

## **APPENDIX B, SECTION 1**

### **VIRGINIA DEPARTMENT OF HISTORIC RESOURCES DATA SHARING SYSTEM FORMS**

**Virginia Department of Historic Resources  
Reconnaissance Level Survey**

**DHR ID#: 000-0042-0003**

**Other DHR ID#:**

**Resource Information**

Resource Name(s): Arlington Cemetery Tombstone Drain  
{ Descriptive }

Date of Construction: 9999

Local Historic District :

**Location of Resource**

Commonwealth of Virginia

County/Independent City: Arlington

Magisterial District:

Town/Village/Hamlet: Arlington National Cemetery

Tax Parcel:

Zip Code: 22211

Address(s): Memorial Drive, off of

USGS Quadrangle Name: WASHINGTON WEST (DC)

UTM Boundary Coordinates :

	<u>NAD</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>
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UTM Center coordinates :	1983	18	320009	4205806
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UTM Data Restricted?.	No
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**National Register Eligibility Status**

Resource has not been evaluated.\*

This Resource is associated with the Arlington National Cemetery

\* Resource has not been formally evaluated by DHR or eligibility information has not been documented in DSS

**Resource Description**

Ownership Status: Public - Federal

Government Agency Owner: U.S. Department of the Army

Acreage: 0.11

Surrounding area: Urban

Open to Public: Yes, limited

Site Description:

March 2012: The tombstone drain is located within Section 29, an undeveloped wooded section of Arlington National Cemetery. Section 29 is characterized by a steep-sided ravine with a stream flowing through it, and several intermittent drainages branching from it. The forested area is in mature oak-hickory forest.

Secondary Resource Summary:

March 2012: None.

**Individual Resource Information**

<u>Count</u>	<u>Resource Types</u>	<u>Resource Status</u>
1	Culvert	Non-Contributing

**Primary Resource Exterior Component Description:**

<u>Component</u>	<u>Comp Type/Form</u>	<u>Material</u>	<u>Material Treatment</u>
Structural System	Foundation - Slab	Marble	other
Structural System	Structural System - Masonry	Concrete	other

Historic Time Period(s): S- The New Dominion (1946- Present)

# Virginia Department of Historic Resources

## Reconnaissance Level Survey

**DHR ID#: 000-0042-0003**

**Other DHR ID#:**

*Historic Context(s):* Architecture/Landscape  
Funerary  
Military/Defense

### **Significance Statement**

March 2012: This landscape feature, the 'tombstone drain' in Section 29 of Arlington National Cemetery was evaluated as non-contributing to landscape of Arlington House by an architectural historian (Millis et al. 1998:117-121; Cleveland 1997). The reason cited was that this

### **National Register Eligibility Information (Intensive Level Survey):**

<u>NR Count</u>	<u>NR Resource Type</u>	<u>NR Resource Status</u>
1	Object	Non-contributing
		1

*National Register Criteria:*

*Period of Significance:*

*Level of Significance:*

### **Graphic Media Documentation**

<u>DHR Negative #</u>	<u>Photographic Media</u>	<u>Negative Repository</u>	<u>Photo Date</u>	<u>Photographer</u>
	digital	USACE Norfolk	March 12, 2012	J. Haynes

### **Bibliographic Documentation**

*Reference #: 1*

*Bibliographic RecordType:* Report  
*Author:* Hearther Millis

*DHR CRM Report Number:*

*Notes:*

Cultural Investigations At Section 29 At Arlington House, The Robert E. Lee Memorial, Arlington County, Virginia.  
Heather

*Reference #: 2*

*Bibliographic RecordType:* Other  
*Author:* Todd Cleveland

*DHR CRM Report Number:*

*Notes:*

NPS Cultural Landscape Inventory, Section 29 Arlington National Cemetery/Arlington House, M. Todd Cleveland, Garrow &

### **Cultural Resource Management (CRM) Events**

*CRM Event # 1,*

*Cultural Resource Management Event:* Survey:Phase I/Reconnaissance

*Date of CRM Event:* March 29, 2012

*CRM Person:* John Haynes

*VDHR Project ID # Associated with Event:* 2012-0390

*CRM Event Notes or Comments:*

Rough measurement of the length of the visible culverts, photography, during fieldwork for Millennium Project.

**Virginia Department of Historic Resources  
Reconnaissance Level Survey**

**DHR ID#: 000-0042-0003**

**Other DHR ID#:**

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**Bridge Information**

**Cemetery Information**

**Ownership Information**

*Name:* Mr. Patrick Hallinan  
*Title:* Superintendent  
*Company:* Army National Cemeteries Program  
*Address:* Arlington National Cemetery  
*City:* Arlington  
*Zip:* 22211 *State:* Virginia *Country:*  
*Phone/Extension:* 877-907-8585 000-000-0000 / 0000 0000  
*Relation to the Property:* Property Manager

**Ownership Information**

*Name:* Mr. Brandon Bies  
*Title:* Site Manager  
*Company:* National Park Service  
*Address:* 700 George Washington Memorial Parkway  
*City:* McLean  
*Zip:* 22101 *State:* Virginia *Country:* USA  
*Phone/Extension:* 703-235-1537 000-000-0000 / 0000 0000  
*Surveyor Notes:* The resource lies partly on land owned by Arlington National Cemetery, and partly in land ceded to the National Park Service for Arlington House.  
*Relation to the Property:* Property Manager



**Virginia Department of Historic Resources  
Reconnaissance Level Survey**

**DHR ID#: 000-0042-0005**

**Other DHR ID#:**

**Resource Information**

*Resource Name(s):* Arlington National Cemetery Section 29 Foot  
Bridge South {Descriptive}

*Date of Construction:*

*Local Historic District :*

**Location of Resource**

Commonwealth of Virginia

*County/Independent City:* Arlington

*Magisterial District:*

*Town/Village/Hamlet:* Arlington National Cemetery

*Tax Parcel:*

*Zip Code:* 22211

*Address(s):* Ord and Weitzel Drive, off of

*USGS Quadrangle Name:* WASHINGTON WEST (DC)

*UTM Boundary Coordinates :*

	<u>NAD</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>
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<i>UTM Center coordinates :</i>	1983	18	320059	4205869
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<i>UTM Data Restricted?.</i>	No
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***National Register Eligibility Status***

Resource has not been evaluated.\*

This Resource is associated with the Arlington National Cemetery

\* Resource has not been formally evaluated by DHR or eligibility information has not been documented in DSS

**Resource Description**

*Ownership Status:* Public - Federal

*Government Agency Owner:* U.S. Department of the Army

*Acreage:* 0.01

*Surrounding area:* Urban

*Open to Public:* Yes, limited

*Site Description:*

March 2012: Arlington National Cemetery Section 29 Foot Bridge South is located within Section 29, an undeveloped wooded

section of Arlington National Cemetery. Section 29 is characterized by a steep-sided ravine with a stream flowing through it,

*Secondary Resource Summary:*

March 2012: None.

**Individual Resource Information**

<u>Count</u>	<u>Resource Types</u>	<u>Resource Status</u>
1	Bridge	Non-Contributing

**Individual Resource Detail Information**

<u>Resource Type.</u>	<u>Bridge</u>	<u>Primary Resource?</u>	<u>Not Evaluated</u>
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<i>Date of Construction:</i>	pre 1935 {Map}	<i>Accessed?</i>	
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<i>Architectural Style:</i>	No Discernable Style	<i>Number of Stories:</i>	0.0
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<i>Form:</i>		<i>Condition:</i>	Ruinous
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*Interior Plan Type:*

*Threats to Resource:* Demolition

March 2012: The Arlington National Cemetery Section 29 South foot bridge is about 6 feet wide and 10 feet long, constructed of white marble slabs, 4 inches thick and 3 to 4 feet long. These are most likely recycled tombstones, replaced by new tombstones when damaged, weathered, or more commonly with an inscription is changed to add a co-buried spouse. Widths of standard

# Virginia Department of Historic Resources

## Reconnaissance Level Survey

**DHR ID#: 000-0042-0005**

**Other DHR ID#:**

government issued tombstones at Arlington National Cemetery have been of 10, 12, and 13 inch widths beginning in 1873, 1903, and 1922 respectively. Abutments of marble slabs parallel the stream bed, supporting a span of about 6 feet. The abutments are about four feet high. The marble slab structure is crowned by courses of red brick laid in English bond, forming a curb. This has collapsed on the upstream side where the streambed has completely filled with alluvium, and has buried the bridge on that side and on top, with the exception of the brick curb on the downstream side. Many detailed maps were drawn of Arlington National Cemetery from 1862 to 1900. The first map was by the U.S. Army, and the last was by the U.S. Navy. The maps show the cemetery as a large, rectangular area, with the streambed running through the center. The maps also show the location of the bridge, and the location of the tombstones. The maps are valuable for understanding the history of the cemetery, and for planning the reconstruction of the bridge.

