2nd 6/16/14

RAWHIDE WASH
(AT SILVERSTONE)
SCOTTSDALE, ARIZONA

LETTER OF MAP REVISION
TECHNICAL DATA NOTEBOOK

March 2013
Updated September 2013
Comment Response May, 2014
WP# 113671.02

DRAINAGE

Submitted to:

LOMC CLEARINGHOUSE
Attention: LOMC Manager
847 South Pickett Street
Alexandria, Virginia 22304-4605

and

City of Scottsdale
7447 E. Indian School Road
Scottsdale, Arizona 85251

Prepared For:

Van Tuyl Group, Inc.
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Phoenix, Arizona 85014
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Email: mpacheco@vtaig.com

Prepared By:

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Website: www.woodpatel.com

Registered Professional Engineer (Civil)
CERTIFICATE NO.
10512
ASHOK C.
PATEL
Date Signed 5/21/14
ARIZONA, U.S.A.

expires 12/31/15

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MISSION: CLIENT SERVICE™

1647-13-1

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May 21, 2014

Mr. Syed Qayum, CFM
LOMR Technical Manager
LOMC Clearing House
847 South Pickett Street
Alexandria, VA 22304-4605

Re: Community No: 045012
Community: City of Scottsdale, AZ
Requester: Ash Patel P.E., R.L.S., CFM

Subject: FEMA letter dated November 20, 2013
Identifier: Silverstone Rawhide Wash LOMR
FIRM Panel: 04013C1310L
WP #113671.02

Dear Mr. Qayum:

In March 2013, Wood, Patel & Associates, Inc. (Wood/Patel) prepared and submitted the Rawhide Wash At Silverstone (Rawhide Wash) Letter of Map Revision (LOMR) Technical Data Notebook (TDN) which addressed Rawhide Wash from its hydrographic apex northern limits to its southern limits west of Scottsdale Road at Williams Drive. FEMA review comments were received on November 20, 2013, requiring clarification of two technical matters. In order to clarify matters, we contacted and continued conversation with representatives of the City of Scottsdale and the BakerAECOM Lakewood office. The following represents our response and clarifications to the two matters outstanding from the November 20, 2013 review.

In summary, the Rawhide Wash channel construction was completed on May 15, 2014 from Pinnacle Peak Road to Scottsdale Road. As-built channel conditions were modeled and subsequently we updated hydraulics and floodplain limits generated for Rawhide Wash. The HEC-RAS hydraulic model modeled the FEMA 100-year flow of 7,900 cfs. The hydraulic analysis results concluded the flow is contained within the channel except at the Scottsdale Road Bridge due to interim outlet conditions. Due to limitations of the interim downstream outlet channel at the Scottsdale Road Bridge, flow leaves the channel flowing to the south, just upstream of the Scottsdale Road Bridge. This is not a new floodplain area as before the channel existed the AO1 floodplain occurred in this area.

Also, additional field visits and investigations occurred regarding the comments concerned with land features and non-levee or floodwall situations or applications. Two locations were investigated based on input from the BakerAECOM Lakewood office and found to not involve levees or floodwalls to produce or support the floodplain delineations or conclusions reached.

The following represents updates that were completed for the Rawhide Wash FEMA LOMR Hydraulic Model. An exhibit is attached to accompany the updated HEC-RAS hydraulic analyses: the Rawhide Wash Letter of Map Revision (LOMR) Technical Data Notebook (TDN) Exhibit 3 Sheet 1 of 2 Rawhide Wash Workmap - LOMR TDN Post Project Conditions Model (HEC-RAS name: RW_SilverstoneLOMR.prj):

1. The as-built topography for the Rawhide Wash from Pinnacle Peak Bridge to the Scottsdale Road Bridge has been included within the HEC-RAS model from Cross Section (C.S.) 2321 through C.S. 3811.
2. The as-built conditions for the Scottsdale Road Bridge have been included within the HEC-RAS model between C.S. 2154 and C.S. 2321.
3. The as-built topography for the daylight channel downstream of the Scottsdale Road Bridge has been included within the HEC-RAS model at C.S. 1990, C.S. 2134 and C.S. 2154.
4. As a result of hydraulically modeling the Scottsdale Road Bridge and the downstream outlet channel, it was necessary to include an additional HEC-RAS cross section (C.S. 1889) to adequately model the overbank flow.

The name of the updated HEC-RAS model is RW_SilverstoneLOMR_Asb.prj. The results of the HEC-RAS model have been displayed on the updated Rawhide Wash (At Silverstone) Letter of Map Revision (LOMR) Technical Data Notebook (TDN) Exhibit 3 Sheet 1 of 2 Rawhide Wash Workmap.

BakerAECOM First Comment
It has come to our attention that the reach of the Unnamed Stream (Rawhide Wash) downstream of East Pinnacle Peak Road has been recently or is currently being modified by channelization since the initiation of this LOMR. Please submit as-built conditions survey or as-built plans, certified by a registered professional engineer, for the channel south of East Pinnacle Peak Road and any other newly constructed structures. Please also provide updated hydraulic modeling and mapping that incorporate the effects of the channel.

Response: Please note that the construction of the flood control channel serving the Unnamed Stream (Rawhide Wash) was very recently completed. As-built elevations were obtained and certified by a registered professional engineer for the Rawhide Channel Plan (south of Pinnacle Peak Road and east of Scottsdale Road) and the certified as-built Rawhide Wash Channel Plan is included with this submittal. Also included is the updated hydraulic analysis (HEC-RAS analysis) which includes the newly built channel in place, as well as updated work maps.

BakerAECOM Second Comment
Please submit additional documentation that shows that there are no floodwalls or levee situations on the banks of the Unnamed Wash between East Pinnacle Peak Road and East Happy Valley Road. In addition, please provide certification by a registered professional engineer, certifying that no floodwalls or levee situations were incorporated into the hydraulic analysis. If floodwalls or levee situations do

exist, please state that they do not come in contact with the base (1-percent-annual-chance) flood or provide evidence that the project meets all parts of Section 65.10 of the NFIP regulations.

Response: We contacted Baker/AECOM's Lakewood office to clarify their second comment. From follow up conversations with the reviewer, we learned this comment is applied to the land features on the east side of Rawhide Wash, approximately 2,500 feet north of Pinnacle Peak Road (Area #1) and a specific location (Area #2) along Miller Road, 1,300 feet north of Pinnacle Peak Road. The following research and information documents that no floodwall or levee situation is incorporated into the hydraulic analysis. Results of the analyzed flow indicate containment occurs within the drainage corridor as depicted on the referenced Exhibit 3.

Area #1:
To insure a non-levee situation occurs, additional detailed topographic cross-sections were investigated at 4 locations as depicted on Plate 1. As is documented by these cross-sections, the base flood elevations are contained by ground elevations, thus creating a non-levee situation. This is best demonstrated by the overbank elevations being higher than the base flood elevations.

Area #2:
The area located along Miller Road approximately 1,300 feet north of Pinnacle Peak Road was investigated for non-containment or a potential breakout. No floodwall or levee situations are known to occur in this investigated area. Detailed review of this area occurred and base flood elevations were investigated for non-containment or potential breakout conditions. Exhibit 3 depicts the resulting floodplain delineation in this area. Plate 2 displays the detailed evaluation of the floodplain at this location. As shown on the Plate 2, the floodplain is contained thus it was concluded that breakout does not occur and containment occurs.

Please note that FEMA headquarters has approved the fee transferred from 13-09-1958P. Therefore, no fee has been included with this submittal.

We believe we have addressed comments adequately to demonstrate compliance with technical matters to support approval of this LOMR. If a misunderstanding has occurred on our part of the technical nuances, please feel free to contact our office and we will be pleased to respond. Thank you for your time and attention to this important matter.

Sincerely,

Wood, Patel & Associates, Inc.

Ashok C. Patel, P.E., R.L.S. CFM
Principal
Email: apatel@woodpatel.com

ACP/slr
enclosures
N:\2011\11367I\Project Support\Admin\Correspondence\11367I Rawhide Wash FEMA Resubmittal May 2014.docx

expires 12/31/15

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U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
045012	City of Scottsdale	AZ	04013C	1235G	9/30/05

2. a. Flooding Source: 4A-4D

   b. Types of Flooding: ☐ Riverine ☐ Coastal ☒ Shallow Flooding (e.g., Zones AO and AH)
   ☒ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Silverstone Rawhide Wash LOMR

4. FEMA zone designations affected: AO (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Ashok C. Patel, P.E., R.L.S., CFM	Company: Wood, Patel & Associates, Inc.	
Mailing Address: 2051 West Northern Avenue, Suite 100 Phoenix, AZ 85021	Daytime Telephone No.: (602) 335-8500	Fax No.: (602) 335-8580
	E-Mail Address: apatel@woodpatel.com	
Signature of Requester (required): Ashok C. Patel	Date: May 21, 2014	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: C. Ashley Couch, P.E., CFM Stormwater Manager + Floodplain Administrator	Community Name: City of Scottsdale	
Mailing Address: 7447 East Indian School Road, Suite 125 Scottsdale, AZ 85251	Daytime Telephone No.: (480) 312-4317	Fax No.: (480) 312-9202
	E-Mail Address: acouch@scottsdaleaz.gov	
Community Official's Signature (required): C. Ashley Couch	Date: 6/26/14	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Ashok C. Patel, P.E.	License No.: 10512	Expiration Date: 12/31/2015	
Company Name: Wood, Patel & Associates, Inc.	Telephone No.: (602) 335-8500	Fax No.: (602) 335-8580	
Signature: Ashok C. Patel	Date: 5/21/14	E-Mail Address: apatel@woodpatel.com	

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☒ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

expires 12/31/15

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Basins 4A-4D

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model → Specify Model: _____
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Williams Drive	658	N/A	N/A
Upstream Limit*	Upstream of Happy Valley Rd	12560	N/A	N/A

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS, Version 4.1.0

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run File Name:	Natural Run Plan Name:	Floodway Run File Name:	Floodway Run Plan Name:	Datum
Duplicate Effective Model*					
Corrected Effective Model*					
Existing or Pre-Project Conditions Model					
Revised or Post-Project Conditions Model	* ew_SilvrstonLOMR-Asb	Post-Project	N/A	N/A	NAVD 88
Other - (attach description)		Full Flow	N/A	N/A	NAVD 88

* For details, refer to the corresponding section of the instructions.

* RW_Silverstone LOMR _ Asb

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: contour mapping from aerial survey

Source: City of Scottsdale Date: 1993 & 2005

Accuracy: 1 & 2 foot contours

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

      - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Basins 4A-4D

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Pinnacle Peak Road Bridge

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Pinnacle Peak Road

   Downstream Limit/Cross Section: 3894

   Upstream Limit/Cross Section: 3999

2. Name of Structure: Rawhide Wash Channel

   Type (check one): ☒ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: downstream of Pinnacle Peak Road

   Downstream Limit/Cross Section: RS 2366

   Upstream Limit/Cross Section: RS 3876

3. Name of Structure: Scottsdale Road Bridge

   Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Scottsdale Road

   Downstream Limit/Cross Section: 2154

   Upstream Limit/Cross Section: 2331

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Basins 4A-4D

Name of Structure: Rawhide Wash Channel

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100-year flood.
The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☒ Inlet to channel ☐ Outlet of channel ☒ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☒ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Basins 4A - 4D

Name of Structure: Pinnacle Peak Road Bridge/Scottsdale Road Bridge

1. This revision reflects (check one):

☒ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)
☒ Shape (culverts only)
☒ Material
☒ Beveling or Rounding
☒ Wing Wall Angle
☒ Skew Angle
☒ Distances Between Cross Sections
☒ Erosion Protection
☒ Low Chord Elevations – Upstream and Downstream
☒ Top of Road Elevations – Upstream and Downstream
☒ Structure Invert Elevations – Upstream and Downstream
☒ Stream Invert Elevations – Upstream and Downstream
☒ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____
Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin

2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

   Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

   Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

   Permit or ID number _____ Permitting Agency or Organization _____

   a. ☐ Local Government Dam ☐ Private Dam

   Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

FREQUENCY (% annual chance)	Stillwater Elevation Behind the Dam/Basin FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one): ☐ upgrading of an existing levee/floodwall system ☐ a newly constructed levee/floodwall system ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc. Station _____ to _____
☐ structural floodwall Station _____ to _____
☐ Other (describe): Station _____ to _____

c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling ☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers: _____
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers: _____
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers: _____
4. A layout detail for the embankment protection measures. Sheet Numbers: _____
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, Floodwall structure, closure structures, and pump stations. Sheet Numbers: _____

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope land side is: _____

b. The maximum levee slope flood side is: _____

c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)

d. Embankment material is protected by (describe what kind): _____

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach		Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
						D_{100}	D_{50}	Thickness	
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								

(Extend table on an added sheet as needed and reference each entry)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:
_____

☐ Overall height: Sta.: _____, height _____ ft.

☐ Limiting foundation soil strength:

Strength ϕ = _____ degrees, c = _____ psf

Slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):
_____

c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ P_A = _____ psf; P_p = _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ P_w = _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ P_{eq} = _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is _____ ft. to _____ ft.

c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression ☐ Other (Describe): _____

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: _____ acres
Draining to ponding area: _____ acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: _____ cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is _____ cfs

h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No
If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the fomal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____

Company Name: _____ Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: Basins 4A - 4D

Name of Structure: Pinnacle Peak Road Bridge/Scottsdale Road Bridge

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume 15.69 acre-feet

Debris load associated with the base flood discharge: Volume NA acre-feet

Sediment transport rate 1.2 (percent concentration by volume)

Method used to estimate sediment transport: See TSDN 13-09-1958P

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: Multiple methods - see TSDN 13-09-1958P

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: See TSDN 13-09-1958P

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

ALLUVIAL FAN FLOODING FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

Flooding Source: Basins 4A-4D - see TSDN 13-09-1958P
Note: Fill out one form for each flooding source studied

A. THREE-STAGE ANALYSIS (Based on DHS-FEMA Guidelines dated February 23, 2000)

1. Stage 1 Analysis

   a. The landform is composed of (check one) ☒ alluvial ☐ debris flow deposits.

   b. Source of data used to determine composition, morphology, and location of the landform:

      Aerial Photos, NRCS Soil Survey, Topographic Mapping, and Field Review

   c. Is there an NRCS soils survey and soil survey map available? ☒ Yes ☐ No
      If Yes, please include a copy of the map and any pertinent sections of the soil survey

2. Stage 2 Analysis

   a. The alluvial fan exhibits ☐ active ☐ inactive ☒ a combination of active and inactive alluvial fan flooding.

   b. Approximate age of inactive fan surfaces (thousands of years): 10,000 yrs.

   c. Is there an opportunity for avulsions that could lead channels or sheetfloods across the older fan surfaces? ☐ Yes ☒ No

   d. Is there evidence of headcutting that could lead to stream piracy? ☐ Yes ☒ No

   e. Is there geomorphic evidence of past avulsions during the Holocene epoch? ☒ Yes ☐ No

   f. The fan exhibits the following types of flooding (check one):

      ☒ Flooding along stable channels
      ☐ Sheetflow
      ☐ Debris flow
      ☐ Unstable flow path flooding

3. Stage 3 Analysis

   The boundaries of the 1%-annual-chance floodplain have been determined using (check one):

   ☐ Risk-Based Analysis
   ☐ FEMA FAN program (if discharge at the apex is different than that given in the effective FIS, then attach MT-2, Form 2 along with a plot of the flood frequency curve on log-normal probability paper and include the drainage area above the hydrographic apex, and the mean, standard deviation, and skew coefficient of the curve)
   ☐ Sheetflow Methods
   ☐ Hydraulic Analytical Methods
   ☐ Geomorphic Data, Post-Flood Hazard Verification, and Historical Information
   ☒ Composite Methods

B. STRUCTURAL FLOOD CONTROL MEASURES

1. The following structural flood control measures are proposed or built (check one):

   ☒ Channelization ☐ Levee/Floodwall ☐ Dam ☐ Sedimentation Basin

2. Do the constructed or proposed structural measures affect flood hazards (including velocity, scour, and sediment deposition) on other areas of the fan? ☒ Yes ☐ No

3. Attach completed Form 3 (Riverine Structures Form).

4. Sediment Transport Considerations:
   Was sediment transport considered? ☒ Yes ☐ No

   If Yes, then fill out Form 3, Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

5. Please attach a copy of the formal Operations and Maintenance Plan.

C. MAPPING REQUIREMENTS

Attach a certified topographic work map showing the following:

- The boundaries of the alluvial fan including: toe, topographic and hydrologic apexes, and lateral boundaries
- The delineation of the active and inactive portions of the fan as determined by the Stage 2 analysis
- The revised 1%-annual-chance floodplain boundaries, as determined by the Stage 3 Analysis, that tie into the effective floodplain boundaries
- The correct alignment of all structural features
- The map scale

Response to First Comment

Revised HEC-RAS Based on Channel Construction

Rawhide Wash (At Silverstone)

LOMR TDN Post Project Conditions Model

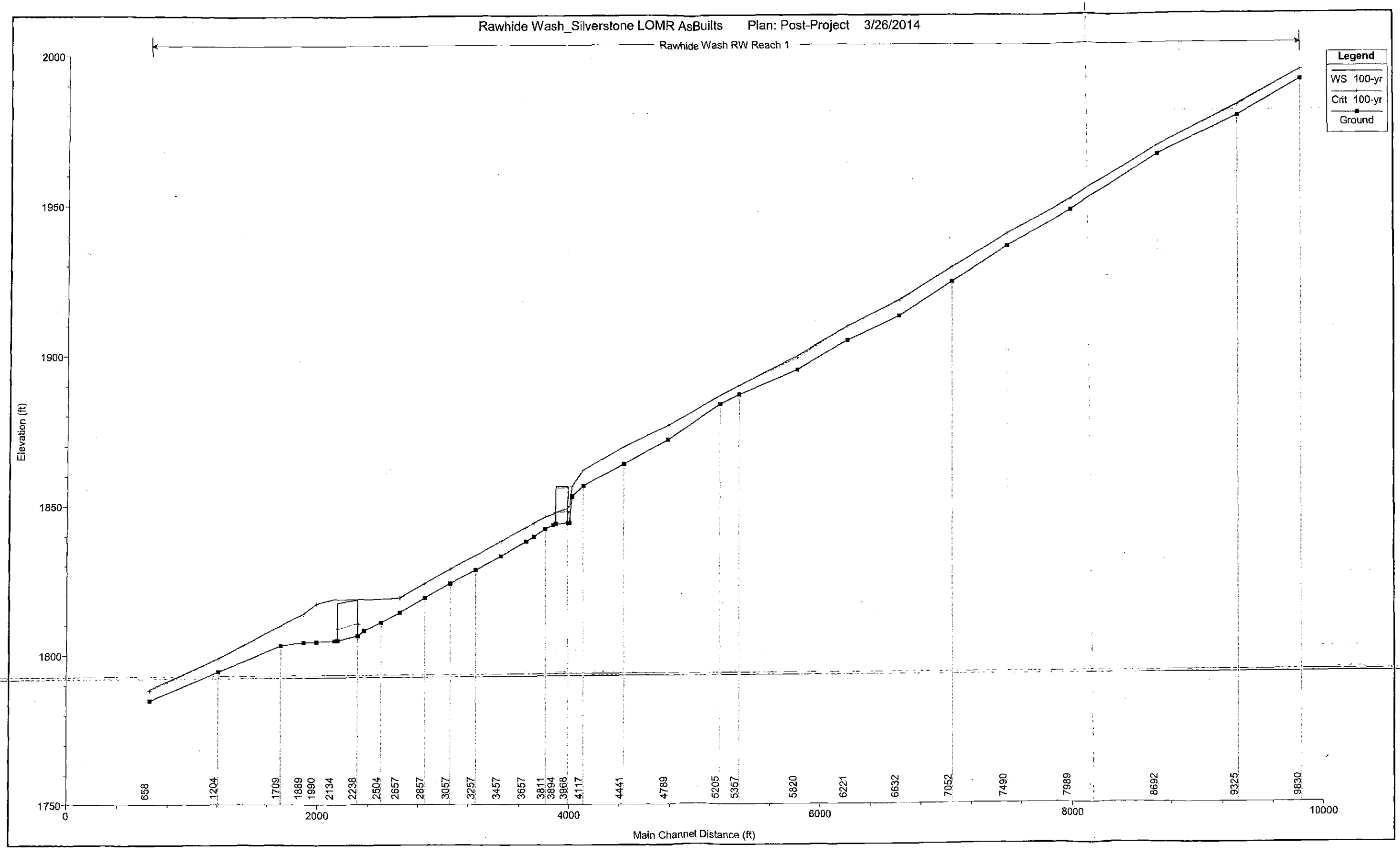
HEC-RAS Name: RW_SilverstoneLOMR_Asb.prj

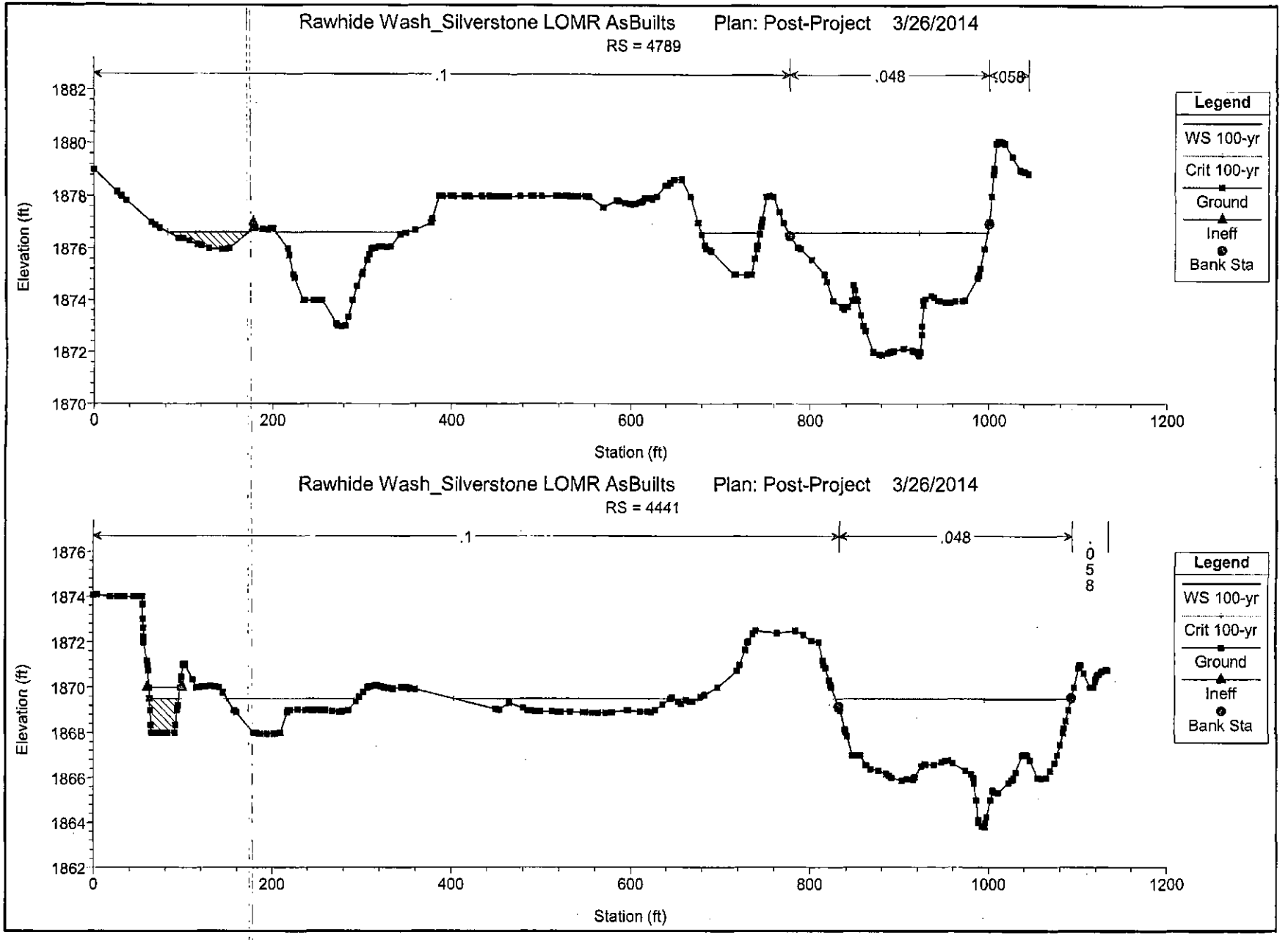
HEC-RAS Plan: post River: Rawhide Wash Reach: RW Reach 1 Profile: 100-yr

