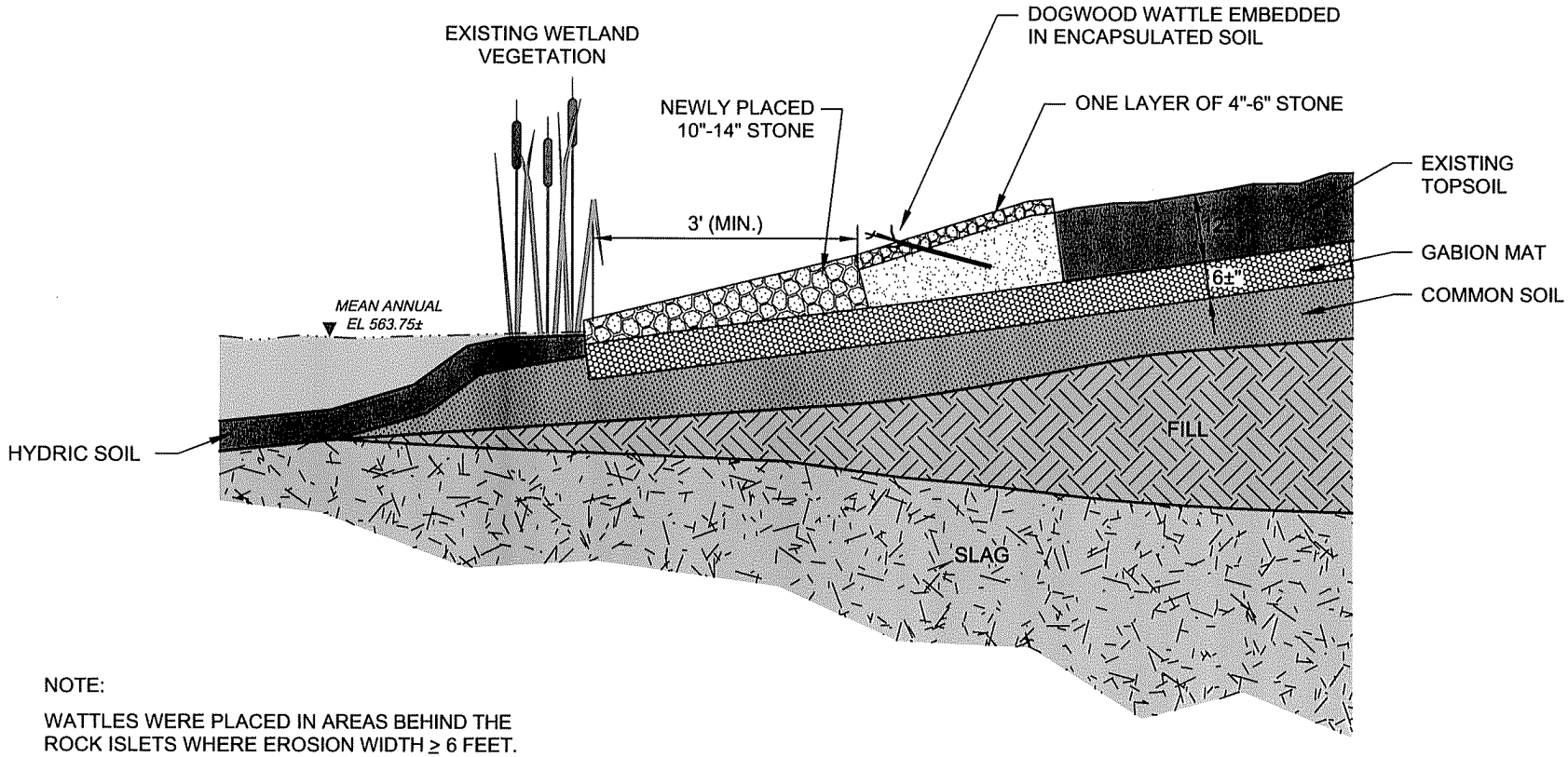


NOTE:

WATTLES WERE PLACED IN AREAS BEHIND THE ROCK ISLETS WHERE EROSION WIDTH ≥ 6 FEET.

figure 2.3

REPAIR WITH ROCK ONLY
REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION-ADDENDUM No. 1
SLOPED BANK STABILIZATION REPAIR
Gratwick - Riverside Park Site, North Tonawanda, New York



NOTE:

WATTLES WERE PLACED IN AREAS BEHIND THE ROCK ISLETS WHERE EROSION WIDTH ≥ 6 FEET.

figure 2.4

REPAIR WITH ROCK AND DOGWOOD WATTLES
REMEDIAL ACTION CONSTRUCTION IMPLEMENTATION-ADDENDUM No. 1
SLOPED BANK STABILIZATION REPAIR
Gratwick - Riverside Park Site, North Tonawanda, New York

APPENDICES

A

APPENDIX A

PHOTOGRAPHS

Dogwood Stem Surrounded by 4 to 6 Inch Stone

Dogwood Stem Surrounded by 4 to 6 Inch Stone

B

APPENDIX B

RIPRAP SOURCE CONTROL TESTING RESULTS

LAFARGE NORTH AMERICA

FACSIMILE

Construction Materials

Date	1/17/05	**Number of pages (inc. this one): 3**	
From	**Jeffrey Jezioro**	**Location**	**Eastern U.S. Region**
To	**CRA Attn:Sunil**	**Location:**	
Fax	**297-2265**		

If there is a problem with the transmission of this document, please call (716) 583-0304 The fax number is (716) 433-4930

Comments

Here is the information you requested.

If there are any problems at all please feel free to contact me at 716-583-0304.. Thanks and have a nice day.

Jeffrey Jezioro

EASTERN U.S. REGION
300 East Joppa Road, Suite 200, Towson, MD 21286
Office: (410) 847-3300 Fax: (410) 847-3308

LAFARGE

January 17, 2005

LDC

Att: Diane Dinsmore
Fax:775-5304
Re: Gratwick Riverside Park

To whom it may concern:

This is to certify that the material being supplied to the above project conforms to the outlined NYSDOT requirements for Item #620.04, Medium Stone Fill. The gradation of this material is below.

