

**Levee Certification Report
Pass Mountain Diversion Levee ID # 291
Maricopa County, Arizona**

Prepared for:

Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85009

Prepared by:



AMEC Earth & Environmental, Inc.
1405 West Auto Drive
Tempe, AZ 85284

AMEC Job Number 09-115-05010
June 14, 2011



FEMA

November 14, 2011

Frank Brown, P.E., CFM
Senior Civil Engineer
Flood Control District Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear Mr. Brown:

This correspondence is in reference to the June 16, 2011 and November 7, 2011, letters and data submissions to the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding certification of the Pass Mountain Diversion Levee System within Maricopa County in order to meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10). The pertinent information regarding the specific levees is listed below.

| | |
|---|---|
| Identifier: | Pass Mountain Diversion Levee System (Levee ID No. 291) |
| Flooding Sources: | Pass Mountain Diversion |
| September 30, 2005 Effective FIRM panels affected: | 04013C2230H |
| December 3, 2010 Preliminary FIRM panels affected: | 04013C2305L |

In support of the Pass Mountain Diversion Levee System segment certification, the following information was submitted:

1. A report prepared by AMEC Earth & Environmental, Inc., "Levee Certification Report – Pass Mountain Diversion Levee ID #291 – Maricopa County, Arizona," dated June 14, 2011.
2. A letter and supplemental data prepared by AMEC Earth & Environmental, Inc. to address review comments from the previously submitted Technical Data Notebook, dated November 7, 2011.

The report prepared by AMEC Earth & Environmental, Inc., was reviewed to verify 44 CFR 65.10 compliance. The following is a summary of the review:

1. Freeboard: Analysis and Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(b)(1).
2. Closures: Analysis and Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(b)(2).

3. Embankment Protection: Analysis and Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(b)(3).
4. Embankment and Foundation Stability: Analysis and Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(b)(4).
5. Settlement: Analysis and Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(b)(5).
6. Maintenance Plans and Criteria: Supporting Documentation was reviewed and found to be in compliance with 44 CFR 65.10(d).

All of the above documentation and data, along with the previously submitted documentation, have been reviewed and based on receipt of this information the Pass Mountain Diversion Levee System (Levee ID No. 291) as shown on the attached Pass Mountain Diversion Levee System Map, meet the minimum certification criteria outlined in 44 CFR 65.10. Therefore, we plan to continue to accredit this levee system on the new Digital Flood Insurance Rate Map (FIRM) as providing protection from the 1-percent-annual-chance (base) flood. The area protected from the base flood by this levee will continue to be mapped as a shaded Zone X and a note will be placed in that area warning users of the flood risk that still exists.

Please be advised that levee systems and the estimated level of protection provided by these systems can and do change with time. Future map updates may require the levee system to be certified again at the time of update. Also, design, construction, operation, and/or maintenance documents may be requested at any time. Deviations from the documentation and data submitted to FEMA could result in the levee system no longer being mapped as providing protection from the base flood on future FIRMs. If at any point additional information is provided to FEMA that shows the levee system no longer meets certification criteria as outlined in 44 CFR 65.10, we will contact the levee owner and community about the possibility of de-accrediting the levee system.

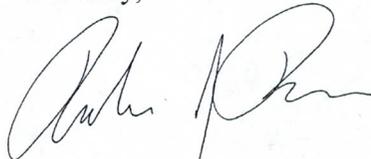
Even though we have mapped the referenced levees as providing protection from the 1-percent-annual-chance flood, it is important to note that levees are only designed to provide a specific level of protection. They can be overtopped or fail in larger flood events. Levee systems require regular maintenance and periodic upgrades to retain their level of protection. When levees do fail, they fail catastrophically, and damage may be more significant than if the levee was not there. Therefore, we encourage you to annually discuss the status and condition of your levees with your governing body. Additionally, it is highly recommended that you consider this risk in your local emergency management plans, including creating evacuation plans for this area.