### Primary Resource Exterior Component Description:

<u>Component</u>	<u>Comp Type/Form</u>	<u>Material</u>	<u>Material Treatment</u>
other	other	Brick	Structural System - Bond, English
other	other	Marble	Structural System - Bond, Common

*Historic Time Period(s):* Q- World War I to World War II (1917-1945)

*Historic Context(s):* Architecture/Landscape  
Funerary  
Military/Defense

### Significance Statement

April 2012: A current study of Arlington National Cemetery by US Army Corps of Engineers architectural historians to produce a National Register of Historic Place nomination has identified the landscape of the cemetery west of Eisenhower Drive as contributing to the historic

### National Register Eligibility Information (Intensive Level Survey):

<u>NR Count</u>	<u>NR Resource Type</u>	<u>NR Resource Status</u>
1	Structure	Non-contributing 1

*National Register Criteria:*

*Period of Significance:*

*Level of Significance:*

### Graphic Media Documentation

<u>DHR Negative #</u>	<u>Photographic Media</u>	<u>Negative Repository</u>	<u>Photo Date</u>	<u>Photographer</u>
	digital	USACE Norfolk	March 12, 2012	J. Haynes

### Bibliographic Documentation

*Reference #: 1*

*Bibliographic RecordType:* NRHP Form

*Author:* Adam Smith

*DHR CRM Report Number:*

*Notes:*

forthcoming NRHP nomination of Arlington National Cemetery as a historic district, draft expected June 2012

*Reference #: 2*

*Bibliographic RecordType:* NRHP Form

# Virginia Department of Historic Resources

## Reconnaissance Level Survey

**DHR ID#: 000-0042-0005**

**Other DHR ID#:**

*Author:* Adam Smith

*DHR CRM Report Number:*

*Notes:*

National Register of Historic Places district nomination of Arlington National Cemetery; draft expected June 2012 by US Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, Illinois.

*Reference #:* 3

*Bibliographic RecordType:* Report

*Author:* Heather Millis

*DHR CRM Report Number:*

*Notes:*

Cultural Investigations At Section 29 At Arlington House, The Robert E. Lee Memorial, Arlington County, Virginia.  
Heather

*Reference #:* 4

*Bibliographic RecordType:* Other

*Author:* Todd Cleveland

*DHR CRM Report Number:*

*Notes:*

NPS Cultural Landscape Inventory, Section 29 Arlington National Cemetery/Arlington House, M. Todd Cleveland, Garrow &

### **Cultural Resource Management (CRM) Events**

*CRM Event #* 1,

*Cultural Resource Management Event:* Survey:Phase I/Reconnaissance

*Date of CRM Event:* March 29, 2012

*CRM Person:* John Haynes

*VDHR Project ID # Associated with Event:* 2012-0390

*CRM Event Notes or Comments:*

Rough measurement of the length of the visible culverts, photography, during fieldwork for Millennium Project.

### **Bridge Information**

*Bridge #* 1    *Virginia Structure #* 0    *Structure ID #* 0

*Type:* Slab

*Bridge Use:* Abandoned

*# of Spans:* 1

*Type of Entity Spanned:* Water

*Name of Entity Spanned:* unnamed stream

*# of Lanes:* 1

### **Cemetery Information**

### **Ownership Information**

*Name:* Mr. Patrick Hallinan

*Title:* Superintendent

*Company:* Army National Cemeteries Program

*Address:* Arlington National Cemetery

*City:* Arlington

*Zip:* 22211

*State:* Virginia

*Country:*

*Phone/Extension:* 877-907-8585    000-000-0000

/ 0000    0000

*Relation to the Property:* Property Manager

**Virginia Department of Historic Resources  
Reconnaissance Level Survey**

***DHR ID#: 000-0042-0005***

***Other DHR ID#:***

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***Ownership Information***

*Name:* Mr. Brandon Bies  
*Title:* Site Manager  
*Company:* National Park Service  
*Address:* 700 George Washington Memorial Parkway  
*City:* McLean  
*Zip:* 22101      *State:* Virginia      *Country:* USA  
*Phone/Extension:* 703-235-1537      000-000-0000      / 0000      0000  
*Surveyor Notes:* The resource lies partly on land owned by Arlington National Cemetery, and partly in land ceded to the National Park Service for Arlington House.  
*Relation to the Property:* Property Manager

**Virginia Department of Historic Resources  
Reconnaissance Level Survey**

**DHR ID#: 000-0042-0004**

**Other DHR ID#:**

**Resource Information**

*Resource Name(s):* Arlington National Cemetery Section 29 Foot  
Bridge North {Descriptive}

*Date of Construction:*

*Local Historic District :*

**Location of Resource**

Commonwealth of Virginia

*County/Independent City:* Arlington

*Magisterial District:*

*Town/Village/Hamlet:* Arlington National Cemetery

*Tax Parcel:*

*Zip Code:* 22211

*Address(s):* Ord and Weitzel Drive, off of

*USGS Quadrangle Name:* WASHINGTON WEST (DC)

*UTM Boundary Coordinates :*

	<u>NAD</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>
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<i>UTM Center coordinates :</i>	1983	18	320052	4205887
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<i>UTM Data Restricted?.</i>	No
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***National Register Eligibility Status***

Resource has not been evaluated.\*

This Resource is associated with the Arlington National Cemetery

\* Resource has not been formally evaluated by DHR or eligibility information has not been documented in DSS

**Resource Description**

*Ownership Status:* Public - Federal

*Government Agency Owner:* U.S. Department of the Army

*Acreage:* 0.01

*Surrounding area:* Urban

*Open to Public:* Yes, limited

*Site Description:*

March 2012: Arlington National Cemetery Section 29 Foot Bridge North is located within Section 29, an undeveloped wooded

section of Arlington National Cemetery. Section 29 is characterized by a steep-sided ravine with a stream flowing through it,

*Secondary Resource Summary:*

March 2012: None.

**Individual Resource Information**

<u>Count</u>	<u>Resource Types</u>	<u>Resource Status</u>
1	Bridge	Non-Contributing

**Individual Resource Detail Information**

<u>Resource Type.</u>	<u>Bridge</u>	<u>Primary Resource?</u>	<u>No</u>
<i>Date of Construction:</i>	pre 1935 {Map}	<i>Accessed?</i>	
<i>Architectural Style:</i>	No Discernable Style	<i>Number of Stories:</i>	0.0
<i>Form:</i>		<i>Condition:</i>	Ruinous
<i>Interior Plan Type:</i>			

*Threats to Resource:* Demolition

March 2012: The Arlington National Cemetery Section 29 North foot bridge is about 6 feet wide and 10 feet long, constructed of white marble slabs, 4 inches thick and 3 to 4 feet long. These are most likely recycled tombstones, replaced by new tombstones when damaged, weathered, or more commonly with an inscription is changed to add a co-buried spouse. Widths of standard

