ENVIRON

June 10, 2013

Ms. Kristine Matzko
Remedial Project Manager (3HS21)
U.S. EPA Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Re: Metal Bank Cottman Avenue NPL Site
Monthly Report due June 10, 2013
Reporting Period: May 1 through May 31, 2013

Dear Ms. Matzko:

As provided in Paragraph 31 of the Utility Consent Decree, and on behalf of the Cottman Avenue PRP Group, Environ Corporation as the Supervising Contractor is submitting to USEPA three copies of a written monthly progress report. Copies of the monthly progress reports are attached to this letter.

Please contact me (617.946.6115) if you need additional information regarding this submission.

Very truly yours,

ENVIRON International Corporation

Joseph P. Vitale

Joseph P. Vitale, PE
Project Director

cc: Cottman Avenue PRP Group
Steering and Technical Committees
Dan J. Jordanger, Esquire

Enclosures
3331508

20 Custom House Street, Suite 800, Boston, MA 02110 www.environcorp.com
Tel: +1 617.946.6100 Fax: +1 617.946.3229

Project Name: Metal Bank NPL Site	For the Month: May 2013	
Project Location: Philadelphia, PA	Report Number: 86	Dated: June 10, 2013

Name: Joseph P. Vitale (ENVIRON)	Title: Project Director
Telephone No.: (617) 946-6115	Telefax No.: (617) 946-3229
Reporting Period: May 1 through May 31, 2013	

(a) Describe the actions, including submittal of work plans and other deliverables, which have been taken toward achieving compliance with the Consent Decree during the previous month:

Actions or Deliverables	Dates Performed or Submitted
Conducted Vegetation Inspection	May 14th
Submitted Sheet Pile Wall Inspection Report	May 17th

(b) List summaries of inspections, sampling, testing, and other data received or generated in the previous month, and when possible, attach the documentation to this report:

Submittals	Dates Performed	Attached/Separate Cover
Sheet Pile Wall Inspection Report	5/17/2013	Attached to this report

(c) Describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next month and provide other information relating to the progress of work:

The current 2-month look-ahead schedule for LTM and O&M is as follows:

LTM Activities	Start Date	Anticipated Completion Date
Herbicide Application Plan	June 3rd	June 14th
Initial herbicide application	Week of July 8th	Week of July 8th
Follow-up herbicide application	Week of July 24th	Week of July 24th
Mow site	Week of August 5th	Week of August 5th

(d) Include information that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays:
As stated in the previous monthly report, we are delaying herbicide application until spring of 2013 following the schedule presented in the Invasive Species Control Plan. We conducted a preliminary inspection of the vegetation on March 21, 2013. This inspection shows the current growth of cover vegetation to be less than 5 inches in length. Greater growth of vegetation is required to properly apply the herbicide. We conducted_the invasive species inspection on May 14th and we are scheduled to apply the herbicide in July 2013 to allow sufficient time for greater growth of the vegetative cover.

(e) Include any modifications to the work plans or other schedules that the Utility PRP Group has proposed to EPA or that have been approved by EPA:
• None
(f) **Describe all activities undertaken in support of the Community Relations Plan during the previous month and those to be undertaken in the next month:**
• None

RA Consultants LLC

Geotechnical Engineering

Walter J. Papp, Jr., Ph.D, P.E.
Senior Partner

Nidal M. AbiSaab, P.E.
Partner

Robert Alperstein, P.E.
Consultant

May 17, 2013

12C1135

Mr. Joseph Vitale, PE, LSP
ENVIRON International
20 Custom House Street
Boston, MA 02110

Re: Report
Sheet Pile Wall Inspection
Metal Bank NPL Site
7301 Milnor Street
Philadelphia, PA 19136

Dear Mr. Vitale:

This report is submitted in accordance with our agreement dated November 12, 2012. It covers our general understanding of the construction and purpose of the sheet pile wall at the referenced site. It also covers a visual structural evaluation of the sheet pile wall, identification of maintenance repairs and development of a monitoring plan.

Project Description

The site is located on the western shore of the Delaware River in an industrialized section of northeastern Philadelphia, Pennsylvania. We understand the site contained PCBs and has been remediated. Part of the remedial plan was to design a sheetpile wall to retain soil from eroding into the Delaware River to the south of the site. We also understand the sheet pile wall has been monitored for tilt and requires a five (5) year visual inspection.

47 Wilkens Drive, Dumont NJ 07628 • (201) 374-1794 • Fax (201) 374-1795
email: walter@raconsultantsnj.com • nidal@raconsultantsnj.com

Referenced Documents

- Topographic Survey Final Contour as-build as of January 19, 2010, Metal Bank NPL Site. Drawing No. 09-08711-001 by Rettew Associates, Inc., dated February 23, 2010.
- Memo to Joseph Vitale from Don Dotson of AMEC dated September 5, 2008.
- Sheetpile Wall General Plan & Notes, Drawing No. C-26, Sheet 32 of 49 By AMEC dated September 6, 2002.
- Sheetpile Wall Partial Plan – Zone 1, Drawing No. C-27, Sheet 33 of 49 By AMEC dated September 6, 2002.
- Sheetpile Wall Partial Plan – Zone 2, Drawing No. C-28, Sheet 34 of 49 By AMEC dated September 6, 2002.
- Sheetpile Wall Partial Plan – Zone 3, Drawing No. C-29, Sheet 35 of 49 By AMEC dated September 6, 2002.
- Sheetpile Wall Sections, Drawing No. C-30, Sheet 36 of 49 By AMEC dated September 6, 2002.

The referenced documents are presented in Appendix A.

Observations and Discussions

The undersigned visited the site on November 19, 2012 during high tide and November 27, 2012 during low tide. Both site visits included landside and water side inspection (above the water level) of the sheetpile wall. The waterside inspections were performed with a small watercraft. In general the sheetpile wall appears to be in good condition with some notable areas that changed since the wall was last inspected.

1. Small ruts (runnels) were observed in a few locations immediately behind the sheetpile wall on the landside above the tieback locations as shown on Figure 1. There is no evidence of soil migrating through the sheets at these locations.

2. According to the memorandum prepared by Don Dotson from AMEC dated September 5, 2008, some of the sheet piles were refusing on the underlying weathered schist above the design tip Elev. -40. It was stated that the likely cause of the sheet pile out-of-plumbness was due to the additional energy that was applied in an attempt to reach Elev. -40.

3. The north side of Zone 1 shows movement of the sheetpile wall system. Evidence of movement of the tieback plates relative to the wale was observed by scraping and removal of the epoxy coating on the face of the wale. In addition, the wale and sheetpile wall appear to be bowing with the apex of the bow at the bolted connection. Refer to Figure 2 for location and photographs.

4. Cracks and separation of the wale were observed where the sheetpile wall changes direction (turns east) in Zone 2. The miter cut and joint where the wales meet at the corner was cracked. The cracks appear to be stress (tension) cracks. Refer to Figure 3 for location and photographs. We understand that this area was previously repaired.

5. The west side of Zone 3 shows signs of movement of the sheetpile wall system. Evidence of movement of the tieback plates relative to the wale was observed by scraping and removal of the epoxy coating on the face of the wale. Refer to Figure 4 for location and photographs.

Notably, the sheet pile wall was subjected to Hurricane Sandy in October 2012. It appears that the sheet pile wall performed well and was not damaged during the hurricane.

Conclusions and Recommendations

As discussed earlier, we understand the intent of the sheet pile wall is to retain the soil landside and prevent soil erosion into the Delaware River. We did not check the calculations or perform an independent review of the design. Our conclusions and recommendations are based on our visual observations, experience and judgment.

In general sheetpile walls are relatively flexible and small movements should be expected. The sheet pile wall has shown signs of movement, nevertheless it appears to be performing in accordance with its design intent.

The numbered items below address the observations and discussions listed above.

1. The sheetpile wall sections show the tiebacks were installed through a 10-in diameter PVC sleeve pipe. The ruts may be attributed to:

    a. Migration of soil into the PVC sleeve.
    b. Difficulties compacting around the pile during placement of the fill.
    c. Lateral movement of the sheet (waterside) creating voids or loosening of the soil around the PVC pipe.
    d. Water flow in and around the PVC pipe.

    In our opinion the few small ruts are inconsequential, nevertheless, we recommend filling the ruts to minimize migration of storm water runoff channeling below grade. Local excavations should be made immediately adjacent to the ruts about 1-ft depth below existing site grade. The ruts and local excavation should be filled and compacted in 6-in lifts with “jumping jack” or walk behind vibratory plate compactor until grade is level. The fill soil should comply with the original project specifications. Replace vegetation in kind.

