AA 707-06 DPW N Cypress Branch Stream
Site Plan Restoration

MSA_S_1829-5520

Martin O'Malley
Governor

Anthony G. Brown
Lt. Governor

Margaret G. McHale
Chair

Ren Serey
Executive Director

STATE OF MARYLAND
CRITICAL AREA COMMISSION
CHESAPEAKE AND ATLANTIC COASTAL BAYS
1804 West Street, Suite 100, Annapolis, Maryland 21401
(410) 260-3460 Fax: (410) 974-5338
www.dnr.state.md.us/criticalarea/

January 25, 2010

Ms. Kelly Krinetz
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road
Annapolis, Maryland 21401

Re: North Branch of Cypress Creek Stream Restoration
Anne Arundel County Department of Public Works
Consistency Report

Dear Ms. Krinetz:

I have received final plans and a consistency report for the above-referenced project per the requirements of COMAR 27.02.02 - State and Local Agency Actions Resulting in Development of Local Significance on Private Lands or Lands Owned by Local Jurisdictions. The County Department of Public Works is proposing to restore 3,000 linear feet of the North Branch of Cypress Creek for the purpose of stabilizing the stream channel, improving the stream's water quality, creating tidal and nontidal habitat, preventing sedimentation of tidal waters, and providing riparian forest enhancement. A portion of the 9.18 acre project site is within the Critical Area. This 3.42 acre portion within the Critical Area is designated as Limited Development Area and is mostly within the 100-foot Buffer from the tributary stream.

Because the proposed disturbance within the Buffer is for the purpose of restoring the environmental condition of the stream and its riparian forest, the Buffer disturbance can be mitigated in place at a 1:1 ratio. The proposed native upland species of shrubs and trees that are shown on the planting plans within the Critical Area portion of the project sufficiently address this Buffer mitigation requirement.

Provided the County receives the other necessary State and local final permits, it appears that the proposed project is consistent with Anne Arundel County's Critical Area Program and will require no further Commission review or action.

We appreciate the opportunity to provide comments on this development proposal. If you have any questions, please contact me at 410-260-3481.

Sincerely,

Amber Widmayer
Natural Resources Planner

cc: AA 707-06

STATE OF MARYLAND
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February 21, 2007

Mr. Tom Burke
Anne Arundel County
Office of Planning and Zoning
2664 Riva Road, MS 6301
Annapolis, Maryland 21401

Re: North Cypress Branch Stream Restoration

Dear Mr. Burke:

As an interested party involved with the Joint Evaluation permit review for the Anne Arundel County Department of Public Works stream restoration project referenced above, this office received a copy of plans in November 2006. We have reviewed those plans and would like to offer the following comments for your consideration as the project moves forward.

1. As a stream restoration project undertaken by Anne Arundel County DPW, it appears that the project could be processed under COMAR 27.02.02 "State and Local Agency Actions Resulting in Development of Local Significance on Private Lands or Lands Owned by Local Jurisdictions". Therefore, DPW must obtain certification that the project is consistent with the local Critical Area Program.

2. One potential issue that Anne Arundel County should be prepared to address is the effect of the proposed project on the 100-foot Buffer. Within the Critical Area portion of the project area, North Cypress Branch stream is bounded on both sides by small grandfathered and developed lots. The alteration of the stream course will move the location of the 100-foot Buffer on these lots which may impact property owners and their need to obtain variances in the future.

We hope these comments will be of use to you. Please feel free to contact us should you have questions regarding process and approval of this project at 410-260-3475.

Sincerely,

Kate Schmidt

Kate Schmidt
Natural Resource Planner
cc: AA707-06

Jeffrey A. Wolinski
Consulting Ecologist
18941 Middletown Road
Parkton, MD 21120
(410) 329-2277

March 31, 2003

Ms. Kathy McCarthy
Wildlife & Heritage Division
Maryland Department of Natural Resources
Tawes State Office Building
Annapolis, MD 21401

RE: Rare, Threatened, and Endangered Species

Dear Ms. McCarthy:

I am working with a group of consultants in restoring the North Branch of Cypress Creek. This project began with tidal dredging and is now moving into the non-tidal watershed, and will include stream channel restoration, wetland enhancement and creation, and stormwater management retrofits. I have enclosed a preliminary map of our watershed action plan for your information.

We are aware that there are significant RTE plant species locales in the near vicinity of this project, mostly bog-type habitats. There is no evidence of these habitats or their representative species in this watershed, however, several old and breached dams are present in the stream valley (shown in red on the enclosed plan) that may have once created conditions suitable for certain bog flora.

Unfortunately, much of the stream valley is heavily infested with invasive exotic species, and the watershed is extremely developed, as you can see by the aerial photo underlying the plan. I do not hold out much hope that we have any RTE species in our project area.

Our restoration efforts will require state and federal permits, so we would like to make a formal request of your division to provide us with any records of RTE species in the vicinity of this project. If possible, we would like to have the information broken down as follows:

1) RTE records from the North Cypress Branch stream valley from Governor Ritchie Highway (MD Rte. 2) to tidal waters.
2) RTE records from the North Cypress Branch watershed as defined on the enclosed plan.
3) RTE records from the vicinity of this project in adjacent watersheds.

This information will allow us to look for potential RTE species in the immediate vicinity of the proposed stream restoration and other projects. Charlie Davis and I will be conducting a detailed plant community assessment of the stream valley early this summer, and we will make you aware of any significant findings. I also hope to have Bill Sipple to the area to gain his perspective.

Thank you in advance for your cooperation. If you have any questions or comments, please contact me at (410) 274-7678.

Sincerely,

Jeffrey Wolinski

Enclosure

cc: Keith Tate, P.E., Bayland Inc.
Rocky Powell, Clear Creeks Consulting
Charles Davis, Consulting Ecologist

North Cypress Branch Joint Permit Application:
Project Overview

PROJECT BACKGROUND

The Cypress Creek Waterway Improvement Project was initiated in 1999 by the Anne Arundel County Department of Public Works (DPW). The project at that time consisted of improvements to the Cypress Creek navigation channel, particularly the removal of accumulated sediment in the headwaters of Cypress Creek. The project also included pre- and post- monitoring to determine the effects of dredging on Submerged Aquatic Vegetation (SAV) and other shallow water habitats. The Cypress Creek project was one of two Anne Arundel County waterway projects that were part of a multi-agency task force SAV/dredging demonstration study that was completed in 2004.

Prior to the removal of accumulated sediment in tidal waters, DPW investigated for significant sediment sources as a part of the Cypress Creek Waterway Improvement project. This investigation, or retrofit assessment, was performed in February 1999 and focused on identifying areas of erosion within the watershed that, if corrected, would minimize future sedimentation and channel maintenance of the Cypress Creek navigation channel and improve water quality. Four sites were identified in the assessment as significant sediment sources to Cypress Creek: a blocked culvert under MD 648, a failing culvert and associated downstream channel degradation at MD 648, sediment accumulation surrounding a concrete channel south of McKinsey Road, and the degraded North Cypress Branch tributary from MD Route 2 downstream to tidal waters.

Based on the retrofit assessment recommendations, DPW initiated the North Cypress Branch Stream Restoration project for the purpose of providing an effective, long-term, self-sustaining sediment management plan for the Cypress Creek navigation channel. The project area includes North Cypress Branch and its tributaries from the culvert outfall at MD Route 2 downstream to the non-tidal/tidal water interface. The primary goals of the stream restoration project are expected to consist of:

- Restored channel stability,
- Restored and diversified floodplain & wetland habitats,
- Restored natural floodplain functions,
- Increased control of runoff from developed areas,
- Reduced sediment loadings from channel and upland sources,
- Improved storm water quality from the 485 acre highly impervious watershed upstream of the project, and
- Improved overall water quality of Cypress Creek.

Prior to beginning the North Cypress Branch Stream Restoration design, project research, inquiries, and extensive studies were performed to determine the extent and location of existing natural environmental features. Studies performed to identify and characterize the existing conditions consisted of a Geomorphic Assessment and Findings Report (April 2002), Wetland Delineation (September, 2003 and Re-flagged August, 2006), Plant Community Assessment (September, 2003), and Rapid Bioassessment (September, 2003).

The Geomorphic Assessment and Findings Report included a detailed channel morphology and stability assessment of North Cypress Branch and a field reconnaissance of the subwatershed to identify the location, nature, and cause of channel instability and sedimentation problems. The assessment confirmed that a significant portion of the North Cypress Branch watershed upstream of MD Route 2 consists of impervious surfaces that convey poorly controlled and poorly treated runoff directly to North Cypress Branch. Evidence of historical channel changes such as channelization, construction of impoundements, and channel maintenance activities were determined to be likely catalysts for the degraded condition of North Cypress Branch.

The Wetland Delineation yielded fifteen wetland systems (A through O) that are located adjacent to the North Cypress Branch mainstem and its tributaries. Vegetation within these wetlands can be generally described as those species typical of red maple forested wetlands. Evidence of historic disturbance to wetland soils is present although all wetlands identified support hydrophytic vegetation and display gleyed or low chroma colors at depths of ten inches or shallower. Hydrology sources consist of overland flow, overbank flows and groundwater discharge from a shallow local water table.

The Plant Community Assessment yielded four unique vegetative communities defined and delineated according to species composition, dominance, and cover class. Vegetative communities located within the project study area consisted of the stream valley, north slope uplands, tidal fringe, and the identified target habitats for potential rare, threatened and endangered species. The most dominant vegetative community is the riparian stream valley, which is characterized as a rich and diverse riparian forest. The north slope uplands make up the next most expansive community type and are defined as a mixed oak forest. This community is the most impacted by adjacent residential developments. The tidal fringe and the rare, threatened, and endangered species habitats are the smallest communities and were the most specifically delineated vegetative communities within the project area. A total of nine specimen trees, defined as trees having a radius at diameter breast height (DBH) of 30 inches or greater, were identified and mapped within the project area.

The Rapid Bioassessment was conducted to assess and document the current biological conditions of North Cypress Branch. The overall result of the assessment revealed marginal conditions for supporting aquatic life. All organisms collected are considered to be at least moderately tolerant of pollution and are

common to degraded and polluted waters. A total of twenty macroinvertebrates of six taxa and seven fish of two species were collected from within the sampling reach. The limited macroinvertebrate and fish species present within the sampling reach were attributed to degraded water quality conditions. Degraded water quality throughout North Cypress Branch is likely a consequence of the highly developed watershed (40% impervious) and a flashy urban flow regime with minimal existing stormwater management. Runoff from substantial adjacent areas of parking lots, roads, and other impervious surfaces is likely to contain elevated toxic compound levels and organic loadings that contribute to the degraded water quality of North Cypress Branch.

Based on the detailed findings of the field assessment, watershed reconnaissance, and other studies performed, two stream restoration design concepts were developed: Alternative 1: E4 channel design, and Alternative 2: DA channel design. Initially, Alternative 1, a stable E4 channel design, was chosen because it was the most cost efficient alternative that would adequately mitigate erosion and sedimentation to tidal waters. The primary goal of the proposed E4 design was to reduce sedimentation to tidal waters and to improve water quality and habitat throughout the severely degraded system.

During permitting of the E4 channel design, DPW requested evaluation of alternatives that would increase stormwater quality and habitat for the highly degraded North Cypress Branch watershed. A Feasibility Study (January 2006) was completed to determine other design options that would accomplish the new broadened project goals. As the design progressed and additional detailed studies were performed to define the extent of stream and habitat degradation, it was realized that the goals of the restoration project could be broadened to further improve water quality and enhance/provide new floodplain and wetland habitats. A concept plan for an innovative re-design of the NCB Stream Restoration Project was developed by the project team as part of the Feasibility Study that included anastomosed stream reaches combined with extensive floodplain and seepage wetlands that utilized that entire floodplain in order to gain significant increases in stormwater quality and habitat.

Based on the results of the Feasibiltiy Study, the revised concept plan was ultimately chosen as the design alternative to be implemented since it provides greater opportunities to incorporate more water quality treatment and new habitat features into the project.

PROJECT PERMITTING HISTORY

Throughout the investigation and design of the originally proposed Alternative 1 - E4 channel design, the project team coordinated with the regulatory agencies and prepared and submitted a Joint Permit Application in February 2005. Initial comments received on this permit application were addressed however, the application was ultimately placed on hold due to the ability to expand the restoration goals of the project. Since that time, the design team has prepared the

enclosed stream and ecological restoration design plans that include stable anastomosed channel sections and extensive floodplain and seepage wetlands for the North Cypress Branch project site. The current Joint Permit Application (attached) was prepared according to the revised habitat creation and enhancement and the proposed stream restoration channel design. The following table summarizes the temporary and permanent impacts expected as result of the proposed restoration project:

Table 1: Summary of Expected Impacts

	Temporary Impact	Permanent Impact	Total Impacts
Nontidal Wetland (SF)		153,899	153,899
25' State Nontidal Wetland Buffer (SF)		262,576	262,576
Tidal Wetland (SF)		16,415	16,415
Perennial Stream Length (LF)	2,948	———	2,948
**Intermittent & Ephemeral Stream Length (LF)*	2,813	———	2,813

**Due to potential changes in policy regarding regulated "waters of the U.S", all impacts to intermittent and ephemeral channels have been included in the permit application and are listed separately*

AVOIDANCE AND MINIMIZATION

Impacts expected to result will be due to a high level of intervention that is required to create a stable, self-maintaining channel. Specifically, at this level of intervention, creating a stable channel will require excavating, grading, and filling of waters of the U.S., nontidal wetlands, non-tidal wetland buffers, 100-year floodplain, and a small portion of tidally influenced wetlands. Since the proposed impacts to existing wetlands and Waters are unavoidable, they were minimized to the greatest extent practicable.

Impacts associated with the North Cypress Branch Stream Restoration were minimized first and foremost by the nature of the project since it involves habitat creation and enhancement as well as stream stabilization and restoration. For this reason, the completed project will result in greater environmental benefits than are currently being provided. The restoration of North Cypress Branch will also benefit Cypress Creek and the Magothy River located downstream of the project area. Therefore, the long term benefits of creating a stable, self-maintaining channel are expected to outweigh the ongoing impacts and environmental cost of continued degradation of North Cypress Branch. These environmental costs associated with

the continued degradation of North Cypress Branch consist of a greater disconnection between the stream channel and its floodplain, increased bank erosion, greater sediment supply to tidal waters, and loss of wetland riparian habitat.

Impacts were minimized initially by performing detailed assessments to identify natural environmental features within the project area. These assessments were used to guide the restoration design and avoid notable features identified within the project area. Notable features that were avoided consist of specimen trees and an area of high quality tidal fringe wetlands located near the confluence of North Cypress Branch and Cypress Creek. Although impacts to tidal wetlands are proposed, they were minimized to the extent practicable. An evaluation of the proposed design within the tidal wetlands showed that these impacts were necessary to merge the stream restoration design, guided by stable anastomosed channel dimensions and slope requirements to allow fish passage, with the wetland habitat design proposed along the tidal interface.