Everyone should understand the risk to life and property that resides behind levees—risk that even the best flood-control system can not completely eliminate. For this reason, FEMA encourages people to understand their risk. The National Flood Insurance Program (NFIP) was created to reduce flood damages by identifying flood risks, encouraging sound community floodplain management practices, and providing flood insurance to lessen the financial impact of flooding. Through the NFIP, property owners in participating communities are able to purchase flood insurance that will insure against flood losses. We hope that you will encourage property owners to purchase flood insurance.

Mr. Frank Brown
November 14, 2011
Page 3 of 3

If you have additional questions regarding this matter, please contact me, either by telephone at (510) 627-7274, or by email at robert.bezek@fema.dhs.gov.

Sincerely,



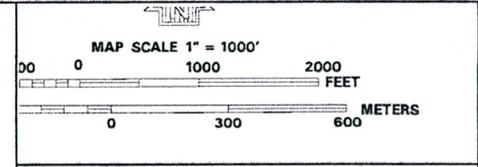
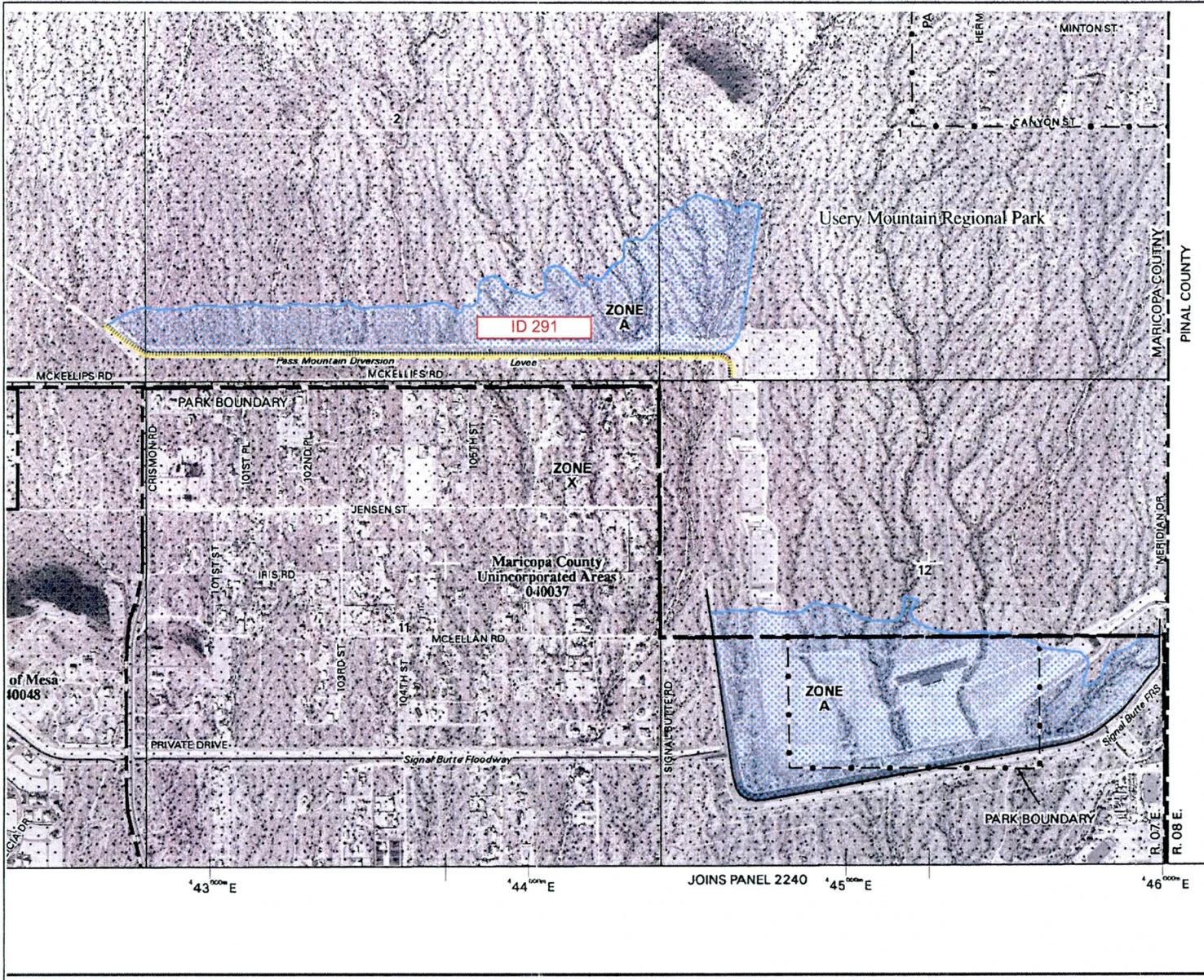
Robert J. Bezek, CFM
Regional Engineer
Mitigation Division