# Virginia Department of Historic Resources

## Reconnaissance Level Survey

**DHR ID#: 000-0042-0004**

**Other DHR ID#:**

government issued tombstones at Arlington National Cemetery have been of 10, 12, and 13 inch widths beginning in 1873, 1903, and 1922 respectively. Abutments of marble slabs parallel the stream bed, supporting a span of about 6 feet. The abutments are about four feet high. The marble slab structure is crowned by courses of red brick laid in English bond, which has collapsed on the downstream side, but remains as a curb on the upstream side. The site is heavily overgrown with underbrush. Many detailed maps were drawn of Arlington National Cemetery from its inception in 1863, which show footpaths. The footpath associated with this

### Primary Resource Exterior Component Description:

<u>Component</u>	<u>Comp Type/Form</u>	<u>Material</u>	<u>Material Treatment</u>
other	other	Brick	Structural System - Bond, English
other	other	Marble	Structural System - Bond, American

*Historic Time Period(s):* Q- World War I to World War II (1917-1945)

*Historic Context(s):* Architecture/Landscape  
Funerary  
Military/Defense

### Significance Statement

April 2012: A current study of Arlington National Cemetery by US Army Corps of Engineers architectural historians to produce a National Register of Historic Place nomination has identified the landscape of the cemetery west of Eisenhower Drive as contributing to the historic

### National Register Eligibility Information (Intensive Level Survey):

<u>NR Count</u>	<u>NR Resource Type</u>	<u>NR Resource Status</u>
1	Structure	Non-contributing 1

*National Register Criteria:*

*Period of Significance:*

*Level of Significance:*

### Graphic Media Documentation

<u>DHR Negative #</u>	<u>Photographic Media</u>	<u>Negative Repository</u>	<u>Photo Date</u>	<u>Photographer</u>
	digital	USACE Norfolk	March 12, 2012	J. Haynes

### Bibliographic Documentation

*Reference #: 1*

*Bibliographic RecordType:* Report  
*Author:* Heather Millis  
*DHR CRM Report Number:*

*Notes:*

Cultural Investigations At Section 29 At Arlington House, The Robert E. Lee Memorial, Arlington County, Virginia.  
Heather

*Reference #: 2*

*Bibliographic RecordType:* Other

# Virginia Department of Historic Resources

## Reconnaissance Level Survey

**DHR ID#: 000-0042-0004**

**Other DHR ID#:**

*Author:* Todd Cleveland

*DHR CRM Report Number:*

*Notes:*

NPS Cultural Landscape Inventory, Section 29 Arlington National Cemetery/Arlington House, M. Todd Cleveland, Garrow &

*Reference #:* 3

*Bibliographic RecordType:* NRHP Form

*Author:* Adam Smith

*DHR CRM Report Number:*

*Notes:*

National Register of Historic Places district nomination of Arlington National Cemetery; draft expected June 2012 by US Army Corps of Engineers Construction Engineering Research Laboratory, Champaign, Illinois.

### **Cultural Resource Management (CRM) Events**

*CRM Event # 1,*

*Cultural Resource Management Event:* Survey:Phase I/Reconnaissance

*Date of CRM Event:* March 29, 2012

*CRM Person:* John Haynes

*VDHR Project ID # Associated with Event:* 2012-0390

*CRM Event Notes or Comments:*

Rough measurement of the length of the visible culverts, photography, during fieldwork for Millennium Project.

### **Bridge Information**

*Bridge # 1*    *Virginia Structure # 0*    *Structure ID # 0*  
*Type:* Slab  
*Bridge Use:* Abandoned  
*# of Spans:* 1

*Type of Entity Spanned:* Water  
*Name of Entity Spanned:* unnamed intermittent branch  
*# of Lanes:* 0

### **Cemetery Information**

### **Ownership Information**

*Name:* Mr. Patrick Hallinan  
*Title:* Superintendent  
*Company:* Army National Cemeteries Program  
*Address:* Arlington National Cemetery  
*City:* Arlington  
*Zip:* 22211    *State:* Virginia    *Country:*  
*Phone/Extension:* 877-907-8585    000-000-0000    / 0000    0000  
*Relation to the Property:* Property Manager

### **Ownership Information**

*Name:* Mr. Brandon Bies  
*Title:* Site Manager  
*Company:* National Park Service  
*Address:* 700 George Washington Memorial Parkway  
*City:* McLean  
*Zip:* 22101    *State:* Virginia    *Country:* USA  
*Phone/Extension:* 703-235-1537    000-000-0000    / 0000    0000  
*Surveyor Notes:* The resource lies partly on land owned by Arlington National Cemetery, and partly in land ceded to the National Park Service for Arlington House.  
*Relation to the Property:* Property Manager

## **APPENDIX B, SECTION 2**

### **DERRICK AND HAIL'S FIELD SKETCHES AND NOTES**



DERRICK & HAILS FIELD NOTES ARLINGTON NATIONAL CEMETERY  
MILLENNIUM DITCH RECON APRIL 16-17, 2012, ARLINGTON, VA.

MONUMENT COUNT:

Middle Branch Millennium Ditch = 432 observed exposed markers, 500 suspected + some suspected on ivy covered bank at upper end of ditch downhill from the mowed lawn adjacent to the parking lot-area either needs to be cleared and/or use ground penetrating radar to detect possible markers.

South Branch Millennium Ditch = 40 observed markers in one 80 ft long reach, 0 suspected

North Branch Millennium Ditch = 164 observed markers in a number of locations, many suspected on left bank by maintenance yard-some eroded areas have markers exposed-need to use ground penetrating radar here also?

Total markers = 636 observed markers + 500 suspected markers = 1,136 total markers

This does not count the marble slabs (markers) used to build the span sections of the two foot bridges or the concrete slabs that line some sections of the bottom of the marker-lined ditch.

MIDDLE BRANCH (MB) MILLENNIUM DITCH:

Based on field analysis and past experience, the following concepts and alternatives were developed. Middle Branch is divided into 9 sections as different methods will be used for stabilization/restoration. The recommended alternative will be based on cost first, the minimal use of stone second, and effectiveness third. The recommended alternative could in some cases have a higher risk of failure compared to some of the alternatives that utilize more stone.

**MB Section 1: 0 ft to +100 ft, length =100 ft - From upstream (US) pipe outfall (location zero) down the steep hill to the end of the broken concrete fill (+70) and 30 ft further until slope breaks and is flatter.**

**Tasks: Remove 31 observed markers in MB gully and 7 markers in trail 15 ft to the left of the pipe outflow (looking downstream (DS) and deposit in maintenance area??**

MB Alternative A). - Recommended-No Action = No cost, no construction disturbance. Some erosion of the bed and banks will probably continue to occur at an unknown rate. Bank and bed erosion pins could be installed to ascertain erosion rates.

MB Alternative B). – Constructed rock blanket contoured as a steep rock chute (rocked waterway). Bed and banks will be completely stabilized. All broken concrete, asphalt and brick will be removed and placed in the maintenance area for proper disposal???. Dave Hails will design this rocked waterway.

**MB Section 2: +100 ft to + 165 ft, length =65 ft - From break in slope to upstream end of the marker lined ditch**

**Tasks: No markers to remove.**

MB Alternative A). - Recommended-Add a one ft thick layer of angular quarried stone sized to Pennsylvania RR-5 or RR-6 specifications for the entire length of this section. The bed of the stream is in a natural step-pool configuration with a minimum amount of native stone available to the stream to use to form the steps and pools. Two sets of short 8 ft long perpendicular keys would be constructed along the reach. This alt. would provide the stream with material to further self-stabilize itself. Banks could be graded to stability and planted with native plants. RR-5 or -6 stone needed= 1 ft deep by 4 ft wide by 65 ft (channel) +32 ft long (for keys) by 110#/cu ft divided by 2,000 # per ton = 21.3 tons by 1.1 = 23.5 tons of RR-5 or RR-6 stone. Plants needed:

MB Alternative B). - No Action. Natural meandering and erosion of the bed and banks will continue to occur at an unknown rate. Bank and bed erosion pins could be installed to ascertain erosion rates.