Impacts that are expected to result from channel excavation, grading, and filling were also minimized by incorporating the existing channel and floodplain features into the restoration design when possible. Examples of how existing channel and floodplain features were incorporated into the design consist of utilizing the existing channel alignment, designing floodplain microtopography using existing mid-channel and lateral bars, and limiting channel grading within the existing, naturally defined floodplain. These design techniques will not only minimize the amount of earthwork required for the project, but will also help preserve the existing, native vegetation seedbed. Invasive species currently present within the project area will be managed by species according to specifications to be developed for this site later during the design process.

CONCLUSION

The purpose of the North Cypress Branch Stream Restoration project is to restore channel stability of North Cypress Branch through providing and enhancing various aquatic, floodplain, and wetland habitats. The restoration project is also expected to benefit Cypress Creek through significantly reduced sedimentation that will also reduce future maintenance dredging. To accomplish the project goals, the stream restoration proposes unavoidable impacts associated with grading, filling, and excavating that are required within the existing 100-year floodplain, nontidal wetlands, tidal wetlands, and waters of the U.S. These impacts were minimized to the greatest extent practicable and are necessary in order to restore the existing degraded channel geometry of North Cypress Branch and accomplish the project goal. Overall, the benefits associated with the stream restoration and wetland enhancement and creation will outweigh the temporary construction impacts and will result in a net gain of diverse wetland habitat.

AA 707-06

NORTH BRANCH OF CYPRESS CREEK

STREAM RESTORATION

CRITICAL AREA CONSISTENCY REPORT

July 2007

Prepared for

Anne Arundel County Government
Department of Public Works

Prepared by

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite C
Hanover, Maryland 21076
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NORTH BRANCH OF CYPRESS CREEK
STREAM RESTORATION
CRITICAL AREA CONSISTENCY REPORT

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North Branch of Cypress Creek Stream Restoration

Critical Area Consistency Report

I. PROJECT LOCATION

The North Branch of Cypress Creek Stream Restoration is located in Severna Park, Anne Arundel County, Maryland. The project area includes North Cypress Branch and its tributaries from the culvert outfall at MD Route 2 downstream to the non-tidal/tidal water interface (Figure 1 – Vicinity Map). The project includes the restoration of 1179± linear feet of streams, creation of a 2.63± acre water quality wetland, 1.36± acres of wetland restoration/creation, and 1.74± acres of upland forest creation.

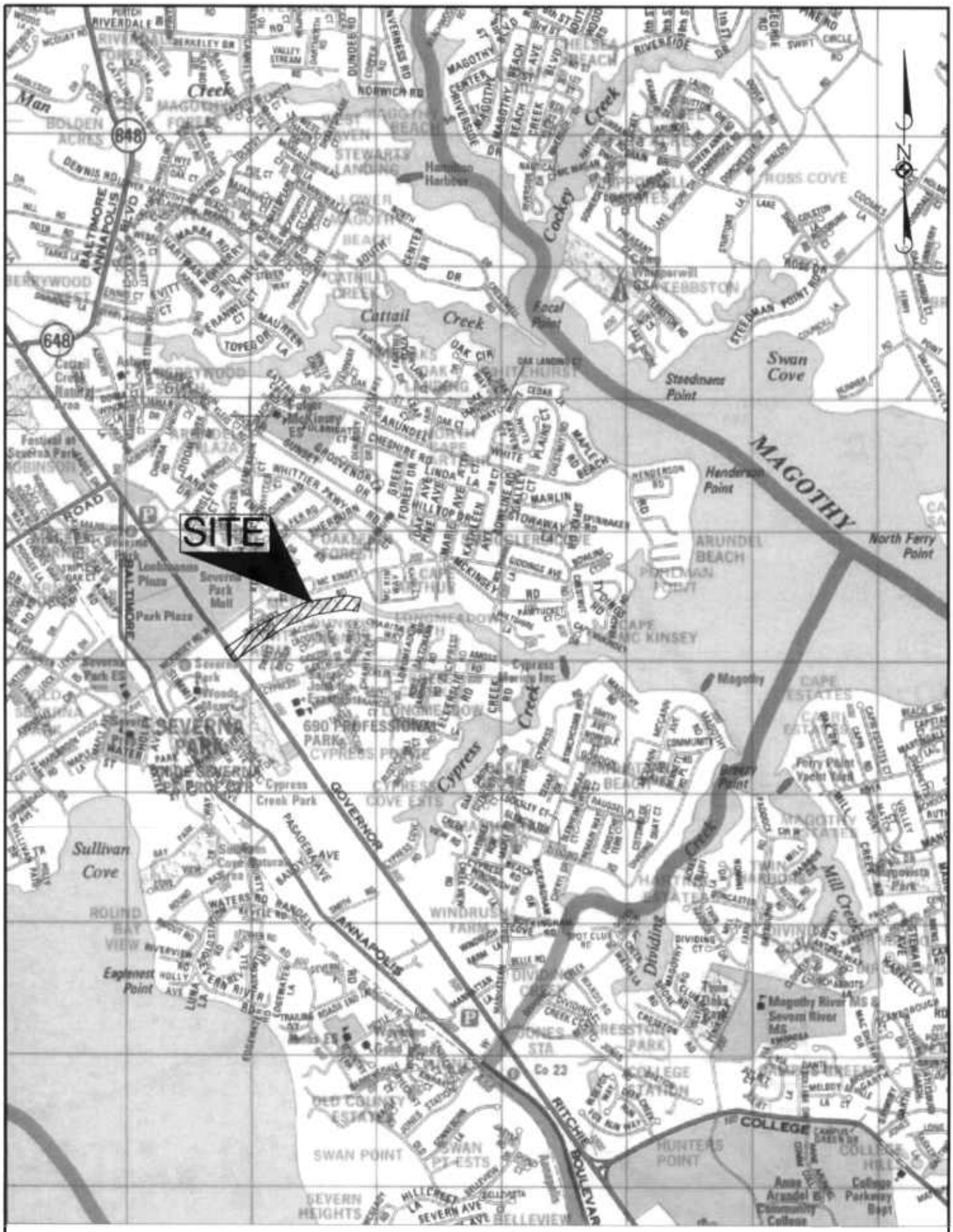
II. PROJECT HISTORY

The Cypress Creek Waterway Improvement Project was initiated in 1999 by the Anne Arundel County Department of Public Works (DPW). The project at that time consisted of improvements to the Cypress Creek navigation channel, particularly the removal of accumulated sediment in the headwaters of Cypress Creek. Prior to the removal of accumulated sediment in tidal waters, DPW investigated the subwatershed for significant sediment sources as a part of the Cypress Creek Waterway Improvement project. This investigation, or retrofit assessment, was performed in February, 1999 and focused on identifying areas of erosion within the watershed that, if corrected, would minimize future sedimentation and channel maintenance of the Cypress Creek navigation channel and improve water quality. Based on the retrofit assessment recommendations, DPW initiated the North Cypress Branch Stream Restoration project for the purpose of providing an effective, long-term, self-sustaining sediment management plan for the Cypress Creek navigation channel. The restoration project will be constructed using a grant received from the State Highway Administration (SHA) Transportation Enhancement Program.

Currently, final design plans for the proposed project are nearing completion and all required County and State permitting processes have been initiated. The final plans are expected to be submitted to the SHA for review and approval by the end of August ,2007. A copy of the most current grading and planting plans are included as Attachment 2.

III. PROJECT DESCRIPTION AND PURPOSE

The proposed project is an ecological restoration of North Cypress Branch, its associated riparian community and tributaries. The primary purpose of the project is to create a self-sustaining sediment management plan for the Cypress Creek



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VICINITY MAP
NORTH CYPRESS BRANCH
STREAM RESTORATION

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navigation channel. Anne Arundel County is also utilizing this opportunity to restore and create numerous upland and wetland habitats. Habitats proposed for the project area are similar to those that are known to be previously located within this area of Anne Arundel County but were altered as a result of significant changes in land use. Benefits of the ecological restoration project will result in the following:

- Restored channel stability;
- Restored and diversified floodplain & wetland habitats;
- Restored vegetative diversity and communities;
- Restored natural floodplain functions;
- Increased control of runoff from developed areas;
- Reduced sediment loadings from channel and upland sources;
- Improved storm water quality from the 485 acre highly impervious watershed upstream of the project; and
- Improved overall water quality of Cypress Creek.

IV. NATURAL RESOURCES INVENTORY

Prior to beginning the North Cypress Branch Stream Restoration design, project research, inquiries, and extensive studies were performed to determine the extent and location of existing natural environmental features. Studies performed to identify and characterize the existing conditions consisted of a Geomorphic Assessment and Findings Report (April, 2002), Wetland Delineation (September, 2003 and Re-flagged August, 2006), Plant Community Assessment (September, 2003), and Rapid Bioassessment (September, 2003).

The Geomorphic Assessment and Findings Report included a detailed channel morphology and stability assessment of North Cypress Branch and a field reconnaissance of the subwatershed to identify the location, nature, and cause of channel instability and sedimentation problems. The assessment confirmed that a significant portion of the North Cypress Branch watershed upstream of MD Route 2 consists of impervious surfaces that convey poorly controlled and poorly treated runoff directly to North Cypress Branch. Evidence of historical channel changes such as channelization, construction of impoundments, and channel maintenance activities were determined to be likely catalysts for the degraded condition of North Cypress Branch.

The Wetland Delineation yielded fifteen wetland systems (A through O) that are located adjacent to the North Cypress Branch mainstem and its tributaries. Vegetation within these wetlands can be generally described as those species typical of red maple forested wetlands. Evidence of historic disturbance to wetland soils is present although all wetlands identified support hydrophytic vegetation and display gleyed or low chroma colors at depths of ten inches or shallower. Hydrology sources consist of overland flow, overbank flows and groundwater discharge from a shallow local water table.

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The following table summarizes the natural environmental features identified within the North Branch of Cypress Creek Stream Restoration project area.

NATURAL FEATURES/DESIGNATIONS

Feature/Designation	*Identified*	*Not Identified*
a) Mean High Tide Shoreline[1]	X	
b) Tidal Wetlands[1]	X	
c) Anadromous Fish Spawning Waters		X
d) Submerged Aquatic Vegetation		X
e) Tributary Streams	X	
f) 100-foot Critical Area Buffer	X	
g) Nontidal Wetlands[1]	X	

h) Expanded Nontidal Wetlands Buffer	X	
i) Hydric Soils	X	
j) Steep Slopes	X	
k) Rare, Threatened or Endangered Species		X
l) Riparian Forest/FIDS Habitat		X
m) Colonial Water Bird Nesting Site		X
n) Waterfowl Concentration Area		X
o) Habitats of Local Significance		X
p) Natural Heritage Area		X
q) Trees and Woodland Areas	X	

[1]Due to the nature of the proposed restoration, the project area is partially located below the mean high tide shoreline. Restoration work proposed below the mean high tide shoreline is being coordinated with the Maryland Department of the Environment (MDE) Tidal Division to obtain a tidal license. Temporary disturbances to non-tidal streams/wetlands are being coordinated with the MDE Non-Tidal Division to obtain the appropriate Federal/State permits.

V. AGENCY INQUIRIES

BayLand Consultants sent inquiry letters on behalf of DPW to the Maryland Department of Natural Resources, Natural Heritage Program and the U.S. Fish and Wildlife Service requesting the known presence of any rare, threatened or endangered species on or within the North Branch of Cypress Creek Stream Restoration project site. A response from the Fish and Wildlife Service was received on June 14, 2006 and stated that there are no federally proposed or listed endangered or threatened species known to exist within the project impact area. A response from the Natural Heritage Program was received on April 14, 2003 and requested a Rare, Threatened and Endangered Species survey of the project area. The survey was completed and no species of concern were identified within the project area. The survey was submitted on September 5, 2006 and a second response from the Natural Heritage Program was received on March 15, 2007 stating that no additional coordination regarding State or Federal records for rare, threatened or endangered species was required (Attachment 3).

VI. CRITICAL AREA REQUIREMENTS

Forest Mitigation

Approximately 4.24 acres of the project area are located within the Chesapeake Bay Critical Area. This area is currently forested and is proposed to be cleared in order to complete the restoration. The reforestation plantings are proposed at a 1:1 ratio and will provide for a dense canopy, understory, shrub, and herbaceous layers to develop. Due to the current

condition of the existing forest and presence of invasive species, the reforestation plan provided will actually exceed the required 1:1 reforestation ratio. Additionally, all temporary stabilization seed consists of native herbaceous species that will enable quick stabilization of disturbed areas and not compete with the proposed permanent vegetation. The proposed reforestation plantings are consistent with forest mitigation critical area criteria.

Impervious Surfaces

There are no impervious surfaces within the North Cypress Branch project area, nor are any proposed. Therefore, impervious surfaces do not exceed 15% of the total project area and the proposed restoration is consistent with the established critical area impervious surface limits.

Impacts to Habitat Protection Areas

Temporary impacts to Habitat Protection Areas (waters of the U.S., non-tidal wetlands, 100-Foot Buffer, etc.) are necessary to prevent further stream and floodplain erosion that are actively destroying the existing habitat within the project area. Since temporary impacts proposed to restore North Cypress Branch will result in a net gain of stable, diverse Habitat Protection Areas, the project is consistent with Critical Area regulations.

VII. SUMMARY

In conclusion, the North Branch of Cypress Creek Stream Restoration project will require temporary impacts to environmental features with the Chesapeake Bay Critical Area. Although a high level of intervention is required to create a stable, self-maintaining channel and adjacent riparian and upland habitat native to this portion of the Critical Area within Anne Arundel County, the overall project is consistent with the intent and requirements of the Critical Area regulations.

707-06

BayLand Consultants & Designers, Inc.

"Integrating Engineering and Environment"

November 13, 2009

Mr. Tom Burke
Department of Inspections and Permits
Permit Application Center
2664 Riva Road
Annapolis, Maryland 21401

RE: North Branch of Cypress Creek Stream Restoration
Anne Arundel County Department of Public Works

Dear Mr. Burke:

The following information is being provided in response to the Critical Area Commission comment letter dated February 21, 2007 and forwarded by your office to BayLand Consultants & Designers, Inc. on May 15, 2007. Many design changes have occurred since the original submittal to address community concerns, agency comments and budget constraints. All design changes are complete and the project plans are being submitted to resume agency reviews and obtain the required approvals. Responses to comments are as follows:

1. A revised set of plans for the North Branch of Cypress Creek Stream Restoration is enclosed for your review. The total project area is approximately 9.18 acres and encompasses existing riparian forest in varying widths adjacent to tributaries and the mainstem of the North Branch of Cypress Creek. Approximately 3.42 acres of the total restoration project area lie within the Critical Area. Goals of the restoration project are to stabilize the stream channel, improve water quality, create various non-tidal and tidal wetland habitats, and prevent sedimentation of tidal waters. Although in order to accomplish these goals temporary impacts to the Critical Area are required, we believe the goals of the restoration project are consistent with the Local Program. All disturbed areas will be revegetated using native trees, shrubs, herbs and seed mixes appropriate for the various proposed wetland habitats. A completed Consistency Report for Local Government Projects form has been included for your approval.