2. Some of sheets were installed out-of-plumb and therefore it is difficult to opine on any subsequent sheetpile movement except for obvious evidence as discussed in items 3, 4, and 5 above.

3. For water side areas where rust or steel is uncoated, prepare all sheets, wales, tieback and apply epoxy sealant in accordance with contract specifications.

4. Corner section of cracked wale: This is likely due to active and at rest soil pressures landside of the sheetpile wall. The resultant forces of these pressures are applied

perpendicular to the plane of the sheetpile wall. Based on visual observations in other areas of the site, the sheetpile wall has moved (translated) laterally. This will tend to separate or "pull" the corner joint of the wale, resulting in cracks of the weld and steel. We recommend repairing the wale by:

a. Remove epoxy coating and prepare wale to accept steel plate.
b. Cut and install steel plate as shown on sketch presented in Appendix B.
c. Areas adjacent to the corner that are cracked shall receive a steel plate placed within the upper wale flange and on top of the bottom wale web.
d. Apply epoxy sealant in accordance with the original contract specifications.

The repair of the corner wale as discussed in item 4 should be periodically inspected for signs of movement, distress or cracking. If this problem persists a corrective action plan should be submitted for EPA approval.

Three tilt meters have been installed on the sheetpiles to monitor their movement. The tilt monitors have the capacity to measure tilt (rotation) of the sheetpile but not translation.

We recommend installing monitoring points (prisms) on the top of the sheetpile wall to monitor potential movements in the x, y, and z coordinates. Proposed location of the survey monitoring points are presented on Figure 5. The monitoring points should be surveyed once every 6-months and the data reviewed by an experienced engineer. If a trend of wall movement is observed, the frequency of the survey should be increased and the sheetpile wall re-evaluated.

Limitations

This report is based on our interpretation of our understanding of the project, referenced documents provided to us, observations made during the undersigned site visits and our understanding of the project as described above.

We appreciate this opportunity to be of service and look forward to working with you as the project proceeds.

Very truly yours,
RA CONSULTANTS LLC

Walter J. Papp, Jr., P.E.

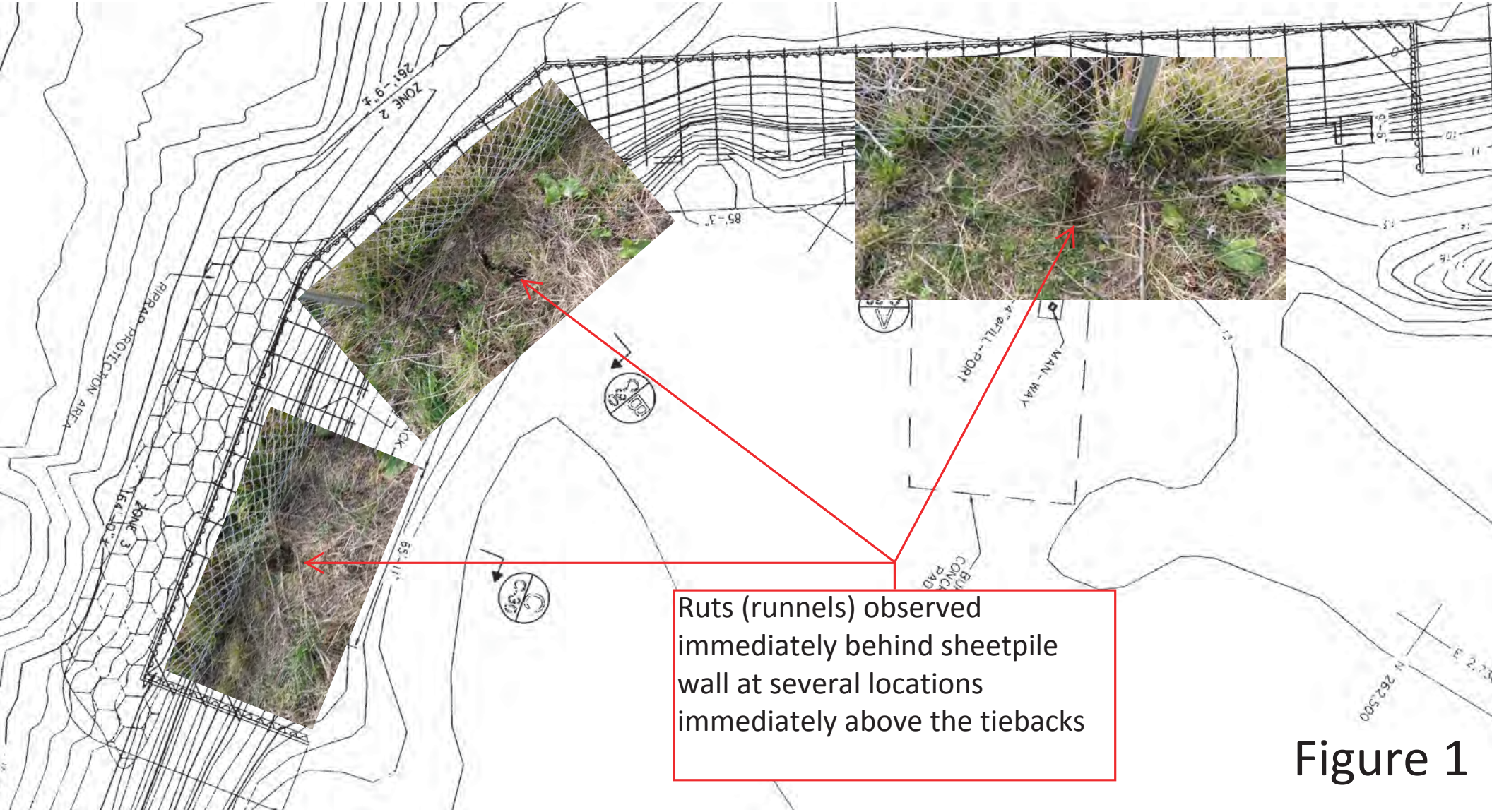

Ruts (runnels) observed immediately behind sheetpile wall at several locations immediately above the tiebacks