Medium Stone Fill - Item #620.04	
Stone Size	**% of Total by Weight**
Heavier than 100 lbs	50 - 100
Smaller than 6"	0 - 10

Our NYSDOT source is 5-5R and our most recent test number is 01AR13.

Sincerely,

Jeffrey Jezioro
Quality Control Technician

CONSTRUCTION MATERIALS / NORTHERN DIVISION
PO Box 510 ~ 400 Hinman Road, Lockport, New York 14094
Office: (716) 439-1300 Fax: (716) 439-9447

LAFARGE

January 17, 2005

LDC

Att: Diane Dinsmore
Fax:775-5304
Re: Gratwick Riverside Park

To whom it may concern:

This is to certify that the material being supplied to the above project conforms to the outlined NYSDOT requirements for Item #620.03, Light Stone Fill. The gradation of this material is as follows:

Light Stone Fill - Item #620.03	
Stone Size	**% of Total by Weight**
Lighter than 100lbs.	90 - 100
Larger than 6"	50 - 100
Smaller than 1/2" Sieve	0 - 10

Our NYSDOT source is 5-5R and our most recent test number is 01AR13.

Sincerely,

Jeffrey Jezioro
Quality Control Technician

CONSTRUCTION MATERIALS / NORTHERN DIVISION
PO Box 510 ~ 400 Hinman Road, Lockport, New York 14094
Office: (716) 439-1300 Fax: (716) 439-9447

C

APPENDIX C

TOPSOIL SOURCE CONTROL TESTING RESULTS

CHOPRA-LEE
INCORPORATED
1815 Love Road
Grand Island
New York 14072
Tel: (716) 773-7625
Fax: (716) 773-7624

Laboratory Analysis Report

Project: Bulk Analysis for Metals, Svol, Vol, PCB's and Cyanide
Gratwick-Riverside Park

Phase:
Sample Date:
Report Date: Thursday, July 17, 2003
Report ID: NY306108.0.7011
PO #:
Reference #:
Report Status: **Final**

performed at the request of: Diane Dinsmore
L.D.C. Construction Co., Inc.

1920 Baseline Road
Grand Island, NY 14072

The enclosed sample results table(s) are for 1 sample(s) received by Chopra-Lee, Inc. on 06/19/2003 submitted by L.D.C. Construction

Authorized Signature:

☑ Peiliang Shen, Manager Analytical Chemistry
☐ Paul S. Chopra, Laboratory Director

The results enclosed are submitted pursuant to Chopra-Lee, Inc.'s current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. These results pertain only to the items tested. Unless notified in writing to return the samples covered by this report Chopra-Lee, Inc. will store what remains of the samples for a period of 15 days before discarding, unless otherwise required by law.

Sample Results

Sample ID: 18750 & 18751 Client: L.D.C. Construction Co., Inc.

Lab Sample #: 26748 Report ID: NY306108.0.7011

Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Heavy Metals using Atomic Spectroscopy						
TAL 23 Heavy Metals / SW 846 7000's/6010	Aluminum	1.9	9.7	11000	mg/kg	06/19/2003
	Antimony	0.49	2.4	ND	mg/kg	06/19/2003
	Arsenic	0.49	2.4	4.71	mg/kg	06/19/2003
	Barium	0.19	0.97	50.5	mg/kg	06/19/2003
	Beryllium	0.097	0.49	-0.467	mg/kg	06/19/2003
	Cadmium	0.097	0.49	0.605	mg/kg	06/19/2003
	Calcium	0.97	4.9	1540	mg/kg	06/19/2003
	Chromium	0.19	0.97	12.2	mg/kg	06/19/2003
	Cobalt	0.19	0.97	6.24	mg/kg	06/19/2003
	Copper	0.19	0.97	12.1	mg/kg	06/19/2003
	Iron	0.49	2.4	13600	mg/kg	06/19/2003
	Lead	0.29	1.5	16.1	mg/kg	06/19/2003
	Magnesium	0.49	2.4	2620	mg/kg	06/19/2003
	Manganese	0.097	0.49	703	mg/kg	06/19/2003
	Mercury	0.033	0.033	0.172	mg/kg	06/24/2003
	Nickel	0.19	0.97	16.8	mg/kg	06/19/2003
	Potassium	0.97	4.9	6030	mg/kg	06/19/2003
	Selenium	0.49	2.4	ND	mg/kg	06/19/2003
	Silver	0.19	0.97	ND	mg/kg	06/19/2003
	Sodium	9.7	49	-14.1	mg/kg	06/19/2003
	Thallium	0.29	1.5	ND	mg/kg	06/19/2003
	Vanadium	0.097	0.49	21.3	mg/kg	06/19/2003
	Zinc	0.19	0.97	82.3	mg/kg	06/19/2003
Polychlorinated Biphenyl's						
Polychlorinate Biphenyls (PCB's) / SW 846 8082	Aroclor - 1016	0.0023	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1221	0.0066	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1232	0.0066	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1242	0.0027	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1248	0.0050	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1254	0.0020	0.0066	ND	mg/kg	06/23/2003
	Aroclor - 1260	0.0023	0.0066	ND	mg/kg	06/23/2003

CHOPRA-LEE

ND = Not Detected in Sample, less than Detection Limit (DL)
-X.XX = Less than the quantitation limit (estimated value)
b = compound detected in blank
NYS DOH ELAP ID# 10954