2. The North Branch of Cypress Creek project area is located within the 100-year floodplain and utilizes the location of the existing stream channel to the greatest extent possible. Significant changes, if any, to the 100-feet buffer located on private properties are not expected.

1321 Mercedes Drive, Suite C Hanover, Maryland 21076
Phone: (410) 694-9401 Fax: (410) 694-9405
email: bayland@baylandinc.com

Should you have any questions or need additional information, please feel free to contact me at (410) 694-9401.

Sincerely,

Gabrielle S Myers

Ms. Gabrielle Myers
Project Scientist

Enclosures
GSM/jm

cc: Ms. Kate Schmidt/CAC
Mr. Dennis McMonigle/AA County DPW
Ms. Meghan Powell/MDSHA

P:\5_2008_NCB Restoration\15 Revise Plans, Specs, CE\2009 SUBMITTAL CORRESPONDENCE\DRAFT Response to CAC Comments-Oct 2009.doc

Consistency Report for Local Government Projects

Project Name: North Branch of Cypress Creek	Jurisdiction: Anne Arundel County
Project Description: Nearly 3,000 linear feet of stream restoration of the North Branch of Cypress Creek, wetland creation and riparian forest enhancement for the purpose of improving water quality and preventing sedimentation into tidal waters.	
Local Agency proposing project: Anne Arundel County, Department of Public Works Contact Name and Phone Number: Dennis McMonigle, 410-222-7908	
Project Location (include street address, tax map and parcel number): Intersection of MD Route 2 and McKinsey Road, Tax map 32 and Parcel 910.	
Critical Area acreage and designation: 100-year Floodplain: Total project area = 9.18 acres, of which 3.42 acres are within the Critical Area, LDA	

Project Data			
Existing forest/woodland/trees:	3.42 ac	% of site:	100%
Proposed clearing:	3.42 ac	% of existing forest:	100%
Mitigation to be provided: Reforestation of entire project area using native species			
Planting location & species (also show on site plan): See enclosed plans - Sheets PL1-9			
Existing impervious surface:	0	% of site:	0%
Proposed new impervious:	0		
Total impervious surface:	0		
If the % of impervious cover excees the permitting amout in the LDA or RCA, the project may need a Conditional Approval from the Critical Area Commission. Please contact your Commission planner for assistance.			
Total Area Disturbed:	3.42 acres		
Stormwater Management: (If site is in the IDA, the 10% worksheets must be attached. Otherwise, local stormwater requirements must be addressed.) Not applicable			
Has project received local approval of SWM and sediment and erosion control plans? SWM - Not applicable, Sediment & Erosion Control - Under Review			
Buffer impacts?		Is project water dependent?	N/A
If there are Buffer impacts proposed and the project is not water dependent, the project may need a Conditional Approval from the Critical Area Commission. Please contact your Commission planner for assistance.			
Other Habitat Protection Areas: Colonial Nesting Waterbird site? Yes ☐ No ☑ Waterfowl Staging Area? Yes ☐ No ☑ Endangered / threatened species? Yes ☐ No ☑ Forest Interior Dwelling Bird Habitat? Yes ☐ No ☑ Anadromous Fish Propagation Waters? Yes ☐ No ☑			
Non-tidal Wetland Impacts? Yes ☑ No ☐		If yes, MDE permit #: *Pending 05-NT-0056/200562464*	
Tidal Wetland Impacts? Yes ☐ No ☑		If yes, MDE permit #:	

In accordance with COMAR 27.02.02, we hereby certify that this local agency project is consistent with the requirements of the local Critical Area Program.

_____ *(Signature)*

Please sign above, attached the site plan to this report and submit to the Critical Area Commission at 1804 West St., Suite 100, Annapolis, MD 21401

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS
ANNE ARUNDEL COUNTY, MARYLAND

PROJECT NO. Q509400
PROPOSAL NO. Q509401

SITE DATA

1. OWNER AND DEVELOPER: ANNE ARUNDEL COUNTY
2. TYPE OF DEVELOPMENT: COUNTY CAPITAL IMPROVEMENT PROJECT
3. CURRENT USE: RESIDENTIAL (OPEN SPACE)
4. TOTAL SITE AREA: 9.19 ACRES
5. TOTAL AREA OF DISTURBANCE: 9.19 ACRES
6. TOTAL AREA OF DISTURBANCE WITHIN THE CRITICAL AREA 3.64 ACRES
7. AREA VEGETATIVELY STABILIZED: 9.19 ACRES
8. AREA OF NON-TIDAL WETLAND DISTURBANCE: 3.53 ACRES (TEMPORARY IMPACT)
9. AREA OF NON-TIDAL WETLAND BUFFER DISTURBANCE: 6.02 ACRES (TEMPORARY IMPACT)
10. ESTIMATED VOLUME OF CUT: 12,947± C.Y.
11. ESTIMATED VOLUME OF FILL: 6,812± C.Y.

*ALL QUANTITIES ARE ESTIMATED AND SHOULD NOT BE USED FOR PRICING.

GENERAL NOTES

1. THE 2' CONTOURS OF THE TOPOGRAPHIC MAP ARE FROM 2002 ANNE ARUNDEL COUNTY AERIAL PHOTOGRAPHY AND THE 1' CONTOURS ARE FROM BAYLAND FIELD RUN SURVEY PERFORMED SUMMER 2003 AND SUMMER 2006.

2. HORIZONTAL CONTROL ESTABLISHED FROM CLOSED LOOP TRAVERSE. VERTICAL CONTROL ESTABLISHED FROM ANNE ARUNDEL COUNTY BENCHMARKS, (NAD 83 DATUM).

GENERAL CONSTRUCTION NOTES

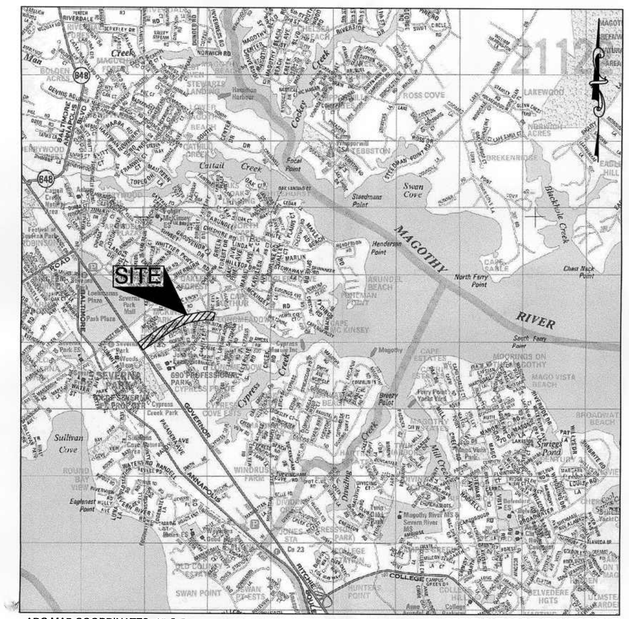
1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS JULY 2006 "STANDARD SPECIFICATIONS FOR CONSTRUCTION", "STANDARD DETAILS FOR CONSTRUCTION" AND THE CONSTRUCTION DOCUMENTS EXCEPT WHERE OTHERWISE INDICATED ON THE CONSTRUCTION DOCUMENTS. THE ANNE ARUNDEL COUNTY STANDARD DOCUMENTS ARE AVAILABLE ON-LINE AT www.aadpw.org/design.
2. THE CONTRACTOR SHALL NOTIFY THE ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS (222-7055) FIVE (5) DAYS PRIOR TO STARTING WORK UNDER THIS CONTRACT.
3. THE CONTRACTOR SHALL NOTIFY MISS UTILITY (1-800-257-7777) AT LEAST THREE (3) WORK DAYS PRIOR TO STARTING WORK ON THIS PROJECT.
4. THE CONTRACTOR SHALL NOTIFY THE ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS TRAFFIC ENGINEERING DIVISION (222-7331) AT LEAST TWO (2) DAYS PRIOR TO STARTING ANY WORK ON THIS PROJECT.
5. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS OWN SATISFACTION BEFORE STARTING CONSTRUCTION. THE DEPARTMENT OF PUBLIC WORKS DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION GIVEN. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS. ANY DAMAGE TO THEM DUE TO HIS NEGLIGENCE SHALL BE REPAIRED IMMEDIATELY AT NO ADDITIONAL EXPENSE TO THE COUNTY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF HIS CONSTRUCTION WITH THE CONSTRUCTION OF OTHER CONTRACTORS.
7. UNLESS OTHERWISE INDICATED ON THESE DRAWINGS, PIPE ELEVATIONS REFER TO INVERTS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION IN KIND OF ANY PRIVATE PROPERTY DAMAGED OR REMOVED DURING CONSTRUCTION. WHERE UTILITIES CROSS PRIVATE PROPERTY, ALL DISTURBED AREAS SHALL BE STABILIZED AS SPECIFICALLY NOTED ON THESE PLANS. ALL PLANTINGS WITHIN RIGHTS OF WAY SHALL BE PROTECTED BY THE CONTRACTOR UNLESS REMOVAL IS REQUIRED TO FACILITATE CONSTRUCTION. THE CONTRACTOR SHALL MARK TREES TO BE REMOVED & OBTAIN APPROVAL FROM THE COUNTY PRIOR TO REMOVAL.
9. EXCESS EXCAVATION SHALL BE DISPOSED OF IN AN OFF-SITE AREA WHICH HAS BEEN APPROVED BY THE ANNE ARUNDEL COUNTY SOIL CONSERVATION DISTRICT.
10. EXISTING STORM DRAIN PIPES AND STRUCTURES WILL NOT BE DISTURBED OR REMOVED UNLESS SPECIFICALLY NOTED ON THE PLANS AND DIRECTED BY THE ENGINEER.
11. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK.

SEQUENCE OF CONSTRUCTION

1.	CONTRACTOR IS TO NOTIFY MDE INSPECTIONS AND COMPLIANCE (410-537-3510) AT LEAST TEN (10) DAYS PRIOR TO COMMENCING WORK.	1 DAY
2.	CONTRACTOR IS TO NOTIFY THE ANNE ARUNDEL COUNTY DEPARTMENT OF INSPECTION AND PERMITS (410-222-7780) FORTY-EIGHT (48) HOURS PRIOR TO COMMENCING WORK.	1 DAY
3.	COMPLETE ALL OTHER NOTIFICATIONS AS DETAILED IN THE GENERAL CONSTRUCTION NOTES.	1 DAY
4.	HOLD A PRE-CONSTRUCTION MEETING ON SITE WITH THE GRADING INSPECTOR, CONSTRUCTION SUPERVISOR, CONTRACTOR AND AGENCY PERSONNEL TO REVIEW SEDIMENT CONTROL REQUIREMENTS AND SEQUENCE OF CONSTRUCTION. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.	1 DAY
5.	INSTALL BLAZE ORANGE FENCE (B.O.F.)AND CLEAR AND GRUB MINIMUM AREA REQUIRED TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1- CONSTRUCTION ACCESS NO. 1A, 1B, AND 1C, THE HEADWATER WETLAND AND TRIBUTARY J.	7 DAYS
6.	INSTALL EROSION AND SEDIMENT CONTROL DEVICES FOR PHASE 1- CONSTRUCTION ACCESS 1A, 1B, AND 7 DAYS. 1C, HEADWATER WETLAND AND TRIBUTARY J.	
7.	CONSTRUCT PHASE 1- CONSTRUCTION ACCESS NO. 1A, 1B, AND 1C, HEADWATER WETLAND, AND TRIBUTARY J, AND VEGETATIVELY STABILIZE.	45 DAYS
8.	INSTALL B.O.F. AND CLEAR AND GRUB MINIMUM AREA TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 2 CONSTRUCTION ACCESS #2.	3 DAYS
9.	INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 2- CONSTRUCTION ACCESS #2.	1 DAYS
10.	CONSTRUCT PHASE 2- CONSTRUCTION ACCESS #2.	2 DAYS
11.	INSTALL B.O.F. AND CLEAR AND GRUB MINIMUM AREA TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 3- MAINSTEM AND TRIBUTARIES A, B, AND D.	15 DAYS
12.	INSTALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 3- MAINSTEM AND TRIBUTARIES A, B, AND D.	15 DAYS
13.	CONSTRUCT PHASE 3- MAINSTEM AND TRIBUTARIES A, B, AND D, AND VEGETATIVELY STABILIZE.	90 DAYS
14.	VEGETATIVELY STABILIZE ANY REMAINING DISTURBED AREAS.	7 DAYS
15.	REMOVE ALL REMAINING TEMPORARY SEDIMENT CONTROL MEASURES WITH THE PERMISSION OF THE SEDIMENT CONTROL INSPECTOR.	7 DAYS
16.	MAINTENANCE BY THE PROPERTY OWNER AND/OR DEVELOPER.	

BEST MANAGEMENT PRACTICES FOR WORKING IN NON-TIDAL WETLANDS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS ARE TO BE STOCKPILED OR STORED IN THE WETLAND OR BUFFER.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF THE NONTIDAL WETLAND.
3. DO NOT USE THE EXCAVATED MATERIALS AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS , UNSIGHTLY DEBRIS, TOXIC MATERIAL OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED , USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO THE NONTIDAL WETLANDS OR BUFFER.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS IN EXCESS OF NONTIDAL WETLANDS LOST UNDER THE ORIGINAL STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE WETLAND AND BUFFER SHALL BE OF THE FOLLOWING RECOMMENDED SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATION OF NONTIDAL WETLANDS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT IMPORTANT AQUATIC SPECIES , IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM AS FOLLOWS: CLASS 1 WATER-IN STREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD OF MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERT(S) SHALL BE CONSTRUCTED AND ANY RIP-RAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.