MB Alternative C). - Add a 2 ft thick layer of angular quarry stone (Pennsylvania designation RR-5 Or RR-6 designation) with a 1 ft thick layer of natural rounded cobbles in the 4 to 12 inch range (add some 12 to 20 inch boulders if available) over the top of the quarry stone for the entire length of this section. Banks could be graded to stability and the lower 2 ft protected with a layer of the native 4 to 12 inch stone, then upper banks planted with native plants. This alt. would significantly reduce erosion of the bed and banks. Stone amount required not calculated.

**MB Section 3: +165 ft to + 300 ft, length = 135 ft - From upstream end of the marker lined ditch to the downstream end where markers are covered with sediment**

**Tasks: Remove 272 observed markers, concrete caps, and all 3 by 3 ft concrete slabs (flooring in channel) and deposit in maintenance area??**

MB Alternative A). - Recommended-Add a series of log check dams across the ditch channel using 15 ft sections of on-site available downed 16 to 24 inch diameter locust or hardwood logs. From the contour map it appears that 4 to 6 log dams will have to be installed in this reach. After the log is placed perpendicular to the channel, filter fabric should be nailed to the US side of the log and draped US, then covered with gravel-cobble-sand mix. Immediately DS of the log a 7 to 14 ft long cobble riffle will be installed (Pennsylvania designation RR-5 stone. Some sediment from the buried channel in Section 4 can be used to partially fill the channel US of the Log Dams. The banks of the ditch can be laid back to stability (2 on 1 slope), and planted. Logs needed: 4 to 6, 15 ft by 16 to 24 inches in diameter. RR-5 stone needed = 8 tons per Log Check Dam. Plants needed:

MB Alternative B). - Add a 9 inch thick layer of angular quarry stone (Penn. RR-5 designation) with a 9 inch thick layer of natural rounded cobbles in the 4 to 12 inch range over the top of the quarry stone for the entire length of this section. Banks could be graded to stability resulting in a shallow channel that would flood into the valley during even some smaller flow events. The angular stone would act as a French drain to convey water and allow water to slow

and infiltrate into the ground, and would also provide channel stability. The upper banks could be planted with native plants. This alt. would significantly reduce erosion of the bed and banks. Cobble needed = 9 inches deep by 44 inches wide by 135 ft long by 110#/cu ft divided by 2,000 # per ton = 20 tons by 1.1 = 22 tons of cobble. During a large flow event some cobble might be displaced. Angular stone needed= 22 tons. Plants needed:

**MB Section 4: +300 ft to + 503 ft, length = 203 ft - From downstream end of the exposed marker lined ditch to the footbridge.**

**Tasks: Remove 406 suspected markers, concrete caps, and all 3 by 3 ft concrete slabs (flooring in channel) and deposit in maintenance area. Demolish footbridge and any bridge foundation works and deposit in maintenance area??**

This section of stream is buried by sediment deposited US of a large fallen tree. The tops of the markers are buried approx. 1 to 2 ft deep so a large amount of sediment will have to be removed to unearth and remove the markers and concrete slab ditch flooring. The large log needs to be placed landward of the right bank of the ditch and a large amount of the excess sediment placed and leveled US of this log to block high flows that are presently using this path to traverse the valley. The flow needs to be guided back into the ditch. ALTERNATIVES FOR THIS SECTION WILL BE SIMILAR TO SECTION 3.

MB Alternative A). - Recommended-log check dams etc. From the contour map it appears that 4 to 6 log dams will have to be installed in this reach. Logs needed 6, 15 ft by 16 to 24 inches in diameter. RR-5 stone needed= 8 tons per log check dam. Plants needed:

MB Alternative B). - Add a 9 inch thick layer of angular quarry stone (Penn. RR-5 designation) with a 9 inch thick layer of natural rounded cobbles in the 4 to 12 inch range over the top of the quarry stone for the entire length of this section. Banks could be graded to stability resulting in a shallow channel that would flood into the valley during even some smaller flow events. The angular stone would act as a French drain to convey water and allow water to slow and infiltrate into the ground, and would also provide channel stability. The upper banks could be planted with native plants. This alt. would significantly reduce erosion of the bed and banks. Cobble needed = 9 inches deep by 44 inches wide by 203 ft long by 110#/cu ft divided by 2,000 # per ton = 30.7 tons by 1.1 = 34 tons of cobble. Angular stone needed= 34 tons. Plants needed:

**MB Section 5: +503 ft to + 569 ft, length = 66 ft - From the footbridge downstream to the first bend DS of the footbridge.**

**Tasks: Remove 83 observed markers and 94 suspected markers and concrete caps and deposit in maintenance area??**

ALTERNATIVES FOR THIS SECTION WILL BE SIMILAR TO SECTION 3.

MB Alternative A). - Recommended-log check dams etc. From the contour map it appears that 2 log dams will have to be installed in this reach. Logs needed = 2, 15 ft by 16 to 24 inches in diameter. RR-5 stone needed = 8 tons per check dam. Plants needed:

MB Alternative B). - Add a 9 inch thick layer of angular quarry stone (Penn. RR-4 designation) with a 9 inch thick layer of natural rounded cobbles in the 4 to 12 inch range over the top of the quarry stone for the entire length of this section. Banks could be graded to stability resulting in a shallow channel that would flood into the valley during even some smaller flow

**events.** The angular stone would act as a French drain to convey water and allow water to slow and infiltrate into the ground, and would also provide channel stability. The upper banks could be planted with native plants. This alt. would significantly reduce erosion of the bed and banks. Cobble needed = 9 inches deep by 44 inches wide by 66 ft long by 110#/cu ft divided by 2,000 # per ton = 10 tons by 1.1 = 11 tons of cobble. Angular stone needed= 11 tons. Plants needed:

**MB Section 6: +569 ft to + 692 ft, length = 123 ft - From the bend downstream to the confluence with the north branch.**

**Tasks: None.**

MB Alternative A). – Recommended – No action. The bed of the stream is mucky, therefore depositional. Some bank erosion might occur over time, but it should be minimal.

**MB Section 7: +692 ft to + 935 ft, length = 243 ft - From the confluence with the north branch downstream to the concrete drain in the left bank.**

**Tasks: Remove 31 observed markers and 203 suspected markers and concrete caps and deposit in maintenance area??**

MB Alternative A). – Recommended - Where markers are removed, replace with a equal volume of cobblestone where the markers had been located. In this section the bed is stable, stream looks fantastic (in dynamic equilibrium) and the stream is actively meandering, but nothing close by will be impacted by the meandering. Cobble needed per marker = 4 inches thick by 13 inches wide by 3 ft long by 234 markers by 110#/cu ft divided by 2,000 # per ton = 13.8 tons by 1.1 = 15 tons of cobble (size = Large River jack or Jumbo River jack). Plants needed:

**MB Section 8: +935 ft to + 963 ft, length = 28 ft – Short straight reach.**

**Tasks: Remove 3 observed markers at drain and rebuild drain splash pad. Remove 4 large creosote fence posts and fencing and deposit all in maintenance area??**

MB Alternative A). – Slope left bank and install 1/4 ton of 4 to 12 inch cobble per ft at the toe. Plant bank. Cobble needed: 1/4 ton by 28 ft = 7 tons of cobble (size = Jumbo River jack or larger). Plants needed:

**MB Section 9: +963 ft to +1038 ft, length = 75 ft – The 75 ft of channel immediately US of the highway bridge.**

**Tasks: Remove 5 observed markers on left bank and deposit in maintenance area??**

MB Alternative A). – Recommended – No action. There is a large amount of very large unsightly chunks of concrete (no exposed rebar). However the concrete is acting like a cascade grade control and stopping US migration of headcuts.

MB Alternative B). – Remove all concrete and deposit in maintenance area. Construct 3 cascade native boulder grade control structures out of 1 to 2 ft rounded boulders. Boulders needed: Not calculated.

**SOUTH BRANCH (SB) MILLENNIUM DITCH:**

**Tasks:** Remove 40 observed markers by hand approximately 300 ft DS of the pipe header wall at the US end of the SB and deposit markers in maintenance area.