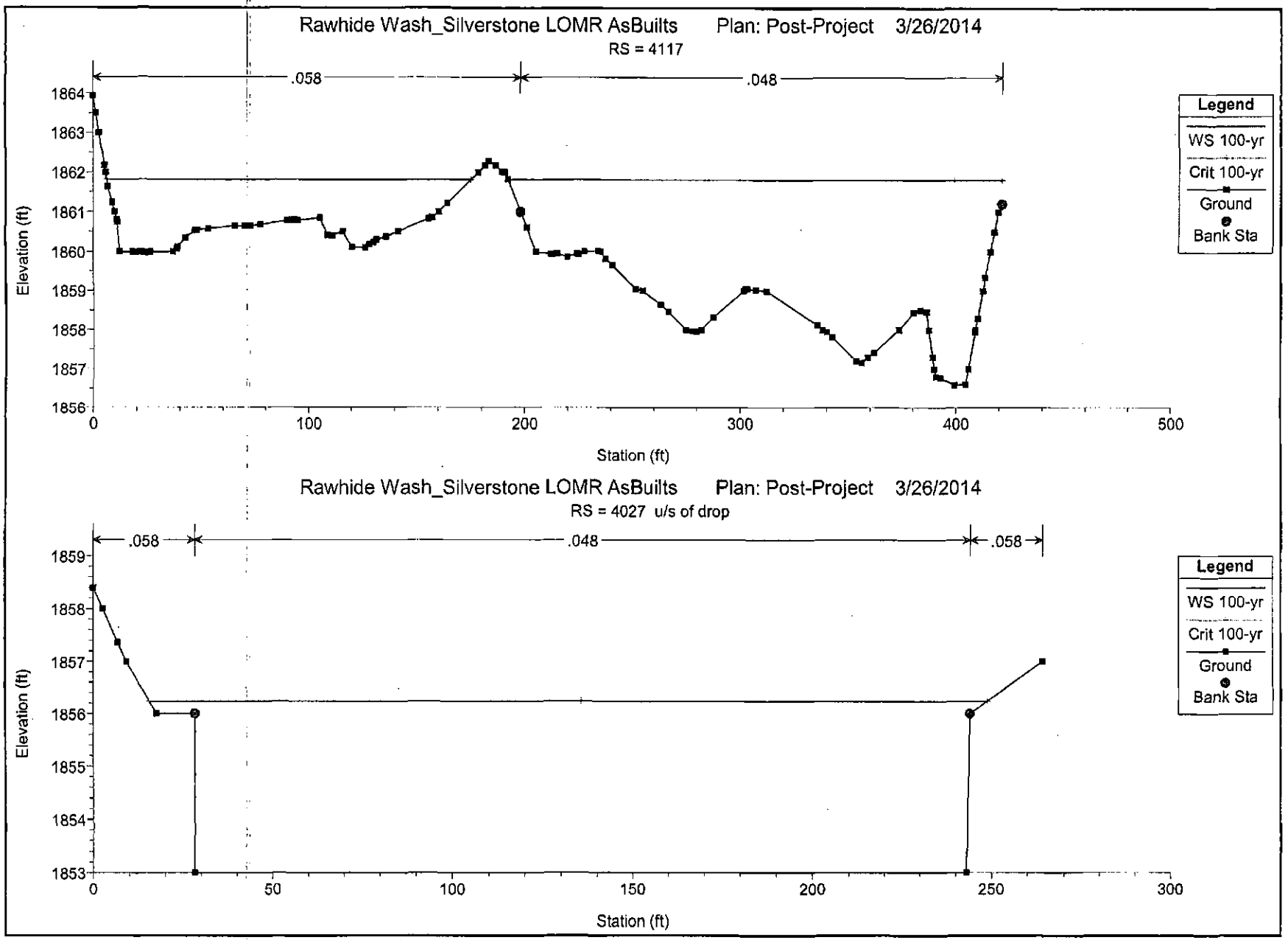
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RW Reach 1	9830	100-yr	7410.16	1991.00	1994.19	1994.19	1994.90	0.027228	6.85	1124.31	907.12	0.97
RW Reach 1	9325	100-yr	7410.16	1978.95	1982.75	1982.38	1983.21	0.015384	5.60	1372.38	807.28	0.74
RW Reach 1	8692	100-yr	7410.16	1966.28	1969.07	1969.07	1969.87	0.030360	7.27	1049.34	673.49	1.02
RW Reach 1	7989	100-yr	7410.16	1947.99	1951.73	1951.57	1952.34	0.020558	6.87	1366.88	907.24	0.87
RW Reach 1	7490	100-yr	7410.16	1936.02	1940.06	1940.02	1940.80	0.022120	6.60	1078.56	634.71	0.89
RW Reach 1	7052	100-yr	7410.16	1924.20	1929.05	1929.05	1930.44	0.024962	9.46	783.56	290.83	1.01
RW Reach 1	6632	100-yr	7410.16	1912.89	1918.19	1917.98	1919.22	0.016085	8.27	962.28	411.52	0.83
RW Reach 1	6221	100-yr	7410.16	1904.94	1909.63	1909.63	1910.95	0.025629	9.37	869.25	476.77	1.02
RW Reach 1	5820	100-yr	7410.16	1895.08	1899.69	1899.16	1900.38	0.013249	7.16	1330.59	621.50	0.75
RW Reach 1	5357	100-yr	7410.16	1886.84	1889.88	1889.88	1890.73	0.037383	9.11	1249.22	723.44	1.17
RW Reach 1	5210		Lat Struct									
RW Reach 1	5205	100-yr	7382.51	1883.67	1886.47		1886.92	0.016647	6.35	1661.82	962.12	0.79
RW Reach 1	4789	100-yr	7376.56	1871.87	1876.64	1876.64	1878.03	0.027717	10.19	945.03	527.13	1.07
RW Reach 1	4441	100-yr	7376.56	1863.79	1869.51	1869.51	1870.63	0.017413	8.69	1039.86	712.45	0.87
RW Reach 1	4300		Lat Struct									
RW Reach 1	4117	100-yr	7367.41	1856.60	1861.81	1861.81	1862.98	0.018551	9.11	927.46	398.05	0.90
RW Reach 1	4027	100-yr	7083.86	1853.00	1856.24	1856.24	1857.84	0.023182	10.15	701.17	233.28	0.99
RW Reach 1	4008	100-yr	7083.86	1844.20	1849.66		1850.36	0.000513	6.71	1055.50	193.75	0.51
RW Reach 1	3999	100-yr	7083.86	1844.20	1849.55	1847.76	1850.34	0.000597	7.14	991.97	185.74	0.54
RW Reach 1	3968		Bridge									
RW Reach 1	3894	100-yr	7083.86	1844.00	1847.51	1847.51	1849.28	0.018732	10.67	664.05	189.54	1.00
RW Reach 1	3876	100-yr	7083.86	1843.58	1847.15	1847.15	1848.77	0.018659	10.22	693.33	216.90	1.01
RW Reach 1	3811	100-yr	7083.86	1842.26	1846.21	1846.21	1847.71	0.009635	10.03	760.07	262.40	0.91
RW Reach 1	3721	100-yr	7083.86	1839.74	1844.29	1844.29	1845.76	0.009348	10.00	776.81	269.49	0.90
RW Reach 1	3657	100-yr	7083.86	1838.07	1842.69	1842.69	1844.17	0.009247	10.11	774.84	265.00	0.90
RW Reach 1	3457	100-yr	7083.86	1833.20	1838.19	1838.19	1839.68	0.008919	10.25	783.71	263.11	0.89
RW Reach 1	3257	100-yr	7083.86	1828.65	1833.45	1833.45	1834.96	0.009073	10.33	776.31	260.23	0.90
RW Reach 1	3057	100-yr	7083.86	1824.22	1829.02	1829.02	1830.53	0.008571	10.24	780.17	261.94	0.88
RW Reach 1	2857	100-yr	7083.86	1819.46	1824.27	1824.27	1825.78	0.009292	10.29	773.86	256.16	0.91
RW Reach 1	2657	100-yr	7083.86	1814.55	1819.46	1819.46	1820.96	0.009006	10.28	776.09	259.58	0.90
RW Reach 1	2504	100-yr	7083.86	1811.20	1819.02		1819.34	0.000936	4.75	1642.11	269.94	0.32
RW Reach 1	2366	100-yr	7083.86	1808.54	1819.00		1819.27	0.000217	4.18	1694.22	162.08	0.23
RW Reach 1	2321	100-yr	7083.86	1806.82	1819.04	1810.74	1819.24	0.000085	3.63	1955.21	160.08	0.18
RW Reach 1	2238		Bridge									
RW Reach 1	2154	100-yr	7083.86	1805.15	1818.95		1819.11	0.000056	3.19	2219.17	160.89	0.15
RW Reach 1	2134	100-yr	7083.86	1805.08	1818.99		1819.09	0.000094	2.53	2797.34	242.89	0.13
RW Reach 1	1990	100-yr	7083.86	1804.70	1817.40	1817.40	1818.91	0.003180	11.28	901.26	294.99	0.70
RW Reach 1	1889	100-yr	7083.86	1804.50	1814.16	1814.01	1814.94	0.023023	7.85	1053.35	989.57	0.93
RW Reach 1	1709	100-yr	7083.86	1803.50	1810.24	1810.15	1811.00	0.020652	7.50	1103.96	1187.70	0.89
RW Reach 1	1204	100-yr	7083.86	1794.69	1799.26	1799.10	1799.74	0.023816	4.89	1290.62	1653.26	0.85

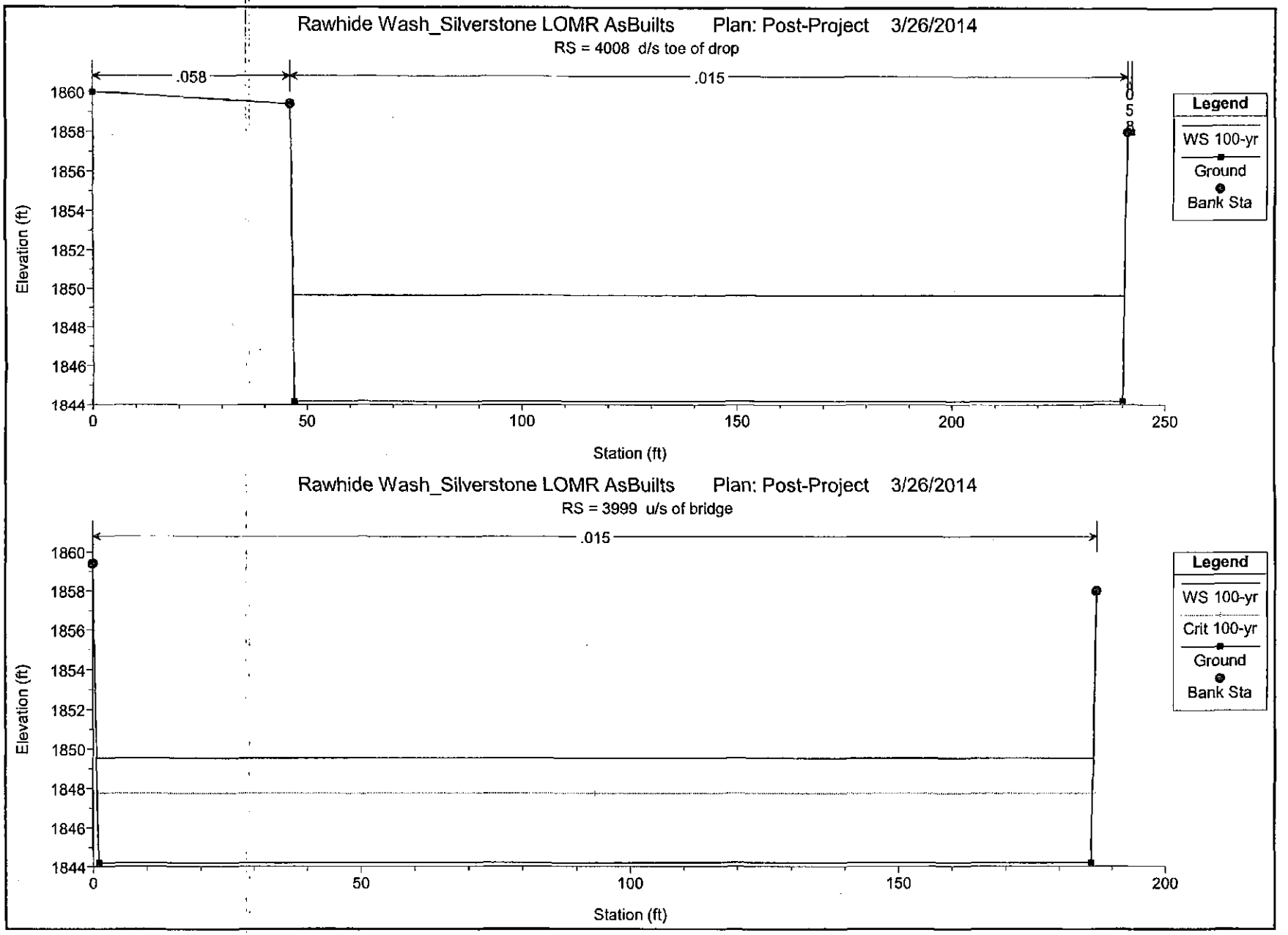
HEC-RAS Plan: post River: Rawhide Wash Reach: RW Reach 1 Profile: 100-yr (Continued)

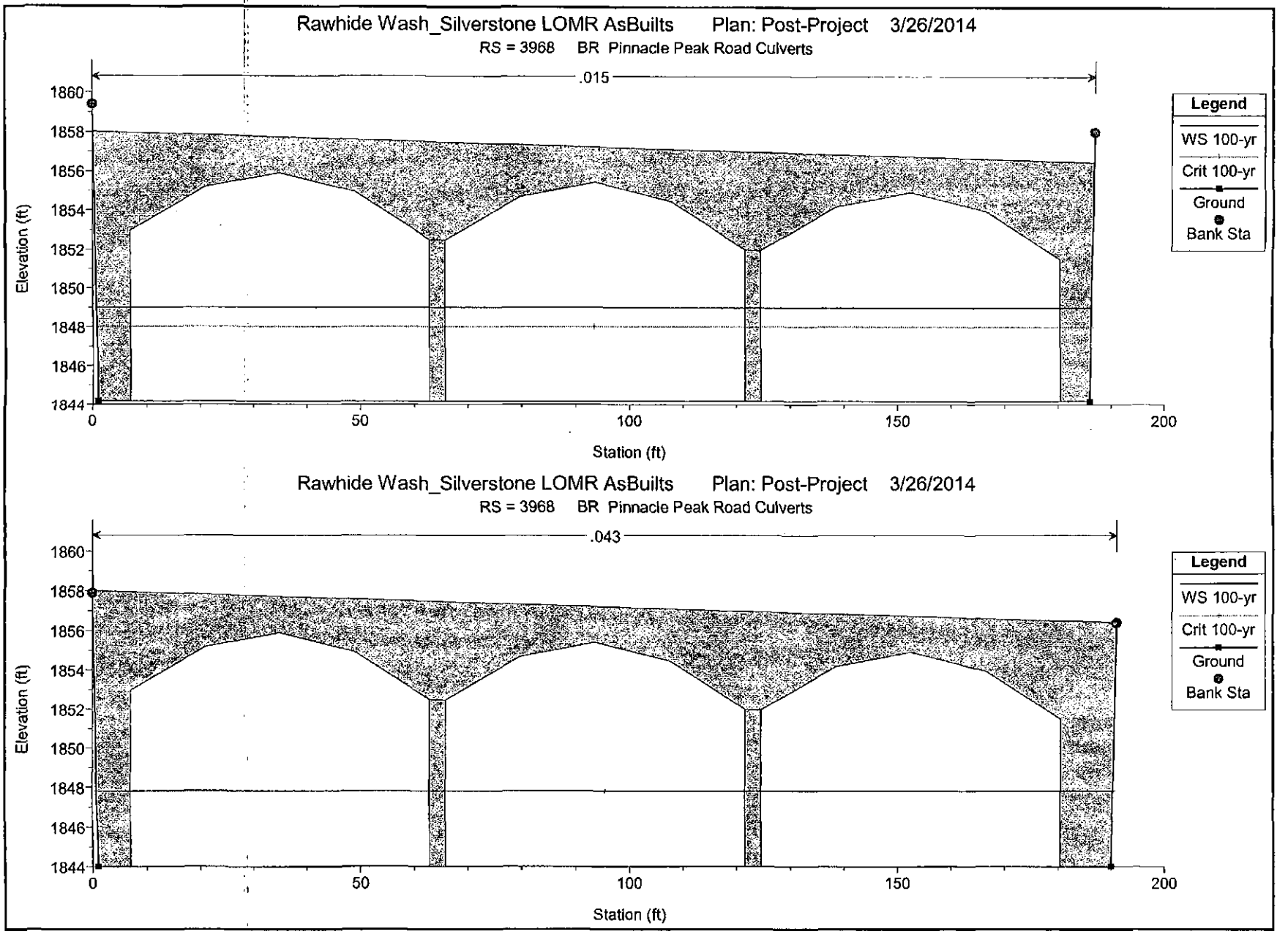
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
RW Reach 1	658	100-yr	7083.86	1784.95	1788.75	1788.33	1789.15	0.016021	5.63	1441.39	1420.41	0.75

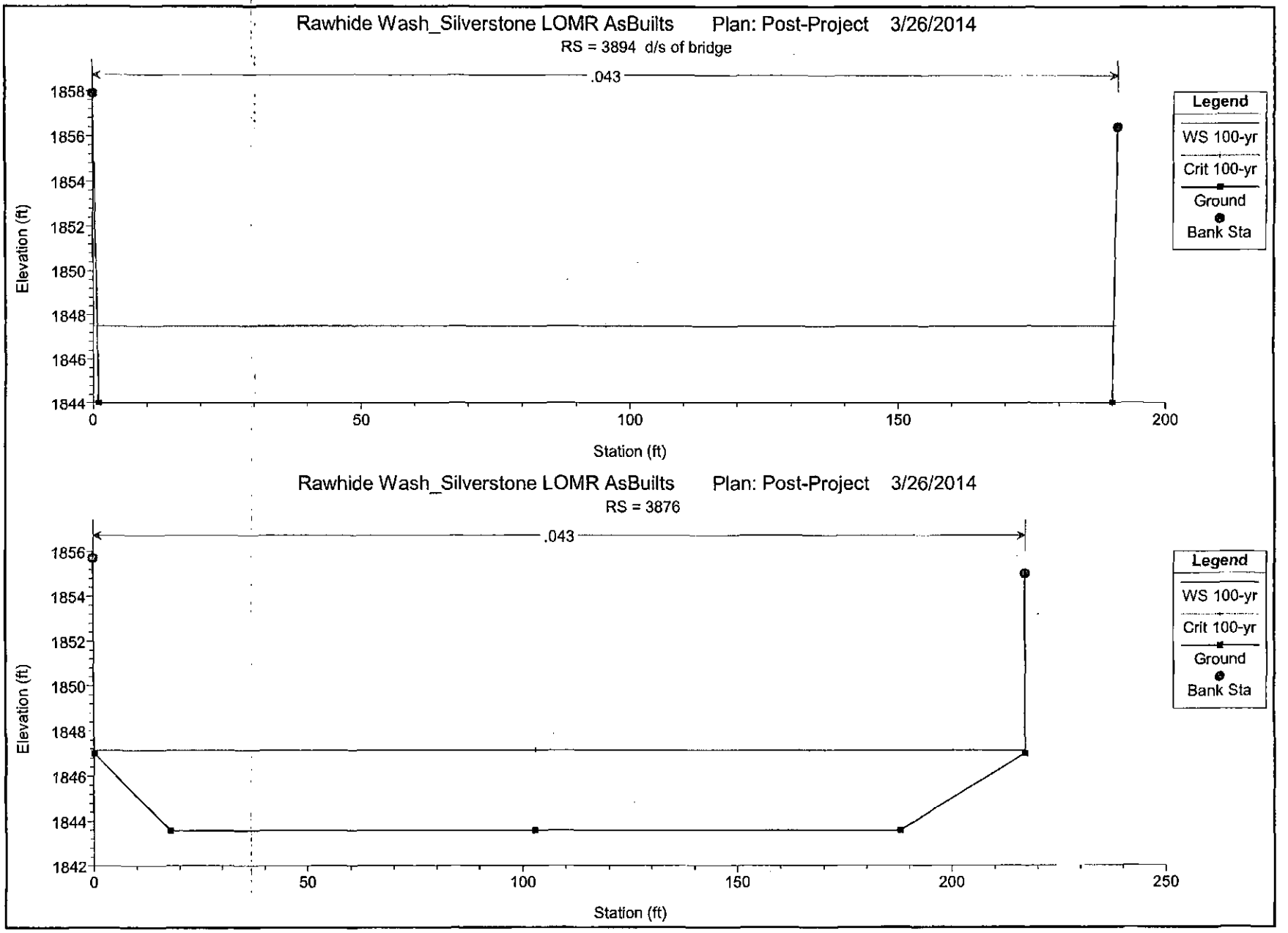

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
Rawhide Wash RW Reach 1
Legend
WS 100-yr
Crit 100-yr
Ground
Elevation (ft)
2000
1950
1900
1850
1800
1750
0
2000
4000
6000
8000
10000
Main Channel Distance (ft)
658
1204
1709
1889
1990
2134
2236
2504
2657
2857
3057
3257
3457
3657
3811
3894
3968
4117
4441
4789
5205
5357
5820
6221
6632
7052
7490
7989
8692
9325
9830