ADC MAP COORDINATES: 15 C-5

VICINITY MAP

SCALE: 1"=2000'

COPYRIGHT ADC THE MAP PEOPLE
PERMITTED USE NUMBER 20809176

BEFORE YOU DIG CALL
1-800-257-7777 OR DIAL 811

MISS UTILITY
CALL BEFORE YOU DIG

LEGEND

PROPERTY LINE		PR. SPOT ELEVATION	15X7	PR. FLOODPLAIN GRADE CONTROL	
1' ELEVATION CONTOUR	— 1 —	STABILIZED CONST. ENTRANCE	SCE	PR. BOULDER COBBLE CASCADE	
5' ELEVATION CONTOUR	— 5 —	PR. ELEVATION CONTOUR	10	PR. COBBLE WEIR	
EX. THALWEG MAINSTEM		LIMIT OF DISTURBANCE/ BLAZE ORANGE FENCE	—BOF— —LOD—	PR. SAND BERM	
EX. TRIBUTARY		PR. LOG GRADE CONTROL			
EX. TREELINE		PR. STEP LOG			
EX. BORING LOCATION	BR-14	PR. BOULDER GRADE CONTROL			
EX. SPECIMEN TREES					

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6-9	GS4-7	TRIBUTARY GEOMETRY & STAKEOUT
10	HW1	HEADWATER WETLAND GRADING PLAN
11-14	MG1-4	MAINSTEM GRADING & PROFILES
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18-20	TG4-6	TRIBUTARY PROFILES
21-36	MS1-16	MAINSTEM CROSS SECTIONS
37	HWD1	HEADWATER WETLAND DETAILS
38	HWD 2	HEADWATER WETLAND DETAILS - BORINGS
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42	SQ1	SEQUENCE OF CONSTRUCTION
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46	TCP1	TRAFFIC CONTROL PLAN
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52-55	PL5-5	TRIBUTARY & SAND PENINSULAS PLANTING PLAN

CONSULTANT'S CERTIFICATION

THE DEVELOPER'S PLAN TO CONTROL SILT AND EROSION IS ADEQUATE TO CONTAIN THE SILT AND EROSION OF THE PROPERTY COVERED BY THE PLAN. I CERTIFY THAT THIS PLAN OF EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THIS SITE, AND WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALVERT COUNTY SOIL CONSERVATION DISTRICT PLAN SUBMITTAL GUIDELINES AND THE CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SEDIMENT AND EROSION CONTROL. I HAVE REVIEWED THIS EROSION AND SEDIMENT CONTROL PLAN WITH THE OWNER/DEVELOPER.

NAME: SEPEHR BAHARLOU
P.E. LICENSE #: 21194

FIRM NAME: BAYLAND CONSULTANTS & DESIGNERS, INC.

ADDRESS: 1321 MERCEDES DRIVE, SUITE C
HANOVER, MARYLAND 21076

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO 21194, EXPIRATION DATE: 4/20/10.

SIGNATURE

DATE

STANDARD RESPONSIBILITY NOTES

I / WE CERTIFY THAT:

1.
   - A. ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN, AND FURTHER, AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY THE ANNE ARUNDEL SOIL CONSERVATION DISTRICT BOARD OF SUPERVISORS OR THEIR AUTHORIZED AGENTS.
   - B. ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

     RESPONSIBLE PERSONNEL ON SITE:
     TO BE DETERMINED
   - C. IF APPLICABLE, THE APPROPRIATE ENCLOSURE WILL BE CONSTRUCTED AND MAINTAINED ON SEDIMENT BASIN(S) INCLUDED IN THIS PLAN. SUCH STRUCTURE(S) WILL BE IN COMPLIANCE WITH THE ANNE ARUNDEL COUNTY CODE.
2. THE DEVELOPER IS RESPONSIBLE FOR THE ACQUISITION OF ALL EASEMENTS, RIGHTS, AND/OR RIGHT-OF-WAY THAT MAY BE REQUIRED FOR THE SEDIMENT AND EROSION CONTROL PRACTICES, STORMWATER MANAGEMENT PRACTICES AND THE DISCHARGE OF STORMWATER ONTO OR ACROSS ADJACENT OR DOWNSTREAM PROPERTIES INCLUDED IN THIS PLAN.
3. INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN SEVEN CALENDAR DAYS FOR THE SURFACE OF ALL CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND FOURTEEN DAYS OF ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. TEMPORARY STABILIZATION OF THE SURFACE OF PERIMETER CONTROLS, DIKES, SWALES, DITCHES, AND PERIMETER SLOPES MAY BE ALLOWED AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR.
4. THE SEDIMENT CONTROL APPROVALS ON THIS PLAN EXTEND ONLY TO AREAS AND PRACTICES IDENTIFIED AS PROPOSED WORK.
5. THE APPROVAL OF THIS PLAN FOR SEDIMENT AND EROSION CONTROL DOES NOT RELIEVE THE DEVELOPER/CONSULTANT FROM COMPLYING WITH ANY FEDERAL, STATE, OR COUNTY REQUIREMENTS APPERTAINING TO ENVIRONMENTAL ISSUES.
6. THE DEVELOPER MUST REQUEST THAT THE SEDIMENT CONTROL INSPECTOR APPROVE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND CONTROL PLAN, THE GRADING OR BUILDING PERMIT, AND THE ORDINANCE.
7. ALL MATERIAL SHALL BE TAKEN TO A SITE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.
8. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE SEDIMENT AND EROSION CONTROL INSPECTOR SHALL BE REQUIRED ON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. THIS WILL REQUIRE FIRST PHASE INSPECTIONS. OTHER BUILDINGS OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THE INITIAL APPROVAL BY THE SEDIMENT AND EROSION CONTROL INSPECTOR IS GIVEN.
9. APPROVAL SHALL BE REQUESTED ON FINAL STABILIZATION OF ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES BEFORE REMOVAL OF CONTROLS.
10. EXISTING TOPOGRAPHY MUST BE FIELD VERIFIED BY RESPONSIBLE PERSONNEL TO THE SATISFACTION OF THE SEDIMENT CONTROL INSPECTOR PRIOR TO COMMENCING WORK.

ASSISTANT CHIEF ENGINEER

SIGNATURE PRINTED NAME

ADDRESS: ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS
2662 RIVA ROAD
ANNAPOLIS, MARYLAND 21401

TELEPHONE: (410) 222-7540

DATE

G02011271

PLANS DATED 10/15/09 FOR 95% DESIGN

CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084
(410) 692-2164

DESIGNED BY: R. POWELL
OCT 2009

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite C
Hanover, Maryland 21076
Phone: (410) 694-9401
Fax (410) 694-9405

BAYLAND JOB NO. 52008

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	REVISED BY	APPROVED	DATE	APPROVED	DATE		
		CHIEF ENGINEER		PROJECT MANAGER		SCALE: AS SHOWN	
						DRAWN BY: GM/VG	10/15/09
						CHECKED BY: SB	10/15/09
		APPROVED	DATE	APPROVED	DATE	SHEET NO. 1 OF 55	
						PROJECT NO. Q509400	
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		PROPOSAL NO. Q509401	

T1
TITLE SHEET

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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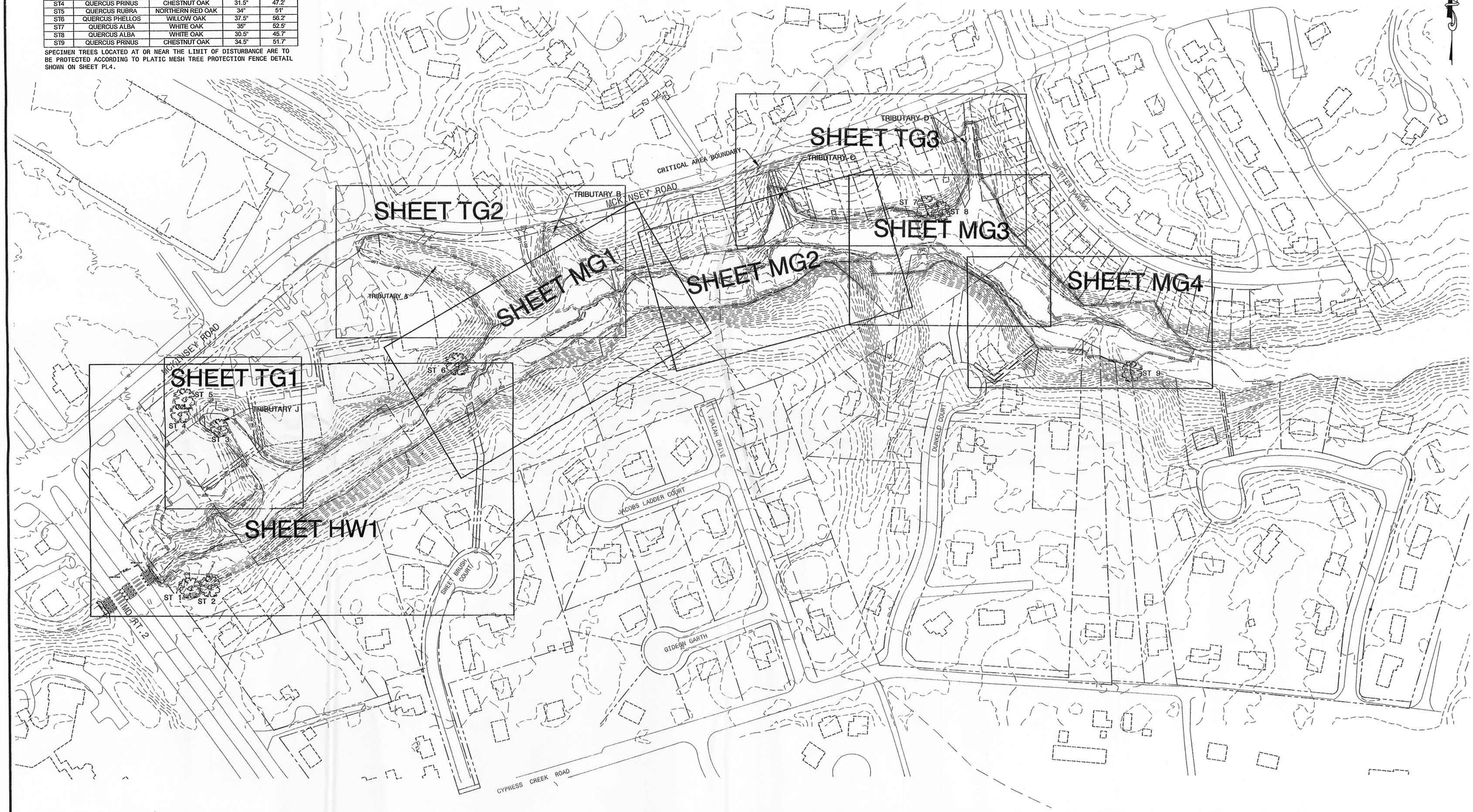
SPECIMEN TREE SUMMARY TABLE

LABEL	SCIENTIFIC NAME	COMMON NAME	DBH	Critical Root Zone
ST1	ACER RUBRUM	RED MAPLE	33"	49.5'
ST2	QUERCUS ALBA	WHITE OAK	33"	49.5'
ST3	QUERCUS BICOLOR	SWAMP WHITE OAK	30"	45'
ST4	QUERCUS PRINUS	CHESTNUT OAK	31.5"	47.2'
ST5	QUERCUS RUBRA	NORTHERN RED OAK	34"	51'
ST6	QUERCUS PHELLOS	WILLOW OAK	37.5"	56.2'
ST7	QUERCUS ALBA	WHITE OAK	35"	52.5'
ST8	QUERCUS ALBA	WHITE OAK	30.5"	45.7'
ST9	QUERCUS PRINUS	CHESTNUT OAK	34.5"	51.7'

SPECIMEN TREES LOCATED AT OR NEAR THE LIMIT OF DISTURBANCE ARE TO BE PROTECTED ACCORDING TO PLATIC MESH TREE PROTECTION FENCE DETAIL SHOWN ON SHEET PL4.



CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

DESIGNED BY: R. POWELL OCT 2009

0 50 100 200
1 Inch = 100 Feet

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite C Phone: (410) 694-9401
Hanover, Maryland 21076 Fax (410) 694-9405

BAYLAND JOB NO. 52008

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

SCALE:	1" = 100'
DRAWN BY: GSM/VG	10/15/09
CHECKED BY: SB	10/15/09
SHEET NO.	2 OF 55
PROJECT NO.	Q509400
PROPOSAL NO.	Q509401

IN1
GRADING SHEET LAYOUT
NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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0 15 30 60
1 Inch = 30 Feet

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Hanover, Maryland 21076 Fax (410) 694-9405
BAYLAND JOB NO. 52008

RECEIVED
JAN 14 2010

REVISED DATE	BY

APPROVED DATE CHIEF ENGINEER	APPROVED DATE PROJECT MANAGER
APPROVED DATE ASSISTANT CHIEF ENGINEER	APPROVED DATE CHIEF, RIGHT OF WAY

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

SCALE:	1" = 30'
DRAWN BY: GM/VG	10/15/09
CHECKED BY: SB	10/15/09
SHEET NO.	3 OF 55
PROJECT NO.	Q509400
PROPOSAL NO.	Q509401

GS1
MAINSTEM GEOMETRY & STAKEOUT

NORTH BRANCH OF CYPRESS
CREEK STREAM RESTORATION

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CLEAR CREEKS CONSULTING
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DESIGNED BY: R. POWELL OCT 2009

0 15 30 60
1 Inch = 30 Feet

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"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite C
Hanover, Maryland 21076
Phone: (410) 694-9401
Fax (410) 694-9405
BAYLAND JOB NO. 52008

RECEIVED
JAN 14 2010

REVISED DATE	BY

APPROVED	DATE	APPROVED	DATE
CHIEF ENGINEER		PROJECT MANAGER	
APPROVED	DATE	APPROVED	DATE
ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

SCALE:	1" = 30'
DRAWN BY: GM/VG	10/15/09
CHECKED BY: SB	10/15/09
SHEET NO.	4 OF 55
PROJECT NO.	Q509400
PROPOSAL NO.	Q509401