Enclosure:

Pass Mountain Diversion Levee System Map

Copies Furnished:

Brian Cosson, AZ DWR, NFIP Coordinator
Christopher J. Brady, City Manager, City of Mesa
Elizabeth Huning, City Engineer, City of Mesa
Robert L. Davies, AMEC Earth & Environmental, Inc.
Tim Murphy, Flood Control District of Maricopa County



NFP

PANEL 2230F

**FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS**

PANEL 2230 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-----------------|--------|-------|--------|
| MARICOPA COUNTY | 040037 | 2230 | F |
| MESA, CITY OF | 040048 | 2230 | F |

Notice to User: The Map Numbers shown below should be used when placing this order. The Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER
04013C2230F
MAP REVISED
SEPTEMBER 30, 2005**

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT version 2.0. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. Further information about National Flood Insurance Program flood hazard maps is available at <http://mnc.fema.gov/>.



Flood Control District of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapely, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

November 07, 2011

Robert J. Bezek, CFM
Regional Engineer
U.S. Department of Homeland Security
Mitigation Division, FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

**Subject: FEMA Comments for Levee Certification Package for Pass Mountain Diversion
Levee, PAL ID#291, Levee Certification Report, June 2011**

Dear Mr. Bezek:

This letter is in response to FEMA's comments dated October 3, 2011 based on our submittal of a report prepared by AMEC Earth & Environmental (now AMEC Environment & Infrastructure, Inc.), "Levee Certification Report for Pass Mountain Diversion Levee ID#291", dated June 2011. The District understands that all items listed in the review comments must be adequately addressed prior to receiving FEMA approval for this levee certification study.

DISTRICT RESPONSES TO SPECIFIC COMMENTS REFERENCED TO THE CHECKLIST ITEMS

A brief description of the comment is made, followed by the District response.

Comment 1. Checklist Item No. A.2 (Freeboard Check) - No response required. This comment concludes that the FLO-2D Version 2009.06 results are acceptable for freeboard analysis.

Comment 2. Checklist Item No. A.2 (Freeboard Check)-This comment concerns the upstream end of the embankment where it ties-in to natural grade and the expected sediment yield in the watershed, and the comment contains several parts, which are summarized in the responses below.

The review comment says in part ". . . the upstream end of the levee is not likely subject to significant flood depth or flow velocities, it is recommended that a special note be added to the Operations and Maintenance (O&M) Plan to make sure to monitor this location during any extreme flooding events." In response, our O&M Division has prepared a Special Provisions addition to the written O&M Plan to address this concern; please see the enclosed one page document. In addition, the O&M maintenance records documenting actual sediment removal are enclosed. These records indicate that only a small amount of accumulated sediments have been removed in the last ten years. The appropriate pages from the O&M Structures Maintenance Map are enclosed to show that the upstream levee end is already part of our maintenance responsibility.

The review comment says in part “. . . could produce sediment that might impact the structure during the flood event. As long as the sediment is not so significant that it would impact the safety of the structure during the flood event, then it could be handled under the O&M plan, as part of their normal post flood maintenance.” A Sediment Yield Analysis (enclosed) has been prepared to address this comment and the results show that insignificant amounts of sediment are produced. The District concludes that sediment accumulations should not impact the safety of the structure during the 1% annual chance flood event. However, as noted above, our O&M Division has a written procedure in place for monitoring the sediment accumulation at the base of the levee and in the conveyance channel. The District will handle the sediment concerns under our O&M plan, as part of our normal post-flood maintenance.