Sample Results

Sample ID: 18750 & 18751 **Client:** L.D.C. Construction Co., Inc.
Lab Sample #: 26748 **Report ID:** NY306108.0.7011
Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Semivolatile Organic Compounds						
Semivolatile - TCL / SW 846 8270	1,2,4-Trichlorobenzene	62	310	ND	ug/kg	07/17/2003
	1,2-Dichlorobenzene	62	310	ND	ug/kg	07/17/2003
	1,2-Diphenylhydrazine (azobenzene)	62	310	ND	ug/kg	07/17/2003
	1,3-Dichlorobenzene	62	310	ND	ug/kg	07/17/2003
	1,4-Dichlorobenzene	62	310	ND	ug/kg	07/17/2003
	2,2'-Oxybis(1-chloropropane)	62	310	ND	ug/kg	07/17/2003
	2,4,5-Trichlorophenol	62	310	ND	ug/kg	07/17/2003
	2,4,6-Trichlorophenol	62	310	ND	ug/kg	07/17/2003
	2,4-Dichlorophenol	62	310	ND	ug/kg	07/17/2003
	2,4-Dimethylphenol	62	310	ND	ug/kg	07/17/2003
	2,4-Dinitrophenol	62	310	ND	ug/kg	07/17/2003
	2,4-Dinitrotoluene	62	310	ND	ug/kg	07/17/2003
	2,6 Dinitrotoluene	62	310	ND	ug/kg	07/17/2003
	2-Chloronaphthalene	62	310	ND	ug/kg	07/17/2003
	2-Chlorophenol	62	310	ND	ug/kg	07/17/2003
	2-Methylnaphthalene	62	310	ND	ug/kg	07/17/2003
	2-Methylphenol	62	310	ND	ug/kg	07/17/2003
	2-Nitroaniline	62	310	ND	ug/kg	07/17/2003
	2-Nitrophenol	62	310	ND	ug/kg	07/17/2003
	3,3'-Dichlorobenzidine	62	310	ND	ug/kg	07/17/2003
	3-Nitroaniline	62	310	ND	ug/kg	07/17/2003
	4,6-Dinitro-2-methyl phenol	62	310	ND	ug/kg	07/17/2003
	4-Bromophenyl phenyl ether	62	310	ND	ug/kg	07/17/2003
	4-Chloro-3-methylphenol	62	310	ND	ug/kg	07/17/2003
	4-Chloroaniline	62	310	ND	ug/kg	07/17/2003
	4-Chlorophenyl phenyl ether	62	310	ND	ug/kg	07/17/2003
	4-Nitroaniline	62	310	ND	ug/kg	07/17/2003
	4-Nitrophenol	62	310	ND	ug/kg	07/17/2003
	Acenaphthene	62	310	ND	ug/kg	07/17/2003
	Acenaphthylene	62	310	ND	ug/kg	07/17/2003
	Aniline	62	310	ND	ug/kg	07/17/2003
	Anthracene	62	310	ND	ug/kg	07/17/2003
	Benzidine	62	310	ND	ug/kg	07/17/2003

Sample Results

Sample ID: 18750 & 18751 **Client:** L.D.C. Construction Co., Inc.
Lab Sample #: 26748 **Report ID:** NY306108.0.7011
Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Semivolatile - TCL / SW 846 8270	Benzo(a)anthracene	62	310	ND	ug/kg	07/17/2003
	Benzo(a)pyrene	62	310	ND	ug/kg	07/17/2003
	Benzo(b)fluoranthene	62	310	ND	ug/kg	07/17/2003
	Benzo(g,h,i)perylene	62	310	ND	ug/kg	07/17/2003
	Benzo(k)fluoranthene	62	310	ND	ug/kg	07/17/2003
	Benzoic acid	62	310	ND	ug/kg	07/17/2003
	Benzyl alcohol	62	310	ND	ug/kg	07/17/2003
	Bis (2-chloroethoxy) methane	62	310	ND	ug/kg	07/17/2003
	Bis (2-chloroethyl) ether	62	310	ND	ug/kg	07/17/2003
	Bis (2-ethylhexyl) phthalate	62	310	ND	ug/kg	07/17/2003
	Butyl benzyl phthalate	62	310	ND	ug/kg	07/17/2003
	Carbazole	62	310	ND	ug/kg	07/17/2003
	Chrysene	62	310	ND	ug/kg	07/17/2003
	Dibenzo(a,h)anthracene	62	310	ND	ug/kg	07/17/2003
	Dibenzofuran	62	310	ND	ug/kg	07/17/2003
	Diethyl phthalate	62	310	ND	ug/kg	07/17/2003
	Dimethyl phthalate	62	310	ND	ug/kg	07/17/2003
	Di-n-butyl phthalate	62	310	ND	ug/kg	07/17/2003
	Di-n-octyl phthalate	62	310	ND	ug/kg	07/17/2003
	Fluoranthene	62	310	ND	ug/kg	07/17/2003
	Fluorene	62	310	ND	ug/kg	07/17/2003
	Hexachlorobenzene	62	310	ND	ug/kg	07/17/2003
	Hexachlorobutadiene	62	310	ND	ug/kg	07/17/2003
	Hexachlorocyclopentadiene	62	310	ND	ug/kg	07/17/2003
	Hexachloroethane	62	310	ND	ug/kg	07/17/2003
	Indeno(1,2,3-cd)pyrene	62	310	ND	ug/kg	07/17/2003
	Isophorone	62	310	ND	ug/kg	07/17/2003
	Naphthalene	62	310	ND	ug/kg	07/17/2003
	Nitrobenzene	62	310	ND	ug/kg	07/17/2003
	N-Nitrosodimethylamine	62	310	ND	ug/kg	07/17/2003
	N-Nitroso-di-n-propylamine	62	310	ND	ug/kg	07/17/2003
	N-Nitrosodiphenylamine	62	310	ND	ug/kg	07/17/2003
	p-Cresol (4-Methylphenol)	62	310	ND	ug/kg	07/17/2003
	Pentachlorophenol	62	310	ND	ug/kg	07/17/2003
	Phenanthrene	62	310	ND	ug/kg	07/17/2003
	Phenol	62	310	ND	ug/kg	07/17/2003

CHOPRA-LEE

ND = Not Detected in Sample, less than Detection Limit (DL)
~ X.XX = Less than the quantitation limit (estimated value)
b = compound detected in blank
NYS DOH ELAP ID# 10954

Client: L.D.C. Construction Co., Inc.
Project: NY306108.0.7011
Report Status: Final

Sample Results

Sample ID: 18750 & 18751 **Client:** L.D.C. Construction Co., Inc.
Lab Sample #: 26748 **Report ID:** NY306108.0.7011
Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Semivolatile - TCL / SW 846 8270	Pyrene	62	310	ND	ug/kg	07/17/2003
	Pyridine	62	310	ND	ug/kg	07/17/2003