Figure 1

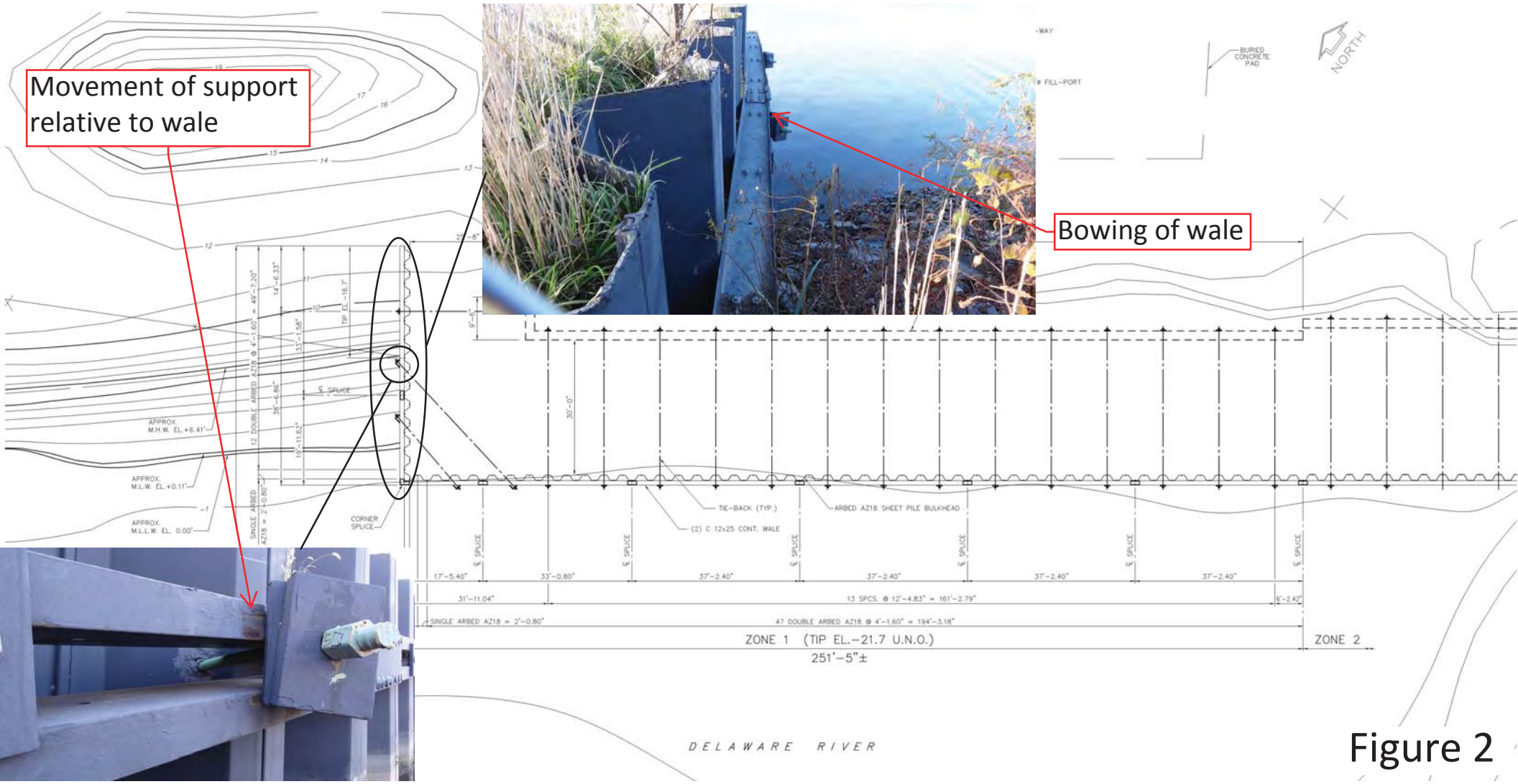

Movement of support relative to wale
Bowing of wale
BURIED CONCRETE PAD
NORTH
FILL-PORT
APPROX. M.H.W. EL.+6.41'
APPROX. M.L.W. EL.+0.11'
APPROX. M.L.L.W. EL. 0.00'
12 DOUBLE ARBED AZ18 @ 4'-1.60" = 49'-7.20"
SINGLE ARBED AZ18 = 2'-0.80"
TIP EL.-16.7'
CORNER SPLICE
TIE-BACK (TYP.)
(2) C 12x25 CONT. WALE
ARBED AZ18 SHEET PILE BULKHEAD
SPLICE
17'-5.40"
33'-0.80"
37'-2.40"
31'-11.04"
13 SPCS. @ 12'-4.83" = 161'-2.79"
6'-2.42"
SINGLE ARBED AZ18 = 2'-0.80"
47 DOUBLE ARBED AZ18 @ 4'-1.60" = 194'-3.18"
ZONE 1 (TIP EL.-21.7 U.N.O.)
251'-5"±
ZONE 2
DELAWARE RIVER

Figure 2

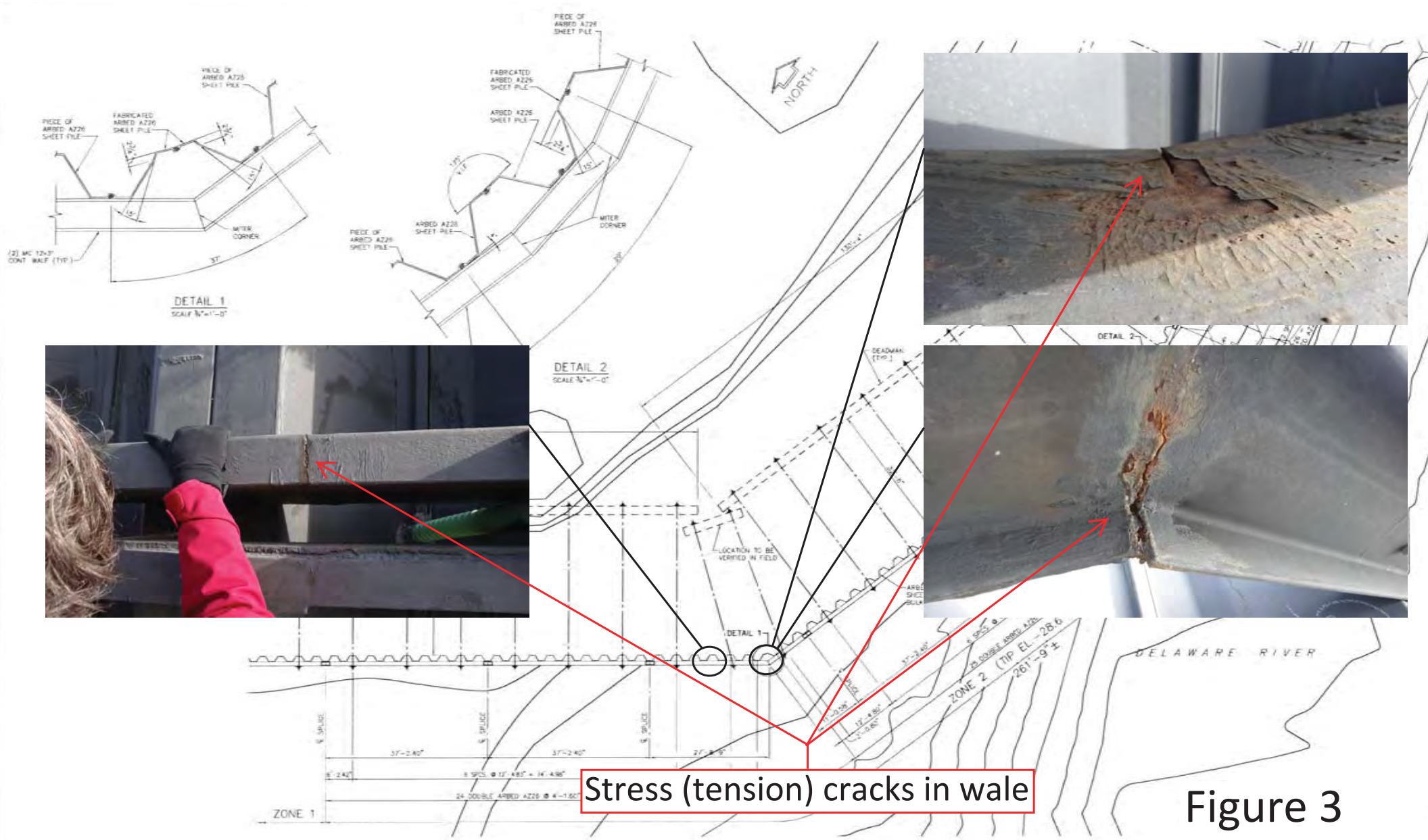

DETAIL 1
DETAIL 2
NORTH
DELAWARE RIVER
ZONE 1
ZONE 2
Stress (tension) cracks in wale