If you have further questions concerning this response, please call me at 602-506-4617.

Sincerely,



Frank Edward Brown, P.E., CFM
Senior Civil Engineer, Mitigation Planning & Technical Programs Branch,
Floodplain Management and Services Division

Enclosures: 1. Special Provisions for Monitoring the Upstream Reach of the Pass Mountain Diversion Channel During Extreme Flooding Events
2. O&M Records, Labor and Equipment Cost for Pass Mountain Diversion Channel
3. Pages depicting the Pass Mountain Diversion Channel from 2011 Flood Control Structures Maintained by the Flood Control District of Maricopa County
4. Sediment Yield Analysis for Pass Mountain Diversion Levee ID #291 Certification, Flood Control District of Maricopa County, November 3, 2011

Cc: Sarah Houghland, BakerAECOM
Brian Cosson, ADWR, NFIP Coordinator
Christopher J. Brady, City Manager, City of Mesa
Elizabeth Huning, City Engineer, City of Mesa
Ed Latimer, AMEC Environment & Infrastructure, Inc.

Enclosures:

1. Special Provisions for Monitoring the Upstream Reach of the Pass Mountain Diversion Channel During Extreme Flooding Events

SPECIAL PROVISIONS FOR MONITORING THE UPSTREAM REACH OF PASS MOUNTAIN DIVERSION CHANNEL DURING EXTREME FLOODING EVENTS.

***UPDATED 10/20/2011**

*NOTE: The right abutment of the south levee does not tie into high ground at the western end of the levee. Any shallow flow (traveling at a low velocity) bypasses the end of the abutment of the south levee and will continue downstream as overland flow.

The Flood Control District of Maricopa County Operations and Maintenance Division, at each inspection, and before predicted storm events, after major flood events and during flood events (if the conditions warrant) will:

1. Monitor the levee for any deep erosion or rilling that was caused by runoff or impoundment and for any other condition(s)/anomalies that would affect or endanger the integrity of the levee.
2. Monitor the entire length of the diversion channel for excessive sediment accumulations, restrictions or blockages. After impoundments have receded in the channel and conditions allow, remove the blockages and dispose of accordingly.
3. During any storm event, take appropriate actions to protect the levee along its entire length and monitor any locations showing less than three feet of freeboard.
4. Stockpile flood fighting material such as C-33 sand, ¾" gravel, ABC and riprap for emergency repairs in strategic locations along the project.

Enclosures:

2. O&M Records, Labor and Equipment Cost for Pass Mountain Diversion Channel

Labor Pass Mountain Diversion Channel

9/29/201

Labor
Hours

Salary + Overhead

1/7

00-2469

AT ALL VEGETATIVE OUTLETS, REMOVE ORGANIC DEBRIS & TRIM BACK VEGETATION AS NEEDED (BOTH INLET & OUTLET SIDE). AT ACCESS GATES OF PROJECT, LUBRICATE FCD LOCKS.

Work Order Total: 6.00 \$89.92

00-2470

FILL IN & COMPACT ALL OBVIOUS RODENT & ANIMAL HOLES THRU OUT PROJECT.

Work Order Total: 12.50 \$190.88

00-2471

AT PROJECT SIGN MCKELLIPS & CRISMON RD., TOUCH UP SIGN

Work Order Total: 6.00 \$89.92

01-8068

TREAT AND MONITOR RODENT ACTIVITY

Work Order Total: 2.00 \$34.10

02-2077 - refer to Equipment Cost pages for date of work order

Operational Inspections for July 2001 indicate that there is sediment in the upper low flow that needs to be removed; sta.# 45+00, 49+00, 52+00, 60+00, 70+00, 75+00 and 105+00.

Work Order Total: 18.00 hours \$325.30

02-2082

Check all fencing & gates throughout project. Repair, adjust or refurbish as needed. Lubricate all FCD locks on gates.

Work Order Total: 1.00 \$22.37

02-2083

Trim down areas of tall vegetation on shoulders of Levee. Cut & remove vegetation growing on down ramps from Levee.