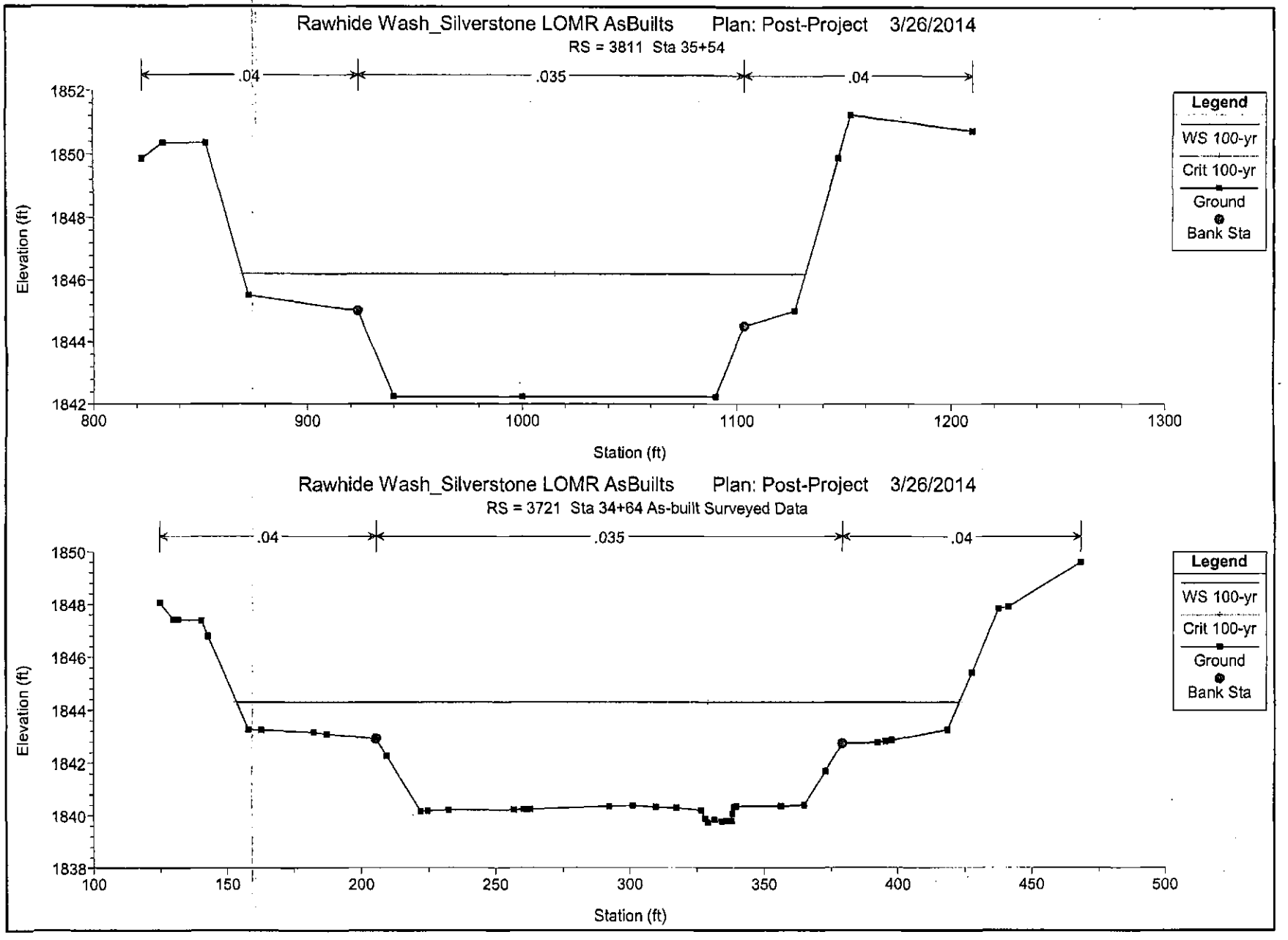

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 4789
.1
.048
.058
Elevation (ft)
1882
1880
1878
1876
1874
1872
1870
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 4441
.1
.048
.058
Elevation (ft)
1876
1874
1872
1870
1868
1866
1864
1862
0
200
400
600
800
1000
1200
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta

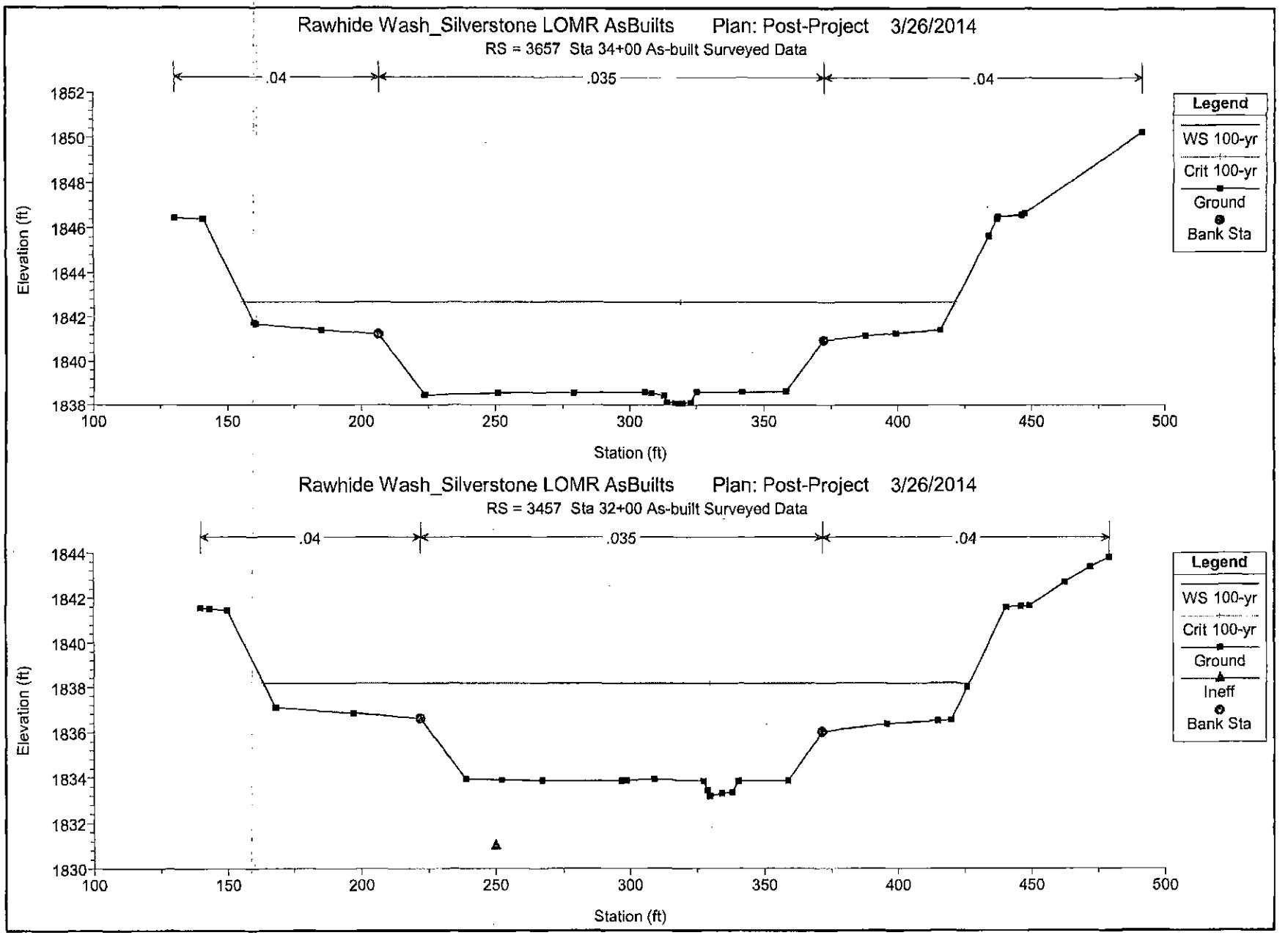

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 4117
.058
.048
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 4027 u/s of drop
.058
.048
.058
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

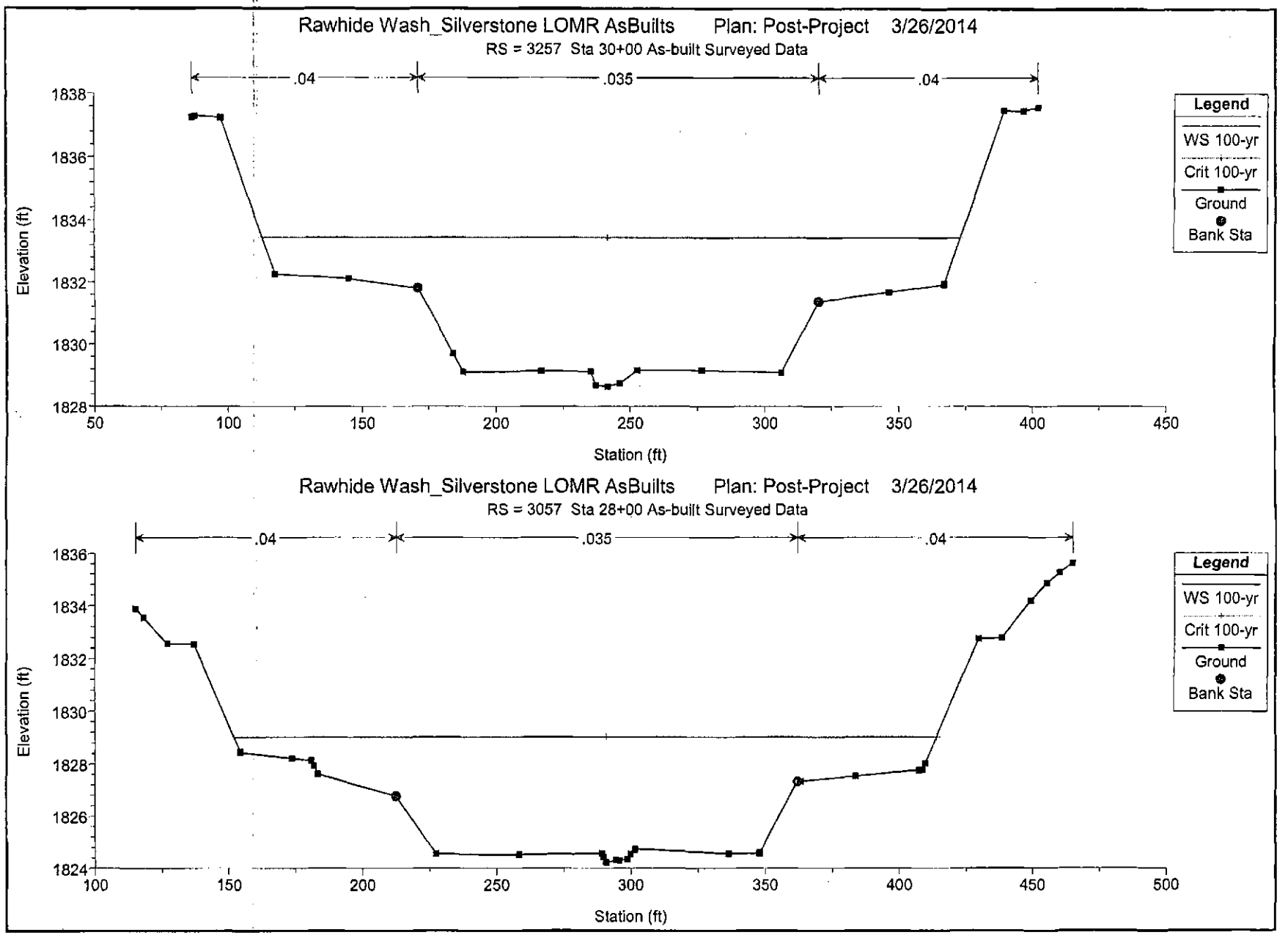

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 4008 d/s toe of drop
.058
.015
Legend
WS 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3999 u/s of bridge
.015
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

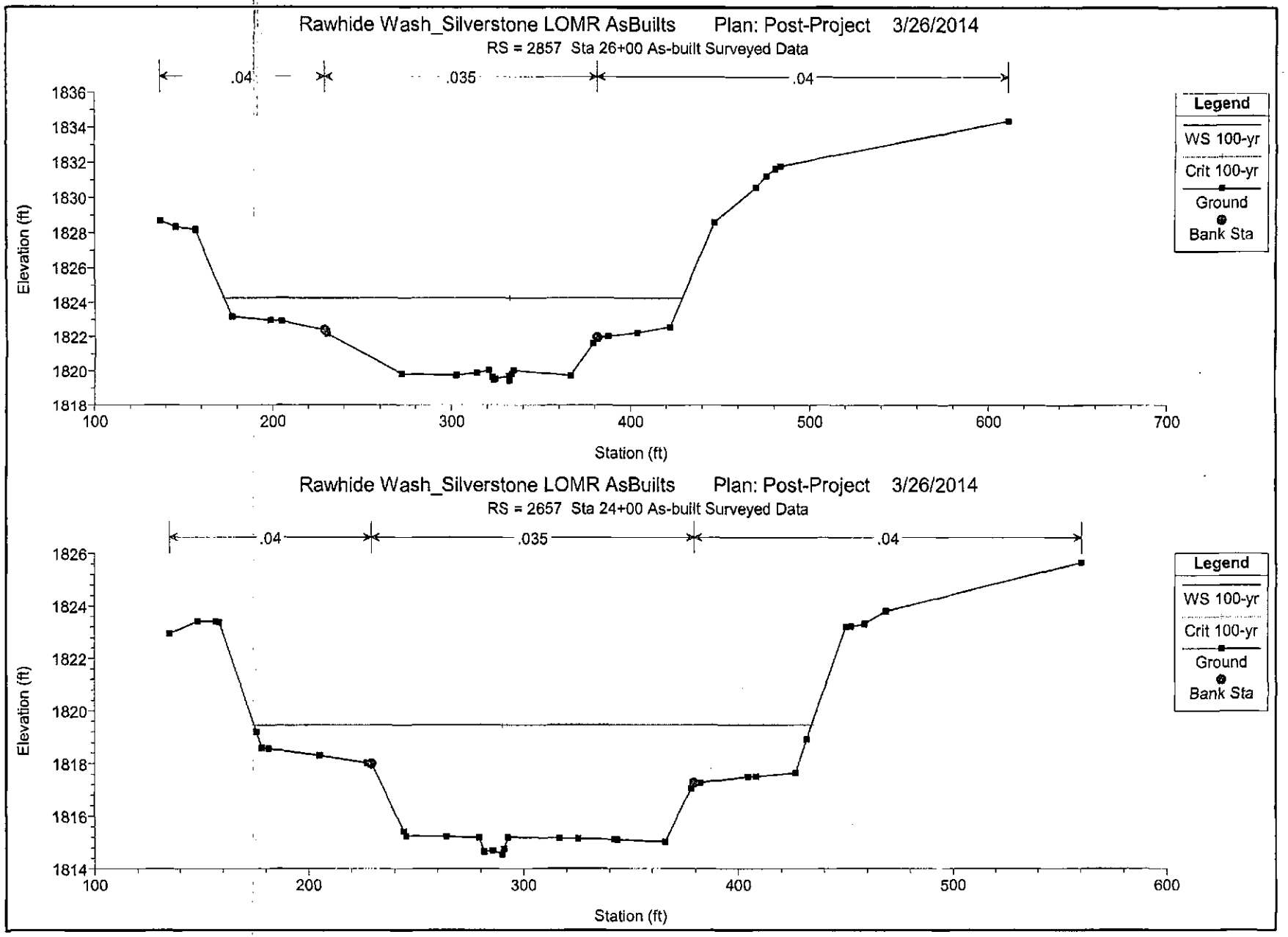

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3968 BR Pinnacle Peak Road Culverts
.015
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3968 BR Pinnacle Peak Road Culverts
.043
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

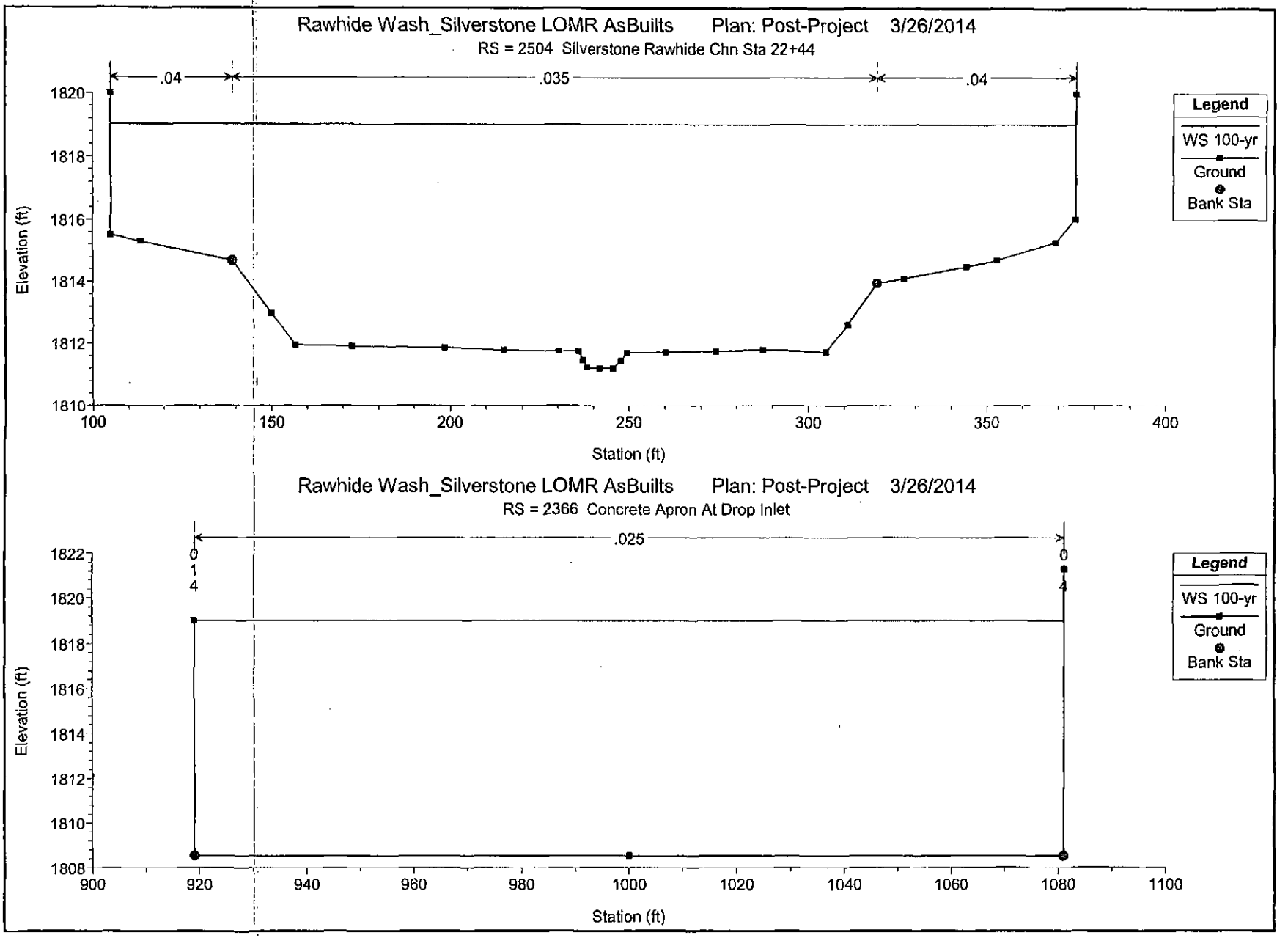

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3894 d/s of bridge
.043
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3876
.043
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

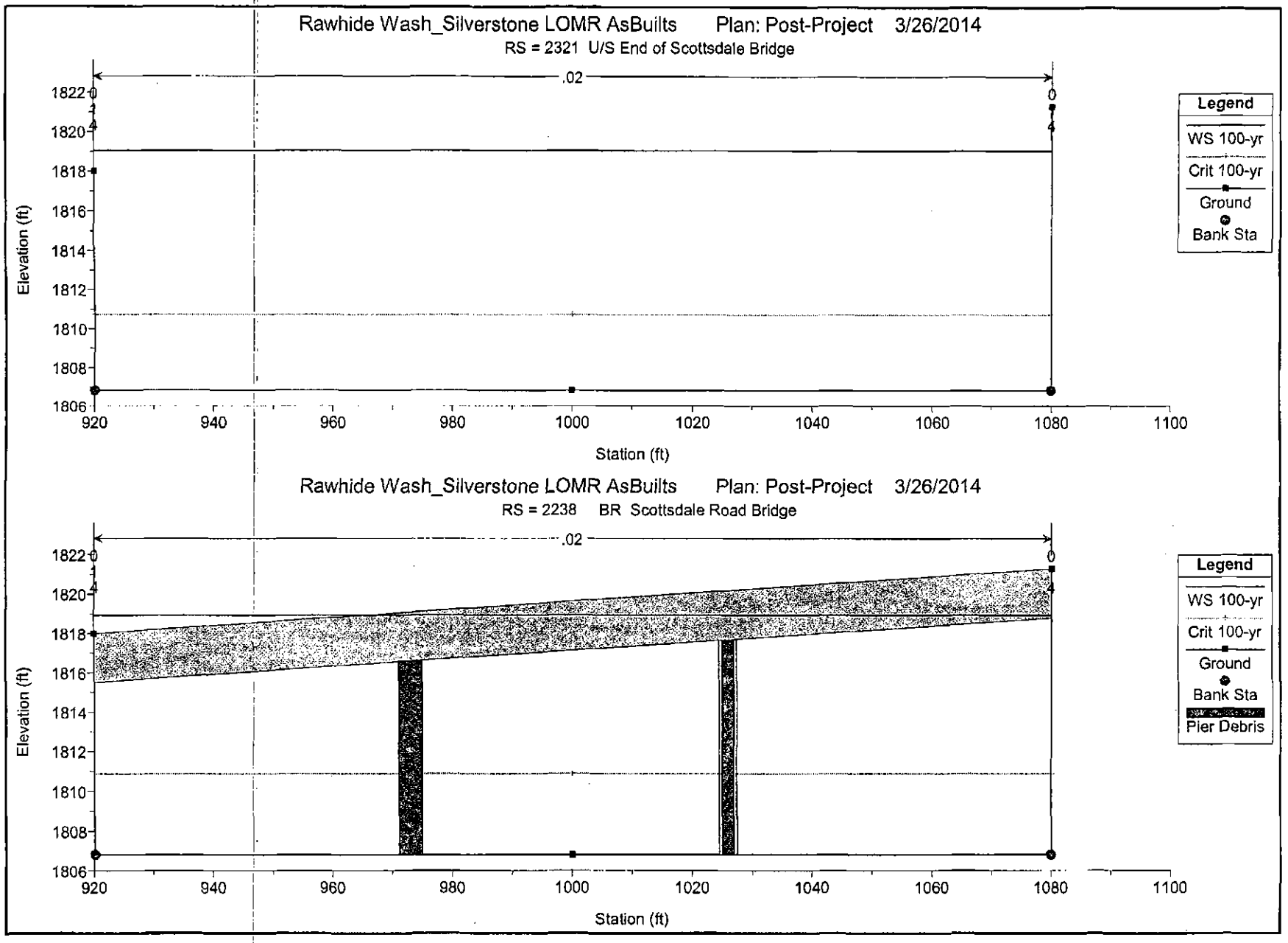

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3811 Sta 35+54
.04
.035
.04
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3721 Sta 34+64 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