Sample Results

Sample ID: 18750 & 18751 **Client:** L.D.C. Construction Co., Inc.
Lab Sample #: 26748 **Report ID:** NY306108.0.7011
Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Volatile Organic Compounds						
Volatile - TCL / SW 846 8260	1,1,1-Trichloroethane	12	58	ND	ug/kg	07/02/2003
	1,1,2,2-Tetrachloroethane	12	58	ND	ug/kg	07/02/2003
	1,1,2-Trichloroethane	12	58	ND	ug/kg	07/02/2003
	1,1-Dichloroethane	12	58	ND	ug/kg	07/02/2003
	1,1-Dichloroethene	12	58	ND	ug/kg	07/02/2003
	1,1-Dichloropropene	12	58	ND	ug/kg	07/02/2003
	1,2,3-Trichlorobenzene	12	58	ND	ug/kg	07/02/2003
	1,2,3-Trichloropropane	12	58	ND	ug/kg	07/02/2003
	1,2,4-Trichlorobenzene	12	58	ND	ug/kg	07/02/2003
	1,2,4-Trimethylbenzene	12	58	ND	ug/kg	07/02/2003
	1,2-Dibromo-3-Chloropropane	12	58	ND	ug/kg	07/02/2003
	1,2-Dibromoethane	12	58	ND	ug/kg	07/02/2003
	1,2-Dichlorobenzene	12	58	ND	ug/kg	07/02/2003
	1,2-Dichloroethane	12	58	ND	ug/kg	07/02/2003
	1,2-Dichloropropane	12	58	ND	ug/kg	07/02/2003
	1,3,5-Trimethylbenzene	12	58	ND	ug/kg	07/02/2003
	1,3-Dichlorobenzene	12	58	ND	ug/kg	07/02/2003
	1,3-Dichloropropane	12	58	ND	ug/kg	07/02/2003
	1,4-Dichlorobenzene	12	58	ND	ug/kg	07/02/2003
	2,2-Dichloropropane	12	58	ND	ug/kg	07/02/2003
	2-Chlorotoluene	12	58	ND	ug/kg	07/02/2003
	4-Chlorotoluene	12	58	ND	ug/kg	07/02/2003
	Benzene	12	58	ND	ug/kg	07/02/2003
	Bromobenzene	12	58	ND	ug/kg	07/02/2003
	Bromodichloromethane	12	58	ND	ug/kg	07/02/2003
	Bromoform	12	58	ND	ug/kg	07/02/2003
	Bromomethane	12	58	ND	ug/kg	07/02/2003
	Carbon tetrachloride	12	58	ND	ug/kg	07/02/2003
	Chlorobenzene	12	58	ND	ug/kg	07/02/2003
	Chlorodibromomethane	12	58	ND	ug/kg	07/02/2003
	Chloroethane	12	58	ND	ug/kg	07/02/2003
	Chloroform	12	58	ND	ug/kg	07/02/2003
	Chloromethane	12	58	ND	ug/kg	07/02/2003
	cis-1,2-Dichloroethene	12	58	ND	ug/kg	07/02/2003

Sample Results

Sample ID: 18750 & 18751 **Client:** L.D.C. Construction Co., Inc.
Lab Sample #: 26748 **Report ID:** NY306108.0.7011
Location: Old carriage house road Grand Island / Field Grab - Soil

Parameters / Method	Analyte	Detection Limit (DL)	Quantitation Limit (QL)	Sample Results	Units	Analysis Date
Volatile - TCL / SW 846 8260	cis-1,3-Dichloropropene	12	58	ND	ug/kg	07/02/2003
	Dibromomethane	12	58	ND	ug/kg	07/02/2003
	Dichlorodifluoromethane	12	58	ND	ug/kg	07/02/2003
	Ethylbenzene	12	58	ND	ug/kg	07/02/2003
	Hexachlorobutadiene	12	58	ND	ug/kg	07/02/2003
	Isopropylbenzene	12	58	ND	ug/kg	07/02/2003
	m,p-Xylene	12	58	ND	ug/kg	07/02/2003
	Methylene chloride	12	58	ND	ug/kg	07/02/2003
	Naphthalene	12	58	ND	ug/kg	07/02/2003
	n-Butylbenzene	12	58	ND	ug/kg	07/02/2003
	n-Propylbenzene	12	58	ND	ug/kg	07/02/2003
	o-Xylene	12	58	ND	ug/kg	07/02/2003
	p-Isopropyltoluene	12	58	ND	ug/kg	07/02/2003
	sec-Butylbenzene	12	58	ND	ug/kg	07/02/2003
	Styrene	12	58	ND	ug/kg	07/02/2003
	tert-Butylbenzene	12	58	ND	ug/kg	07/02/2003
	Tetrachloroethene	12	58	ND	ug/kg	07/02/2003
	Toluene	12	58	ND	ug/kg	07/02/2003
	trans-1,2-Dichloroethene	12	58	ND	ug/kg	07/02/2003
	trans-1,3-Dichloropropene	12	58	ND	ug/kg	07/02/2003
	Trichloroethene	12	58	ND	ug/kg	07/02/2003
	Trichlorofluoromethane	12	58	ND	ug/kg	07/02/2003
	Vinyl chloride	12	58	ND	ug/kg	07/02/2003
Wet Chemistry Procedures						
Cyanide / SW 846 9010	Cyanides, as CN-	0.010	0.010	ND	mg/kg	06/30/2003

end of sample 26748

Sample Chain of Custody

Submit Final Report To:

L.D.C. CONSTRUCTION Co., INC.
1930 BASELINE RD.
GRAND ISLAND NY 14072
DIANE DINAMARCE
773-7857 — 775-5904

GRATWICK-RIVERSIDE PARK

5-7 days.