GS2
MAINSTEM GEOMETRY & STAKEOUT

NORTH BRANCH OF CYPRESS
CREEK STREAM RESTORATION

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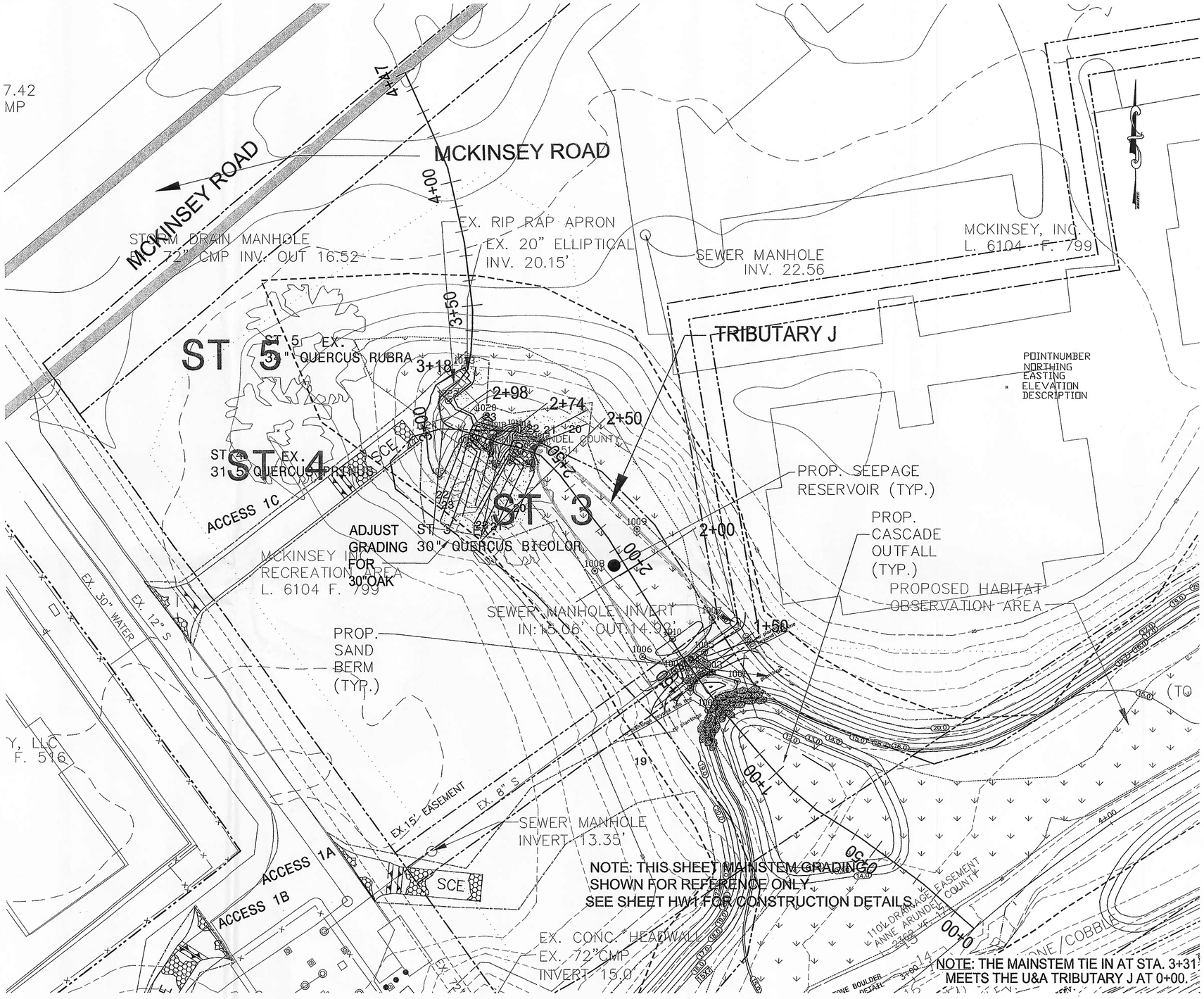

NOTE: THE MAINSTEM TIE IN AT STA. 3+31 MEETS THE U&A TRIBUTARY J AT 0+00.

TRIBUTARY J COORDINATE LOCATION TABLE	
OFFSET DISTANCE	COORDINATE NORTHING / EASTING
0+00	1442610.6, 512998.5
0+26	1442590.7, 513015.9
0+50	1442571.7, 513029.9
0+57	1442565.5, 513034.5
0+78	1442548.1, 513045.5
0+92	1442537.6, 513054.4
1+00	1442532.2, 513060.3
1+22	1442518.1, 513076.8
1+40	1442506.3, 513090.7
1+50	1442500.3, 513098.7
1+61	1442494.1, 513107.1
1+87	1442479.8, 513130.1
2+00	1442473.2, 513140.7
2+14	1442465.6, 513153.1
2+46	1442446.1, 513178.7
2+50	1442443.8, 513181.0
2+57	1442438.6, 513186.2
2+67	1442429.4, 513189.5
2+74	1442422.9, 513191.1
2+83	1442414.2, 513194.2
2+93	1442404.0, 513197.0
2+96	1442401.2, 513198.2
2+98	1442399.8, 513200.1
3+01	1442398.9, 513201.9
3+07	1442398.1, 513207.2
3+09	1442398.7, 513209.4
3+13	1442401.8, 513212.8
3+18	1442405.3, 513215.3
3+19	1442406.1, 513216.1
3+25	1442409.6, 513220.6
3+31	1442410.9, 513227.2
3+49	1442411.6, 513244.5
3+75	1442408.5, 513270.9
4+06	1442401.9, 513300.8
4+26	1442393.6, 513319.6
4+47	1442384.9, 513338.5

FOR STAKEOUT TABLE
SEE SHEET 9 GS7

UNDERWOOD & ASSOCIATES
LANDSCAPE ARCHITECTURE • DESIGN/BUILD • ECOLOGICAL RESTORATION
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ANNAPOLIS, MARYLAND 21401
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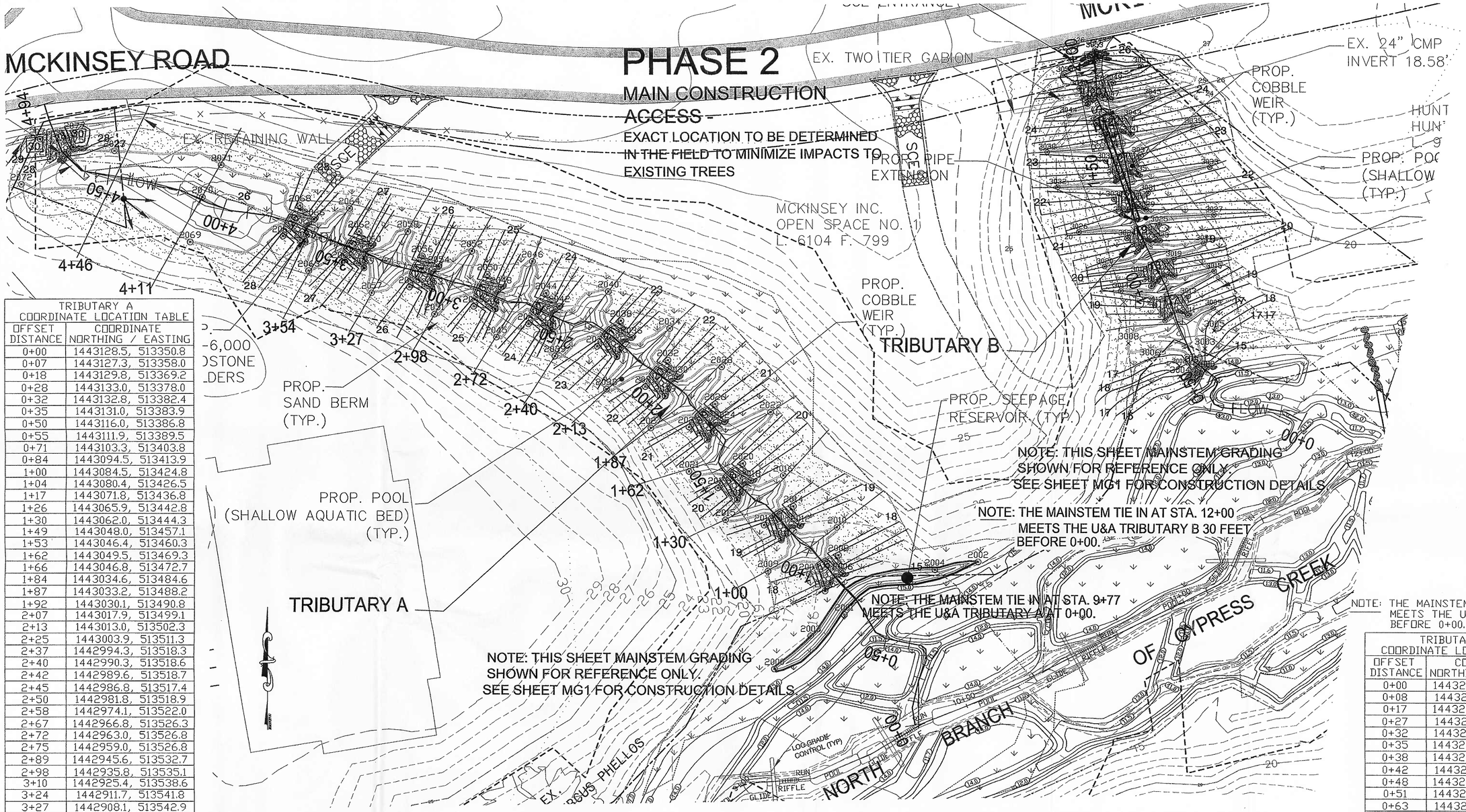
ENGINEER
DAVID J. WALLACE, P.E.
701 CHESAPEAKE AVENUE
ANNAPOLIS, MARYLAND 21403
Telephone: 410) 544-1225

RECEIVED JAN 14 2010

REVISED DATE	BY	APPROVED DATE	APPROVED DATE		
		CHIEF ENGINEER	PROJECT MANAGER	SCALE: 1"=20'	GS4
		APPROVED DATE	APPROVED DATE	DRAWN BY: JMP	TRIBUTARY J GEOMETRY & STAKEOUT NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	CHECKED BY: KU	
				SHEET NO. 6 of 55	
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS



FOR STAKEOUT TABLE SEE SHEET 9 GS7

NOTE: THE MAINSTEM TIE IN AT STA. 9+77 MEETS THE U&A TRIBUTARY A AT 0+00.

TRIBUTARY A COORDINATE LOCATION TABLE	
OFFSET DISTANCE	COORDINATE NORTHING / EASTING
0+00	1443128.5, 513350.8
0+07	1443127.3, 513358.0
0+18	1443129.8, 513369.2
0+28	1443133.0, 513378.0
0+32	1443132.8, 513382.4
0+35	1443131.0, 513383.9
0+50	1443116.0, 513386.8
0+55	1443111.9, 513389.5
0+71	1443103.3, 513403.8
0+84	1443094.5, 513413.9
1+00	1443084.5, 513424.8
1+04	1443080.4, 513426.5
1+17	1443071.8, 513436.8
1+26	1443065.9, 513442.8
1+30	1443062.0, 513444.3
1+49	1443048.0, 513457.1
1+53	1443046.4, 513460.3
1+62	1443049.5, 513469.3
1+66	1443046.8, 513472.7
1+84	1443034.6, 513484.6
1+87	1443033.2, 513488.2
1+92	1443030.1, 513490.8
2+07	1443017.9, 513499.1
2+13	1443013.0, 513502.3
2+25	1443003.9, 513511.3
2+37	1442994.3, 513518.3
2+40	1442990.3, 513518.6
2+42	1442989.6, 513518.7
2+45	1442986.8, 513517.4
2+50	1442981.8, 513518.9
2+58	1442974.1, 513522.0
2+67	1442966.8, 513526.3
2+72	1442963.0, 513526.8
2+75	1442959.0, 513526.8
2+89	1442945.6, 513532.7
2+98	1442935.8, 513535.1
3+10	1442925.4, 513538.6
3+24	1442911.7, 513541.8
3+27	1442908.1, 513542.9
3+34	1442903.1, 513545.7
3+54	1442883.8, 513552.9
3+69	1442870.5, 513559.6
3+82	1442858.4, 513562.8
3+97	1442843.2, 513564.8
4+07	1442834.0, 513568.0
4+19	1442823.0, 513573.1
4+34	1442808.0, 513577.2
4+61	1442781.7, 513581.4
4+73	1442773.5, 513589.5
4+86	1442768.4, 513602.5
4+94	1442766.3, 513609.3

NOTE: THE MAINSTEM TIE IN AT STA. 12+00 MEETS THE U&A TRIBUTARY B 30 FEET BEFORE 0+00.

TRIBUTARY B COORDINATE LOCATION TABLE	
OFFSET DISTANCE	COORDINATE NORTHING / EASTING
0+00	1443289.2, 513478.0
0+08	1443281.9, 513481.8
0+17	1443273.3, 513483.5
0+27	1443263.1, 513483.1
0+32	1443257.1, 513483.4
0+35	1443255.4, 513483.6
0+38	1443252.5, 513484.9
0+42	1443250.7, 513488.1
0+48	1443253.8, 513493.8
0+51	1443253.0, 513495.9
0+63	1443243.1, 513503.3
0+64	1443243.6, 513504.5
0+79	1443237.3, 513518.1
0+90	1443234.0, 513528.4
0+95	1443232.7, 513533.2
1+27	1443218.9, 513561.9
1+43	1443217.2, 513577.8
1+61	1443213.2, 513595.0
1+70	1443210.4, 513604.4
1+75	1443205.6, 513607.9
1+81	1443203.6, 513611.9
1+92	1443202.9, 513623.5
2+00	1443201.5, 513631.1

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RECEIVED JAN 14 2010 CRITICAL AREA COMMISSION

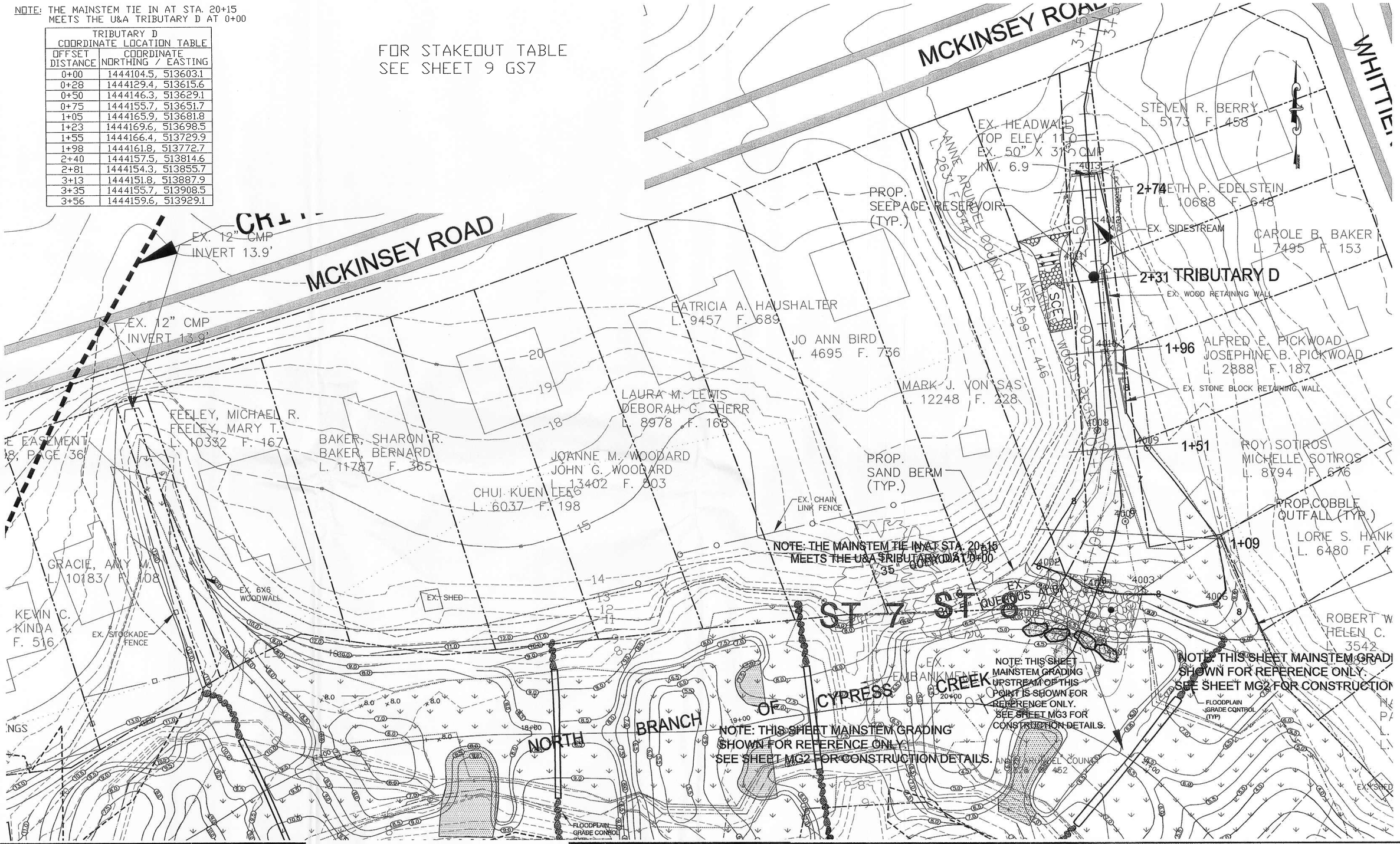
ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED DATE	APPROVED DATE		
		CHIEF ENGINEER	PROJECT MANAGER	SCALE: 1"=20'	GS5
		APPROVED DATE	APPROVED DATE	DRAWN BY: JMP	TRIBUTARY A & B GEOMETRY & STAKEOUT NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	CHECKED BY: KU	
				SHEET NO. 7 of 55	
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	