Figure 3

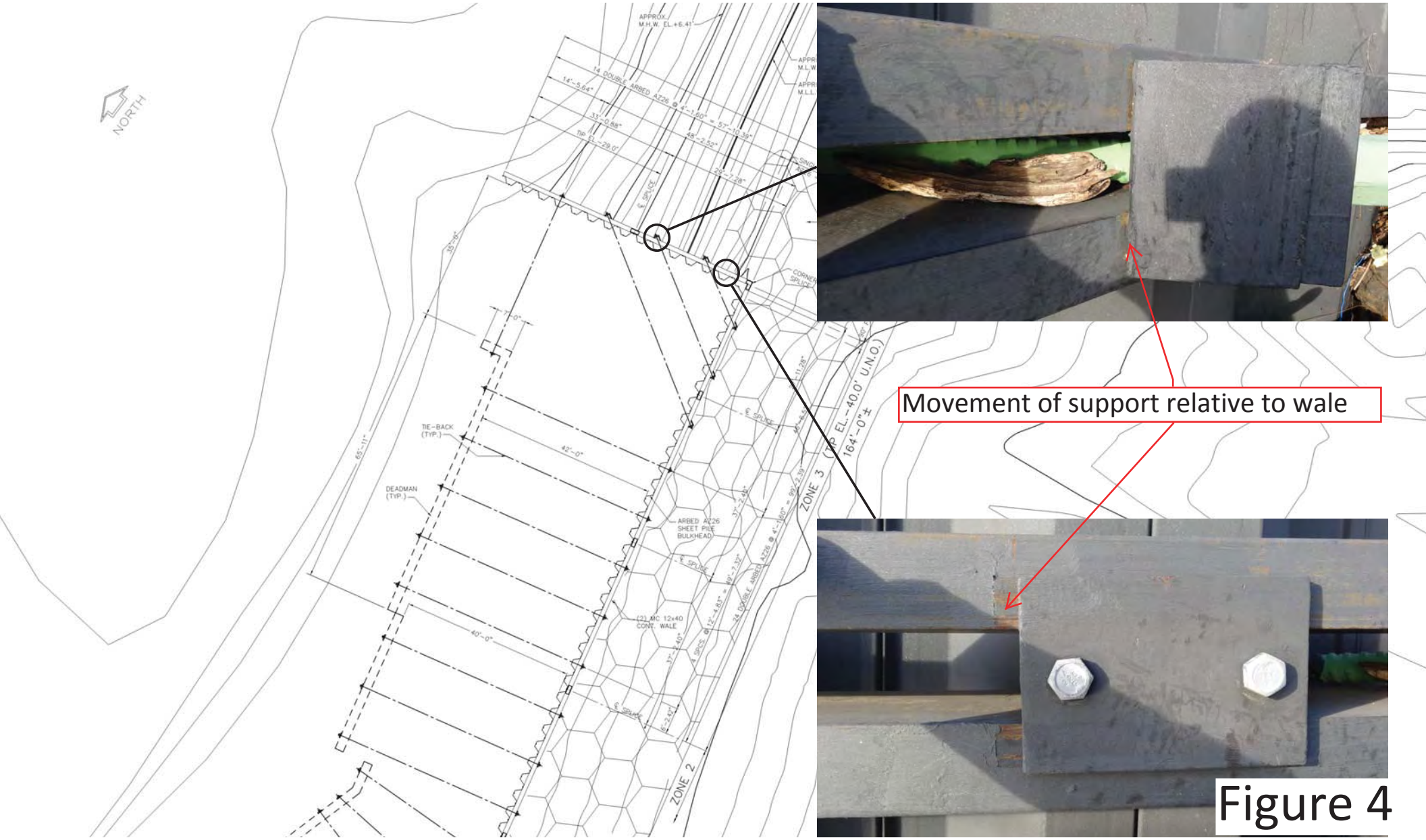

NORTH
APPROX. M.H.W. EL.+6.41'
14 DOUBLE ARBED AZ26 @ 4'-1.60" = 57'-10.39"
14'-5.64"
33'-0.88"
TIP EL.-29.0'
28'-2.52"
23'-7.28"
6" SPLICE
35'-9"
7'-0"
TIE-BACK (TYP.)
42'-0"
65'-11"
DEADMAN (TYP.)
ARBED AZ26 SHEET PILE BULKHEAD
(2) MC 12x40 CONT. WALE
40'-0"
37'-2.40"
4 SPCS. @ 12'-4.83" = 49'-7.33"
24 DOUBLE ARBED AZ26 @ 4'-1.60" = 99'-2.39"
ZONE 3
TIP EL.-40.0' U.N.O.)
164'-0"±
ZONE 2
Movement of support relative to wale

Figure 4

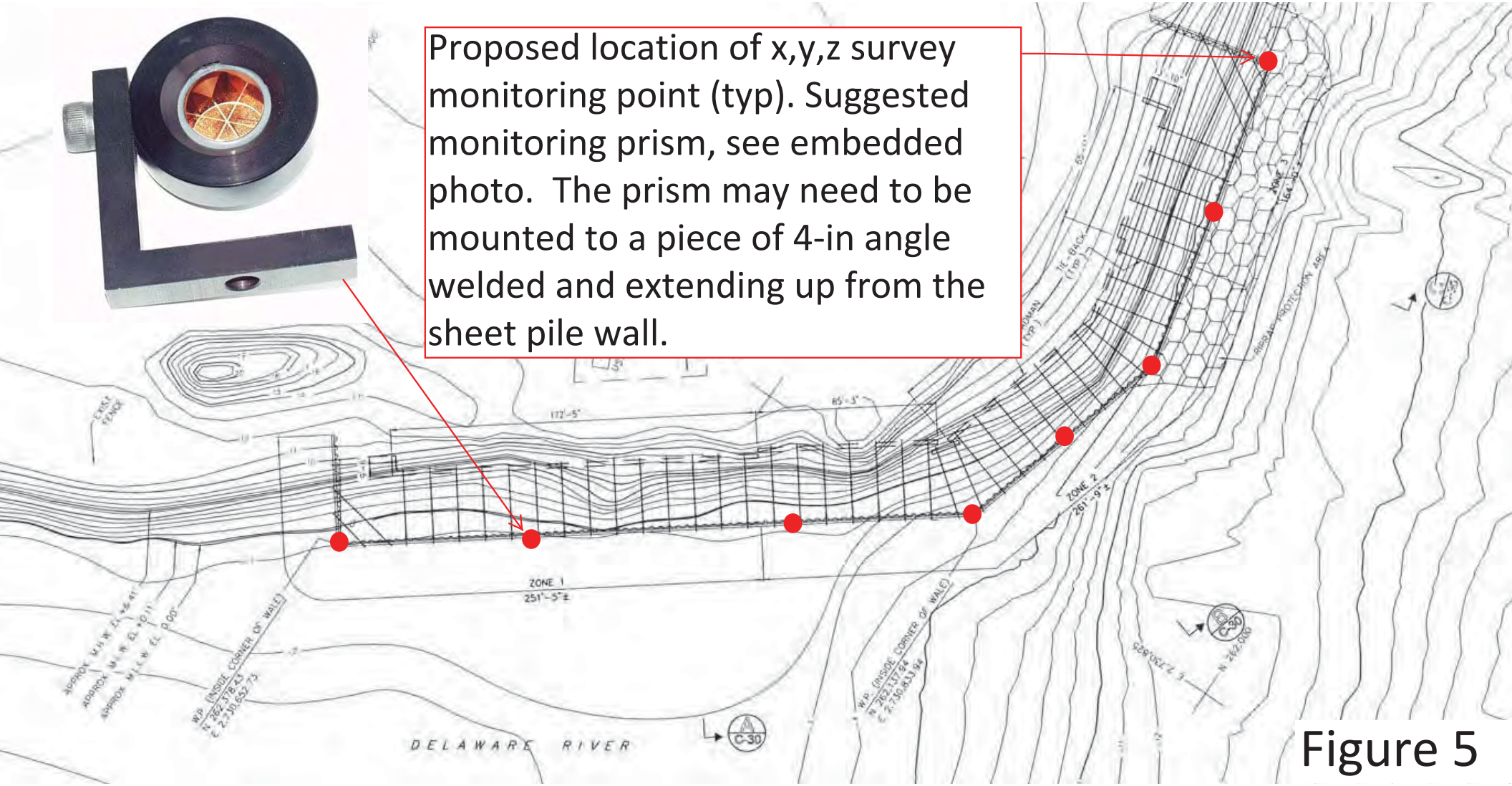

Proposed location of x,y,z survey monitoring point (typ). Suggested monitoring prism, see embedded photo. The prism may need to be mounted to a piece of 4-in angle welded and extending up from the sheet pile wall.
ZONE 1
251'-5"±
ZONE 2
261'-9"±
ZONE 3
164'-0"±
172'-5"
65'-3"
DELAWARE RIVER
C-30

Figure 5

APPENDIX A

LEGEND

- CHAINLINK FENCE
- LEGAL RIGHT OF WAY
- PROPERTY LINE
- EDGE OF PAVEMENT
- EDGE OF STONE
- EDGE OF WATER
- JUNCTION BOX
- UTILITY POLE
- BENCH MARK
- MONITORING WELL
- RIP-RAP
- OUTLINE CONCRETE UNAPL SUMPS