Date Sampled	Sample Location	Comp	Grab	TCL V61	TCL S-V61	PCB's	TAL Metals	Cyanide				Remarks & Comments
	Old Carriage House Rd Grand Island			X	X	X	X	X				18750
												18751

Sampled by:

Date / Time:

Relinquished / Received by: [signature] Date / Time: 4/28/03 5:30

Relinquished / Received by: Diane Dinamarce Date / Time: 4/29/03 10:55

Received by: [signature] Date / Time: 4/29/03 1:37 PM

All samples submitted for analysis are subject to Chopra-Lee, Inc.'s standard terms & conditions for the sale of services

Submit To:
Chopra-Lee, Inc.
1815 Love Road
Grand Island, NY 14072
716-773-7625 FAX 716-773-7624

NY 306108

D

APPENDIX D

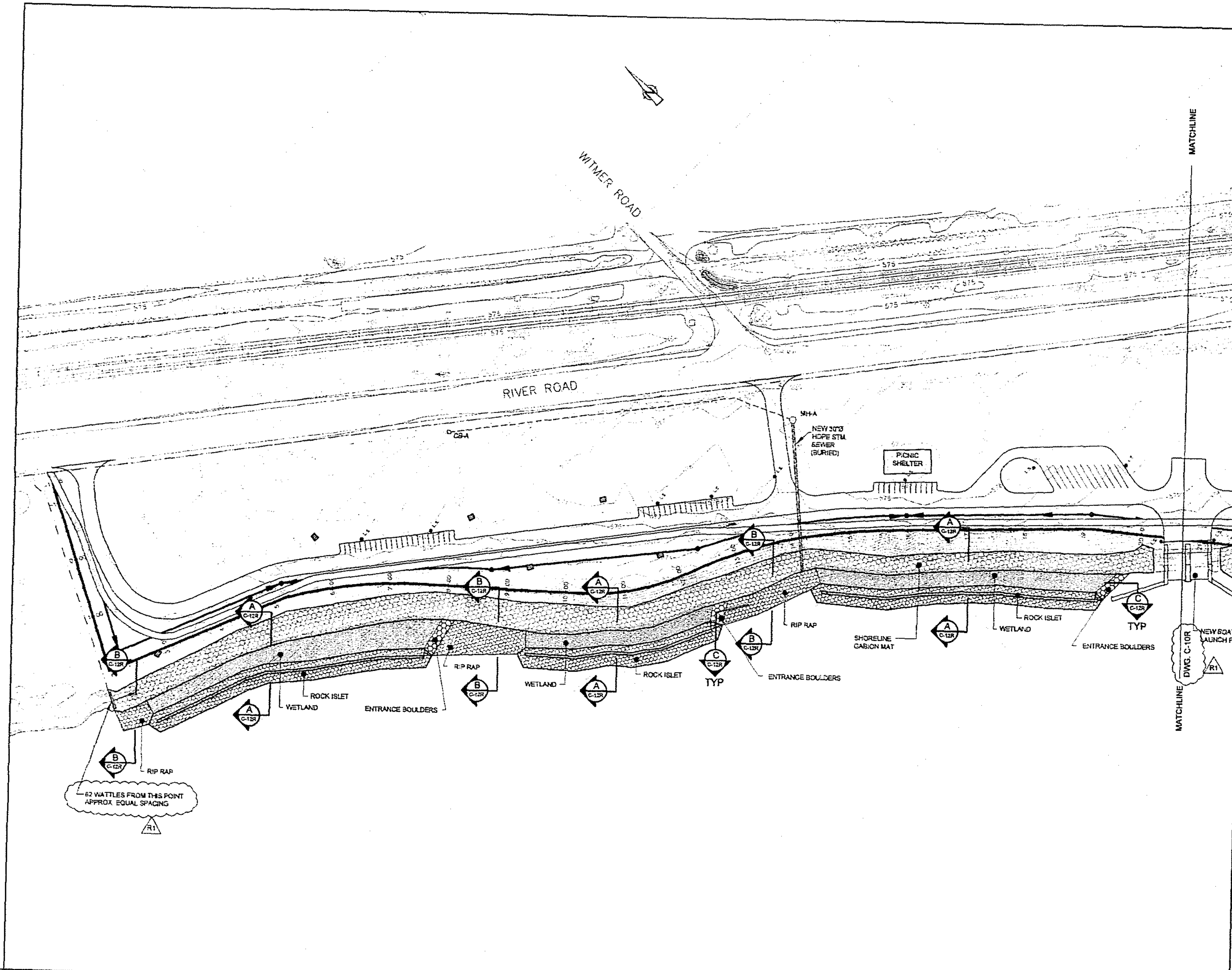
LIST OF PARTICIPANTS, FINAL INSPECTION

Sign-In 7987

December 10, 2004

Gratwick - Riverside

Person	Signature	Organization	Phone / Fax
Klaus Schmidtke	Klaus Schmidtke	CRA	519-884-0510 -0525
Jeff Konsella	Jeff Konsella	NYSDEC	716 851-7220
JIM TUK	Jim Tuk	NYSDEC	716 851-7220
DIANE DIXSMORE	Diane Dixsmore	L.D.C. Constr.	716-773-7357
DAVID C. MAZIARZ		N.T. ENG	695-8565
Dale W Marshall		City Engineer	695-8565
J. Drum		NYSDEC	518 402 5734
Sunil Mittal	SKmittal	CRA	716-297-2160
Lyle Dinsmore	Lyle Dinsmore	L.D.C. Const.	716-773-7357



#	Revision	Date	Initial
R1	ADDED SHORELINE REPAIR DETAILS	JAN. 18/05	KDS

This drawing is updated by CRA Infrastructure & Engineering, Inc. to include relevant changes (identified by encircling) based on the NYSDEC approved design documents and approved subsequent modifications.

The undersigned certify, based on the information provided by Conestoga-Rovers & Associates, Ltd. personnel directly responsible for the related work activities, that the Gratwick-Riverside Park Site Remedial Program was implemented and all the related construction activities were completed in accordance with the NYSDEC approved design documents and approved modifications issued during the progress of the work.

Klaus Schmidtke, Ph.D., Project Manager
Conestoga-Rovers & Associates

Sunil K. Mital, PE
CRA Infrastructure & Engineering, Inc.
(Subsidiary of Conestoga-Rovers & Associates, Inc.)