NOTE: THE MAINSTEM TIE IN AT STA. 20+15 MEETS THE U&A TRIBUTARY D AT 0+00

TRIBUTARY D COORDINATE LOCATION TABLE	
OFFSET DISTANCE	COORDINATE NORTHING / EASTING
0+00	1444104.5, 513603.1
0+28	1444129.4, 513615.6
0+50	1444146.3, 513629.1
0+75	1444155.7, 513651.7
1+05	1444165.9, 513681.8
1+23	1444169.6, 513698.5
1+55	1444166.4, 513729.9
1+98	1444161.8, 513772.7
2+40	1444157.5, 513814.6
2+81	1444154.3, 513855.7
3+13	1444151.8, 513887.9
3+35	1444155.7, 513908.5
3+56	1444159.6, 513929.1

FOR STAKEOUT TABLE
SEE SHEET 9 GS7



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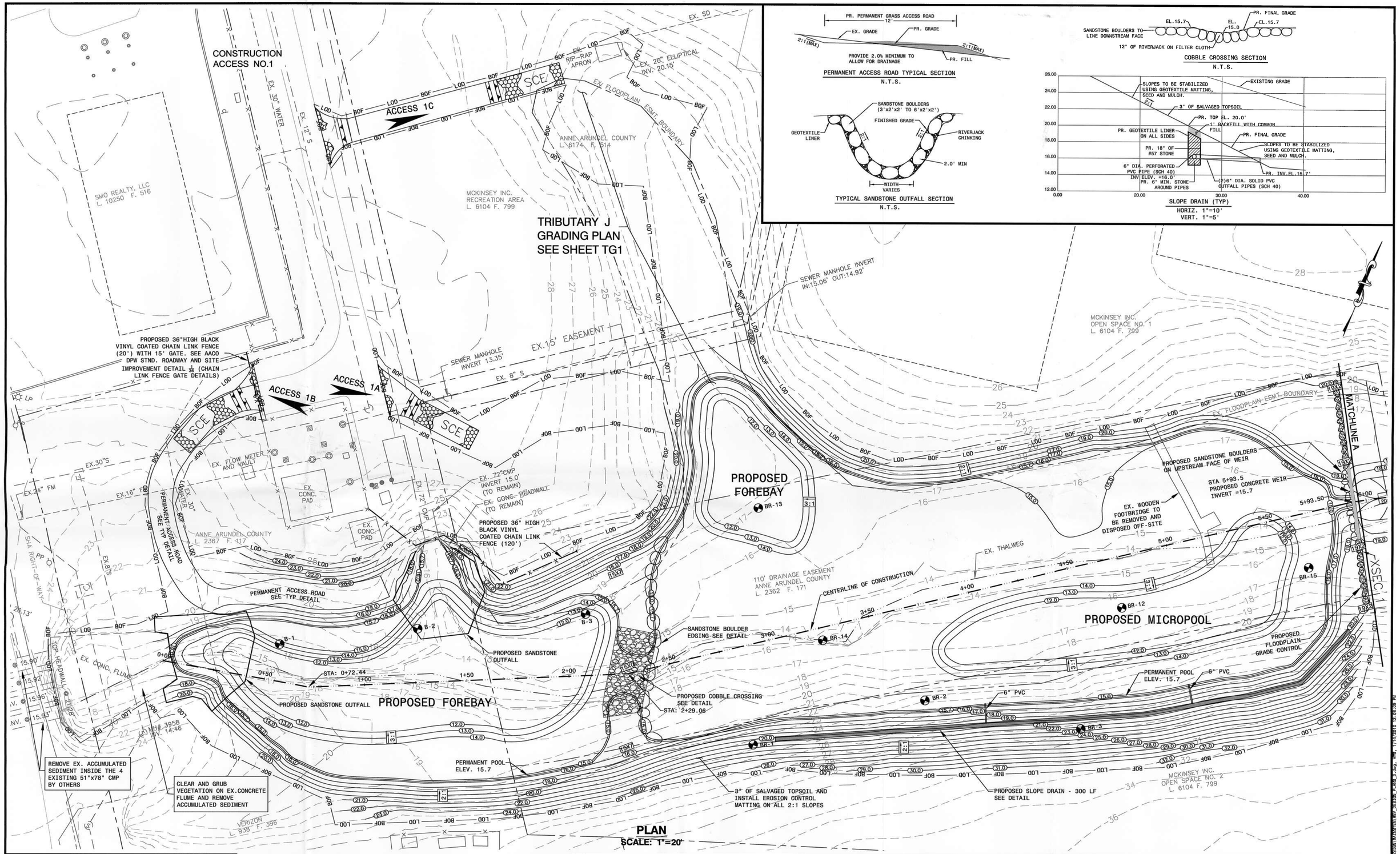
ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED DATE	APPROVED DATE		
		CHIEF ENGINEER	PROJECT MANAGER	SCALE: 1"=20'	GS6
		APPROVED DATE	APPROVED DATE	DRAWN BY: JMP	TRIBUTARY D GEOMETRY & STAKEOUT NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	CHECKED BY: KU	
				SHEET NO. 8 of 55	
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	



LEGEND

15X7 PROPOSED SPOT ELEVATION

CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

DESIGNED BY: R. POWELL OCT 2009

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite C Phone: (410) 694-9401
Hanover, Maryland 21076 Fax (410) 694-9405

BAYLAND JOB NO. 52008

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ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY				
		APPROVED DATE	APPROVED DATE	SCALE: 1" = 20'	HW1 HEADWATER WETLAND GRADING
		CHIEF ENGINEER	PROJECT MANAGER	DRAWN BY: GM/VG 10/15/09	
		APPROVED DATE	APPROVED DATE	CHECKED BY: SB 10/15/09	NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	SHEET NO. 10 OF 55	
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	

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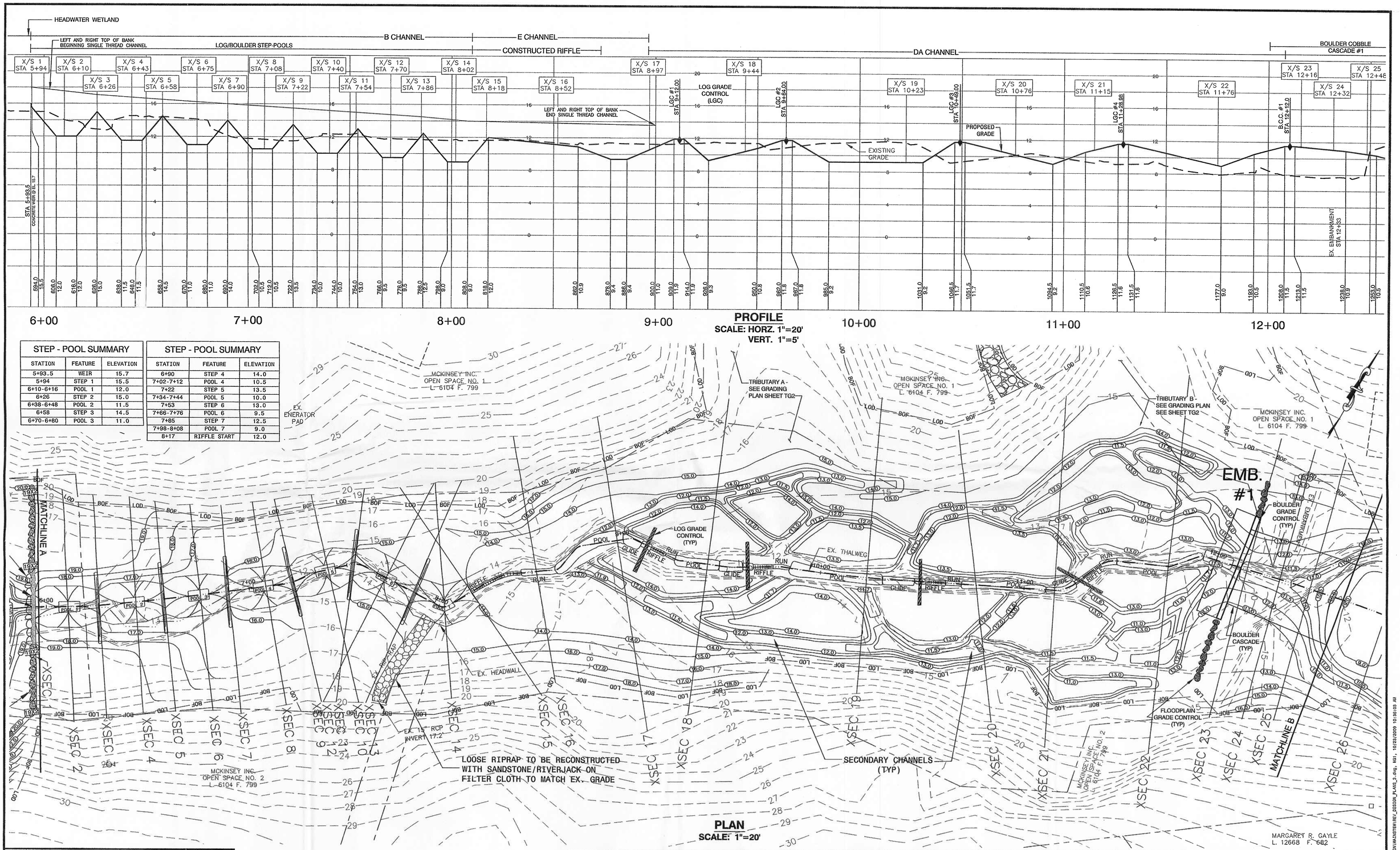

STEP - POOL SUMMARY		
STATION	FEATURE	ELEVATION
5+93.5	WEIR	15.7
5+94	STEP 1	15.5
6+10-6+16	POOL 1	12.0
6+26	STEP 2	15.0
6+38-6+48	POOL 2	11.5
6+58	STEP 3	14.5
6+70-6+80	POOL 3	11.0

STEP - POOL SUMMARY		
STATION	FEATURE	ELEVATION
6+90	STEP 4	14.0
7+02-7+12	POOL 4	10.5
7+22	STEP 5	13.5
7+34-7+44	POOL 5	10.0
7+53	STEP 6	13.0
7+66-7+76	POOL 6	9.5
7+85	STEP 7	12.5
7+98-8+08	POOL 7	9.0
8+17	RIFFLE START	12.0

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NOTE:
FOR CROSS SECTIONS SEE SHEETS MS1-MS14

0 10 20 40
1 Inch = 20 Feet

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RECEIVED JAN 14 2010 CHIEF, RIGHT OF WAY

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED	DATE	APPROVED	DATE		
		CHIEF ENGINEER		PROJECT MANAGER		SCALE: 1" = 20'	
		APPROVED	DATE	APPROVED	DATE	DRAWN BY: GM/VG	10/15/09
						CHECKED BY: SB	10/15/09
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		SHEET NO. 11 OF 55	
						PROJECT NO. Q509400	
						PROPOSAL NO. Q509401	

MG1
MAINSTEM GRADING & PROFILE

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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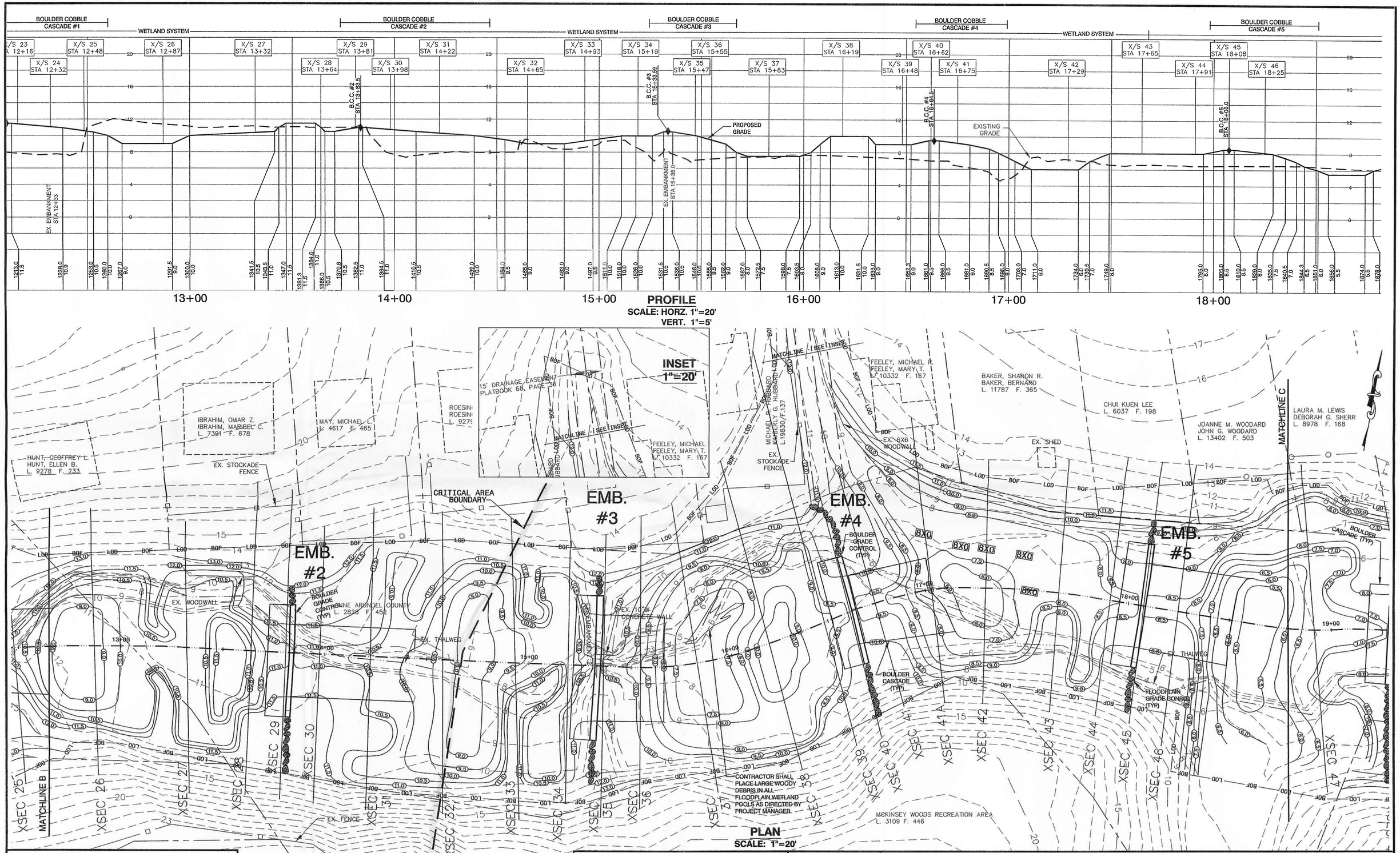