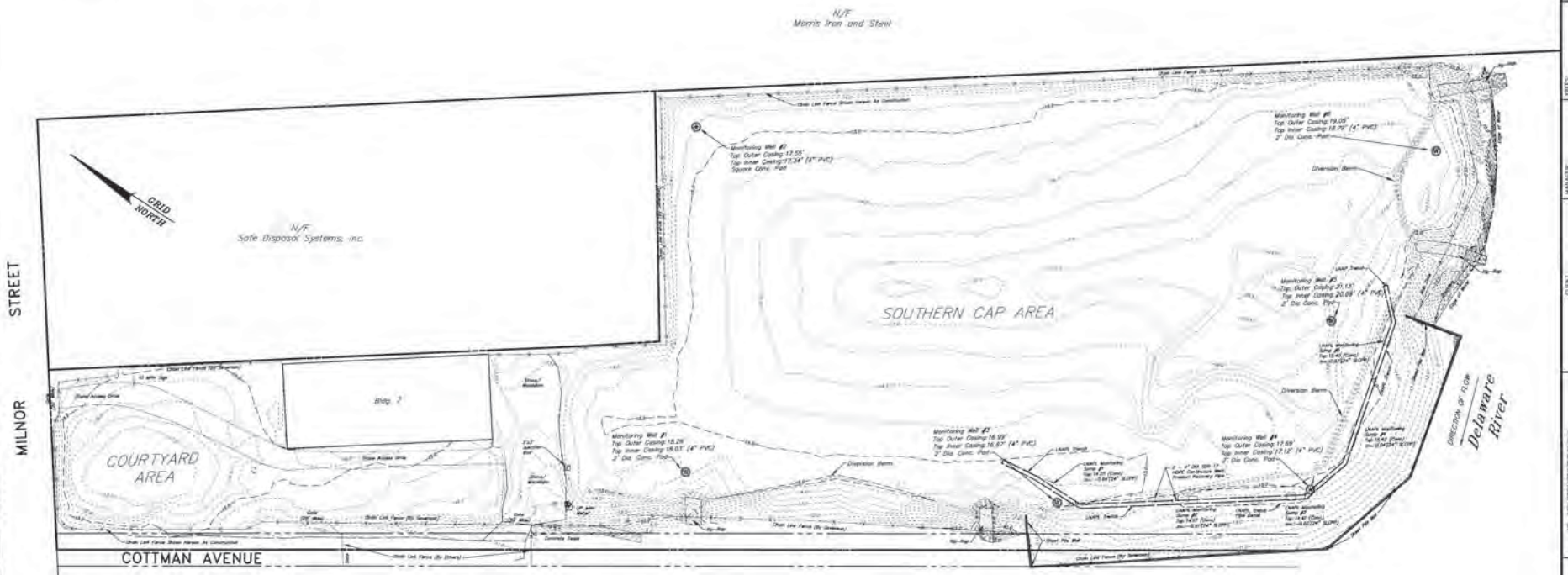
REFERENCE PLANS

1. PLANS ENTITLED "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 3, REVISED REMEDIAL DESIGN, METAL BANK SITE, PHILADELPHIA, PENNSYLVANIA" SHEETS 1 THRU 49, PREPARED BY: AMEC EARTH & ENVIRONMENTAL, INC., PLYMOUTH MEETING, PA, DATED: 11/09/2007 & 4/04/2008.
2. PLAN ENTITLED "HYDROGRAPHIC SURVEY, METAL BANK NPL SITE, PRE-EXCAVATION SURVEY, SITUATED IN CITY OF PHILADELPHIA, PHILADELPHIA COUNTY, PENNSYLVANIA", PREPARED BY: LGA ENGINEERING, INC., LAKEWOOD, NJ, DATED: 9/08/2008.

GENERAL NOTES

PROJECT COORDINATE SYSTEM:
HORIZONTAL: PENNSYLVANIA STATE PLANE COORDINATE SYSTEM (SPCS), PA SOUTH ZONE, NORTH AMERICAN DATUM (NAD) 83/92.
VERTICAL: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88)

SITE BENCHMARK: MAG NAIL IN UTILITY POLE (NO #)
ELEVATION: 12.07'
DATUM: NAVD 88



CERTIFICATION STATEMENT

BY THIS SUBMITTAL, I HEREBY REPRESENT THAT I HAVE DETERMINED AND VERIFIED THE CONTOURS OF THE SOUTHERN CAP AREA AND THE COURTYARD AREA SHOWN HEREON AS OF JANUARY 19, 2010.

4 FEBRUARY 2010

DAVID L. JENSEN, PLS NO. SU075123, FOR RETTEW ASSOCIATES, INC.

NO	DATE	REVISION
5	2/23/10	REVISED LABEL, CONTOURS & OVERVIEW ITEM
4	2/9/10	REVISED TRENCH LABEL/FEET COLOR
3	2/8/10	REVISED ADD PROPERTY LINE SAFE DISPOSAL
2	2/5/10	REVISED TRENCH EST. LABEL/MAGNUM LABEL
1	2/4/10	REVISED MONITORING WELL NUMBERS

FOR RETTEW ASSOCIATES INC.

COMMONWEALTH OF PENNSYLVANIA
DAVID LAWRENCE JENSEN
SU075123
PROFESSIONAL LAND SURVEYOR

NOTES:
1. ALL COORDINATES ARE PENNSYLVANIA STATE PLANE COORDINATE SYSTEM (SPCS), PA SOUTH ZONE, NORTH AMERICAN DATUM (NAD) 83/92.
2. ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88).
3. ALL DIMENSIONS ARE IN FEET AND DECIMALS THEREOF.
4. ALL ELEVATIONS ARE ROUNDED TO THE NEAREST 0.01 FOOT.
5. ALL ELEVATIONS ARE ROUNDED TO THE NEAREST 0.01 FOOT.

MANAGER: DLJ | DESIGN BY: TLJ | CHKD BY: TLJ
SURV. CREW: MBS | FIELDBOOK NO: FB - 16.3 | CHKD BY:
DRAWN BY: JDC | CHKD BY:
DRAWING REFERENCE: G:\METAL BANK\DWG\TOPO\TOPO-2010-1-19.dwg

CLIENT:
Sevenson Environmental Services, Inc.
2749 Lockport Road
Niagara Falls, NY 14305

SCALE: 1"=50'
0 25 50 100 150

RETTEW
RETTEW Associates, Inc.
Lancaster • Chambersburg • Mechanicsburg • Harrisburg • Lititz • Lewisburg • Pottstown • Reading • Shippensburg • Williamsport
2500 Gulph Road, Blue Bell, PA 19422
Phone (610) 408-7000 • Fax (610) 408-3273
Website: www.RETTEW.com
Email: info@RETTEW.com
Discovery • Planning • Surveying & Engineering Professionals

TOPOGRAPHIC SURVEY FINAL CONTOUR AS-BUILT AS OF JANUARY 19, 2010

METAL BANK NPL SITE

PHILADELPHIA PENNSYLVANIA

DATE: 02-01-2010

SHEET NO. 1 OF 3

DWG. NO. 09-08711-001

Memo

To	**Joseph Vitale (MPI)**	File no	**470530001.0300.******
From	**Don Dotson**	cc	
Tel	**615-333-0630**		
Fax	**615-781-0655**		
Date	**September 5, 2008**		

Subject **Site Visit, Driving Criteria, Wall Surcharge, Pile Tip Elevation, & Obstructions**

Site Visit

I visited the site on August 28, 2008 to observe the condition of the sheet piles driven to-date at Zone 3. As indicated by the photos below, some of the piles were visibly out-of-plumb both to the east (Photo 1) and north (Photo 2).

Photo 1

AMEC Earth & Environmental, Inc.
3800 Ezell Rd., Suite 100
Nashville, TN 37211
Tel +1 (615) 333-0630
Fax +1 (615) 781-0655
www.amec.com

Photo 2

In addition, some of the pile tops were visibly damaged (Photo 3).

Photo 3

It appears that the piles were refusing on the underlying weathered schist above the design tip elevation of -40.0 feet and additional energy was applied in an attempt to reach -40.0 feet. This is a likely cause of the out-of-plumbness.

Driving Criteria

AMEC recommends that the following driving criteria from the Corps of Engineers EM 1110-2-2504 be adopted and the following text added before the first sentence of Project Specification Section 3.02.A. Pile Driving: “Drive the piles with a vibratory hammer with a minimum of 2200 inch-pounds of energy to the indicated tip elevation or refusal, whichever occurs first. Refusal is defined as the point where the penetration rate falls below one foot per minute.”

Surcharge

The current sheet pile wall design includes a surcharge amount of 150 psf. This was included in anticipation of the requirement for construction equipment to be within close proximity to the top of the wall during excavation operations. After reviewing the sheet pile wall design calculations, AMEC does not believe that it would be prudent to remove the surcharge criteria at this time. Since it is likely that some redesign of the sheet pile wall will be required due to the final sheet pile tip elevation, AMEC can review the surcharge criteria at that time.

Pile Tip Elevation for Remedial Construction

Based upon AMEC’s groundwater elevation memo and scour analysis memo the pile tip elevations required will be based upon the scour analysis results. The controlling groundwater elevation pertaining to the secondary function of the sheet pile wall is -5 feet elevation. The controlling scour depths for the primary function of the sheet pile wall are 22 feet of sheet pile embedment length in Zone 3 and 10 feet of sheet pile embedment length in both Zones 1 and 2.

Sheet Pile Obstructions

If piles refuse on an obstruction above the minimum required depth for scour, the sheet piles should be removed and the obstruction removed or penetrated with a chisel beam. The sheet pile should then be re-driven to the design tip elevation or to refusal, whichever occurs first.