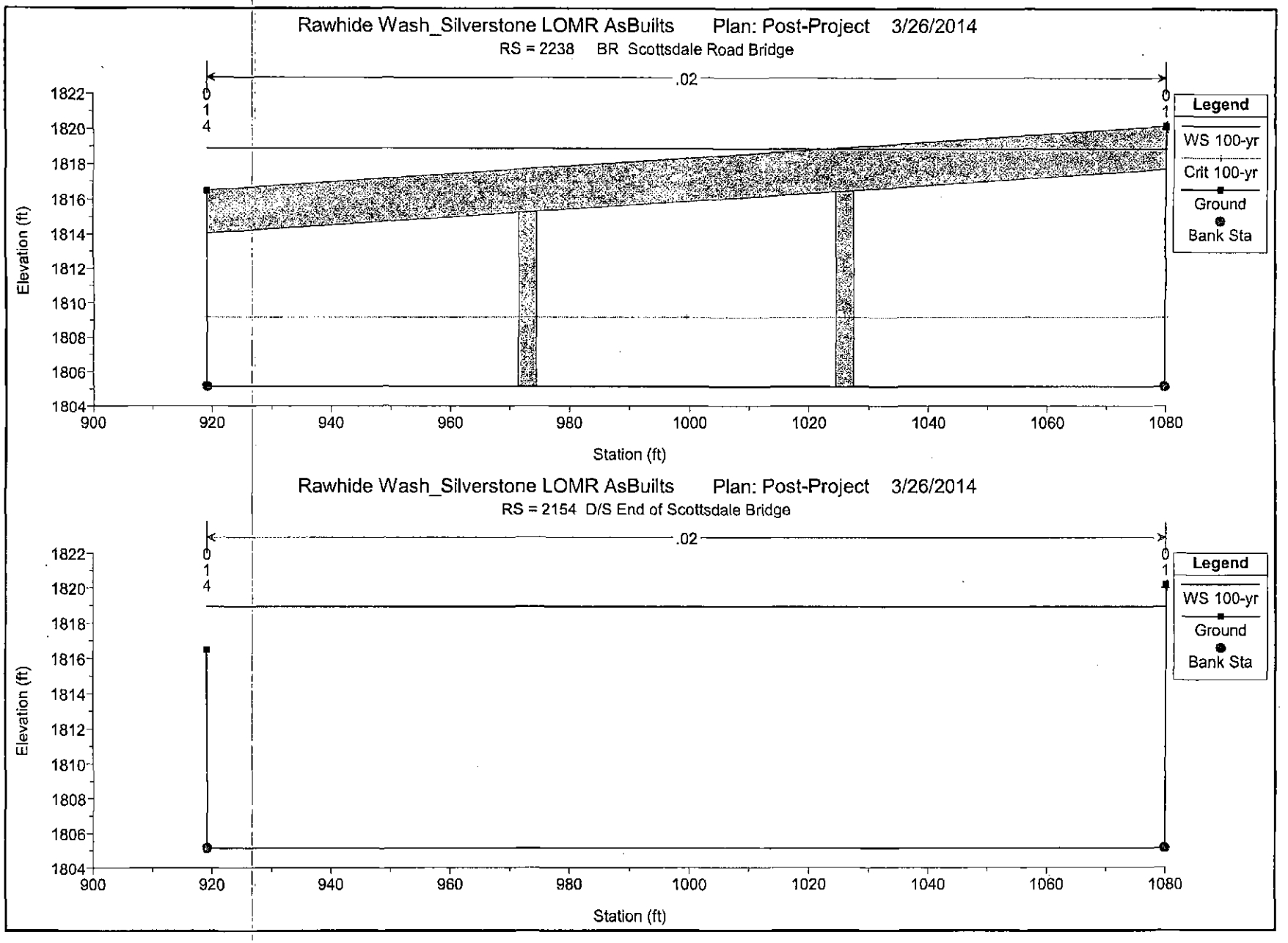

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3657 Sta 34+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3457 Sta 32+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta

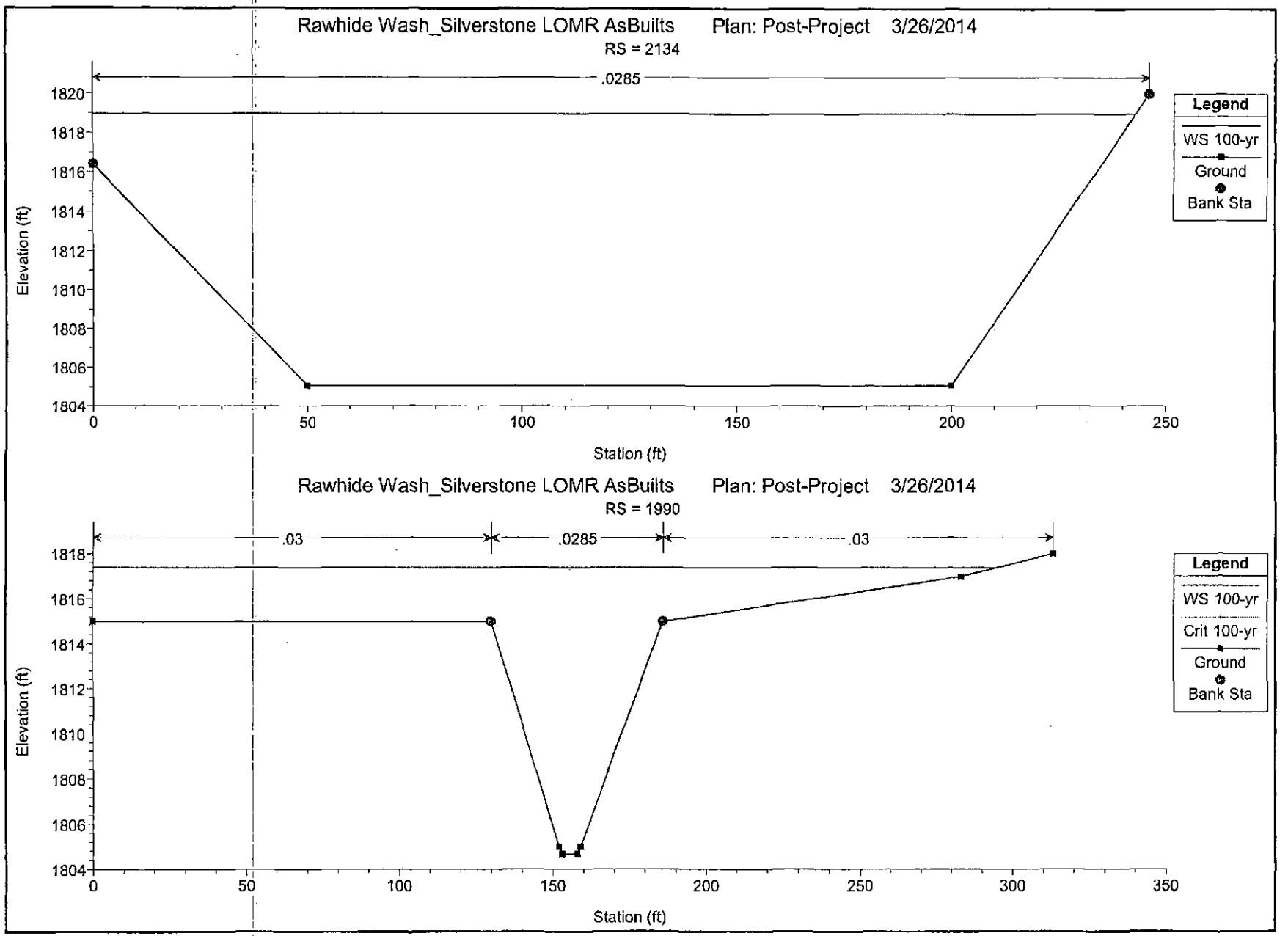

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3257 Sta 30+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
1838
1836
1834
1832
1830
1828
50
100
150
200
250
300
350
400
450
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 3057 Sta 28+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
1836
1834
1832
1830
1828
1826
1824
100
150
200
250
300
350
400
450
500
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

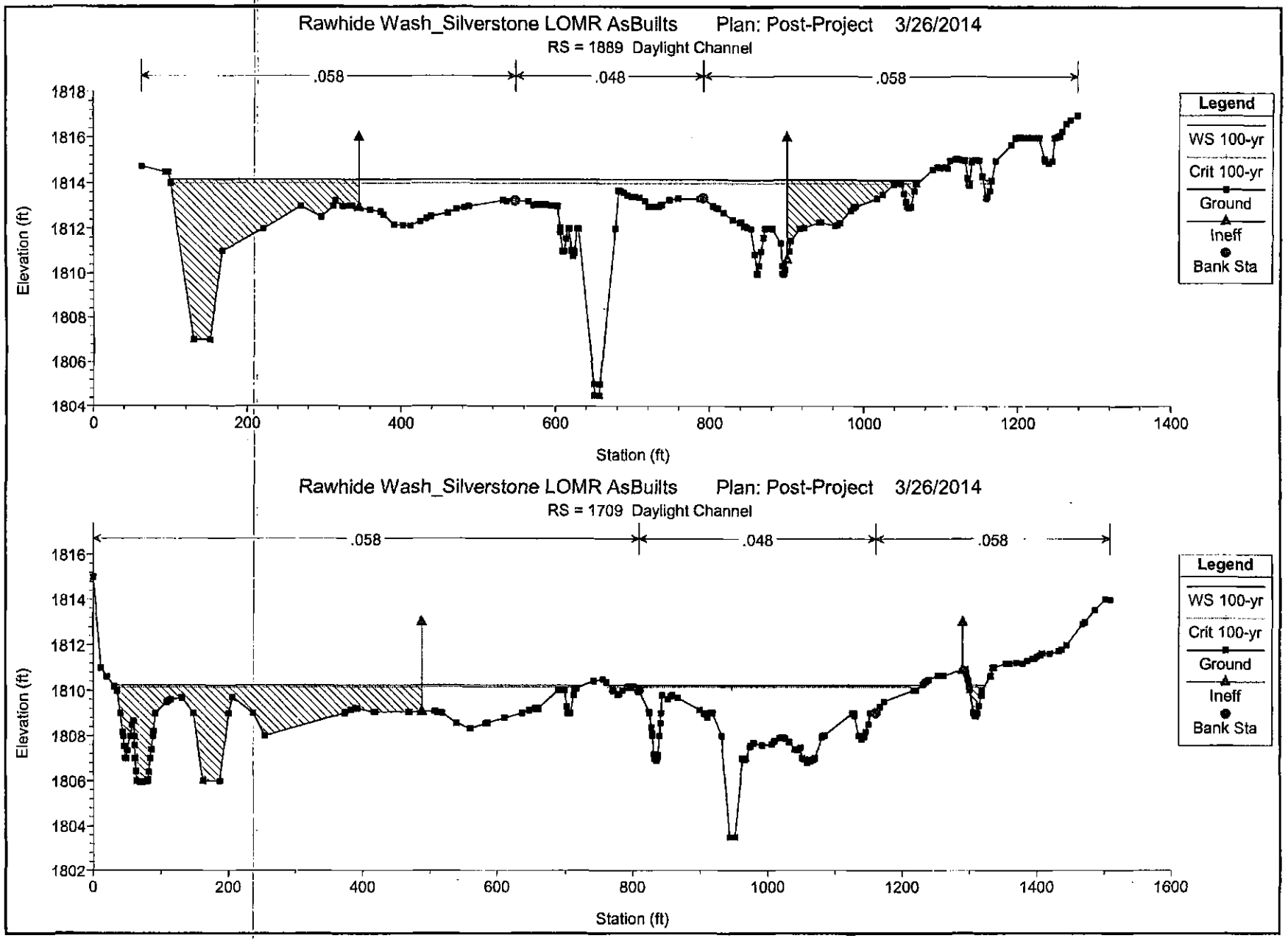

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2857 Sta 26+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
1836
1834
1832
1830
1828
1826
1824
1822
1820
1818
100
200
300
400
500
600
700
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2657 Sta 24+00 As-built Surveyed Data
.04
.035
.04
Elevation (ft)
1826
1824
1822
1820
1818
1816
1814
100
200
300
400
500
600
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta

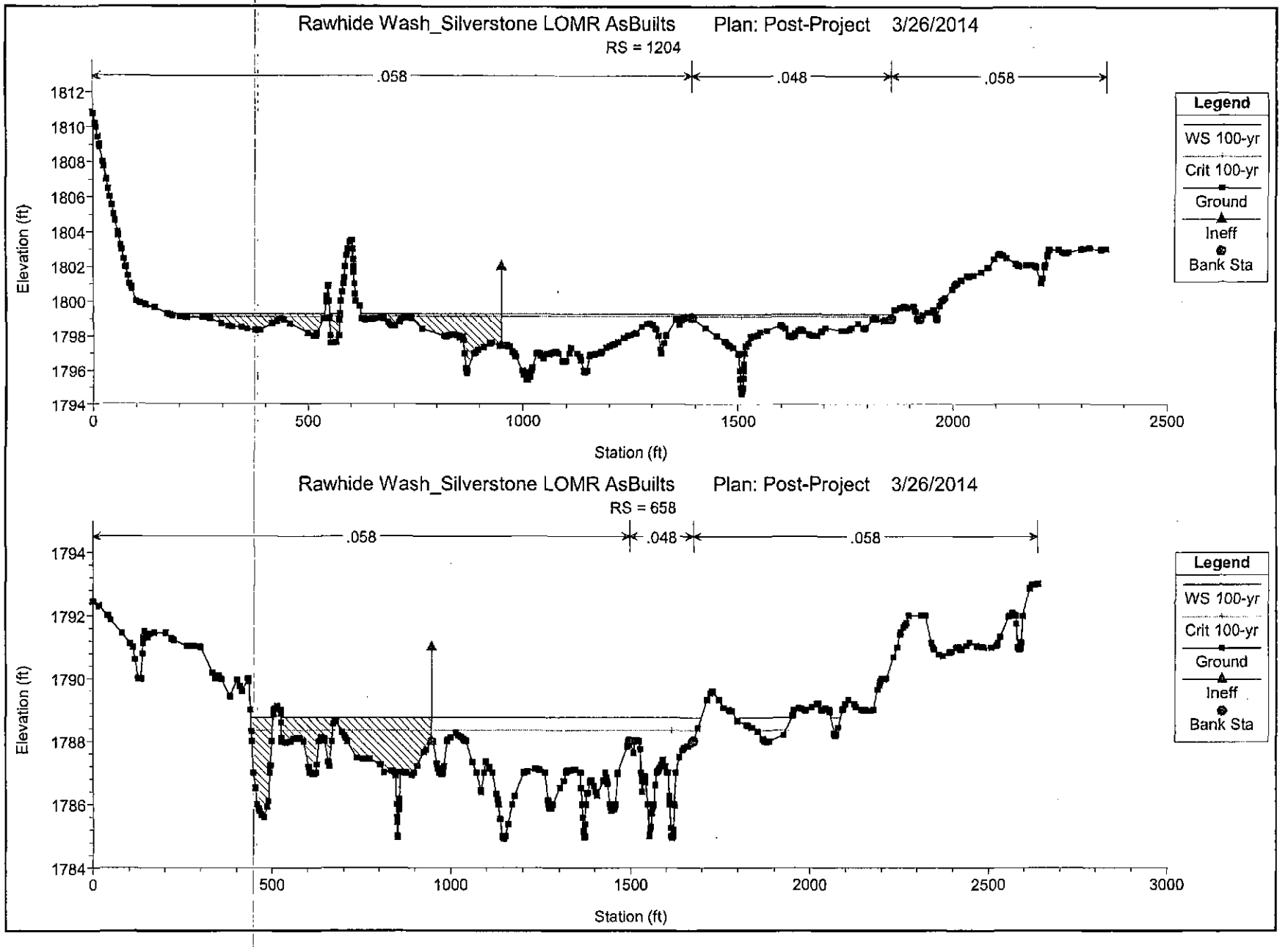

Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2504 Silverstone Rawhide Chn Sta 22+44
.04
.035
.04
Legend
WS 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2366 Concrete Apron At Drop Inlet
.025
Legend
WS 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2321 U/S End of Scottsdale Bridge
.02
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
1822
1820
1818
1816
1814
1812
1810
1808
1806
920
940
960
980
1000
1020
1040
1060
1080
1100
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2238 BR Scottsdale Road Bridge
.02
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Pier Debris
Elevation (ft)
Station (ft)


Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2238 BR Scottsdale Road Bridge
.02
0
1
4
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Elevation (ft)
1822
1820
1818
1816
1814
1812
1810
1808
1806
1804
900
920
940
960
980
1000
1020
1040
1060
1080
Station (ft)
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2154 D/S End of Scottsdale Bridge
.02
0
1
4
Legend
WS 100-yr
Ground
Bank Sta
Elevation (ft)
1822
1820
1818
1816
1814
1812
1810
1808
1806
1804
900
920
940
960
980
1000
1020
1040
1060
1080
Station (ft)


Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 2134
.0285
Legend
WS 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 1990
.03
.0285
.03
Legend
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 1889 Daylight Channel
.058
.048
.058
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 1709 Daylight Channel
.058
.048
.058
Elevation (ft)
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta


Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 1204
.058
.048
.058
Elevation (ft)
1812
1810
1808
1806
1804
1802
1800
1798
1796
1794
0
500
1000
1500
2000
2500
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta
Rawhide Wash_Silverstone LOMR AsBuilts Plan: Post-Project 3/26/2014
RS = 658
.058
.048
.058
Elevation (ft)
1794
1792
1790
1788
1786
1784
0
500
1000
1500
2000
2500
3000
Station (ft)
Legend
WS 100-yr
Crit 100-yr
Ground
Ineff
Bank Sta

Work Maps Depicting Floodplain with Channel Construction, Exhibit 3 (Sheets 1 & 2)

INSERT

MATCH SHEET 2

MATCH INSERT ABOVE

RS 1204
Q=7090 cfs
FP=1799.3

RS 658
Q=7090 cfs
FP=1788.8

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Scottsdale Rd

Premiere at Pinnacle Peak

Rawhide Wash

Los Portones

La Vista

Breakout
5210
33 cfs

RS 6632
Q=7414 cfs
FP=1918.2

RS 6221
Q=7414 cfs
FP=1909.6

RS 5820
Q=7414 cfs
FP=1899.7

RS 5357
Q=7414 cfs
FP=1889.9

RS 5205
Q=7387 cfs
FP=1886.5

RS 4789
Q=7381 cfs
FP=1876.7

Study Limit

RS 4441
Q=7381 cfs
FP=1869.5

Breakout
4300
294 cfs

RS 4027
Q=7090 cfs
FP=1856.2

RS 4008
Q=7090 cfs
FP=1849.7

RS 4117
Q=7372 cfs
FP=1861.8

Pinnacle Peak Rd Bridge
Flow contained within

RS 3999
Q=7090 cfs
FP=1849.6

RS 3894
Q=7090 cfs
FP=1847.5

RS 3876
Q=7090 cfs
FP=1847.2

RS 3811
Q=7090 cfs
FP=1846.2

Channel & Bridge area
are reflected in contours.
See construction plans

RS 3721
Q=7090 cfs
FP=1844.3

RS 3657
Q=7090 cfs
FP=1842.7

RS 3457
Q=7090 cfs
FP=1838.2

RS 3257
Q=7090 cfs
FP=1833.5

RS 3057
Q=7090 cfs
FP=1829.0

Silverstone Site

RS 2857
Q=7090 cfs
FP=1824.3

RS 2657
Q=7090 cfs
FP=1819.5

RS 2504
Q=7090 cfs
FP=1819.0

RS 2154
Q=7090 cfs
FP=1819.0

RS 2366
Q=7090 cfs
FP=1819.0

RS 2134
Q=7090 cfs
FP=1819.0

RS 2321
Q=7090 cfs
FP=1819.0

RS 1990
Q=7090 cfs
FP=1817.4

RS 1889
Q=7090 cfs
FP=1814.2

Scottsdale Rd Bridge
Breakout occurs to the south

RS 1709
Q=7090 cfs
FP=1810.2

Cross Section 1
Q=423 cfs
FP=1836.1

RS 1204
Q=7090 cfs
FP=1799.3

RS 658
Q=7090 cfs
FP=1788.8

Hydraulic Analysis
Study Limit

Pinnacle Peak Rd

Williams Dr

Miller Rd

74th St

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- River Section
- Cross Section 1
- Hydraulic Base Line
- Revised_100Year_Floodplain_5_15_2014
- Floodplain Removal (Proposed Zone X)
- Rawhide Wash east breakout flow route
- Base Flood Elevation
- Silverstone Site
- Study Limit_Zone Break
- Index Contour
- Inter Contour

FEMA Effective Flood Zones

- A
- AE
- AH
- AO

0 100 200 400 Feet

N

EXHIBIT 3

Sheet 1 of 2

Rawhide Wash Workmap

Job No. 113671.02

Date: 6/18/2014

WOOD/PATEL
MISSION: CLIENT SERVICE™

Document Path: N:\2011\113671.02\GIS\Maps\Exhibit 3 Rawhide Wash Workmap_Sheet 1 As-built_current.mxd

Legend

- River Section
- Hydraulic Base Line
- Possible 100-Yr Floodplain Boundary
- Rawhide Wash east breakout flow route
- BFEs
- Study Limit_Zone Break
- Index Contour
- Inter Contour

FEMA Effective Flood Zones

- A
- AE
- AH
- AO

0 100 200 400 Feet

N

EXHIBIT 3

Sheet 2 of 2

Rawhide Wash Workmap

Job No. 113671.02

Date: 5/22/2014

WOOD/PATEL
MISSION: CLIENT SERVICE™

Document Path: N:\2011\113671.02\GIS\Maps\Exhibit 3 Rawhide Wash Workmap_Sheet 2 SEC Exhibit for Ash.mxd

Digital Files (HEC-RAS, Work Maps)

Channel-As-Built Plans ,included CD in back pocket

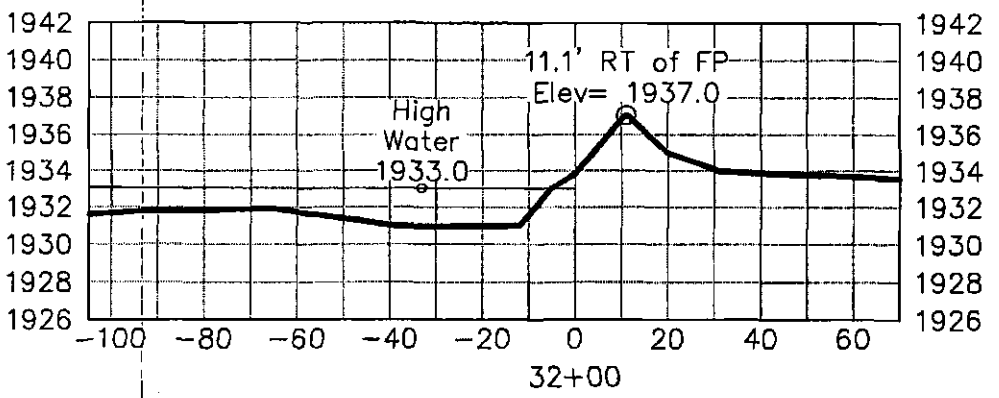
Response to Second Comment

Area 1 – Land Feature on East Side of Wash;