STATE OF NEW YORK · SUNIL K. MITAL · LICENSED PROFESSIONAL ENGINEER · 66603

IT IS A VIOLATION OF THE LAW FOR ANY PERSON TO ALTER THIS DOCUMENT UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY

Approved

DRAWING STATUS

Status	Date	Initial
RECORD DRAWINGS	SEPT. 2001	RJS

GRATWICK-RIVERSIDE PARK SITE
PERFORMING PARTIES

SITE REMEDIATION

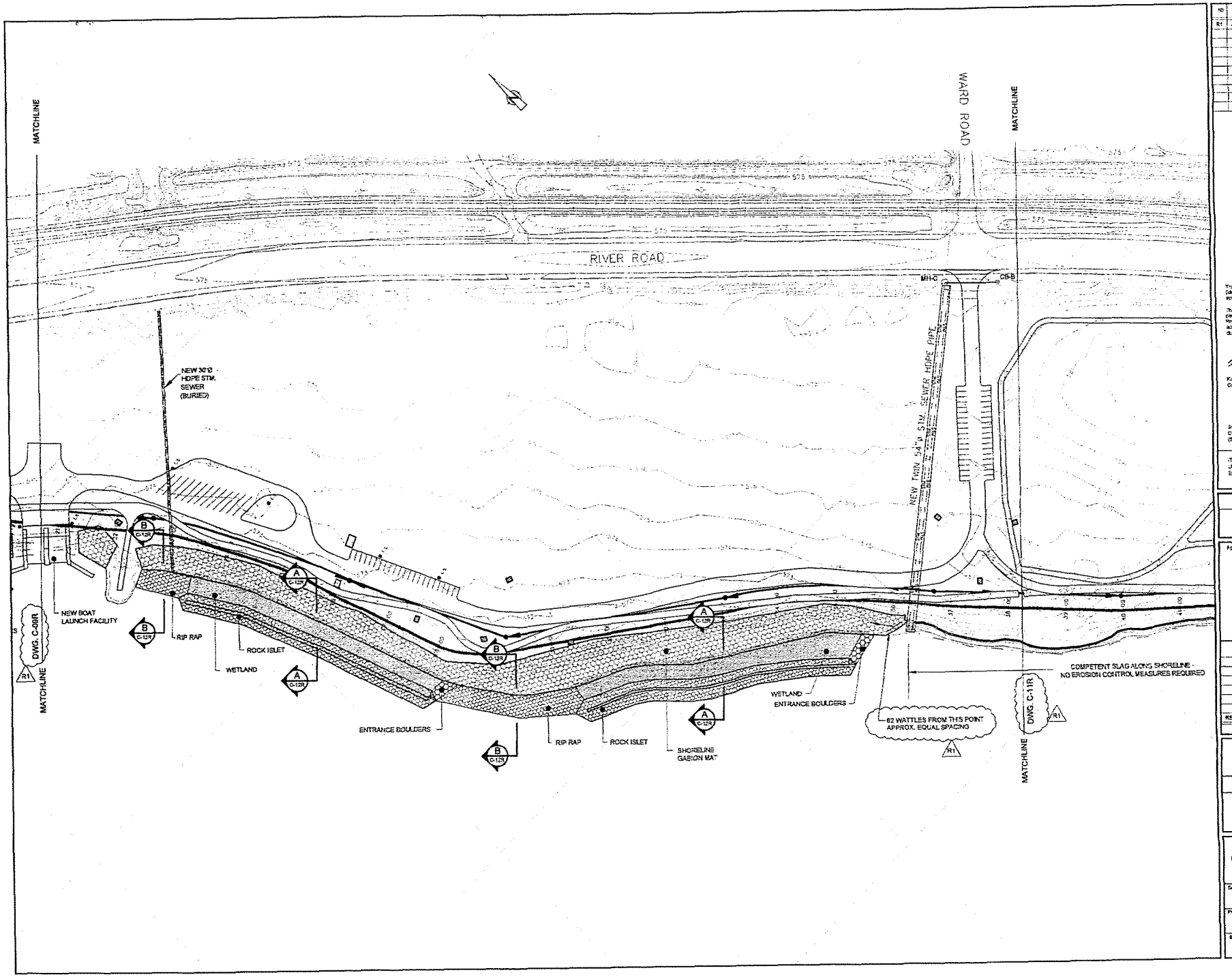
SHORELINE PROTECTION/SEDIMENT REMEDIATION - SHEET 1 OF 3

CRA CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: K.D. SCHMIDTKE	Reviewed By: R.J. SNYDER	Date: FEBRUARY 1998	
Scale: 1"=80'	Project No.: 07987-00	Report No.: 031	Drawing No.: C-09R

07987-00(031)GN-WA006 MAR 14/2006



NO	Revision	Date	Initial
R1	ADDED SHORELINE REPAIR DETAILS	JAN 1999	KDS

This drawing is updated by CRA Infrastructure & Engineering, Inc. to include relevant changes identified by recordings based on the NYSDEC approved design documents and approved subsequent modifications.

The undersigned certify based on the information provided by Conestoga-Rovers & Associates, Ltd. concerned directly responsible for the required work activities, that the Gratwick Riverside Park Site Remedial Program was implemented and all the related construction activities were completed in accordance with the NYSDEC approved design documents and approved modifications issued during the progress of the work.

Klaus Schmidtke, Ph.D., Project Manager
Conestoga-Rovers & Associates Ltd.

Scott R. Wise, PE
CRA Infrastructure & Engineering, Inc.
(Subsidiary of Conestoga-Rovers & Associates Ltd.)