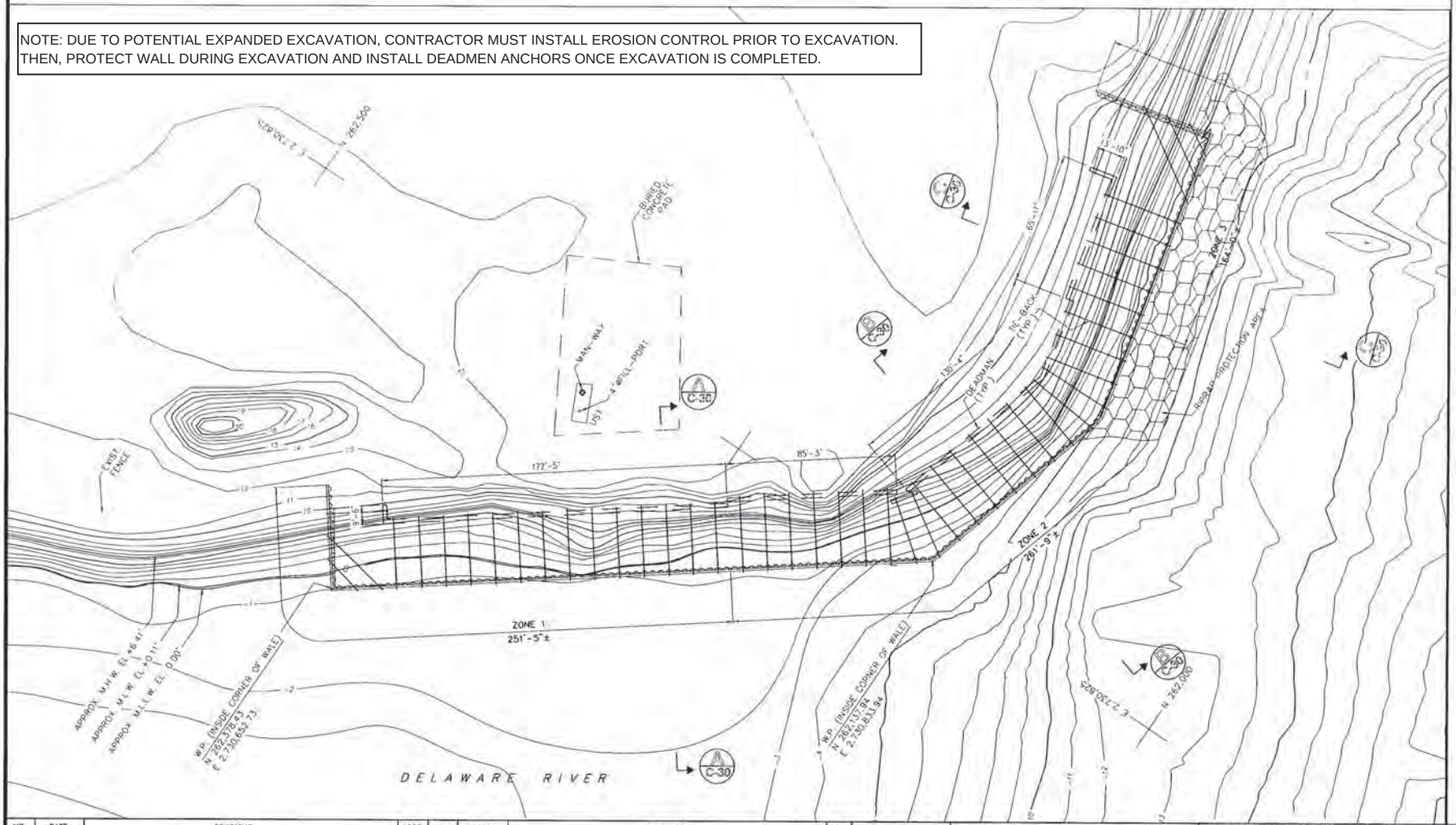
Don W. Dotson, PE, SE, P. Eng., PhD
Senior Engineer, Chief Designer
Geo-Structural Design Group

GENERAL NOTES

1. THE PURPOSE OF THESE NOTES IS TO INDICATE THE MINIMUM REQUIREMENTS OF MATERIALS TO BE FURNISHED AND INSTALLED UNDER THE CONTRACT TO BE USED FOR FUTURE REFERENCE BY THE CLIENT, ITS HEIRS, AND/OR SUCCESSORS. THESE NOTES, OR PORTIONS THEREOF, SHALL NOT BE USED BY THE CONTRACTOR IN PLACE OF PROJECT SPECIFICATIONS.
2. STRUCTURAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE BUILDING CODE OF THE STATE OF PENNSYLVANIA, LATEST EDITION, AND APPLICABLE LOCAL BUILDING CODES. WORK SHALL COMPLY WITH FEDERAL, STATE, AND LOCAL PERMIT CONDITIONS.
3. THE COMPLETED BULKHEAD HAS BEEN DESIGNED TO WITHSTAND A 150 PSF SURCHARGE IN CONJUNCTION WITH DESIGN DREDGE MUDLINE ELEVATIONS INDICATED IN THE CONTRACT DRAWINGS. THE BULKHEAD HAS BEEN DESIGNED WITH THE INFORMATION PROVIDED IN THE SOIL BORING LOGS PROVIDED IN THE BID DOCUMENT.
5. SUBSTITUTIONS MAY BE FURNISHED FOR MATERIALS SPECIFIED HEREIN PROVIDED ACCEPTANCE IS SECURED BY THE ENGINEER.
6. STRUCTURAL FILL BEHIND THE SHEET PILE WALL SHALL CONSIST OF BROKEN OR CRUSHED STONE. BANK OR CRUSHED GRAVEL OR MIXTURES THEREOF. BROKEN OR CRUSHED STONE SHALL CONSIST OF WELL GRADED, SOUND, TOUGH, DURABLE STONE. BANK OR CRUSHED GRAVEL SHALL CONSIST OF WELL GRADED, SOUND, TOUGH, DURABLE PARTICLES OF CRUSHED OR UNCRUSHED GRAVEL FREE FROM SOFT, THIN, ELONGATED OR LAMINATED PIECES AND ORGANIC OR OTHER DELETERIOUS SUBSTANCES. THE FINES CONTENT (AMOUNT PASSING NO. 200 STANDARD SIEVE) OF THIS MATERIAL SHALL NOT EXCEED 15% TO ENSURE THE BACKFILL IS FREE DRAINING.
7. WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE, FOR STEEL, LATEST EDITION, AS ADOPTED BY THE AMERICAN WELDING SOCIETY (AWS). WELDING SHALL BE PERFORMED BY A WELDER CERTIFIED IN ACCORDANCE WITH AWS STANDARDS.
8. FILTER FABRIC SHALL BE MIRAFI 700X GEOTEXTILE FABRIC.
9. CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 318-(LATEST EDITION) BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AS ADOPTED BY THE AMERICAN CONCRETE INSTITUTE.
10. DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ACI-318 AND THE ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
11. DETAILING, FABRICATION, AND ERECTION OF REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ACI-318 AND THE ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
12. DESIGN FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE MANUAL OF STEEL CONSTRUCTION - ASD, NINTH EDITION AS ADOPTED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
13. SYSTEMS INTERNATIONAL, USA, INC. THREADBAR SHALL BE GRADE 60 (GRADE 420) E-DUR SERIES, AS REQUIRED FOR CONDITIONS OF INTENDED USE.
14. TIE ROD ASSEMBLIES CONSISTING OF TIE RODS, STEEL COUPLERS, AND NUTS, SHALL BE DYWIDAG THREADBAR REINFORCING SYSTEM AS MANUFACTURED BY DYWIDAG.

   TIE ASTM A615 (EXCEPT FOR MARKINGS). TIE ROD ASSEMBLIES SHALL BE FUSION BONDED EPOXY COATED. FUSION BONDED EPOXY COATING SHALL CONFORM TO ASTM A775.
15. CONNECTIONS SHALL BE DESIGNED AND DETAILED BY THE STEEL FABRICATOR EXCEPT FOR THOSE SPECIFICALLY DETAILED IN THE CONTRACT DOCUMENTS.

NOTE: DUE TO POTENTIAL EXPANDED EXCAVATION, CONTRACTOR MUST INSTALL EROSION CONTROL PRIOR TO EXCAVATION. THEN, PROTECT WALL DURING EXCAVATION AND INSTALL DEADMEN ANCHORS ONCE EXCAVATION IS COMPLETED.



LEGEND

SECTION 10

SHEET NO.