For location, see Work Map Exhibit 3, Sheet 2,Cross-Section 7490

Detailed Hydraulic Cross-Sections: Plate 1, Section H, I, J, K

Detailed Hydraulic Cross-Sections: Plate 1, Sections H, I, J, K



(H)

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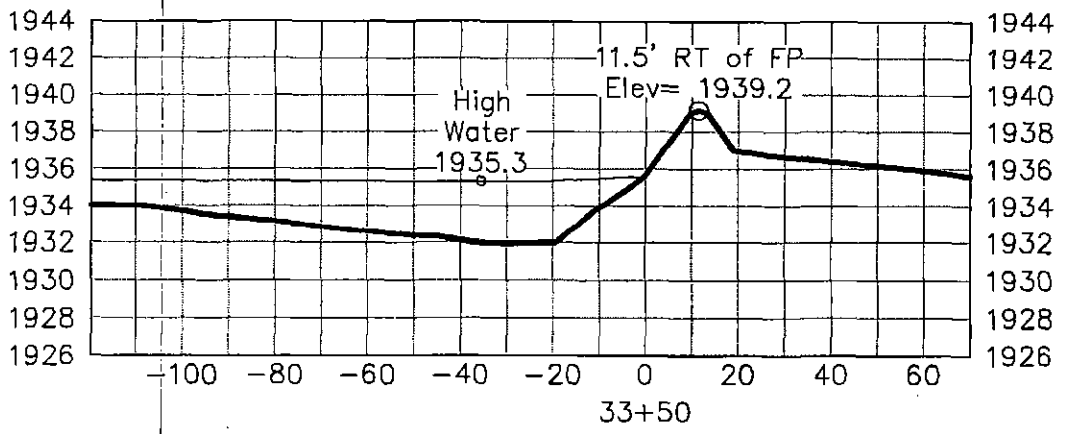
www.woodpatel.com
PHOENIX • MESA • TUCSON • GOODYEAR



(1)

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Phoenix, AZ 85021
(602) 335-8500
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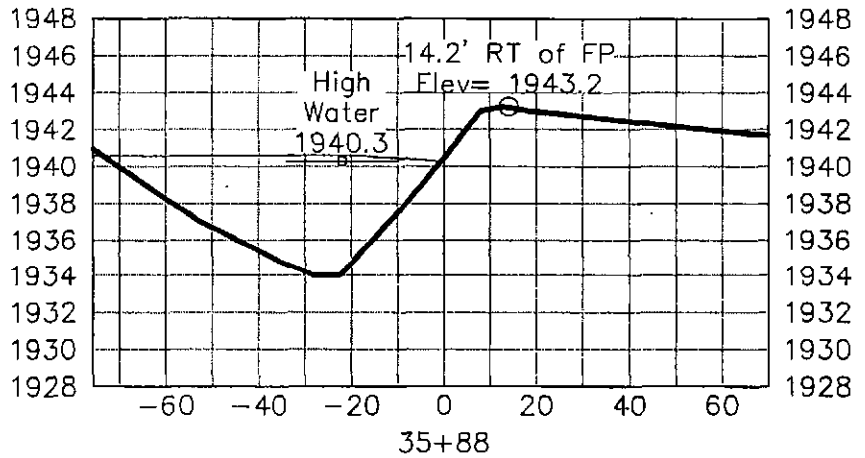

(J)

SECTION

WOOD/PATEL
HYDROLOGISTS
LAND SURVEYORS
CONSTRUCTION MANAGERS
2051 W. Northern Ave.
Phoenix, AZ 85021
(602) 335-8500
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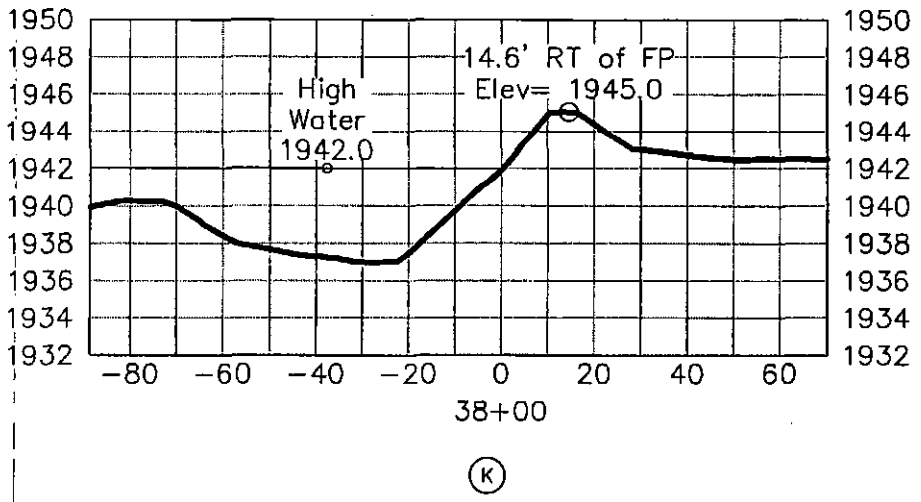

(K)

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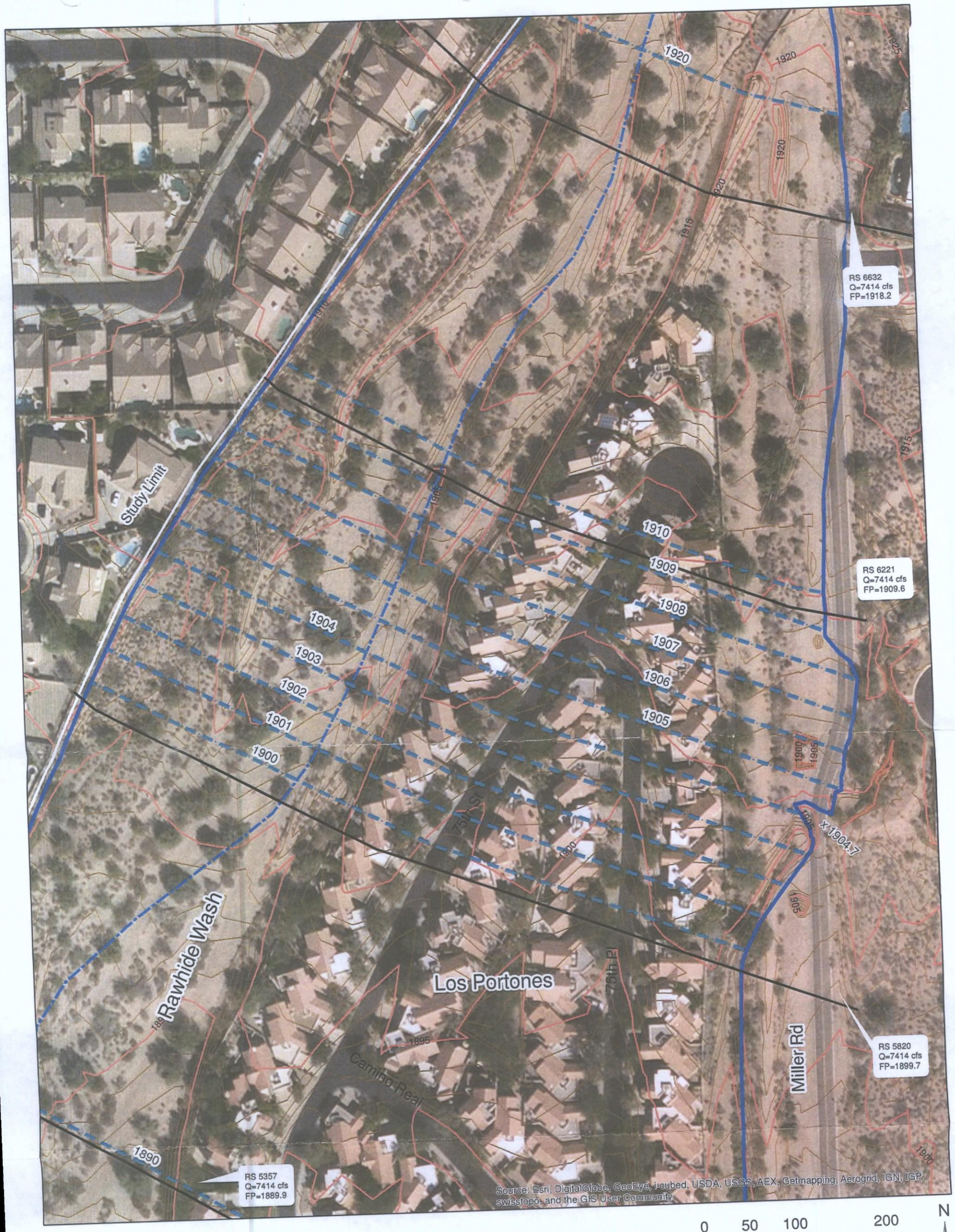
Area 2 – North Miller Road About 1,300 feet North of Pinnacle Peak Road

Detailed Evaluation of Floodplain Boundary, Plate 2



0 50 100 200 Feet

N

Legend

- River Section
- Cross Section 1
- Hydraulic Base Line
- Revised_100Year_Floodplain_5_15_2014
- Base Flood Elevation
- Study Limit_Zone Break
- Index Contour
- Inter Contour

PLATE 2

Rawhide Wash Workmap

WOOD/PATEL
MISSION: CLIENT SERVICE™

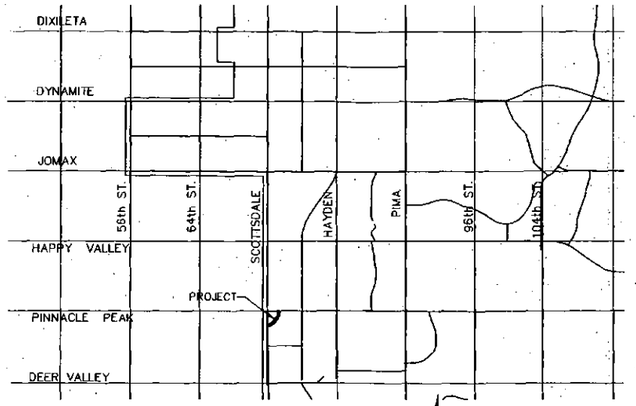
Date: 5/20/2014 Job No. 113671.02

Document Path: N:\2011\113671.02\GIS\Maps\Rawhide Wash Workmap_Plate 2.mxd

Digital Files (HEC-RAS, Work Maps)

RAWHIDE WASH CHANNEL
PINNACLE PEAK ROAD TO SCOTTSDALE ROAD

A PORTION OF SECTION 14
T.4N., R.4E., OF THE G.&S.R.M.,
MARICOPA COUNTY, ARIZONA



LOCATION MAP
N.T.S.

ADDRESS: 23033 N. SCOTTSDALE ROAD
PARCEL: 212-02-001D

THE ENGINEER OF RECORD ON THESE PLANS HAS RECEIVED A COPY OF THE APPROVED STIPULATIONS FOR THIS PROJECT AND HAS DESIGNED THESE PLANS IN CONFORMANCE WITH THE APPROVED STIPULATIONS.

SIGNATURE: _____

NOTE

1. WITHIN THREE MONTHS OF CITY ACCEPTING CHANNEL CONSTRUCTION PER THIS PLAN SET, OWNER/DEVELOPER WILL CAUSE THE LANDSCAPE WORK TO START IN COMPLIANCE WITH THE CITY APPROVED LANDSCAPE PLAN AND WITH 2-MP-2006 AND 21-DR-2007
2. THIS PLAN SET IS TO BE REVIEWED WITH HECRAS FILE NAMED RAWHIDECHN_IMP.PRJ AND DATED 10/23/2012.

MAINTENANCE NOTE

1. THE SILVERSTONE MASTER ASSOCIATION IS RESPONSIBLE FOR MAINTENANCE OF PARCEL I. RAWHIDE WASH IS AN ACTIVE WATERCOURSE AND MAINTENANCE OF THE CHANNEL AND IT'S ASSOCIATED IMPROVEMENTS WILL BE ONGOING AND VARY IN NEEDS DEPENDING ON FLOOD EVENTS.

UTILITY NOTES

1. THESE PLANS HAVE BEEN SUBMITTED TO THE FOLLOWING UTILITY COMPANIES AND THE WORK CONTAINED IN THESE PLANS HAS BEEN APPROVED BY THESE COMPANIES WITHIN THEIR AREA OF INTEREST. THE SIZE AND LOCATIONS, AS SHOWN, OF THE GAS, TELEPHONE AND POWER LINES, AND CONNECTIONS AGREE WITH THE INFORMATION CONTAINED IN THE UTILITY COMPANY RECORDS. WHERE THE WORK TO BE DONE CONFLICTS WITH ANY OF THESE UTILITIES, THE CONFLICTS SHALL BE RESOLVED AS SPECIFIED. CONFLICTS ARISING DURING THE COURSE OF CONSTRUCTION FROM UNFORESEEN CIRCUMSTANCES SHALL BE REPORTED TO THE INTERESTED UTILITY COMPANY AND BE RESOLVED BY THEM AND THE DESIGN ENGINEER.
2. THE CITY WILL NOT PARTICIPATE IN THE COST OF CONSTRUCTION OR UTILITY RELOCATION.

NO CONFLICT SIGNATURE BLOCK

Utility	Utility Company	Name of Company Representative	Telephone Number	Date Signed
Electric	Arizona Public Service	Scott Tiner	(602) 493-4421	02-26-2013
Telephone	Century Link	Debbie Ramsey	(602) 630-0492	04-17-2013
Natural Gas	Southwest Gas	Marcus Watanabe	(480) 730-3855	03-19-2013
Cable TV	COX Communications	Juris Briganti	(602) 694-1974	03-13-2013
	Crown Castle Solutions	Aaron Lamoureux	(480) 734-2407	05-02-2013
Water	City of Scottsdale	Doug Mann	(480) 312-5636	N/A
Sewer	City of Scottsdale	Doug Mann	(480) 312-5636	N/A

Engineer's Certification
I, [illegible], being the person responsible for designing the facilities necessary to serve this development, hereby certify that all of the utility companies listed above, have reviewed this project proposal and all conflicts have been resolved at this point. "No Conflict" forms have been obtained from each utility company and are included in this submittal.

Signature _____ Date 9.1.13

CITY OF SCOTTSDALE
REVIEW & RECOMMENDED APPROVAL BY:

FIRE DEPT	N/A	GRADING & DRAINAGE	5/16/13 Richard Mlynarik
PLANNING	5/10/13	WATER & SEWER	N/A
TRAFFIC	N/A	PAVING	N/A
STRUCTURAL	N/A	RET. WALL	N/A

APPROVED BY:
Greg S. Hebl 5-16-2013
ENGINEERING COORDINATOR MANANGER OR DESIGNEE DATE

QUANTITIES

DESCRIPTION	UNIT	ESTIMATED QUANTITY
CHANNEL EXCAVATION	CY	129186
FILL (TO F.G.)	CY	6412
SOIL CEMENT BANK PROTECTION	CY	13710
LOOSE RIPRAP REMOVAL	CY	1140
GABION ROCK (BOXES)	CY	1050
GABION ROCK (MATTRESSES)	CY	1700
GROUTED RIPRAP (TYPE I)	CY	760
FILTER FABRIC (UNDER GABIONS)	SY	6400
COLORED CONCRETE SIDEWALK (10' WIDE W/THICKENED EDGE)	CY	204
DECOMPOSED GRANITE - MAINTENANCE ROAD	SF	5250
FLOOD SIGN	EA	9

HAUL PERMIT NOTE

1. HAUL ROUTE PERMITS ARE REQUIRED FOR ANY HAUL OPERATION WHICH UTILIZES CITY RIGHT-OF-WAY WITH A VOLUME EXCEEDING 5,000 C.Y.

BENCHMARK AND LAND SURVEY DATA

ALL TOPOGRAPHY WAS OBTAINED FROM KENNEY AERIAL MAPPING, INC., PROJECT NUMBER 0502928, FLIGHT DATE NOVEMBER, 2005

THE HORIZONTAL DATUM FOR THIS SURVEY IS BASED ON THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION (MCDOT) GEODETIC DENSIFICATION AND CADASTRAL SURVEY (GDACS) WEBSITE "www.mcdot.maricopa.gov", UNDER THE SURVEY INFORMATION LINK OF SEPTEMBER 2005.

PROJECTION: ARIZONA CENTRAL ZONE, NAD 83, (EPOCH 92)
DATUM: GRS-80
UNITS: INTERNATIONAL FEET
GEOID MODEL: GEOID 03

CONTROL POINT: 1HH2
PID: AJ3694
LATITUDE: 33:41'03.58979"N
LONGITUDE: 111:56'34.12945"W
ELLIPSOID HEIGHT: 489.76 METERS
DESCRIPTION: STAINLESS STEEL ROD

MODIFIED=TO=GROUND-AT=(GRID)=N:-981750.679, E:-697356.926, USING A SCALE FACTOR OF 1.0001832915.

HORIZONTAL ADJUSTMENT: NONE
HORIZONTAL ROTATION: NONE

THE VERTICAL DATUM FOR THIS SURVEY IS BASED ON BRASS CAP IN HANHOLE CITY OF SCOTTSDALE GPS POINT #2152 AT THE INTERSECTION OF PINNACLE PEAK AND SCOTTSDALE ROAD HAVING AN ELEVATION OF 1840.266, CITY OF SCOTTSDALE NAVD 88 DATUM.

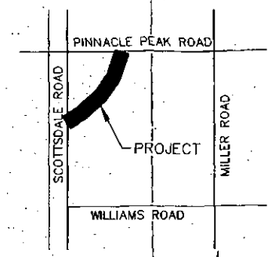
I CERTIFY THAT ALL ELEVATIONS REPRESENTED ON THIS PLAN ARE BASED ON THE ELEVATION DATUM FOR THE CITY OF SCOTTSDALE BENCHMARK PROVIDED ABOVE.

FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM	FIRM ZONE	BASE FLOOD ELEVATION (IN AO ZONE, USE DEPTH)
045012	1235	G	SEPT. 30, 2005	AO	1'-2'

THESE CONSTRUCTION DOCUMENTS ARE CERTIFIED AS REPRESENTING AS-BUILT CONDITIONS

WOOD, PATEL & ASSOCIATES INC.
PHOENIX, ARIZONA



VICINITY MAP
N.T.S.

OWNER / DEVELOPER
SILVERSTONE DEVELOPMENT, INC.
1550 E. MISSOURI AVENUE, STE. 300
PHOENIX, AZ 85011
CONTACT: MR. MIKE PACHECO
TEL.: (602) 230-1051
FAX: (602) 230-2826
EMAIL: MPACHECO@VTAIG.COM

ENGINEER
WOOD, PATEL & ASSOCIATES, INC.
2051 WEST NORTHERN, STE. 100
PHOENIX, ARIZONA 85021
CONTACT: MR. DARREL WOOD, P.E.
TEL: (602) 335-8500
FAX: (602) 335-8580
EMAIL: DWOOD@WOODPATEL.COM

GEOTECHNICAL ENGINEER
ALPHA GEOTECHNICAL & MATERIALS, INC.
TEMPE, ARIZONA 85282
CONTACT: MR. JAMES E. WEAVER, P.E.
TEL: (602) 453-3265
FAX: (602) 453-3267
EMAIL: JWEAVER@ALPHAGEOTECH.COM

SHEET INDEX

A = SECTION LETTER OR DETAIL NUMBER
1 = DRAWING NUMBER IN WHICH DETAIL APPEARS. NO DRAWING NUMBER IMPLIES A TYPICAL SECTION.