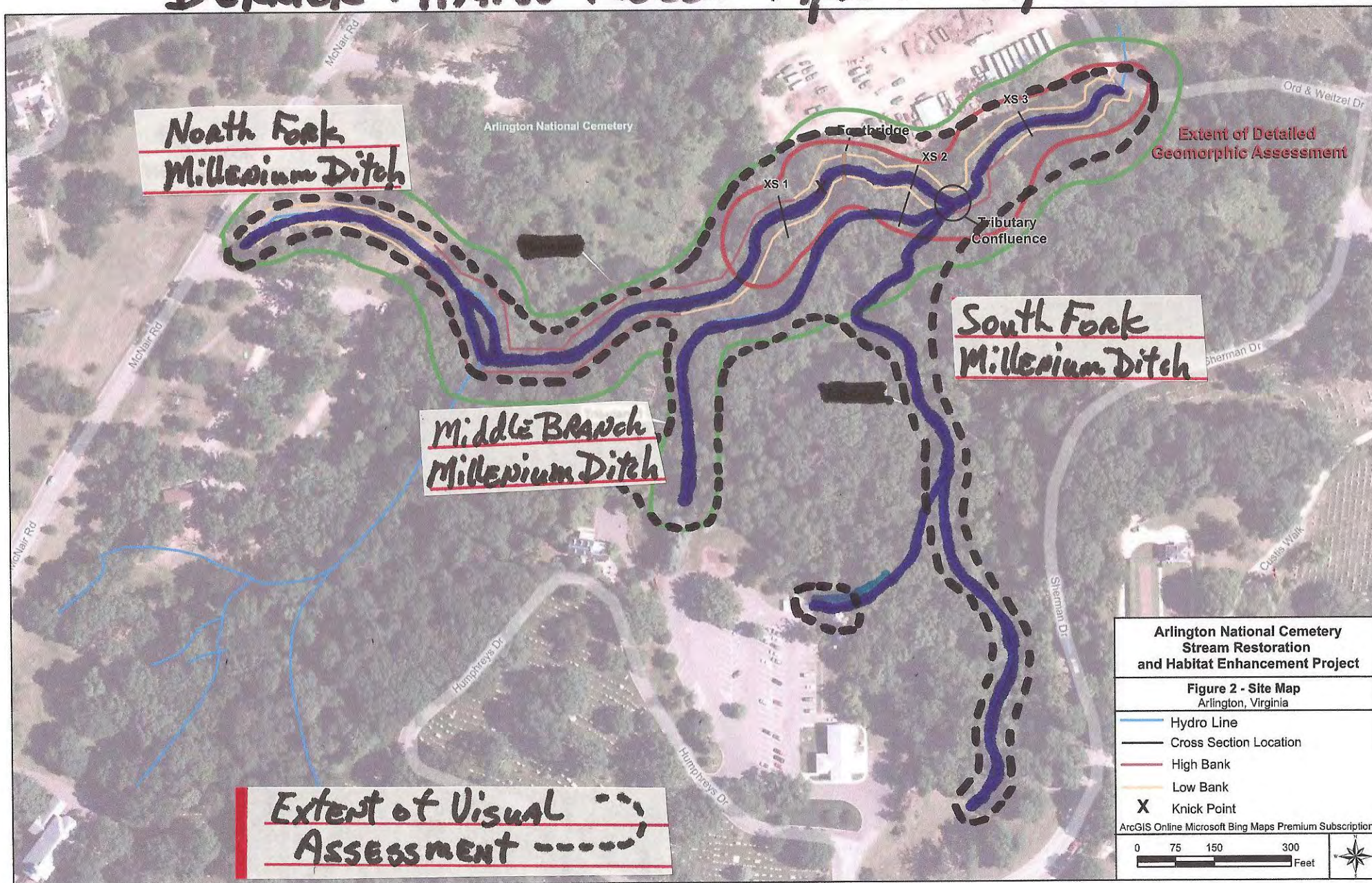
**NORTH BRANCH (NB) MILLENNIUM DITCH:**

**Tasks:** Demolish the footbridge and deposit material in the maintenance area?  
Remove markers from the following areas and deposit markers in the maintenance area??  
**Note:** zero location is the confluence of the North Branch with the Middle branch.

+22	- 40 observed markers
+63 to +68	- 2 observed markers
+79 to +92	- 23 observed markers
+137	- 1 observed marker
+177	- 1 observed marker
+186 to +195	- 89 observed markers (wingwalls on footbridge)
+300 to +300	- 7 observed markers
Way US	- 1 observed marker



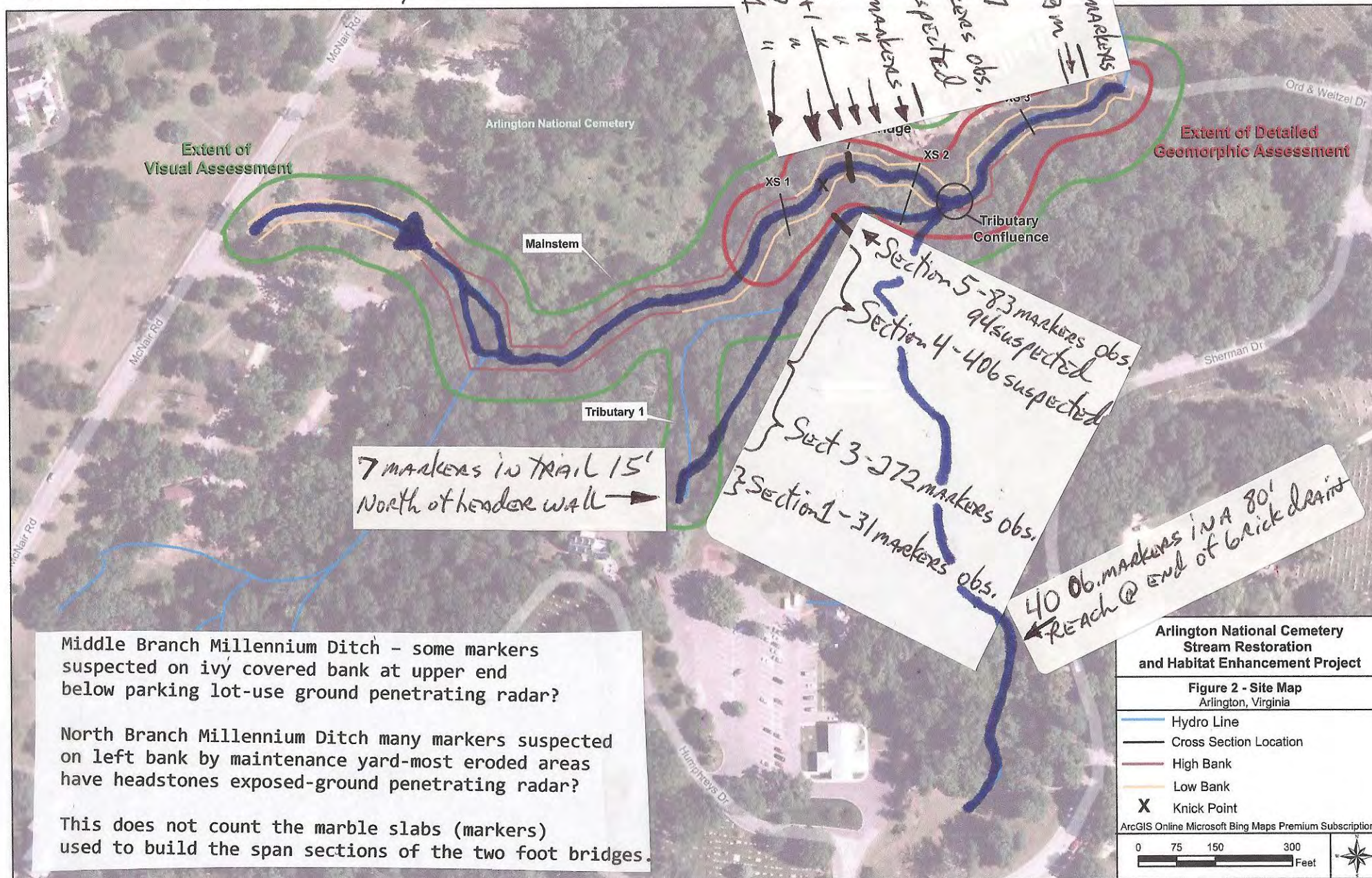
# Deprick & Hails Recon Apr 16-17, 2012





# Derrick & Hails Recon April 16-17, 2012

## Markers Observed or suspected



Middle Branch Millennium Ditch - some markers suspected on ivy covered bank at upper end below parking lot-use ground penetrating radar?