SHEETPILE WALL

NOTES

1. FOR SHEETPILE WALL SECTION AND DETAILS SEE DRAWING NO. C-27 THRU C-31. AT THE DISCRETION OF THE ENGINEER, ACTUAL EMBEDMENT DEPTHS MAY VARY DUE TO ENCOUNTERED CONDITIONS IN THE FIELD AT THE TIME OF INSTALLATION.
2. ELEVATIONS ARE IN FEET AND REFERENCE THE MEAN LOWER LOW WATER DATUM. HORIZONTAL COORDINATES REFERENCE NORTH AMERICAN DATUM OF 1983 (NAD-83), SPCS FOR PA (AS).
3. LAND SURVEY DATA ARE BASED ON SURVEY BY AMERICAN GEOTECH, INC. DATED NOVEMBER 28, 1999.
4. BATHYMETRIC SURVEY DATA ARE BASED UPON SURVEY BY AQUA SURVEY, INC. PROVIDED TO AMERICAN GEOTECH, INC.
5. SECTIONS AND DETAILS APPLY TO SAME AND SIMILAR CONDITIONS UNLESS SPECIFICALLY NOTED OTHERWISE.
6. BATHYMETRIC CONDITIONS ARE VARIABLE AND SUBJECT TO CHANGE.
7. SUBMERGED OBJECTS MAY BE PRESENT IN THE PROJECT AREA.
8. UNPAVED UPLAND EXCAVATIONS SHALL BE CONDUCTED A MINIMUM OF 15 FEET SHOREWARD FROM THE CONCRETE DEADMEN. IN THE EVENT THAT THIS DISTANCE IS UNACHIEVABLE, SHORING MUST BE CONSTRUCTED AND APPROVED BY THE ENGINEER.

TRUE NORTH

GRAPHIC SCALE

(IN FEET)

NO.	DATE	REVISIONS	APPR.	NO.	DATE	REVISIONS	APPR.
1	03/01/00	30% Design Submittal		6			
2	02/02/01	60% Design Submittal		7			
3	03/14/02	90% Design Submittal		8			
4	09/06/02	100% Design Submittal		9			
5				10			

amec EARTH & ENVIRONMENTAL, INC.
ONE PLYMOUTH MEETING, SUITE 850
PLYMOUTH MEETING, PENNSYLVANIA 19462

OCEAN AND COASTAL CONSULTANTS, INC. 25 CORPORATE DRIVE, STRATFORD CT 06615 TEL (203) 268 5007 FAX (203) 268 5821

PREPARED FOR: COTTMAN AVENUE PRP GROUP

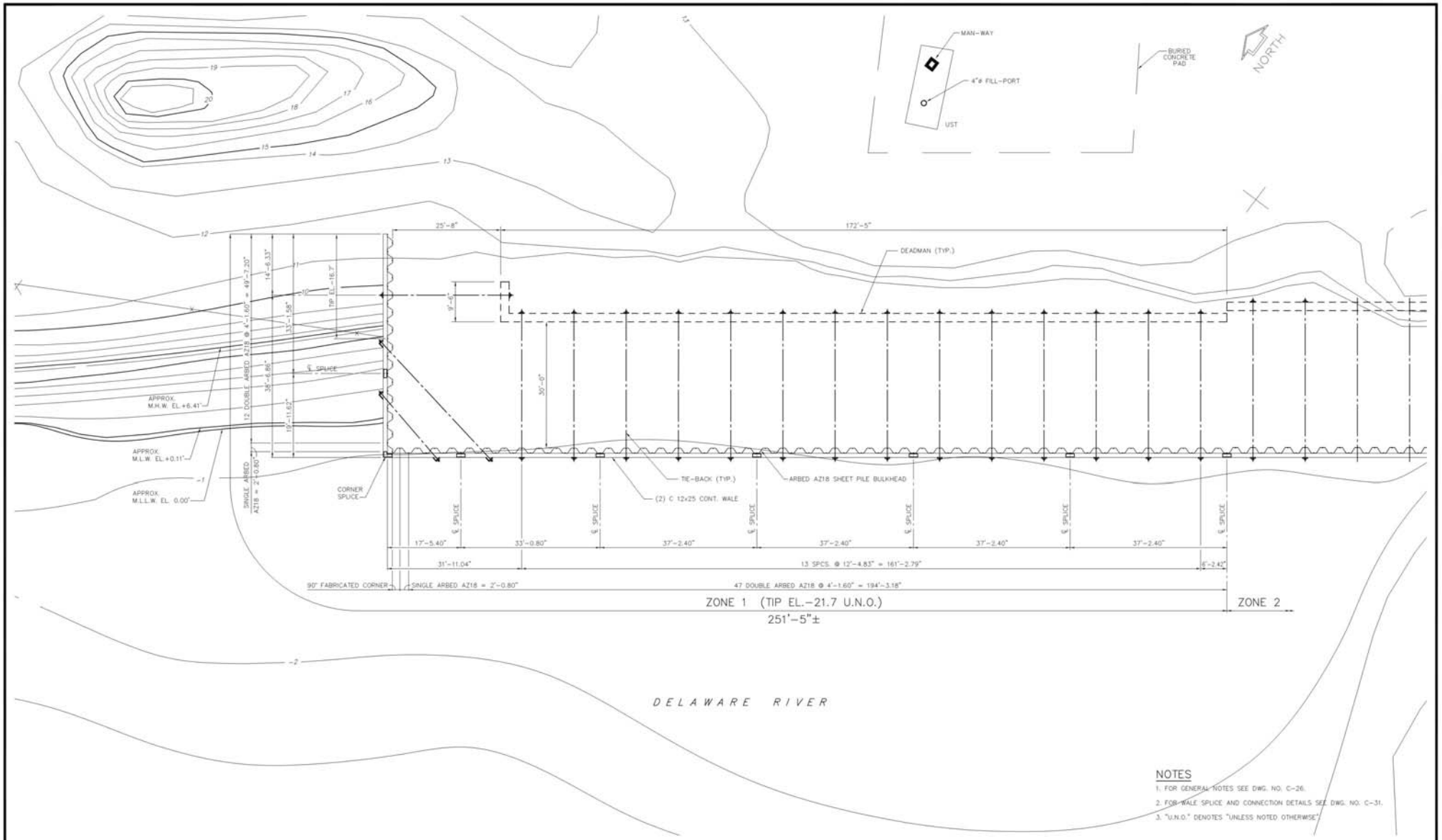
SUBMITTED TO: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 ARCH STREET
PHILADELPHIA, PENNSYLVANIA

CONTACT: MS. LINDA R. DIETZ

REMEDIAL DESIGN
METAL BANK NPL SITE
PHILADELPHIA, PENNSYLVANIA

TITLE: SHEETPILE WALL GENERAL PLAN & NOTES

DRAWN BY	CM	CHECKED BY	RB	DATE	09/06/02
SCALE	AS SHOWN	DRG. NO.	C-26	SHEET	32 OF 49



NOTES

1. FOR GENERAL NOTES SEE DWG. NO. C-26.
2. FOR WALE SPLICE AND CONNECTION DETAILS SEE DWG. NO. C-31.
3. "U.N.O." DENOTES "UNLESS NOTED OTHERWISE".