NOTE:
FOR CROSS SECTIONS SEE SHEETS MS1-MS14

0 10 20 40
1 Inch = 20 Feet

CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

DESIGNED BY: R. POWELL OCT 2009

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RECEIVED
JAN 14 2010

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED	DATE	APPROVED	DATE	SCALE: 1" = 20'	
		CHIEF ENGINEER		PROJECT MANAGER		DRAWN BY: GSM/VG	10/15/09
		APPROVED	DATE	APPROVED	DATE	CHECKED BY: SB	10/15/09
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		SHEET NO. 12 OF 55	
						PROJECT NO. Q509400	
						PROPOSAL NO. Q509401	

MG2
MAINSTEM GRADING & PROFILE

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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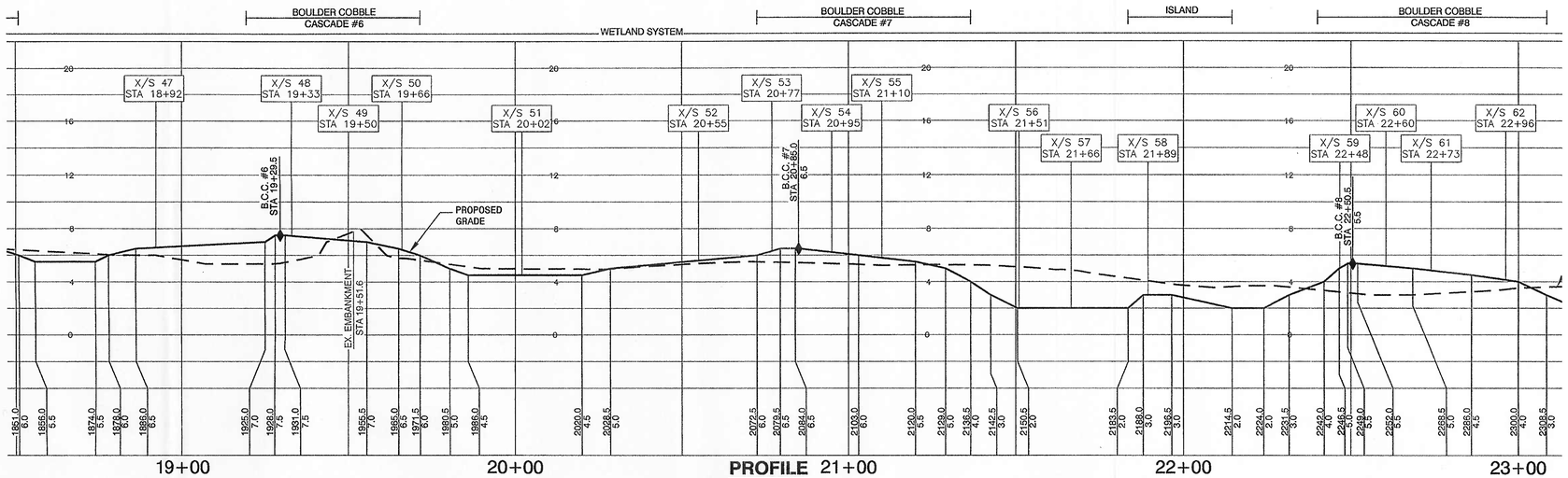
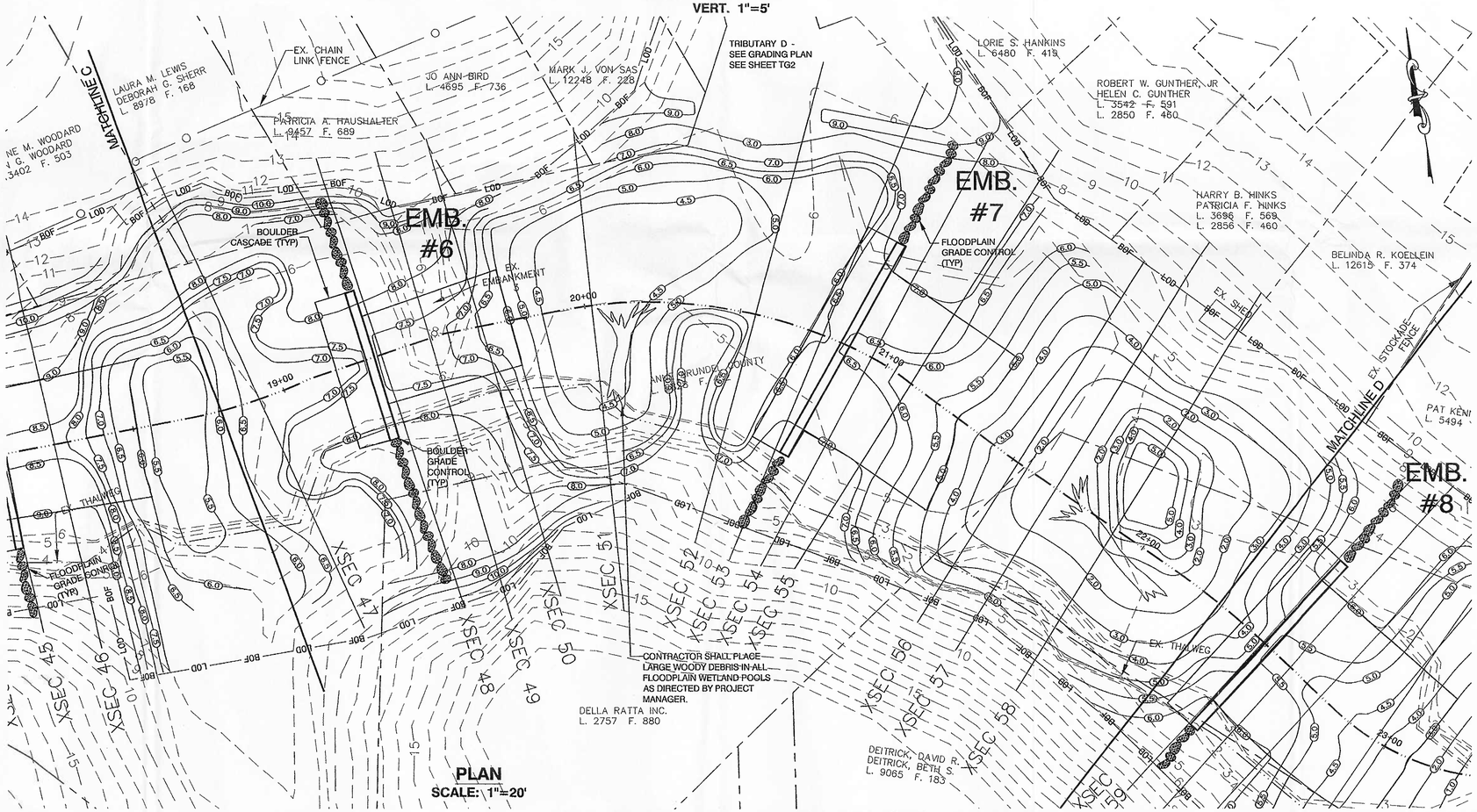


PROFILE

SCALE: HORZ. 1"=20'
VERT. 1"=5'



PLAN
SCALE: 1"=20'

CLEAR CREEKS CONSULTING
1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

DESIGNED BY: R. POWELL OCT 2009

NOTE:
FOR CROSS SECTIONS SEE SHEETS MS1-MS14

0 10 20 40
1 Inch = 20 Feet

BayLand Consultants & Designers, Inc.
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Hanover, Maryland 21076
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CONTROLLER'S OFFICE

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED	DATE	APPROVED	DATE
		CHIEF ENGINEER		PROJECT MANAGER	
		APPROVED	DATE	APPROVED	DATE
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY	

SCALE:	1" = 20'
DRAWN BY: GSM/VG	10/15/09
CHECKED BY: SB	10/15/09
SHEET NO.	13 OF 55
PROJECT NO.	Q509400
PROPOSAL NO.	Q509401

MG3
MAINSTEM GRADING & PROFILE

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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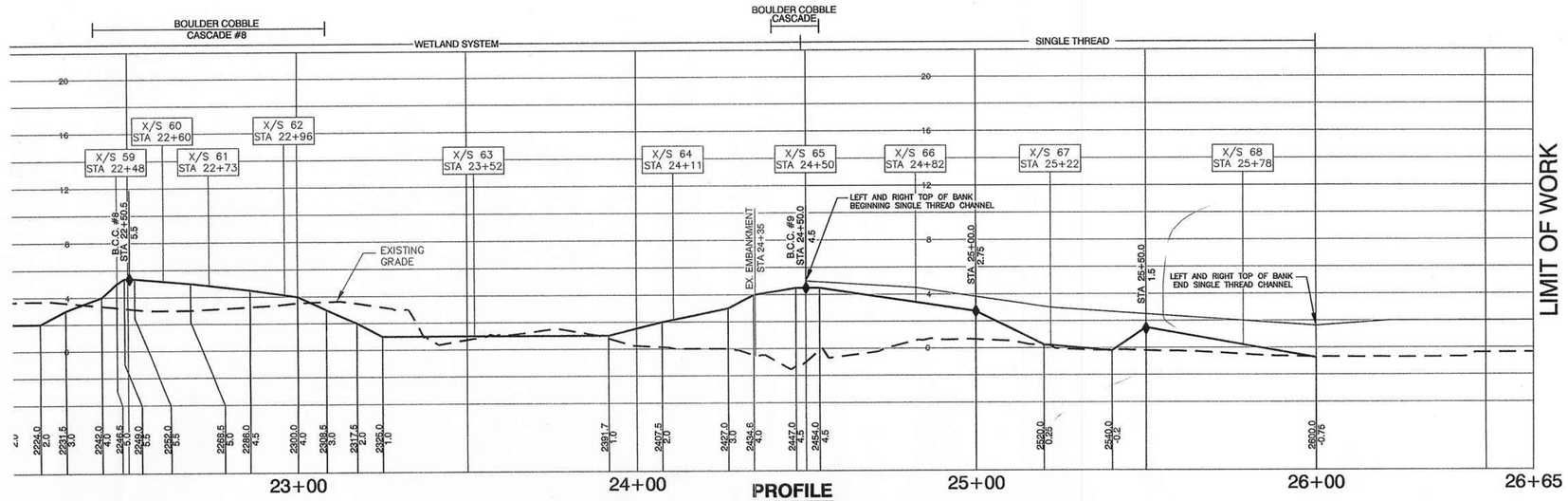
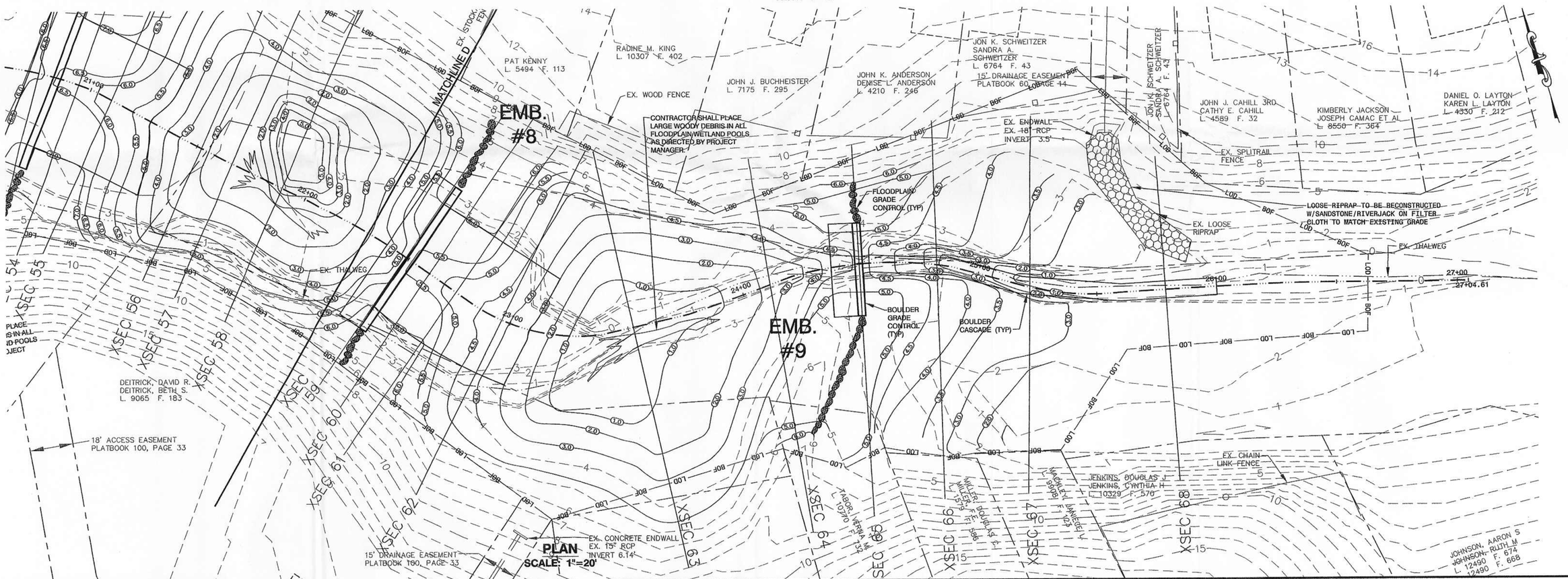