SYMBOLS

- APPROXIMATE GEOTECHNICAL SAMPLING LOCATION
- APPROXIMATE GEOTECHNICAL TEST PIT LOCATION
- (100) HEC-RAS CROSS SECTION LOCATION WITH 100-YR-WATER-SURFACE-ELEVATION
- FG=44.0 FINISHED GRADE
- FLOOD SIGN
- N.I.C. NOT IN CONTRACT
- P=1808.11 TOE OF BANK PROTECTION ELEVATION
- UGE MANHOLE

CALL TWO WORKING DAYS BEFORE YOU DIG 263-1100 1-800-STAKE-IT (OUTSIDE MARICOPA COUNTY)

WOOD/PATEL
LAND DEVELOPMENT • WATER RESOURCES
TRANSPORTATION/TRAFFIC
WATER/WASTEWATER • CONSTRUCTION MANAGEMENT
2051 W. Northern Ave.
Phoenix, AZ 85021
(602) 335-8500
www.woodpatel.com
PHOENIX • MESA • TUCSON

SILVERSTONE
SCOTTSDALE
RAWHIDE WASH CHANNEL
COVER SHEET

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	01 OF 09

CASE NO. 113-SA-2007 2-MP-2006 PLAN CHECK NO. 1612-07-01 NATIVE PLANT CASE NO. 124-NP-06

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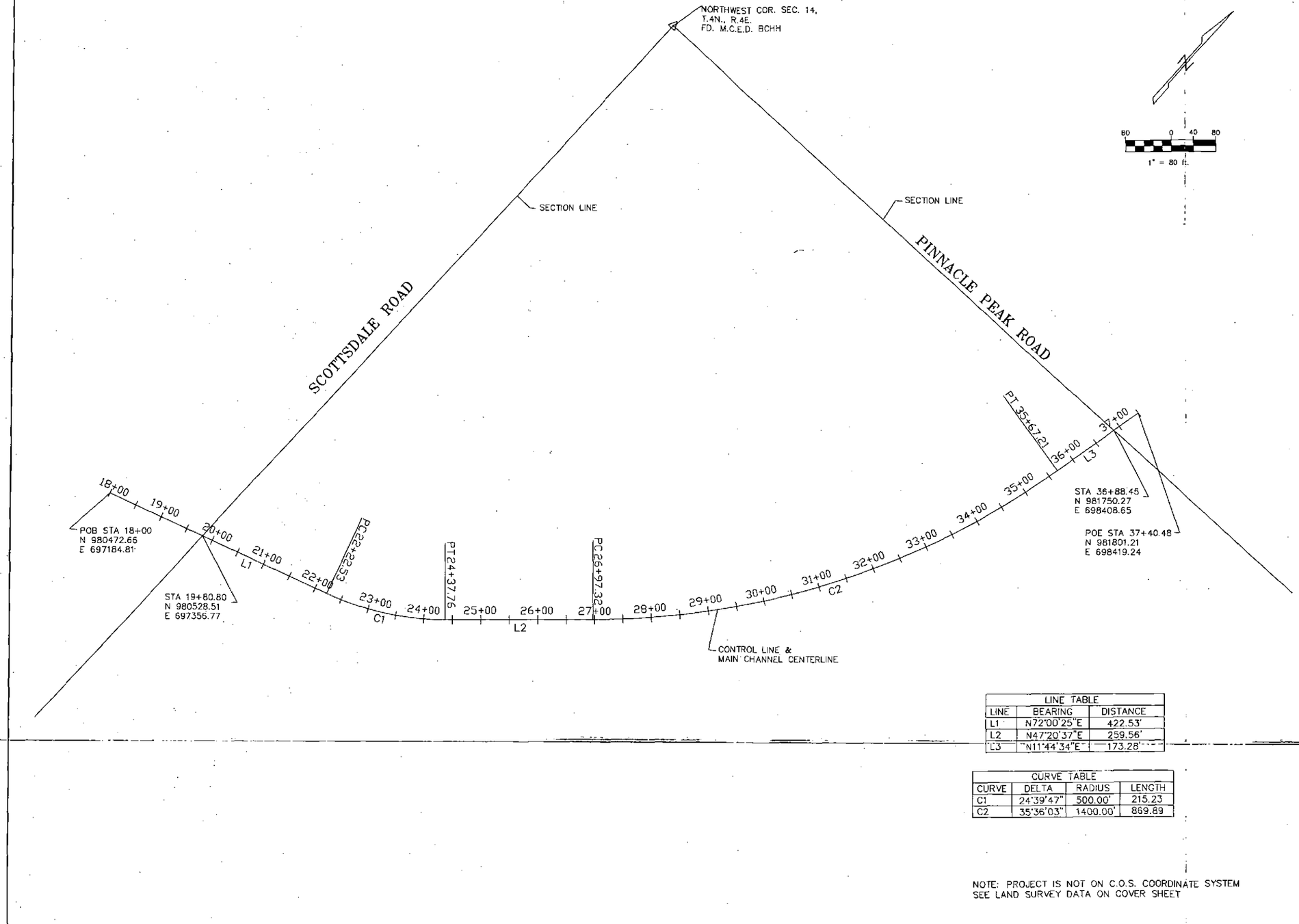

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N72°00'25"E	422.53'
L2	N47°20'37"E	259.56'
L3	N11°44'34"E	173.28'

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	24°39'47"	500.00'	215.23
C2	35°36'03"	1400.00'	869.89

NOTE: PROJECT IS NOT ON C.O.S. COORDINATE SYSTEM
SEE LAND SURVEY DATA ON COVER SHEET

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
OUTSIDE MARICOPA COUNTY

C:\temp\AcPublish_3128\113671-002Cntrl.dwg 05/07/2013 10:03

WOOD/PATEL
2051 W. Northern Ave.
Phoenix, AZ 85021
(602) 335-8500

SILVERSTONE
SCOTTSDALE
RAWHIDE WASH CHANNEL
GEOMETRIC DRAINAGE LAYOUT SHEET

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	02 OF 09

CASE NO. 113-SA-2007 2-MP-2006 PLAN CHECK NO. 1612-07-01 NATIVE PLANT CASE NO. 124-NP-06

GENERAL NOTES

CITY OF SCOTTSDALE
GENERAL CONSTRUCTION NOTES
FOR PUBLIC WORKS CONSTRUCTION

1. ALL IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THE LATEST MARICOPA COUNTY ASSOCIATION OF GOVENMENTS STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE SUPPLEMENTAL STANDARD SPECIFICATIONS AND DETAILS. IF THERE IS A CONFLICT, THE LATTER SHALL APPLY. ALL FACILITIES CONSTRUCTION SHALL COMPLY WITH THE 2003 IBC, 1994 UPC, 2003 IMC, 2003 IFC AND THE 1999 NEC.
2. THE ENGINEERING DESIGN ON THESE PLANS ARE APPROVED BY THE CITY IN SCOPE AND NOT IN DETAIL. IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
3. APPROVAL OF THE PLANS BY THE CITY IS VALID FOR 6 MONTHS. IF A PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN THE SIX MONTHS OF REVIEW, THE PLANS SHAL BE RESUBMITTED TO THE CITY FOR REAPPROVAL.
4. A CITY CAPITAL PROJECTS INSPECTOR WILL INSPECT ALL WORK WITHIN THE CITY RIGHTS-OF-WAY, EASEMENTS AND FACILITIES.
5. WHEREVER EXCAVATION IS DONE CONTACT THE BLUE STAKE CENTER AT 602-263-1100, TWO WORKING DAYS BEFORE EXCAVATION IS TO BEGIN. THE CENTER WILL SEE THAT THE LOCATION OF UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL COLLECT IF NECESSARY.
6. CITY ENCROACHMENT AND BUILDING PERMITS ARE REQUIRED FOR WORK IN PUBLIC RIGHTS-OF-WAY, EASEMENTS GRANTED FOR PUBLIC PURPOSES AND FACILITIES. PERMITS WILL BE ISSUED BY THE CITY'S ONE STOP SHOP. COPIES OF ALL PERMITS SHALL BE RETAINED ON-SITE AND SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE WORK STOPPAGE UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
7. ALL EXCAVATION AND GRADING WHICH IS NOT IN PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC PURPOSES MUST CONFORM TO CHAPTER 70, EXCAVATION AND GRADING, OF THE 2003 EDITION OF THE INTERNATIONAL BUILDING CODE PREPARED BY THE INTERNATIONAL CODE COUNCIL. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY.
8. THRUST RESTRAINT, WHERE REQUIRED, ON ALL CITY WATER LINES SHALL BE PROVIDED USING MEGALUG MECHANICAL JOINT RESTRAINTS OR CITY APROVED EQUAL.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR SALVAGING PROTECTED NATIVE PLANTS PRIOR TO THE START OF CONSTRUCTION.
10. ANY ASPHALT MIX DESIGN USED ON ALL CITY OF SCOTTSDALE PROJECTS SHALL HAVE BEEN APPROVED FOR THAT USE AND APPEAR ON THE "APPROVED LIST OF ASPHALT MIXES" AS DISTRIBUTED BY THE EAST VALLEY ASPHALT COMMUNITY (EVAC).
11. SITE LINES SHALL BE SHOWN AT ALL INTERSECTION, ALLEY AND DRIVEWAY LOCATIONS.
12. ANY DEVIATION FROM THE APPROVED PLANS SHALL BE REVIEWED AND APPROVED BY THE CITY OF SCOTTSDALE PRIOR TO THAT CHANGE BEING INCORPORATED INTO THE PROJECT.
13. ANY SPECIAL INSPECTION REQUIRED SHALL BE IN ADDITION TO ANY ROUTINE INSPECTION BY THE CITY OF SCOTTSDALE.
14. BASED ON THE INFORMATION SUBMITTED ON THE PLANS AND ASSOCIATED DOCUMENTS, THE CITY OF SCOTTSDALE HAS REVIEWED AND FOUND THEM TO BE IN ACCORDANCE WITH THE CITY OF SCOTTSDALE MUNICIPAL CODE AND ARE ACCEPTABLE FOR PERMIT ISSUANCE. THIS ACCEPTANCE BY THE CITY OF SCOTTSDALE DOES NOT AUTHORIZE VIOLATIONS OF ANY APPLICABLE CODE, ORDINANCE OR STANDARD AS ADOPTED BY THE MUNICIPAL CODE.
15. ALL EXPOSED CONCRETE SHALL BE OF CITY COLOR "SAN DIEGO BUFF".
16. ALL EXPOSED LOOSE RIPRAP SHALL BE ANGULAR "DESERT CHARACTER" TYPE.

ENGINEERS NOTES

1. MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION INCLUDING LATEST REVISION AND CURRENT SUPPLEMENTALS THEREOF PER THE LOCAL TOWN OR CITY) ARE INCORPORATED INTO THIS PLAN IN THEIR ENTIRETY.
2. ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION COVERED BY THIS PLAN SHALL BE IN ACCORDANCE WITH THE M.A.G. STANDARD SPECIFICATIONS AND DETAILS AND CURRENT SUPPLEMENTS THEREOF PER THE LOCAL CITY OR TOWN UNLESS SPECIFIED OTHERWISE IN THESE PLANS OR ELSEWHERE IN THE CONTRACT DOCUMENTS. CONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH ALL REQUIRED STANDARD SPECIFICATIONS, DETAILS AND SUPPLEMENTS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
3. THE CONTRACTOR IS RESPONSIBLE FOR ALL METHODS, SEQUENCING, AND SAFETY CONCERNS ASSOCIATED WITH THIS PROJECT DURING CONSTRUCTION, UNLESS SPECIFICALLY ADDRESSED OTHERWISE IN THIS PLAN OR ELSEWHERE IN THE CONTRACT.
4. THE CONTRACTOR IS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION COVERED BY THIS PLAN.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE ALL WORK COVERED BY THIS PLAN.
6. THE QUANTITIES AND SITE CONDITIONS DEPICTED IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO ERROR AND OMISSION. CONTRACTORS SHALL SATISFY THEMSELVES AS TO ACTUAL QUANTITIES AND SITE CONDITIONS PRIOR TO BIDDING THE WORK FOR THE CONSTRUCTION COVERED BY THIS PLAN.
7. A REASONABLE EFFORT HAS BEEN MADE TO SHOW THE LOCATIONS OF EXISTING UNDERGROUND FACILITIES AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND/OR FACILITIES CAUSED DURING THEIR CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL CALL 48 HOURS IN ADVANCE FOR BLUE STAKE (1-800-STAKE-IT) PRIOR TO ANY EXCAVATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL COORDINATION OF CONSTRUCTION AFFECTING UTILITIES AND THE COORDINATION OF ANY NECESSARY UTILITY RELOCATION WORK.
9. ALL PAVING, GRADING, EXCAVATION, TRENCHING, PIPE BEDDING, CUT, FILL, AND BACKFILL SHALL COMPLY WITH THE RECOMMENDATIONS SET FORTH IN THE SOILS (GLOTECHNICAL) REPORT FOR THIS PROJECT IN ADDITION TO THE REFERENCED REQUIRED SPECIFICATIONS AND DETAILS.
10. THE CONTRACTOR IS TO VERIFY THE LOCATION AND THE ELEVATIONS OF ALL EXISTING UTILITIES AT POINTS OF TIE-IN PRIOR TO COMMENCING ANY NEW CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER'S AGENT.
11. CONTRACTOR TO VERIFY AND COORDINATE ALL DIMENSIONS AND SITE LAYOUT WITH ARCHITECT'S FINAL SITE PLAN AND FINAL BUILDING DIMENSIONS BEFORE STARTING WORK. REPORT DISCREPANCIES TO OWNER'S AGENT.
12. COORDINATION BETWEEN ALL PARTIES IS ESSENTIAL PART OF CONTRACT.
13. CONTRACTOR IS RESPONSIBLE FOR PROJECT AND SITE CONDITIONS, AND MUST BE ALERT TO WEATHER CONDITIONS AS THE PROJECT SITE IS LOCATED IN A FLOOD PRONE AREA AND SUBJECT TO FLOODING AND ITS HAZARDS.
14. THE CONTRACTOR IS TO VERIFY THE LOCATION, ELEVATION, CONDITION, AND PAVEMENT CROSS-SLOPE OF ALL EXISTING SURFACES AT POINTS OF TIE-IN AND MATCHING, PRIOR TO COMMENCEMENT OF GRADING, PAVING, CURB AND GUTTER, OR OTHER SURFACE CONSTRUCTION. SHOULD EXISTING LOCATIONS, ELEVATIONS, CONDITION, OR PAVEMENT CROSS-SLOPE DIFFER FROM THAT SHOWN ON THESE PLANS, RESULTING IN THE DESIGN INTENT REFLECTED ON THESE PLANS NOT ABLE TO BE CONSTRUCTED, THE CONTRACTOR SHALL NOTIFY THE OWNER'S AGENT IMMEDIATELY FOR DIRECTION ON HOW TO PROCEED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR ALL COSTS ASSOCIATED WITH CORRECTIVE ACTION IF THESE PROCEDURES ARE NOT FOLLOWED.

ENGINEERS NOTES
(CONTINUED)

15. CONTRACTOR IS RESPONSIBLE TO COORDINATE UTILITY CROSSINGS AT CULVERT CROSSINGS BEFORE STARTING WORK ON CULVERT. COORDINATE WITH OWNER REPRESENTATIVE. VERIFY UTILITY LINES AND/OR CONDUITS ARE IN PLACE BEFORE STARTING CULVERT WORK.
16. THIS PROJECT REQUIRES A REGULAR ONGOING MAINTENANCE PROGRAM FOR THE DESIGNED DRAINAGE SYSTEM(S) TO PRESERVE THE DESIGN INTEGRITY AND THE ABILITY TO PERFORM ITS OPERATIONAL INTENT. FAILURE TO PROVIDE MAINTENANCE WILL JEOPARDIZE THE DRAINAGE SYSTEM(S)' PERFORMANCE AND MAY LEAD TO IT'S INABILITY TO PERFORM PROPERLY AND/OR CAUSE DAMAGE.
17. SEWER LINES DESIGNED IN PROFILE AND PUBLIC WATER LINES ARE REQUIRED TO BE ASBUILT AND THE INSTALLATION AND TESTING WITNESSED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODES R18-9-E301 "4.01 GENERAL PERMIT: SEWAGE COLLECTIONS SYSTEMS" AND R18-4-507 AND 508 "APPROVAL OF CONSTRUCTION" AND "RECORD DRAWINGS", RESPECTIVELY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY OWNER 72 HOURS IN ADVANCE WHEN THOSE SYSTEMS ARE READY TO BE WITNESSED.
18. THE CONSTRUCTION DOCUMENTS CONTAINED HEREIN ARE TO BE COORDINATED WITH CONSTRUCTION OF THE PINNACLE PEAK ROAD IMPROVEMENTS PROJECT AS WELL AS THE PINNACLE PEAK ROAD BRIDGE IMPROVEMENTS AND THE PROPOSED OR EXISTING SCOTTSDALE ROAD BRIDGE IMPROVEMENTS.
19. THIS PROJECT REQUIRES AN ARMY CORPS OF ENGINEERS SECTION 404 PERMIT BEFORE DESIGNATED WATERS OF THE U.S. CAN BE DISTURBED.
20. IT IS NOTED THE PROJECT SITE IS IN A FEMA 100 YEAR ZONE AO FLOODPLAIN AND THE PROPOSED CHANNEL HAS BEEN DESIGNED FOR 10,900 CFS WITHOUT BENEFIT OF UPSTREAM CHANNEL IMPROVEMENTS TO SUPPORT THIS WORST CASE SCENARIO. MAINTENANCE OF THE CHANNEL WILL BE REQUIRED
21. THE FUTURE CHANNEL PRESENTED BY THIS PLAN SET CAN NOT BE CONSTRUCTED IN ITS ENTIRETY UNTIL THE SCOTTSDALE ROAD BRIDGE IMPROVEMENTS, AND DOWNSTREAM ACCOMODATIONS ARE MADE FOR THE POTENTIAL DRAINAGE.

EROSION CONTROL NOTES

SUPPLEMENTAL
EROSION CONTROL SPECIFICATIONS
FOR GABION MATTRESSES

WORK DESCRIPTION
This work shall consist of furnishing and installing erosion control geotextiles, loose angular riprap or other erosion protection material in accordance with the lines, grade, design and dimensions shown in the drawings and as specified here.

Geotextile: The geotextile shall be Maccaferri MacTex MX 275 or approved equal. The geotextile shall be composed of synthetic fibers formed into nonwoven fabric. Fibers used in manufacture of the geotextile shall be composed of long chain polymeric filaments. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages. These materials shall conform to the requirements of Table "A". The geotextile shall contain stabilizers and/or inhibitors to make the fibers resistant to deterioration resulting from exposure to sunlight or heat. The geotextile shall be free of defects or flaws which significantly affect its physical and/or filtering properties.

TABLE "A"
PHYSICAL REQUIREMENTS-EROSION CONTROL
NONWOVEN GEOTEXTILE

Property	Units	Numeric Value	Test Method
Grab Tensile Strength	lb	200	ASTM D 4632
Grab Elongation	%	50	ASTM D 4632
Seam Strength	lb	200	ASTM D 4632
Puncture Strength	lb	130	ASTM D 4833
Mullen Burst Strength	lb/in^2	400	ASTM D 3786
Trapezoid Tear	lb	80	ASTM D 4533
Permittivity	Sec^{-1}	1.4	ASTM D 4491
Ultraviolet Stability %	%	70/500 Hrs	ASTM D 4355
Apparent Opening Size	U.S. Standard Sieve	80	ASTM D 4751

All numerical values represent minimum average roll values (i.e., average of test results from any sampled roll in a lot shall meet or exceed the minimum values) in a weaker principal direction. Lot sampled according to ASTM 4354 "Practice for Sampling of Geosynthetics for Testing".

Conformance of geotextiles to specification property requirements shall be based on ASTM D 4759, "Practice for Determining the Specification Conformance of Geosynthetics". Owner will require a letter from the manufacturer certifying that the geotextiles furnished meet specification requirements.

If field seams are required by owner, values apply to both field and factory.

Geotextile Shipment and Storage: The geotextile shall be kept dry and wrapped such that it is protected from the elements during shipping and storage. At no time shall the geotextile be exposed to ultraviolet light for a period exceeding fourteen days. The geotextile shall be labeled as per ASTM D4873, "Guide for Identification, Storage, and Handling of Geotextiles". Rolls shall be stored in a manner which protects them from the elements. If stored outdoors, they shall be elevated and protected with a waterproof cover.

Geotextile Placement: The geotextile shall be placed on a smooth graded surface approved by the owner. The geotextile shall be placed in such a manner that will not excessively stretch or tear upon placement of the overlying materials. Care should be taken to place the geotextile in intimate contact with the soil such that no void spaces exist between the underlying soil and the geotextile. Anchoring of the geotextile shall be accomplished through the use of key trenches of aprons at the crest and toe of slope.

Geotextile sheets shall be joined by either seaming or overlapping. All overlaps and seams shall be subject to the approval of the owner. Overlapped sheets shall have a minimum overlap of 3 feet. Overlaps shall be constructed with the upstream sheet placed over the downstream sheet or the upslope sheet placed over the downslope sheet. All overlaps shall be pined on 3-foot centers to hold the overlap in place during Gabion/Mattress placement. Pins are to be 3/16-in. diameter, 18-inches long, steel pins pointed at one end and fitted with a 1.5 inch diameter washer at the other.

SUPPLEMENTAL
EROSION CONTROL SPECIFICATIONS (continued)
FOR GABION MATTRESS/BOX GABION

Care shall be taken during construction to avoid contamination of the geotextile during construction. Contaminated geotextile shall be removed and replaced at the contractor's expense. Damaged geotextile shall be removed or repaired as directed by the owner. The patch shall extend 3 feet beyond the perimeter of the tear or damage and be pinned on 3-foot centers.

In the event that installation of the Gabion/Mattress and/or Stone demonstrates excessive damage/puncture to the geotextile, in the opinion of the owner. The contractor shall install a two inch gravel blanket between the geotextile and the Gabion/Mattress at the contractor's sole expense.

Granular bedding may be used in lieu of geotextile. Granular bedding shall be 4" thick, 3" minus graded gravel.

Gabion/Mattress Stone: Stone placement shall begin at the Gabion/Mattress toe and proceed up the slope. Stone shall not be dropped onto the geotextile from a height of more than 1 foot unless field trials demonstrate, to the approval of the inspector, that greater drop heights will not damage/puncture the geotextile. Any geotextile damaged during placement of stone shall be replaced as directed by the owner at the contractor's expense. Concrete rubble shall not be allowed as an acceptable substitution for stone. Stone shall conform to Table "B".

TABLE "B"

36" BOX GABION	12" GABION MATTRESS	18" GABION MATTRESS
D_{MIN} = 4"	D_{MIN} = 4"	D_{MIN} = 5"
D_{50} = 6"	D_{50} = 6"	D_{50} = 9"
D_{MAX} = 8"	D_{MAX} = 8"	D_{MAX} = 12"

Box Gabion Stone/Gabion Mattress: Gabions and mattresses shall be fabricated in such a manner that the sides, ends, lid and diaphragms can be assembled at the construction site into rectangular units of the specified sizes. Gabions and mattresses are to be single unit construction, the base, ends and sides either to be woven into a single unit or one edge of these members connected to the base section of the unit in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh.
Where the length of the gabion or mattress exceeds its horizontal width, the gabion or mattress is to be equally divided by diaphragms, of the same mesh and diameter as the body of the gabions or mattresses, into cells whose length does not exceed the horizontal width. The gabions and mattresses shall be furnished with necessary diaphragms secured in proper position on the base section in such a manner that no additional tying at this juncture will be necessary.

All perimeter edges of gabions and mattresses are to be securely selvedged or bound so that the joints formed by tying the selvages have at least the same length as the body of the mesh.

Gabions and mattress shall conform to the project plan details. Stone shall be placed in close contact in the unit so that maximum fill is obtained. The units may be filled by machine with sufficient handwork to accomplish requirements of this specification.

Three-foot high cells shall be filled in three lifts. Two connecting tie wires shall be placed between each lift in each cell. Care shall be taken to protect the vertical panels and diaphragms from being bent during filling operations.
The last lift of stone in each cell shall be level with the top of the gabion or mattress in order to properly close the lid and provide an even surface.

All gabion and mattress units shall be periodically tied or continuously laced together using selvedge wire, each to its neighbor, along all contacting edges, at 6-inch maximum spacing between ties, in order to form continuous connection structure.

Box gabions shall be fabricated from zinc coated 8x10 mesh steel wire meeting:

Mesh Opening: Hex Nom 3-1/4" x 4-1/2"
Mesh Wire: 0.120" Nom.Diam., 0.85 OZS./sq.ft zinc coating
Selvedge Wire: 0.1535" Nom. Diam., 0.90 ozs./sq.ft. zinc coating
Lacing Wire: 0.0866" Nom. Diam., 0.70 ozs./sq.ft. zinc coating

Box gabions shall be MACCAFERRI gabions or approved equal.

GabionMats shall be fabricated from zinc coated 8x10 mesh steel wire meeting:

Mesh Opening: Hex Nom 3-1/4" x 4-1/2"
Mesh Wire: 0.120" Nom.Diam., 0.85 OZS./sq.ft zinc coating
Selvedge Wire: 0.1535" Nom. Diam., 0.90 ozs./sq.ft. zinc coating
Lacing Wire: 0.0866" Nom. Diam., 0.70 ozs./sq.ft. zinc coating

GabionMats shall be MACCAFERRI GabionMats or approved equal.

SUPPLEMENTAL
COMPACTION

Compaction behind the bank protection is per M.A.G. Spec. 211. Backfill below natural ground on the wash site of the bank protection is to be native material including cobbles compacted to 95% standard proctor, per M.A.G. Spec 211.

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NATIVE PLANT CASE NO. 124-NP-06
PLAN CHECK NO. 1612-07-01
2-MP-2006
CASE NO. 113-SA-2007

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	03 OF 09

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SOIL CEMENT NOTES

SUPPLEMENTAL
SOIL CEMENT SPECIFICATIONS
FOR BANK PROTECTION

(1) Description:

This work shall consist of the construction of soil-cement bank protection at the locations and in accordance with the details shown on the project plans and the requirements of these special provisions, including excavating, dewatering, backfilling and grading the channel banks to the lines, grades and cross sections shown on the project plans; furnishing and mixing aggregate, cement and water; spreading and compacting the mixture.