NO.	DATE	REVISIONS	APPR.	NO.	DATE	REVISIONS	APPR.
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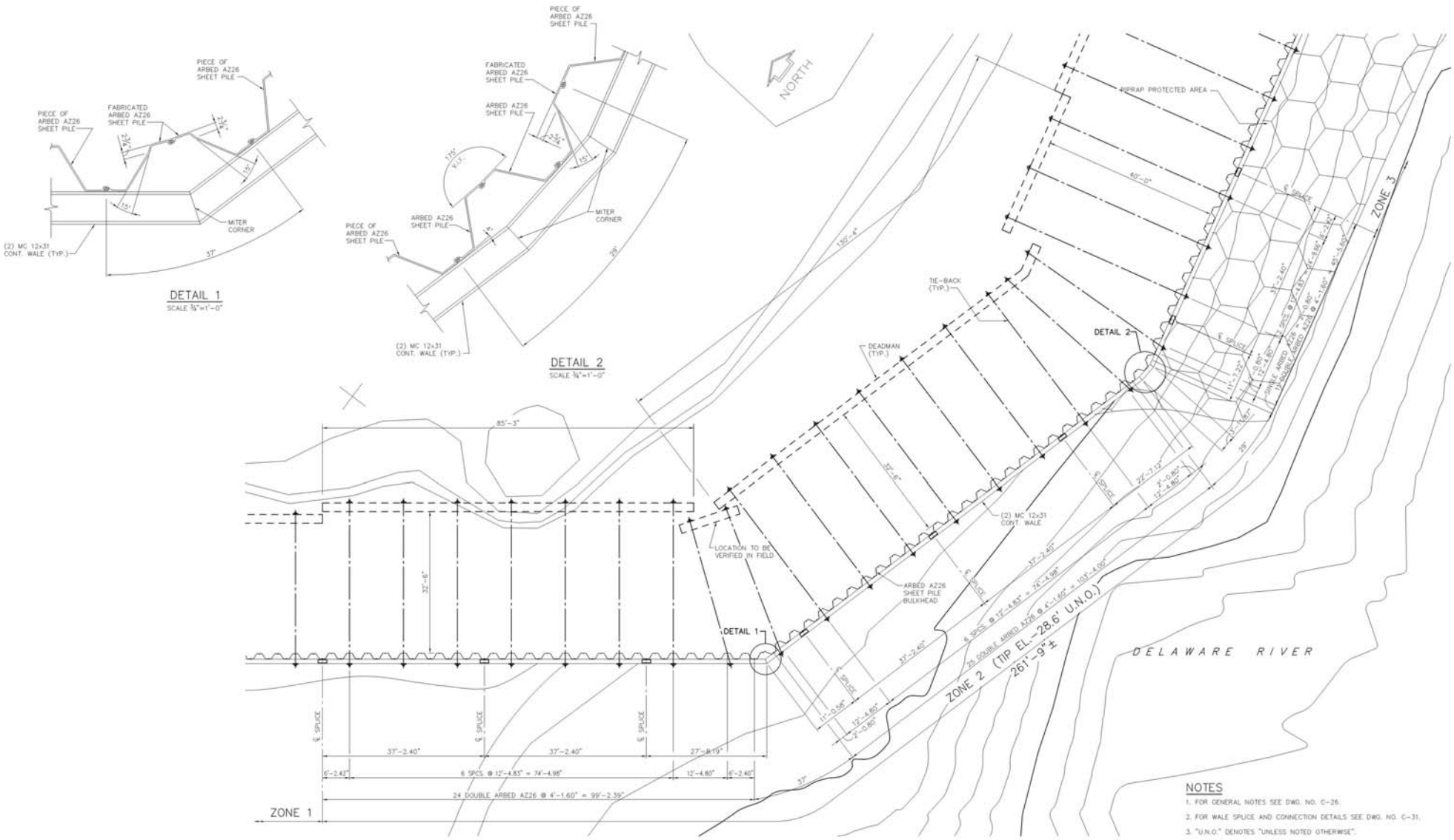
REGION III
1650 ARCH STREET
PHILADELPHIA, PENNSYLVANIA
CONTACT: MS. LINDA R. DIETZ

REMEDIAL DESIGN
METAL BANK NPL SITE
PHILADELPHIA, PENNSYLVANIA

TITLE: SHEETPILE WALL PARTIAL PLAN
ZONE 1

DRAWN BY	CM	CHECKED BY	RD	DATE	09/06/02
SCALE	AS SHOWN	DRG. NO.	C-27	SHEET	33 OF 49



NOTES

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SUBMITTED TO: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 ARCH STREET
PHILADELPHIA, PENNSYLVANIA
CONTACT: MS. LINDA R. DIETZ

REMEDIAL DESIGN
METAL BANK NPL SITE
PHILADELPHIA, PENNSYLVANIA

TITLE: SHEETPILE WALL PARTIAL PLAN
ZONE 2

DRAWN BY	CM	CHECKED BY	RD	DATE	09/06/02
SCALE	AS SHOWN	DRG. NO.	C-28	SHEET	34 OF 49

NOTES

1. FOR GENERAL NOTES SEE DWG. NO. C-26.
2. FOR WALE SPLICE AND CONNECTION DETAILS SEE DWG. NO. C-31.
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PREPARED FOR: COTTMAN AVENUE PRP GROUP
SUBMITTED TO: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 ARCH STREET
PHILADELPHIA, PENNSYLVANIA
CONTACT: MS. LINDA R. DIETZ

REMEDIAL DESIGN
METAL BANK NPL SITE
PHILADELPHIA, PENNSYLVANIA

TITLE: SHEETPILE WALL PARTIAL PLAN
ZONE 3

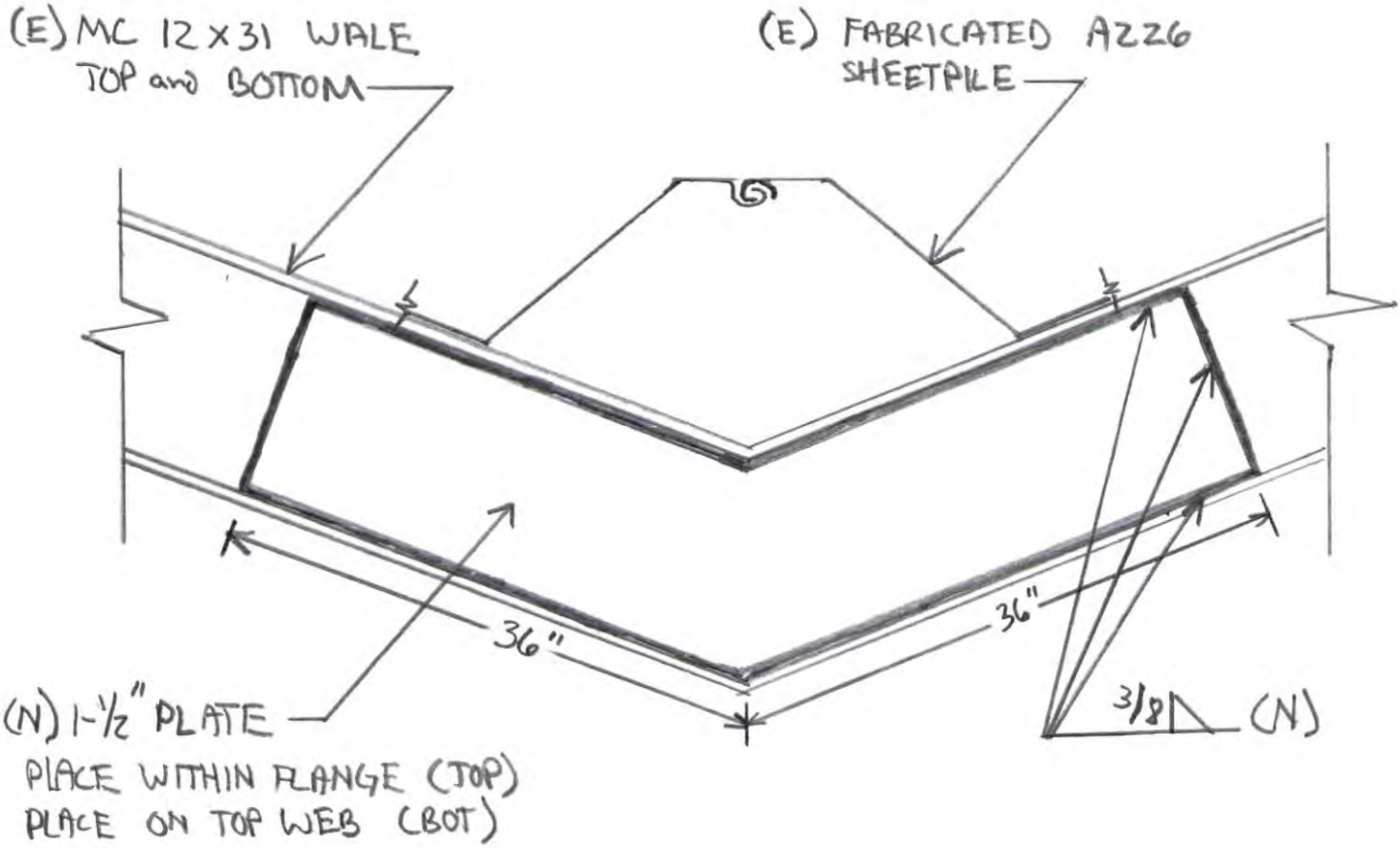
DRAWN BY	CM	CHECKED BY	RD	DATE	09/06/02
SCALE	AS SHOWN	DRG. NO.	C-29	SHEET	35 OF 49

APPENDIX B

RA Consultants LLC
47 Wilkens Drive Dumont New Jersey 07628

Project No. 12C1135 | Sheet No. 1
Client Environ | Date 5-4-13
Project Metal Bank | Subject Wale - corner repair | Des. By WJP

(E) - EXISTING
(N) - NEW



DETAIL 1

PART PLAN - INTERSECTION OF
ZONE 1 & ZONE 2.

NTS