North Branch Millennium Ditch many markers suspected on left bank by maintenance yard-most eroded areas have headstones exposed-ground penetrating radar?

This does not count the marble slabs (markers) used to build the span sections of the two foot bridges.



## **APPENDIX B, SECTION 3**

### **SIEGRIST'S FIELD SKETCHES AND NOTES**



**From:** [Siegrist, Kevin W. MAJ NAO](#)  
**To:** [Sydnor, Cara Y NAO](#); [Conner, Susan L. NAO](#); [Haynes, John H. NAO](#); [Mahar, Sean M NAO Contractor](#)  
**Subject:** Field Data plus descriptions (UNCLASSIFIED)  
**Date:** Tuesday, July 31, 2012 3:42:04 AM  
**Attachments:** [Field Data 26 Jul 12.pdf](#)

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Classification: UNCLASSIFIED

Caveats: NONE

Cara, on top of this data was the written description of each section. Since there are 3 sections that required documentation, I will provide 3 written descriptions:

Section 1: Section 1 travels a from South West to North East for a length of 131'6" consisting of a channel made from concrete pavers and headstones. The channel is broken into two sections based off the channel wall construction material. One section is 29'7" long and the channel wall is made of concrete pavers that are roughly 1 1/2" thick and vary in width from 1'6" to 3'. The remaining channel has walls that are constructed of headstones that are roughly 2 1/2" thick and vary in width from 10" to 1'2". The channel itself has a base of 3'x3'x1 1/2" concrete pavers. Along the top of the wall, there is a concrete cap roughly 2 1/2" high and varying between 4" and 8" thick that ties the side walls together. Concrete is also used along the back side of the walls to various depths and periodically along the inside edge. The North East section of the channel gradually drops below ground level and continues for an unknown length due to sediment build up.

Section 2: Section 2 is a short section of headstone that is 8'8" long with a width of 1'1". This section consists of 4 visible headstones at various states of erosion laying next to and stacked upon one another. 3 of the 4 headstones have visible markings on them, two numbers "10357" and "10255", and one religious cross in a circle. Two of the headstones are connected to each other by a concrete grout.

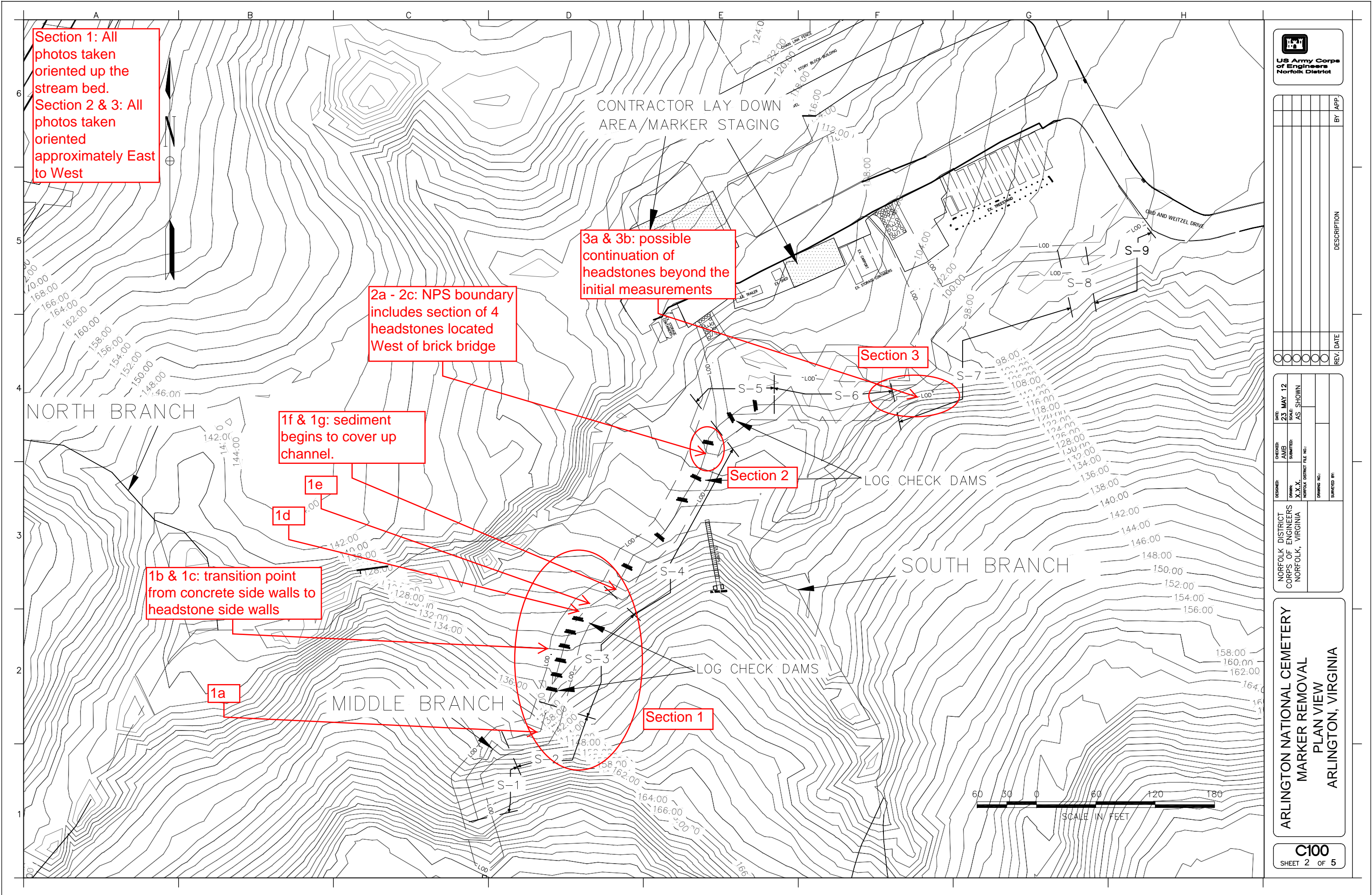
Section 3: Section 3 is a stream channel consisting of multiple headstones placed next to each other. The headstones are laid side by side and bordered by additional headstones at a raised angle to funnel water flow over the headstone base. The section visible is 7 headstones placed side by side with one side having 3 headstones to boarder and the other just having one. Both sides, and portions of this section, are immersed in the stream and covered by sediment. The visible section is 9' long by 7'2" wide and is oriented in East to West. As the stream is followed further East from Section 3, periodically portions of headstones are visible through the water and sediment placed in a manner that indicates a similar layout. This section spans 89' from the West most visible portion of Section 3 to the East most headstone that appears to form this same design.

Respectfully,

MAJ Kevin Siegrist  
Program Management Officer  
757-633-8552

Classification: UNCLASSIFIED

Caveats: NONE



Section 1: All photos taken oriented up the stream bed.  
Section 2 & 3: All photos taken oriented approximately East to West

2a - 2c: NPS boundary includes section of 4 headstones located West of brick bridge

3a & 3b: possible continuation of headstones beyond the initial measurements

1f & 1g: sediment begins to cover up channel.

1b & 1c: transition point from concrete side walls to headstone side walls

Section 1

Section 2

Section 3



REV	DATE	DESCRIPTION	BY	APP.