Soil cement for bank protection shall attain a minimum compressive strength of 750 pounds per square inch at seven days when tested in accordance with the requirements of Arizona Test Method 241, and shall contain no less cement than that percentage required to obtain 750-pound-per-square-inch-plus-two-percent cement for erosion resistance.

(2) Materials:

Aggregate shall conform to the following requirements when tested in accordance with the requirements of Arizona Test Method 201.

Sieve SizePercent Passing 1-1/2 inch (98-100), No. 4 (60-90), No. 200 (5.0-15.0).
The geotechnical evaluation in support of this project is hereby incorporated into these special provisions. As noted in the report, the on-site soils may be suitable for reuse as soil-cement materials.

Plasticity index shall be a maximum of three when tested in accordance with the requirements of AASHTO T 90.
Clay lumps larger than one inch shall be screened out of the raw soil prior to mixing.

2.01 Portland Cement, Flyash and Water:

Portland cement, Flyash and Water shall conform to the requirements of ADOT Standard Specifications for Road and Bridge Construction, 2000, Subsection 1006-2. Portland cement shall comply with the latest Specifications for Portland cement (ASTM C 150, Type II). The cement used for trial mixes, control strips and soil cement production shall be the same type as specified in these Special Provisions. Any proposed change in cement type by the Contractor shall be submitted to the Owner for approval. Any changes in cement type will result in additional trial mixes and control strips. The Contractor shall be responsible for additional testing and control strip construction at no additional cost to the Owner.

2.02 Bituminous Material for Curing Seal:

Bituminous material for curing seal shall be emulsified asphalt, Grade SS-1, conforming to the requirements of ADOT Standard Specifications for Road and Bridge Construction, 2000, Section 1005.

2.03 Mix Design:

The contractor shall determine the mix proportions of the soil aggregate, flyash, cement and moisture, and shall furnish soil cement conforming to the requirements specified herein. The job-mix design with the supporting test results shall be submitted to the Owner for approval, prior to incorporating any of the material into the work. The "base" amount of cement shall be determined by laboratory testing by the contractor and shall continue to be monitored throughout the duration of the project based on field observation & testing with modification as required to meet existing field conditions.

The percent of cement to be used in the mix shall be calculated to be the weight of cement divided by the total weight of the dry compacted soil-cement.

Included in the job-mix design data shall be the grade of cement, brand of flyash, and the source of aggregate. A new mix design shall be submitted for approval any time the contractor requests a change in materials, or proportioning of the materials, from that given in the approved mix designs.

2.04 Preparation:

Before soil-cement placement begins, the area to be protected shall be graded and shaped to lines and grades as shown on the project plans. The subgrade shall be compacted to a minimum of 95 percent of the maximum density, as determined in accordance with the requirements of the applicable test methods of the ADOT Materials Testing Manual. Immediately prior to placement of the soil-cement mixture, the subgrade shall be moistened if necessary. Soft or yielding subgrade shall be corrected and made stable before construction proceeds.

(3) Construction Requirements:

3.01 Mixing:

Aggregate, flyash and cement for soil-cement embankment shall be proportioned. The plant shall be either of the batch-mixing type using revolving blade, rotary drum mixers, or of the continuous mixing type, at the option of the contractor. The aggregate, flyash and cement may be proportioned either by weight or by volume.

Fly ash may be used at the option of the contractor. A maximum of 20 percent of the total weight of cement may be replaced with fly ash, in accordance with the requirements specified in ADOT Standard Specifications for Road and Bridge Construction, 2000, Section 1006.

The water shall be proportioned by weight or volume and there shall be means by which the Owner may readily verify the amount of water required per batch or the rate of water flow required for continuous mixing. The time of the addition of water or the points at which it is introduced into the mixer shall be as approved by the Owner.

The moisture content of the completed mixture shall be uniform and within two percentage points of the optimum at the point of delivery to the work. The optimum moisture content will be determined in accordance with the requirements of Arizona Test Methods 221 and 222. The flyash and cement shall be added in such a manner that it is uniformly distributed throughout the aggregate during the mixing operation.

There shall be safe, convenient facilities for sampling the cement and flyash in the supply line to the weight hopper or pugmill. The charge in the batch mixer or the rate of feed to the continuous mixer shall not exceed that which will permit complete mixing of all of the mix material.

3.02 Batch Mixing:

The mixer shall be equipped with a sufficient number of paddles of a type and arrangement to produce a uniformly mixed batch. The mixer shall be equipped with a timing device which will indicate, by a definite audible or visual signal, the expiration of the mixing period. The device shall be accurate to within two seconds.

The time of mixing a batch shall begin after all ingredients are in the mixer and shall end when the mixer is half emptied. Mixing shall continue until a homogeneous mixture of unchanging appearance is produced. The time of the mixing shall not be less than 30 seconds.

The batch-mixing plant shall provide sampling facilities which are satisfactory to the Owner and which will allow representative samples of the soil-cement mixture to be obtained easily and safely.

3.03 Continuous Mixing:

Aggregate shall be drawn from the storage facility by a feeder or feeders which will continuously supply the correct amount of aggregate in proportion to the cement.

A control system shall be provided that will automatically close down the plant when the material in any storage facility approaches the strike-off capacity of the feed gate. The plant will not be permitted to operate unless this automatic control system is in good working condition.

The feeder for the aggregate shall be mechanically or electrically driven.

Continuous mix plants shall provide sampling facilities which are satisfactory to the Owner, and which will allow representative samples of the aggregate and the soil-cement mixture to be obtained easily and safely.

The cement feeder and the aggregate feeders shall be equipped with devices by which the rate of feed can be accurately determined while the plant is in full operation.

3.04 Spreading:

Mixed materials shall be transported from the plant to the construction site in approved vehicles and spread on the moistened subgrade embankment, or previously completed soil-cement with spreading equipment that will produce layers of such widths and thicknesses as are necessary for compaction to the required dimensions of the completed soil-cement layers. Spreading shall be accomplished by the use of approved spreader boxes or finishing machines. The compacted layers of soil-cement shall not exceed eight inches in thickness, nor be less than four inches in thickness. Each successive layer shall be placed as soon as practicable after the preceding layer is completed, and certified.

All soil-cement surfaces that will be in contact with succeeding layers of soil-cement shall be kept continuously moist by fog spraying until placement of the subsequent layer, provided that the contractor will not be required to keep such surfaces continuously moist for a period longer than seven days. Mixing and placing shall not proceed when the soil-aggregate or the area on which the soil-cement is to be placed is frozen. Soil-cement shall be mixed or placed only when the air temperature is at least 40 degrees F and rising, and not when the temperature is expected to drop below 40 degrees F in the next 24 hours.

3.05 Compaction:

Soil-cement shall be uniformly compacted to a minimum of 95 percent with an average of 98 percent of maximum density as determined in accordance with the requirements of the applicable test methods of the ADOT Materials Testing Manual, as directed and approved by the Owner. Optimum moisture and maximum density shall be determined in the lab in accordance with the requirements of Arizona Test Methods 221 and 222 by the contractor prior to construction. Wheel rolling with only hauling equipment will not be an acceptable method of compaction.

At the start of compaction, the mixture shall be in a uniform, loose condition throughout its full depth. Its moisture content shall be as previously specified herein. No section shall be left undisturbed for longer than 30 minutes during compaction operations. Compaction of each layer shall be accomplished in such a manner as to produce a dense surface free of compaction planes and shall be completed within one hour from the time water is added to the mixture. Whenever the contractor's operation is interrupted for more than two hours, the top surface of the completed layer, if smooth, shall be scarified to a depth of at least one inch with a spike-tooth instrument prior to placement of the next lift. The surface, after scarifying, shall be swept using a power broom or other method approved by the Owner, to completely free the surface of all loose material prior to actual placement of the soil-cement mixture for the next lift.

3.06 Finishing:

After compaction, the soil-cement shall be further shaped, if necessary, to the required lines, grades, and cross-sections.

3.07 Curing:

Temporarily exposed surfaces shall be kept moist as previously set forth. Care must be exercised to ensure that no curing material other than water is applied to the surface that will be in contact with succeeding layers.

Permanently exposed surfaces shall be kept in a moist condition for seven days, or they may be covered with bituminous curing material, subject to the Owner's approval. Any damage to the protective covering within seven days shall be repaired to the satisfaction of the Owner.

Regardless of the curing material used, the permanently exposed surfaces shall be kept moist until the protective cover is applied. Such protective cover is to be applied as soon as practicable, with a maximum time limit of 24 hours between the finishing of the surface and the application of the protective cover or membrane.

When necessary, the soil-cement shall be protected from freezing for seven days after its construction by a covering of loose earth, straw, or other suitable material approved by the Owner.

3.08 Maintenance:

The contractor shall be required, within the limits of its contract, to maintain the soil-cement and curing seal in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the contractor at its own expense and repeated as often as necessary. Faulty work shall be replaced for the full depth of the layer.

CONTRACTOR NOTE:
THE CEMENT REQUIREMENT SHALL BE MONITORED CONTINUOUSLY THROUGHOUT THE DURATION OF THE PROJECT AND THE DESIGN MIX SHALL BE MODIFIED AND APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE BASED ON FIELD CONDITIONS AND TESTING.

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EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DFW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	04 OF 09

NATIVE PLANT CASE NO. 124-NP-06
PLAN CHECK
2-MP-2006
CASE NO. 113-SA-2007
PLAN CHECK NO. 1612-07-01

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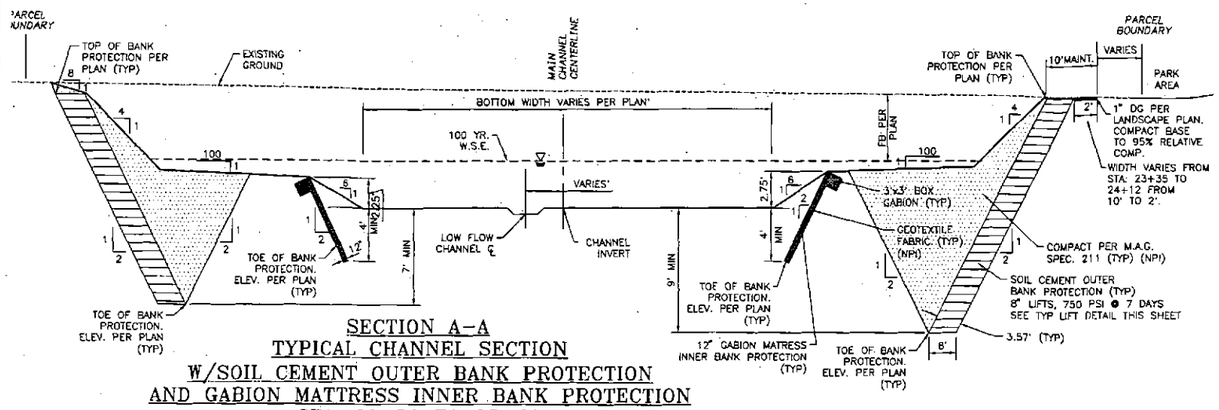
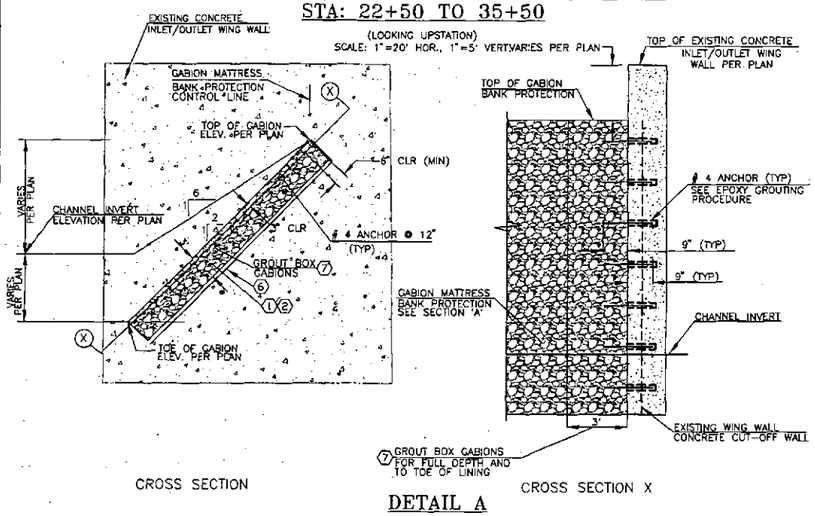


SECTION A–A
TYPICAL CHANNEL SECTION
W/SOIL CEMENT OUTER BANK PROTECTION
AND GABION MATTRESS INNER BANK PROTECTION
STA: 22+50 TO 35+50



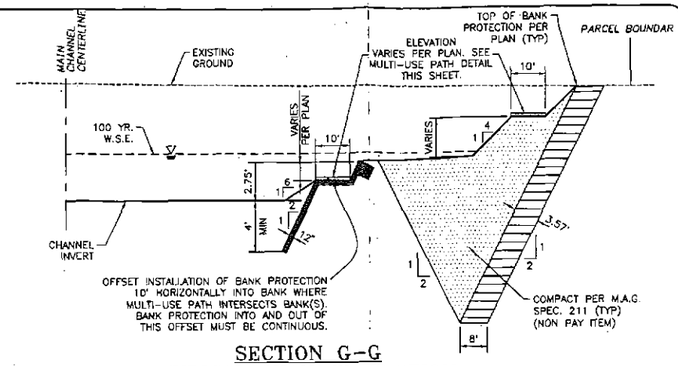
DETAIL A
GROUTED GABION CONCRETE TIE–IN DETAIL
TO BRIDGES' INLET/OUTLET CONCRETE WING WALLS
N.T.S.

EPOXY GROUTING PROCEDURE

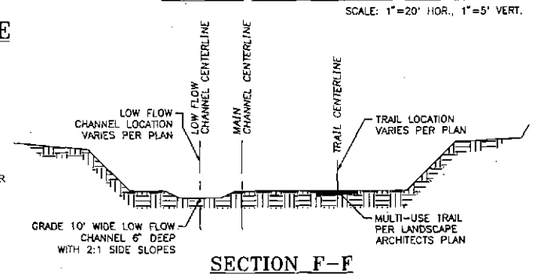
1. DRILL HOLE:
   DRILL HOLE IN EXISTING CONCRETE, 1/8" LARGER DIAMETER THAN ANCHOR TO BE USED. EMBEDMENT DEPTH SHALL BE 9".
2. CLEAN HOLE:
   FOR DRY–DRILLED HOLE, VACUUM OR BLOW OUT HOLE USING OIL–FREE AND MOISTER–FREE COMPRESSED AIR. FOR WET–DRILLED HOLES, WASH OUT HOLE TO REMOVE DRILLING SLURRY RESIDUE, REMOVE FREE STANDING WATER AND ALLOW HOLE TO THOROUGHLY DRY.
3. EPOXY:
   HILTI HY–150 ADHESIVE ANCHOR SYSTEM (I.C.B.O. REPORT NO. 5193). ANCHOR INSTALLATION PER MANUFACTURERS RECOMMENDATIONS. OTHER EPOXY MAY BE USED IF APPROVED BY A STRUCTURAL ENGINEER.
4. PREPARE ANCHOR:
   CLEAN, DRY AND WIPE ANCHOR FREE OF ALL WATER, DIRT, OIL AND GRASS, ETC.
5. SET ANCHOR:
   FILL HOLE WITH EPOXY, INSERT ANCHOR AND WORK UP AND DOWN AND TAP LIGHTLY TO COMPLETE EMBEDMENT.
6. SET OR CURE TIME:
   DO NOT DISPLACE OR MOVE ANCHOR IN ANY WAY AFTER ANCHOR IS SET. ALLOW EPOXY TO CURE FOR 24 HOURS MINIMUM BEFORE PLACING ADJACENT GROUTED BOX GABIONS.

CONSTRUCTION NOTES

1. INSTALL 3'X 3' BOX GABIONS. MACCAFERRI ZINC COATED GABIONS OR APPROVED EQUAL. SEE EROSION CONTROL NOTES SHEET 3.
2. INSTALL BOX GABION STONE. SEE EROSION CONTROL NOTES SHEET 3.
3. INSTALL GABION MATTRESSES (6' X 3' X 1'). MACCAFERRI ZINC COATED RENO MATTRESSES OR APPROVED EQUAL. SEE EROSION CONTROL NOTES SHEET 3.
4. INSTALL GABION MATTRESS STONE. SEE EROSION CONTROL NOTES SHEET 3.
5. FILL SOILS SHALL BE COMPACTED TO A MINIMUM OF 95% OF THEIR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D–698 WITH A MOISTURE CONTENT WITHIN 2% OF OPTIMUM. THE FILLS SHALL BE SLIGHTLY OVERBUILT AND TRIMMED TO SLOPES SHOWN IN THESE PLANS. BANK FILLS ARE TO BE COMPLETED PRIOR TO PLACEMENT OF BANK PROTECTION. AREAS TO BE FILLED SHALL BE WIDENED AND LEVELED TO ALLOW FOR ACCESS OF COMPACTION EQUIPMENT. CLEAN SAND AND GRAVEL FROM THE NEW RIVER CHANNEL SHALL NOT BE USED FOR BANK FILL.
6. INSTALL GEOTEXTILE FABRIC AS SHOWN. MACCAFERRI MACTEX MX 275 OR APPROVED EQUAL. SEE EROSION CONTROL NOTES SHEET 3.
7. GROUT GABION STONE AND/OR GABION MATTRESS STONE FOR FULL DEPTH OF GABION AND/OR MATTRESS. THE GROUT SHALL BE AS SPECIFIED IN MAG SPECIFICATION 220.5.



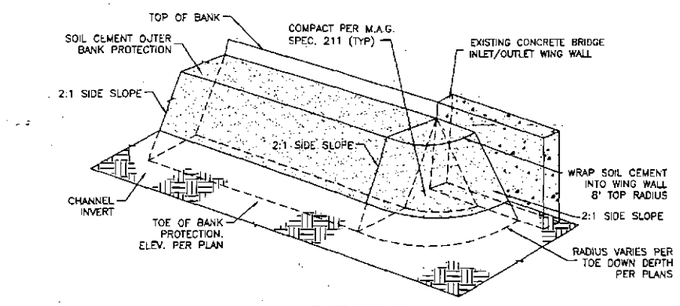
SECTION G–G
TYPICAL CHANNEL SECTION
BANK PROTECTION OFFSET FOR MULTI–USE PATH
SCALE: 1"=20' HOR., 1"=5' VERT.



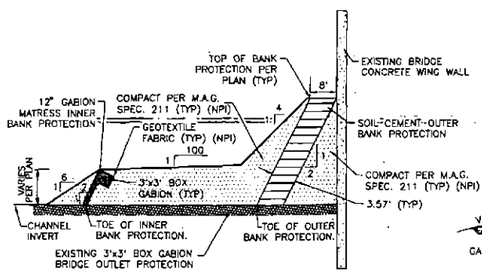
SECTION F–F
TYPICAL CHANNEL SECTION
LOW FLOW CHANNEL & MULTI–USE TRAIL
STA: 21+00 TO 35+60
NTS

PER SECTION 1A.12 M.U.T.C.D.

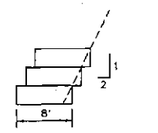
FLOOD SIGN
NTS



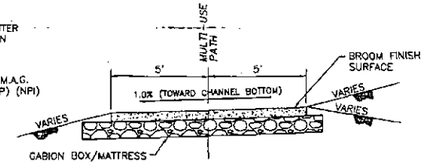
DETAIL B
SOIL CEMENT OUTER BANK PROTECTION TIE–IN DETAIL
TO BRIDGES' INLET/OUTLET CONCRETE WING WALLS
N.T.S.



DETAIL C
BANK PROTECTION
AT PINNACLE PEAK BRIDGE OUTLET
N.T.S

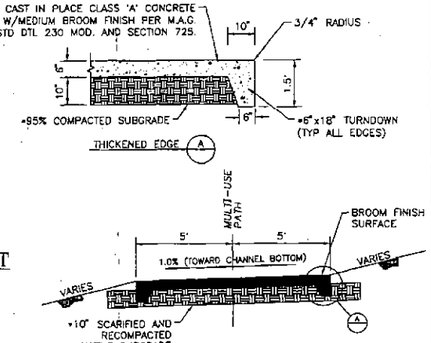


TYPICAL SOIL CEMENT
LIFT DETAIL
NTS



NOTES:
1. GROUT GABION BOX/MATTRESS STONE FOR FULL DEPTH OF GABION MATTRESS AND 1" DEPTH OF GABION BOXES. THE GROUT SHALL BE AS SPECIFIED IN MAG SPEC. 220.5.
2. EXPOSED CONCRETE SHALL BE CITY COLOR "SAN DIEGO BUFF".

MULTI–USE PATH OVER
GROUTED GABION BOXES/MATTRESS
NTS



NOTES:
1. CONTROL/CONTRACTION JOINTS SHALL BE INSTALLED WITH A MAXIMUM SPACING OF 10 FEET.
2. EXPOSED CONCRETE SHALL BE CITY COLOR "SAN DIEGO BUFF".

* DOES NOT APPLY WHERE PATH IS INSTALLED ONTO GABION BOX/MATTRESS AND SOIL CEMENT, SEE DETAILS THIS SHEET.