STATE OF NEW YORK — SCOTT R. WISE — 072515 — LICENSED PROFESSIONAL ENGINEER

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Approved

DRAWING STATUS

Status	Date	Initial
RECORD DRAWINGS	SEPT 2001	RJS

GRATWICK-RIVERSIDE PARK SITE PERFORMING PARTIES

SITE REMEDIATION

SHORELINE PROTECTION/SEDIMENT REMEDIATION - SHEET 2 OF 3

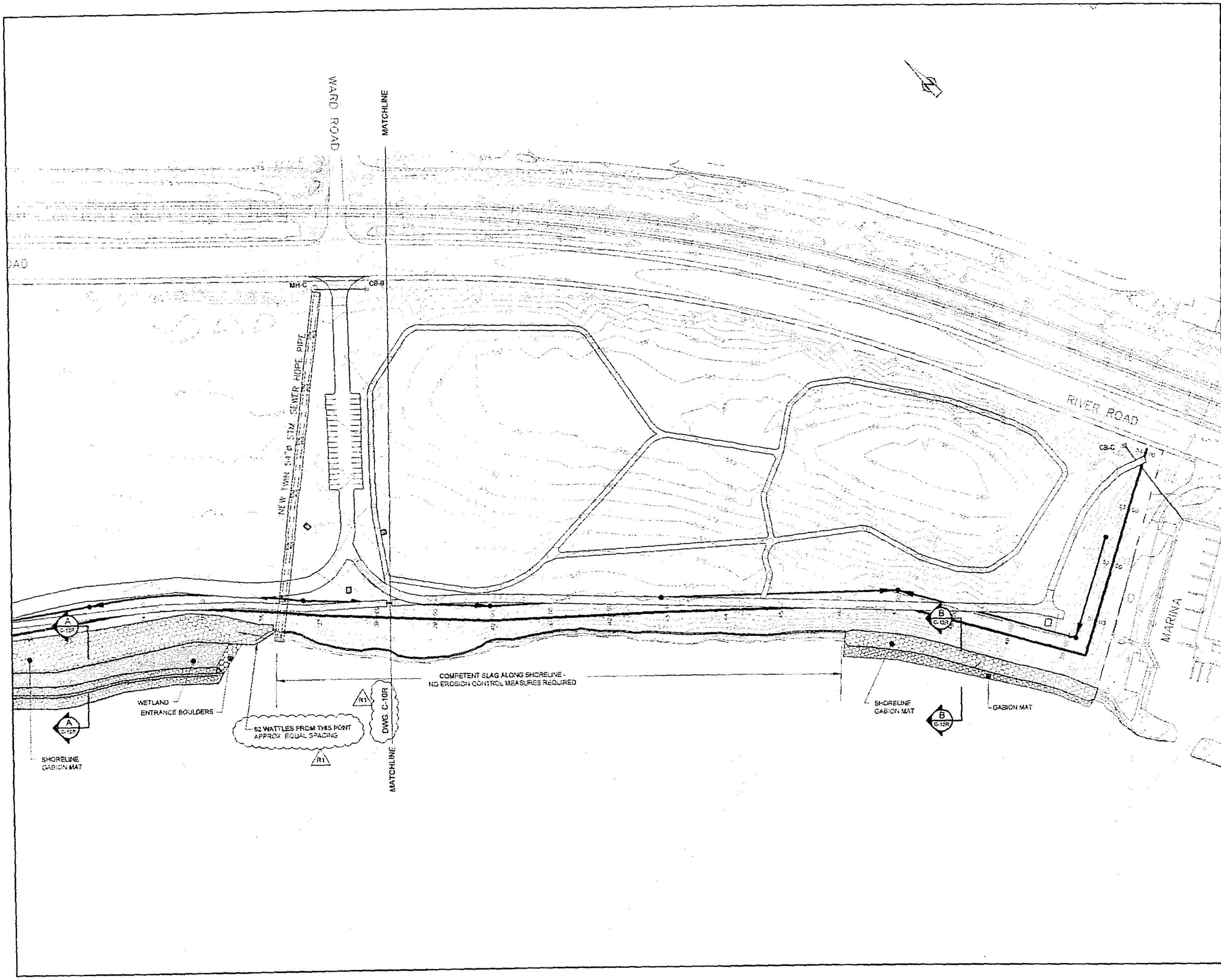
CRA CONESTOGA-ROVERS & ASSOCIATES

Source Reference

Project Manager:	Reviewed By:	Date:
K.D. SCHMIDTKE	R.J. SNYDER	FEBRUARY 1998

Scale:	Project No.:	Report No.:	Drawing No.:
1"=50'	07987-00	031	C-10R

07987-00(23)(DWG)(ARCH) MAR 14/2005



No.	Revision	Date	Initial
R1	ADDED SHORELINE REPAIR DETAILS	JAN. 18/06	KDS

This drawing is updated by CRA Infrastructure & Engineering, Inc. to include relevant changes (denoted by encircling) based on the NYSDEC approved design documents and approved subsequent modifications.

The undersigned certify, based on the information provided by Conestoga-Rovers & Associates, Ltd. personnel directly responsible for the related work activities, that the Gratwick-Riverside Park Site Remedial Program was implemented and all the related construction activities were completed in accordance with the NYSDEC approved design documents and approved modifications issued during the progress of the work.

Klaus Schmidtke, Ph.D., Project Manager
Conestoga-Rovers & Associates, Ltd.

3/23/05
Sunil K. Mital, PE
CRA Infrastructure & Engineering, Inc.
(Subsidiary of Conestoga-Rovers & Associates)

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DRAWING STATUS

Status	Date	Initial
RECORD DRAWINGS	SEPT. 2001	RJS

GRATWICK-RIVERSIDE PARK SITE
PERFORMING PARTIES

SITE REMEDIATION

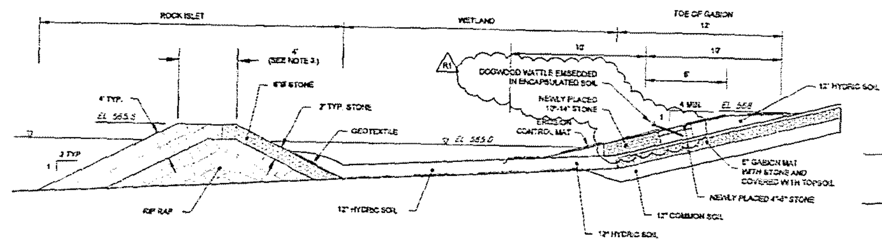
SHORELINE PROTECTION/SEDIMENT REMEDIATION - SHEET 3 OF 3

CRA CONESTOGA-ROVERS & ASSOCIATES

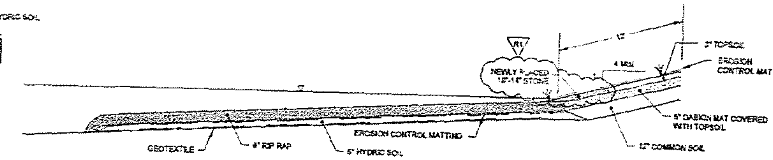
Source Reference:

Project Manager:	Reviewed By:	Date:	
K.D. SCHMIDTKE	R.J. SNYDER	FEBRUARY 1998	
Scale: 1"=80'	Project No.: 07987-00	Report No.: 031	Drawing No.: C-11R

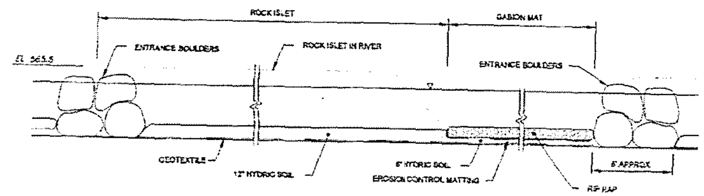
07987-00(031)CN-WA008 MAR 14/2005



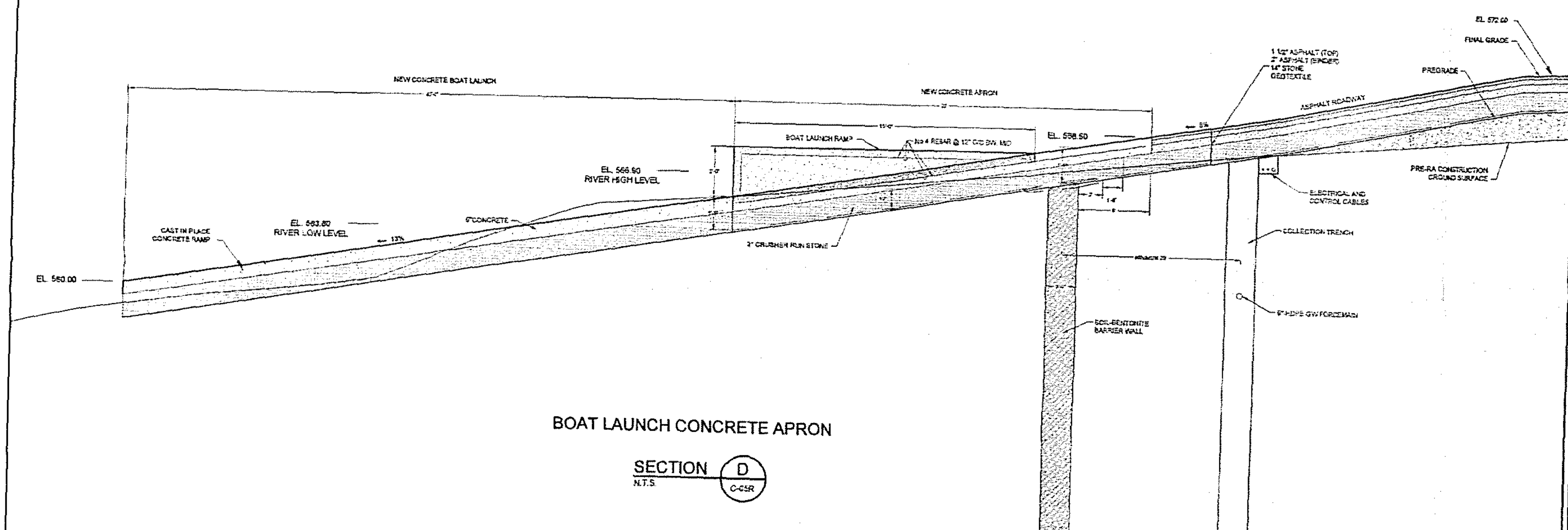
WETLAND AND ROCK ISLET SECTION A A A TYP.
(C-09R, C-10R, C-11R)
N.T.S.



GABION MAT SECTION B B B TYP.
(C-09R, C-10R, C-11R)
N.T.S.



SECTION C TYP.
(C-09R)
N.T.S.



BOAT LAUNCH CONCRETE APRON

SECTION D
(C-05R)
N.T.S.

No	Revision	Date	Initial
R1	ADDED SHORELINE REPAIR DETAILS	JAN. 14/05	KDS

NOTES

1. GABION MAT IN RIVER NOT PLACED ON SLOPES GREATER THAN 6%.
2. RIVER LEVELS (NVGD)

	UPSTREAM BNDRY	DOWNSTREAM BNDRY
MAX DAILY MEAN	567.12	566.71
MIN DAILY MEAN	563.95	563.64

3. ALL ROCK ISLETS HAVE A TOP WIDTH OF 4', EXCEPT THE ROCK ISLET IMMEDIATELY SOUTH OF THE BOAT LAUNCH, WHICH HAS A TOP WIDTH OF 6'.

This drawing is updated by CRA Infrastructure & Engineering, Inc. to include relevant changes (identified by clouding) based on the NYSDEC approved design documents and approved subsequent modifications.

The undersigned certify, based on the information provided by Conestoga-Rovers & Associates, Ltd. personnel directly responsible for the related work activities, that the Gratwick-Riverside Park Site Remedial Program was implemented and all the related construction activities were completed in accordance with the NYSDEC approved design documents and approved modifications issued during the progress of the work.

Klaus Schmidtke, Ph.D., Project Manager
Conestoga-Rovers & Associates, Ltd.

Sunil K. Mital, PE 3/25/05
CRA Infrastructure & Engineering, Inc.
(Subsidiary of Conestoga-Rovers & Associates, Inc.)

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SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial
RECORD DRAWINGS	SEPT. 2001	RJS

GRATWICK-RIVERSIDE PARK SITE PERFORMING PARTIES

SITE REMEDIATION

SHORELINE PROTECTION/SEDIMENT REMEDIATION - SECTIONS & DETAILS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
K.D. SCHMIDTKE	R.J. SNYDER	FEBRUARY 1998	
Scale:	Project No.:	Report No.:	Drawing No.:
NO SCALE	07987-00	031	C-12R

07987-00(031)GN-WA007 MAR 14/2005