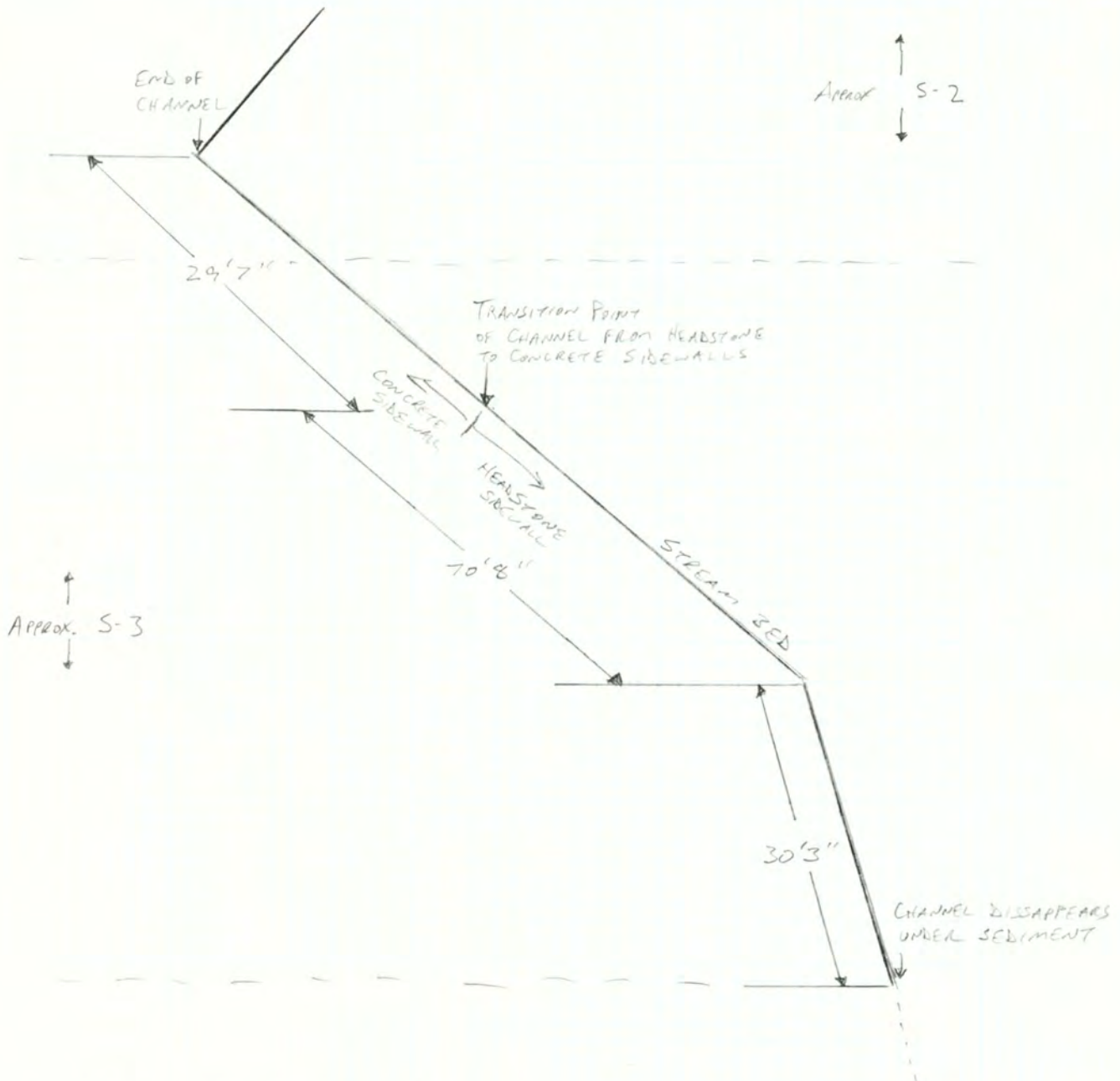
DESIGNED: NORFOLK DISTRICT	CHECKED: AMB	DATE: 23 MAY 12
DRAWN: X.X.X.	SUBMITTED: AS SHOWN	SCALE: AS SHOWN
NORFOLK DISTRICT FILE NO.:		DRAWING NO.:
SURVEYED BY:		

ARLINGTON NATIONAL CEMETERY  
MARKER REMOVAL  
PLAN VIEW  
ARLINGTON, VIRGINIA

**ENGINEERING DIV.****BRANCH****SECTION**PROJECT MUSEUM AREA HEADSTONE REMOVALSUBJECT NPS FIELD DOCUMENTATION REQ'SBY \_\_\_\_\_ DATE 26 JUL 72 CHECKED \_\_\_\_\_PAGE 1 OF 4SECTION 1: MEASURED DISTANCE FOR MAN-MADE CHANNEL

(APPROX)

\* NOT TO SCALE \*



NOTE: RECOMMEND ADJUSTING S-3 TO INCLUDE ENTIRE STRETCH OF CHANNEL. AFTER WALKING GROUND & COMPARING TO MAP/DRAWING, S-2 SEEMS TO INCLUDE A PORTION OF THE CHANNEL EVEN THOUGH THE STATION CHART SAYS IT DOESN'T.



1a: End of channel vic  
S-2 & S-3



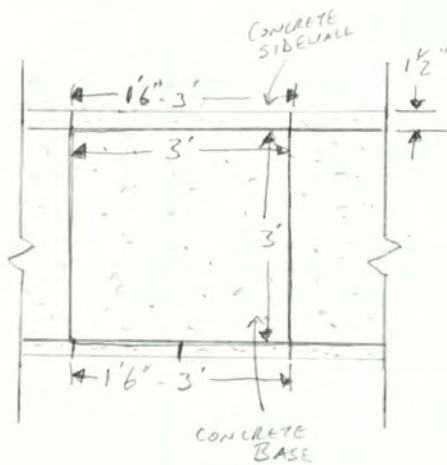
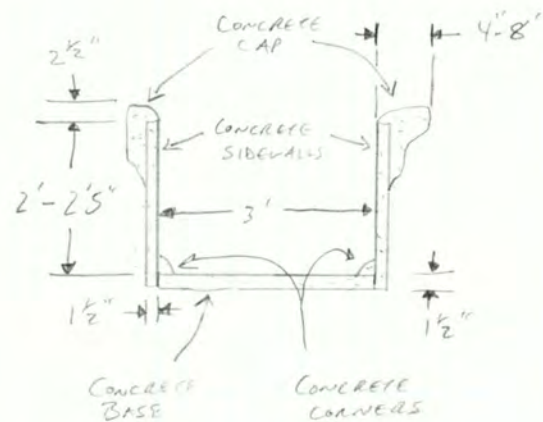
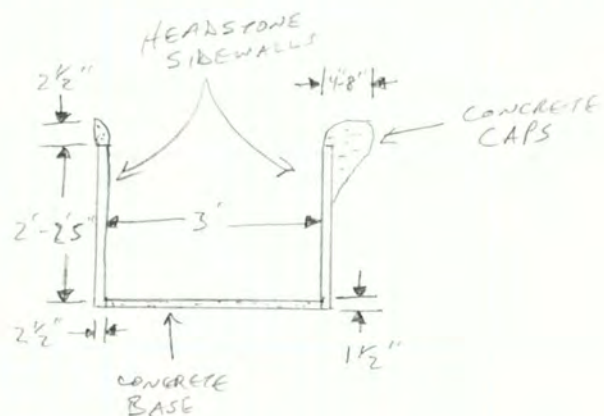
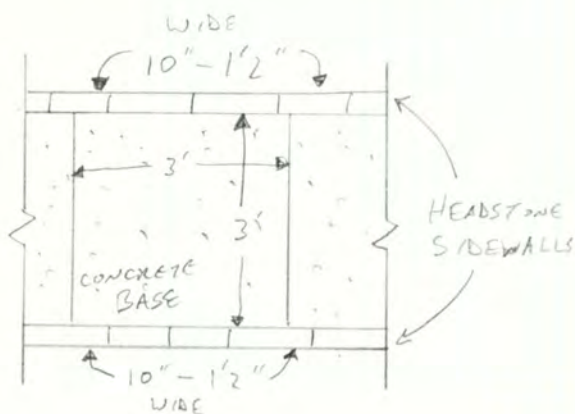
07/26/2012