MULTI–USE PATH
NTS

RIP–RAP GRADATION	
PERCENT FINER BY WEIGHT (%)	SIEVE SIZE TYPE I
15	4"
50	9"
85	14"
100	18"

RIP–RAP GRADATION

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SILVERSTONE
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RAWHIDE WASH CHANNEL
DETAIL SHEET

NATIVE PLANT CASE NO. 124–NP–06
PLAN CHECK NO. 1612–07–01
1" 2–MP–2006
CASE NO. 113–SA–2007

EXPIRES 12–31–13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DBW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	05 OF 09

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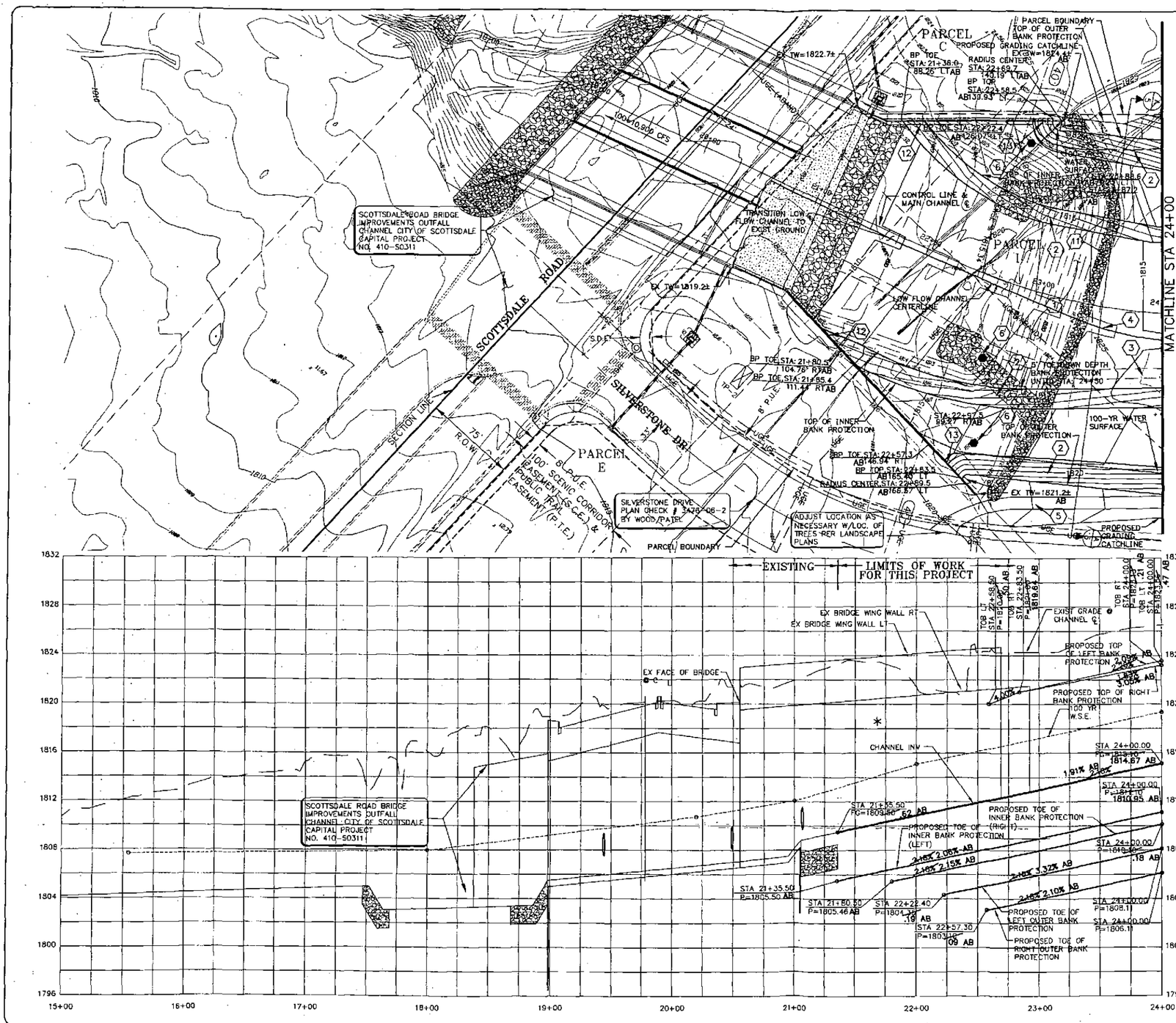

Horz 1" = 40 ft.
Vert 1" = 8 ft.

CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND SECTION A-A, SHEET 5
2. CONSTRUCT BANK PROTECTION PER SECTION A-A, SHEET 5
3. CONSTRUCT MEANDERING TRAIL PER SECTION F-F, SHEET 5, LOCATION PER PLAN
4. CONSTRUCT LOW FLOW CHANNEL PER SECTION F-F, SHEET 5, LOCATION PER PLAN
5. 10' MAINT. ROAD, COMPACT BASE TO 95% RELATIVE COMP. 1" MIN. D.G. UNTIL STA: 23+35 THEN TRANSITION TO COMBINATION SOIL CEMENT AND D.G. PER CROSS SECTION A-A, SHEET 5.
6. INSTALL SIGN BASE PER MAG STD DTL 131 TYPE B MODIFIED FOR 3 FT CONCRETE BURIED ENCASEMENT. MOUNT SIGN EACH SIDE (2) OF POST (PER SHEET 5).
11. REMOVE & SALVAGE EXISTING RIPRAP
12. CONSTRUCT GROUTED GABION CONCRETE TIE-IN DETAIL BANK PROTECTION PER DETAIL A, SHEET 5
13. CONSTRUCT SOIL CEMENT TIE-IN DETAIL BANK PROTECTION PER DETAIL B, SHEET 5

NOTE

* DESIGNATED ARMY CORPS OF ENGINEERS 404 WASH, PERMIT HAS BEEN REQUESTED AND OBTAINED BY OWNER

BP= BANK PROTECTION

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SILVERSTONE
SCOTTSDALE
RAWHIDE WASH CHANNEL

NATIVE PLANT CASE NO. 124-NP-06

PLAN CHECK NO. 1612-07-01

2-MP-2006

CASE NO. 113-SA-2007

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	06 OF 09

CALL TWO WORKING DAYS BEFORE YOU DIG
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1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

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SECTION E-E
GRADE CONTROL STRUCTURE
TIE-IN DETAIL
STA: 26+00 & 31+00
(LOOKING UPSTATION)
N.T.S.

SECTION D-D
GRADE CONTROL STRUCTURE
STA: 26+00 & 31+00
N.T.S.

CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND SECTION A-A, SHEET 5.
2. CONSTRUCT BANK PROTECTION PER SECTION A-A, SHEET 5.
3. CONSTRUCT MEANDERING TRAIL PER SECTION F-F SHEET 5, LOCATION PER PLAN.
4. CONSTRUCT LOW FLOW CHANNEL PER SECTION F-F AND SECTION G-G, SHEET 5. LOCATION PER PLAN.
5. 10' MAINT. ROAD, COMPACT BASE TO 95% RELATIVE COMP. 1" MIN. D.G. PER LANDSCAPE PLAN
6. INSTALL SIGN BASE PER MAG STD DTL 131 TYPE B MODIFIED FOR 3 FT CONCRETE BURIED ENCASEMENT. MOUNT SIGN EACH SIDE (2) 'OF' POST (PER SHEET 5)
7. CONSTRUCT GRADE CONTROL STRUCTURE PER SECTIONS D-D AND E-F, THIS SHEET.
8. CONSTRUCT PATH PER SECTION G-G AND MULTI-USE PATH DETAIL SHEET 5. LOCATION PER PLAN.
14. CONSTRUCT PATH OVER GABION BOXES/MATTRESS PER DETAIL MULTI-USE PATH OVER GROUTED GABION BOXES/MATTRESS SHEET 5. LOCATION PER PLAN.
15. CONSTRUCT PATH OVER SOIL CEMENT PER DETAIL MULTI-USE PATH OVER SOIL CEMENT SHEET 5. LOCATION PER PLAN.

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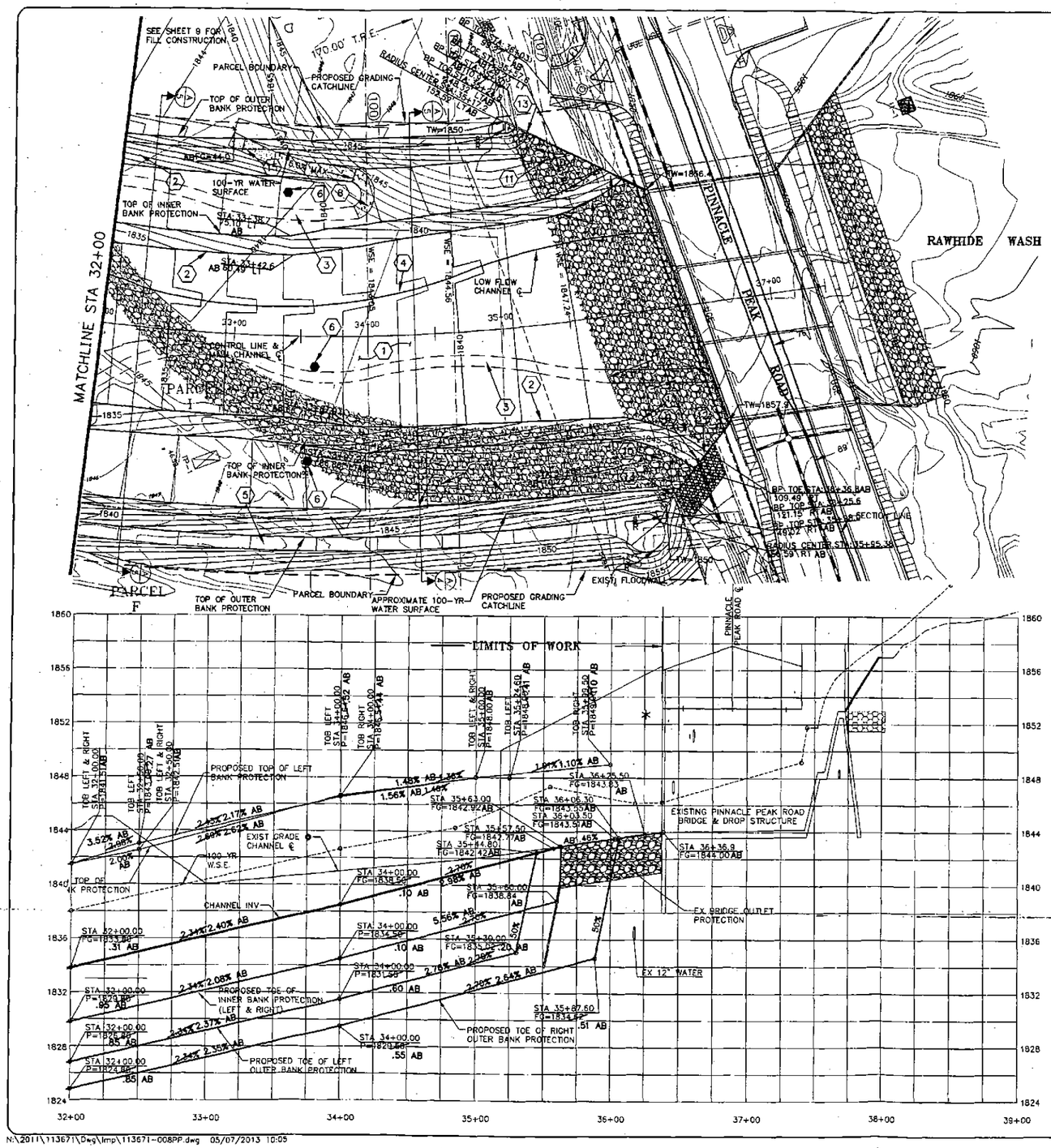
PLAN & PROFILE

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEH
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	07 OF 09

NATIVE PLANT CASE NO. 124-NP-06
PLAN CHECK NO. 1612-07-01
2-MP-2006
CASE NO. 113-SA-2007



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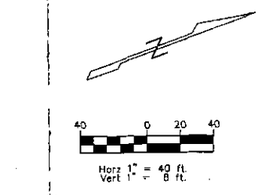

CONSTRUCTION NOTES

1. GRADE CHANNEL PER PLAN AND SECTIONS A-A, SHEET 5.
2. CONSTRUCT BANK PROTECTION PER SECTIONS A-A, SHEET 5.
3. CONSTRUCT MEANDERING TRAIL PER SECTION F-F SHEET 5. LOCATION PER PLAN.
4. CONSTRUCT LOW FLOW CHANNEL PER SECTION F-F, SHEET 5. LOCATION PER PLAN.
5. 10' MAINT. ROAD, COMPACT BASE TO 95% RELATIVE COMP. 1" MIN. D.G. PER LANDSCAPE PLAN.
6. INSTALL SIGN BASE PER MAG STD DTL 131 TYPE B MODIFIED FOR 3 FT CONCRETE BURIED ENCASEMENT MOUNT SIGN EACH SIDE (2) OF POST (PER SHEET 5).
8. CONSTRUCT PATH PER SECTION G-G AND MULTI-USE PATH DETAIL SHEET 5, LOCATION PER PLAN.
9. DO NOT DISTURB STORM SEWER OUTFALL ACCESS BARRIER FOR EXISTING STORM DRAIN PIPE. PIPE INV. OUT = 1845.5
10. DO NOT DISTURB EXISTING BRIDGE GABION BOXES OUTLET PROTECTION. ADJUST BANK PROTECTION TOE-DOWN DEPTH PER DETAIL C, SHEET 5.
11. REMOVE AND SALVAGE EXISTING RIP-RAP.
12. CONSTRUCT GROUTED GABION CONCRETE TIE-IN DETAIL BANK PROTECTION PER DETAIL A, SHEET 5
13. CONSTRUCT SOIL CEMENT TIE-IN DETAIL BANK PROTECTION PER DETAIL B, SHEET 5.
14. CONSTRUCT PATH OVER GABION BOXES/MATTRESS PER DETAIL MULTI-USE PATH OVER GROUTED GABION BOXES/MATTRESS SHEET 5, LOCATION PER PLAN.
15. CONSTRUCT PATH OVER SOIL CEMENT PER DETAIL MULTI-USE PATH OVER SOIL CEMENT SHEET 5, LOCATION PER PLAN.

NOTE:
EXISTING UTILITY ALIGNMENTS AND INVERTS SHOWN ARE APPROXIMATE AND ARE SHOWN FOR REFERENCE PURPOSES ONLY. CONTRACTOR IS TO VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION.

NOTE

* DESIGNATED ARMY CORPS OF ENGINEERS 404 WASH, PERMIT HAS BEEN REQUESTED AND OBTAINED BY OWNER

BP= BANK PROTECTION

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SILVERSTONE
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RAWHIDE WASH CHANNEL
PLAN & PROFILE

NATIVE PLANT CASE NO. 124-NP-06

PLAN CHECK NO. 1612-07-01

CASE NO. 113-SA-2007 2-MP-2006

EXPIRES 12-31-13

DESIGNED	JLL/JD
DRAWN	KLR/JD
CHECKED	DEW
DATE	06 MAY 2013
SCALE	1" = 40'
JOB NO.	113671.01
SHEET	08 OF 09

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INSERT

MATCH SHEET 2

MATCH SHEET BELOW

MATCH INSERT ABOVE

RS 1204
Q=7090 cfs
FP=1799.3

RS 658
Q=7090 cfs
FP=1788.8

RS 6632
Q=7414 cfs
FP=1918.2

RS 6221
Q=7414 cfs
FP=1909.6

RS 5820
Q=7414 cfs
FP=1899.7

RS 5357
Q=7414 cfs
FP=1889.9

RS 5205
Q=7387 cfs
FP=1886.5

Breakout
5210
33 cfs

RS 4789
Q=7381 cfs
FP=1876.7

RS 4441
Q=7381 cfs
FP=1869.5

Breakout
4300
294 cfs

RS 4027
Q=7090 cfs
FP=1856.2

RS 4008
Q=7090 cfs
FP=1849.7

RS 4117
Q=7372 cfs
FP=1861.8

RS 3999
Q=7090 cfs
FP=1849.6

RS 3894
Q=7090 cfs
FP=1847.5

RS 3876
Q=7090 cfs
FP=1847.2

RS 3811
Q=7090 cfs
FP=1846.2

RS 3721
Q=7090 cfs
FP=1844.3

RS 3657
Q=7090 cfs
FP=1842.7

RS 3457
Q=7090 cfs
FP=1838.2

RS 3257
Q=7090 cfs
FP=1833.5

RS 3057
Q=7090 cfs
FP=1829.0

RS 2857
Q=7090 cfs
FP=1824.3

RS 2657
Q=7090 cfs
FP=1819.5

RS 2504
Q=7090 cfs
FP=1819.0

RS 2366
Q=7090 cfs
FP=1819.0

RS 2321
Q=7090 cfs
FP=1819.0

RS 2154
Q=7090 cfs
FP=1819.0

RS 2134
Q=7090 cfs
FP=1819.0

RS 1990
Q=7090 cfs
FP=1817.4

RS 1889
Q=7090 cfs
FP=1814.2

RS 1709
Q=7090 cfs
FP=1810.2

Cross Section 1
Q=423 cfs
FP=1836.1

Pinnacle Peak Rd Bridge
Flow contained within

Channel & Bridge area
are reflected in contours.
See construction plans

Scottsdale Rd Bridge
Breakout occurs to the south

Hydraulic Analysis
Study Limit

Premiere at
Pinnacle Peak

Rawhide Wash

Los Portones

La Vista

Silverstone Site

Study Limit

Study Limit

Pinnacle Peak Rd

Pinnacle Peak Rd

Williams Dr

Scottsdale Rd

Miller Rd

Legend

- River Section
- Cross Section 1
- Hydraulic Base Line
- Revised_100Year_Floodplain_5_15_2014
- Floodplain Removal (Proposed Zone X)
- Rawhide Wash east breakout flow route
- Base Flood Elevation
- Silverstone Site
- Study Limit_Zone Break
- Index Contour
- Inter Contour

FEMA Effective Flood Zones

- A
- AE
- AH
- AO

0 100 200 400 Feet

N

EXHIBIT 3

Sheet 1 of 2

Rawhide Wash Workmap

Job No. 113671.02

Date: 6/18/2014

WOOD/PATEL
MISSION: CLIENT SERVICE™

Document Path: N:\2011\113671.02\GIS\Maps\Exhibit 3 Rawhide Wash Workmap_Sheet 1 As-built_current.mxd

Legend

- River Section
- Hydraulic Base Line
- Possible 100-Yr Floodplain Boundary
- Rawhide Wash east breakout flow route
- BFEs
- Study Limit_Zone Break
- Index Contour
- Inter Contour

FEMA Effective Flood Zones

- A
- AE
- AH
- AO

0 100 200 400 Feet

N

EXHIBIT 3

Sheet 2 of 2

Rawhide Wash Workmap

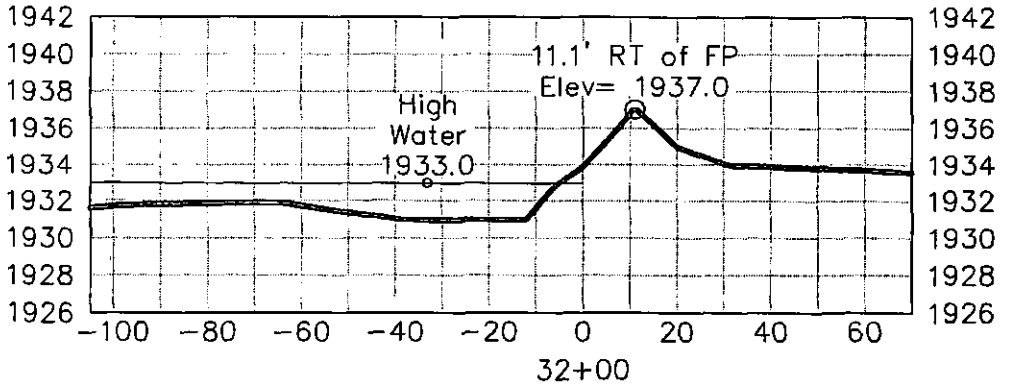
Job No. 113671.02

Date: 5/22/2014

WOOD/PATEL
MISSION: CLIENT SERVICE™

Document Path: N:\2011\113671.02\GIS\Maps\Exhibit 3 Rawhide Wash Workmap_Sheet 2 SEC Exhibit for Ash.mxd

Detailed Hydraulic Cross-Sections: Plate 1, Sections H, I, J, K



(H)

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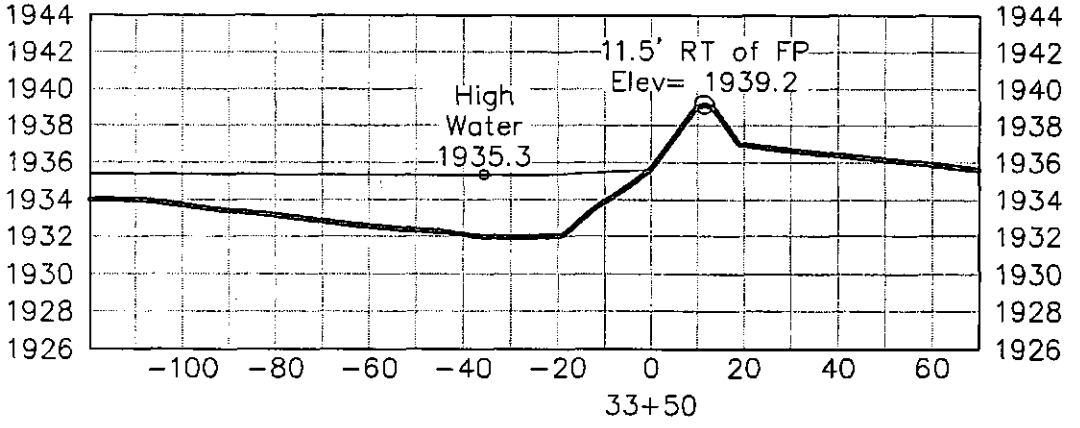

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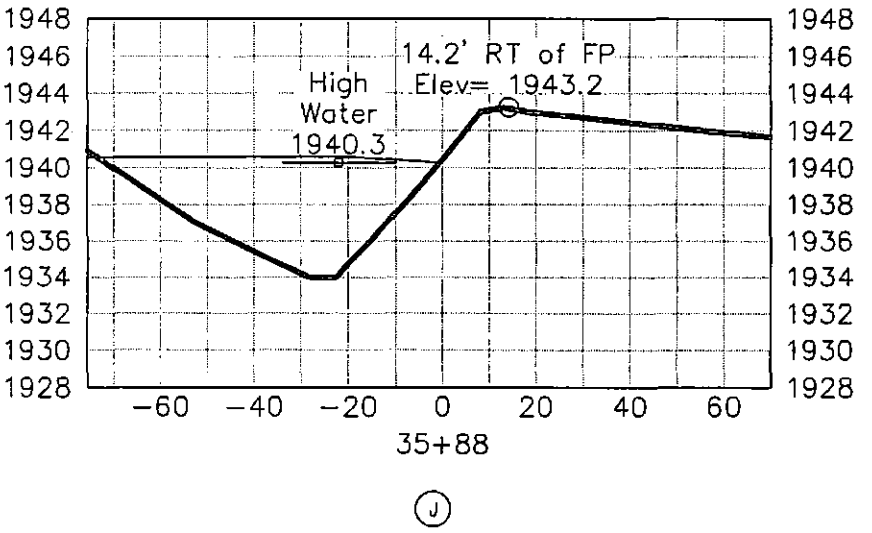

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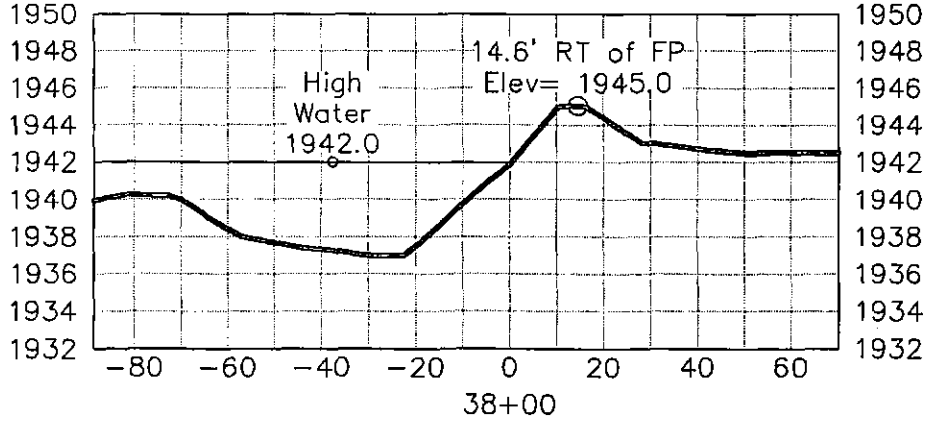

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Appendix F

Exhibits