PROFILE

SCALE: HORZ. 1"=20'
VERT. 1"=5'



PLAN

SCALE: 1"=20'

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1317 Knopp Road, Jarrettsville, Maryland 21084 (410) 692-2164

DESIGNED BY: R. POWELL | OCT 2009

NOTE:
FOR CROSS SECTIONS SEE SHEETS MS1-MS14

0 10 20 40
1 Inch = 20 Feet

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Hanover, Maryland 21076
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JAN 14 2010
CRITICAL AREA COMMISSION

REVISED DATE	BY

APPROVED DATE — CHIEF ENGINEER
APPROVED DATE — ASSISTANT CHIEF ENGINEER
APPROVED DATE — PROJECT MANAGER
APPROVED DATE — CHIEF, RIGHT OF WAY

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

SCALE:	1" = 20'
DRAWN BY: GSM/VG	10/15/09
CHECKED BY: SB	10/15/09
SHEET NO.	14 OF 55
PROJECT NO.	Q509400
PROPOSAL NO.	Q509401

MG4
MAINSTEM GRADING & PROFILE

NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION

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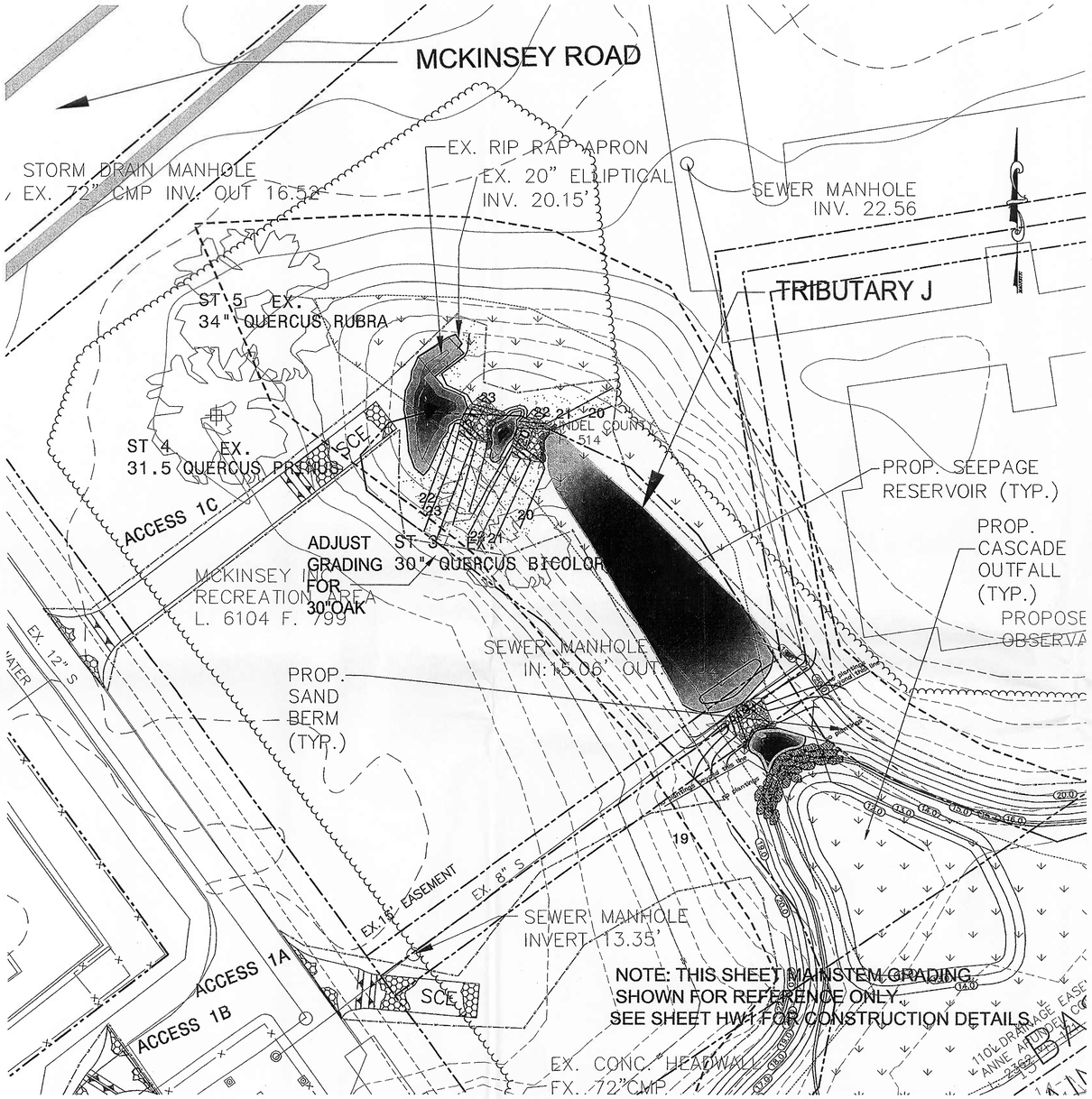

LEGEND

- EX. CONTOURS
- EX. TREE LINE
- FLOW — PROP. FLOW LINE
- PROP. CONTOURS
- PROP. COBBLE BED
- PROP. WEIRS (SIZE VARIES)
- PROP. POOL (SIZE VARIES)
- PROP. BOULDER (SIZE VARIES)
- PROP. BOULDER SUBMERGED (SIZE VARIES)
- PROP. SAND BERM

UNDERWOOD & ASSOCIATES
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Telephone: 410) 544-1225

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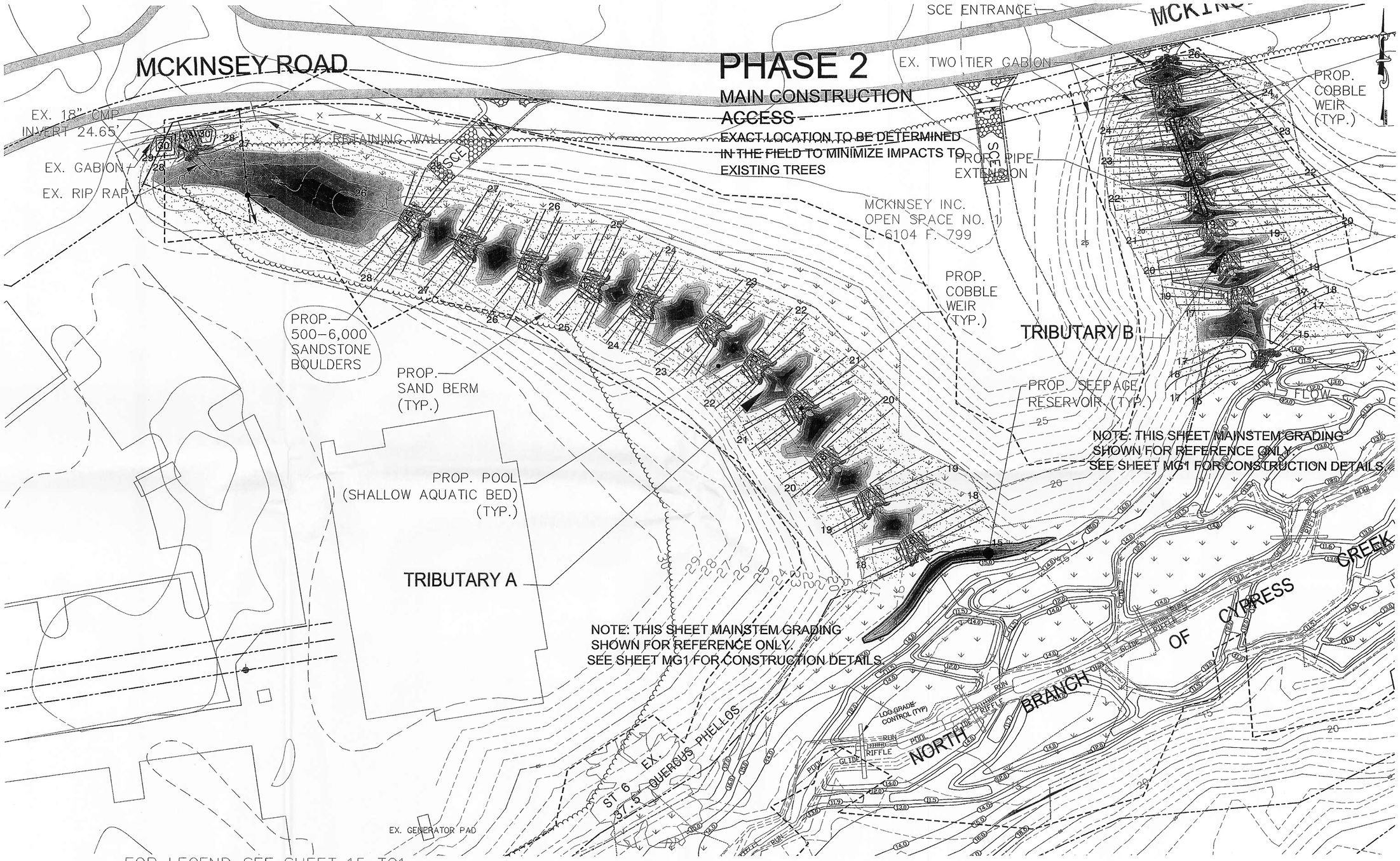
JAN 14 2010
CRITICAL AREA COMMISSION

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED DATE	APPROVED DATE		
		CHIEF ENGINEER	PROJECT MANAGER	SCALE: 1"=20'	TG1
		APPROVED DATE	APPROVED DATE	DRAWN BY: JMP	TRIBUTARY J GRADING
				CHECKED BY: KU	NORTH BRANCH OF CYPRESS CREEK
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	SHEET NO. 15 of 55	STREAM RESTORATION
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	



FOR LEGEND SEE SHEET 15 TG1.

UNDERWOOD & ASSOCIATES
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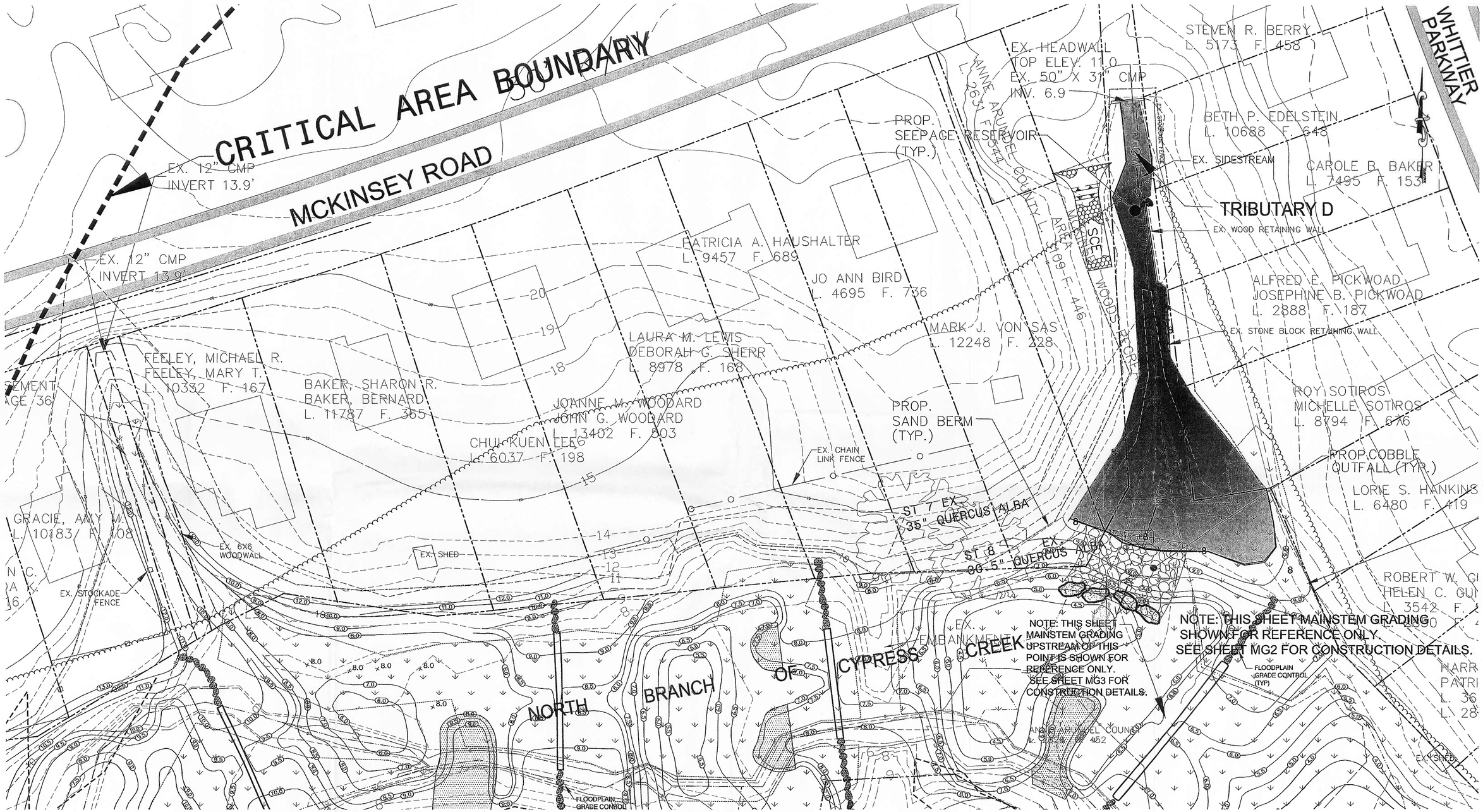
JAN 14 2010
CHIEF, DIVISION OF CONSERVATION

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED	DATE	APPROVED	DATE		
		CHIEF ENGINEER		PROJECT MANAGER		SCALE:	1"=20'
		APPROVED	DATE	APPROVED	DATE	DRAWN BY:	JMP
		ASSISTANT CHIEF ENGINEER		CHIEF, RIGHT OF WAY		CHECKED BY:	KU
						SHEET NO.	16 of 55
						PROJECT NO.	Q509400
						PROPOSAL NO.	Q509401

TG2

TRIBUTARY A & B GRADING
NORTH BRANCH OF CYPRESS CREEK
STREAM RESTORATION



FOR LEGEND SEE SHEET 15 TG1.

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ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS

REVISED DATE	BY	APPROVED DATE	APPROVED DATE		
		CHIEF ENGINEER	PROJECT MANAGER	SCALE: 1"=20'	TG3
		APPROVED DATE	APPROVED DATE	DRAWN BY: JMP	TRIBUTARY C & D GRADING NORTH BRANCH OF CYPRESS CREEK STREAM RESTORATION
		ASSISTANT CHIEF ENGINEER	CHIEF, RIGHT OF WAY	CHECKED BY: KU	
				SHEET NO. 17 of 55	
				PROJECT NO. Q509400	
				PROPOSAL NO. Q509401	