**ENGINEERING DIV.****BRANCH****SECTION**

**PROJECT** MILLENNIUM AREA HEADSTONE REMOVAL **SUBJECT** NPS FIELD DOCUMENTATION REQ'S  
**BY** \_\_\_\_\_ **DATE** 26 JUL 12 **CHECKED** \_\_\_\_\_ **PAGE** 2 **OF** 4

SECTION 1: PROFILE & PLAN DETAILS OF CHANNELS  
 \* NOT TO SCALE \*

CONCRETE SIDEWALL CHANNELPLANPROFILEHEADSTONE SIDEWALL CHANNEL



1b: Channel transition  
point from concrete  
sidewalls to headstone  
sidewalls





1c: Channel transition  
point from concrete  
sidewalls to  
headstone sidewalls



07/26/2012



1d



07/26/2012



1e: looking up  
channel from  
transition point  
towards S-2



07/26/2012



1f: looking up  
channel from  
beginning of  
headstone sidewall  
section towards  
transition point.  
Channel disappears  
in sediment



07/26/2012



1g



07/26/2012



2a: headstones in  
reference to brick  
bridge. NPS and  
ANC property  
crosses between  
the two



07/26/2012



2b



07/26/2012



**ENGINEERING DIV.**

BRANCH

## SECTION

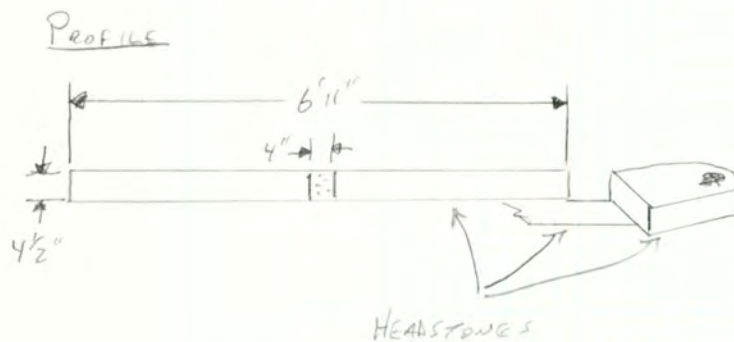
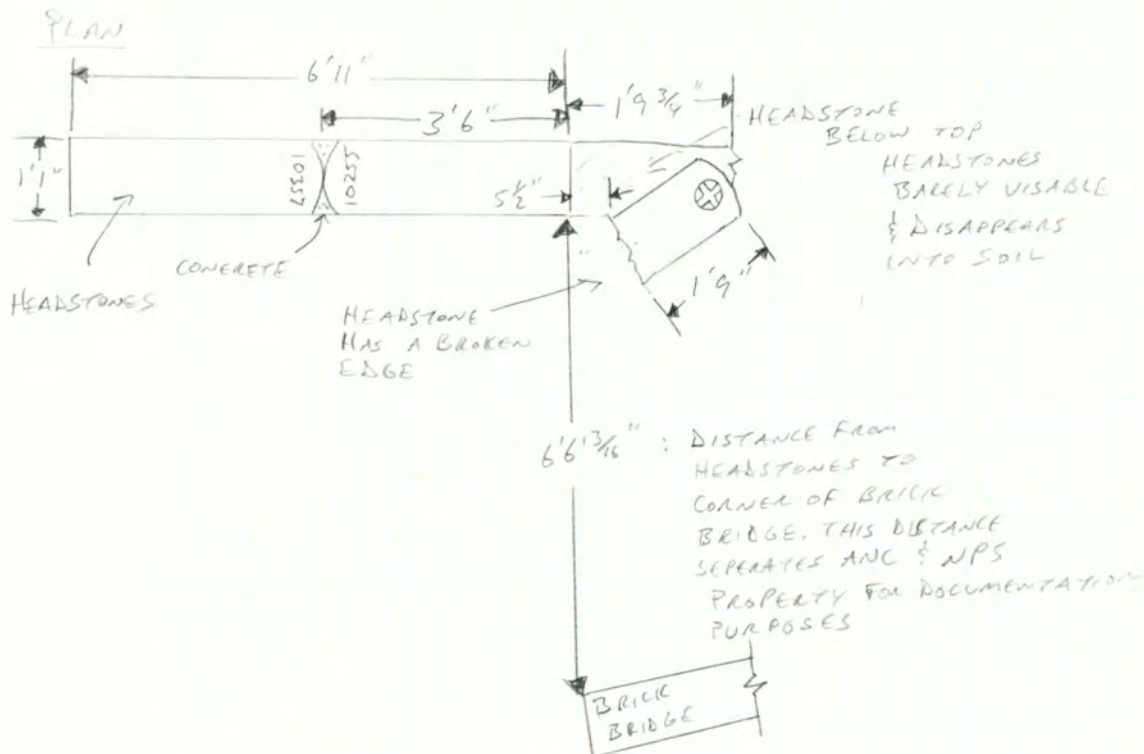
PROJECT MILLENNIUM AREA HEADSTART REMOVAL SUBJECT NPS FIELD DOCUMENTATION  
BY \_\_\_\_\_ DATE 26 JUL 12 CHECKED \_\_\_\_\_ PAGE 3 OF 4

PAGE 3 OF 4

## SECTION 2: PROFILE & PLAN DETAILS OF HEASTONES

(APPROX)

\* Not To Scale \*





2c



07/26/2012

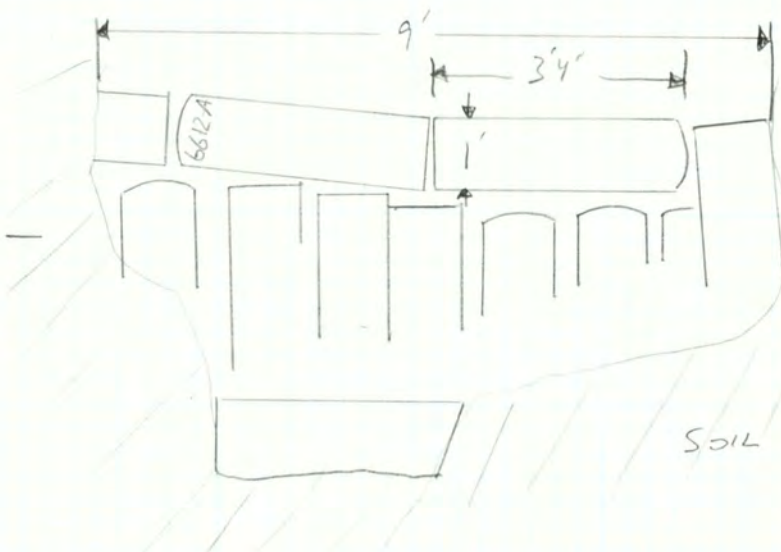
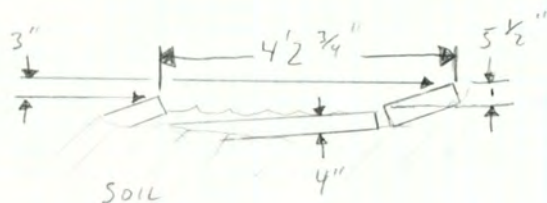


**ENGINEERING DIV.****BRANCH****SECTION**PROJECT MILLENNIUM AREA HEADSTONE REMOVALSUBJECT NPS FIELD DOCUMENTATIONBY \_\_\_\_\_ DATE 26 JUL 11 CHECKED \_\_\_\_\_PAGE 4 OF 4SECTION 3: HEADSTONE STREAM BED

\*NOT TO SCALE\*

PLAN

HEADSTONE  
STREAM BED  
APPEARS &  
DISAPPEARS FOR  
A TOTAL OF 89'  
FROM THE WESTERN  
TO EASTERN EDGE

PROFILE



3a



07/26/2012



3b



07/26/2012