Work Order Total: 106.00 \$1,918.09

02-2084

Remove accumulated silt deposits in Low Flow Channel at washes, north westerly end of project.

Work Order Total: 40.50 \$486.10

02-2085

Trim areas of tall vegetation on slopes of low flow channel north westerly end. Trim vegetation & remove organic debris at inlets & outlets of all vegetative drains.

| | | |
|-------------------|-------|----------|
| Work Order Total: | 39.50 | \$779.54 |
|-------------------|-------|----------|

02-8179

Check the entire project for rodent activity and treat as needed.

2/7

| | | |
|-------------------|------|--------|
| Work Order Total: | 0.50 | \$8.74 |
|-------------------|------|--------|

03-8182

Check the entire project for Mosquito's and treat as needed.

| | | |
|-------------------|------|---------|
| Work Order Total: | 2.00 | \$36.81 |
|-------------------|------|---------|

04-2327

The breakaway fence on the far south end of the structure install 3 ball delineators.

| | | |
|-------------------|------|---------|
| Work Order Total: | 4.00 | \$54.93 |
|-------------------|------|---------|

04-2328

Service all access gates and locks through out the structure.

| | | |
|-------------------|-------|----------|
| Work Order Total: | 21.50 | \$267.59 |
|-------------------|-------|----------|

04-2329

There is deep-rooted vegetation that is growing on the slopes and floodway invert. Cut and stump treat deep-rooted vegetation accordingly.

| | | |
|-------------------|-------|----------|
| Work Order Total: | 52.00 | \$550.34 |
|-------------------|-------|----------|

05-4165

At sta.#46+80 on the downstream slope cut and stump treat the deep rooted vegetation.

| | | |
|-------------------|------|----------|
| Work Order Total: | 9.00 | \$155.69 |
|-------------------|------|----------|

05-4166

At sta.# 47+65 at the inlet coming from the north there is accumulated sediment that needs to be removed.

| | | |
|--------------------------|-------------|-----------------|
| <u>Work Order Total:</u> | <u>9.00</u> | <u>\$155.69</u> |
|--------------------------|-------------|-----------------|

05-4167

At sta.# 111+13 (drop structure #3) there is organic debris that needs to be removed. Since the time this inspection pick up and discard any debris or trash throughout the project.

| | | |
|-------------------|------|----------|
| Work Order Total: | 9.00 | \$155.69 |
|-------------------|------|----------|

05-4168

At sta.# 117+22 (drop structure #4) replace the missing station placard. At sta.# 45+00 refurbish the station placard. At sta.#80+00 replace the existing placard with a new one on the existing post.

Work Order Total: 7.50 \$129.74

3/7

05-4169

At sta.# 138+20 refurbish the staff gauge at the outlet near the breakaway fence.

Work Order Total: 7.00 \$120.35

05-4170

At sta.# 138+20 repair the breakaway fence at the outlet to Signal Butte FRS. Check all project fencing since the date of this inspection and make repairs as required. Lubricate all locks.

Work Order Total: 16.50 \$285.43

05-4171

Between all the drop structures perform mowing operations to remove unwanted vegetation in the channel invert.

Work Order Total: 32.50 \$693.69

06-4133

Sediment plugs in the invert at Spillway Trail, NightHawk Wash Trail and Amigos Wash Trail. Also, there is a sediment mound from the last clean up at Amigos Wash Trail. Remove all sediment and disposed of accordingly.

Work Order Total: 26.00 \$645.87

06-4134

Remove all vegetation, trash and debris from inlet and outlet drains. Also, remove deep rooted vegetation throughout upstream and downstream slope embankments; including the invert. Cut and stump treat according to O&M SOP and dispose of accordingly.

Work Order Total: 108.50 \$1,654.66

06-4135

Install directional arrow signage at all drop structures adjacent to maintenance roadways on both north and south sides as needed.

Work Order Total: 20.00 \$330.94

06-4136

Check all gates throughout project that may have been vandalized post inspection and repair and/or refurbish as needed in reference to O&M SOP. Note; lubricate all 3E59 locks

Work Order Total: 10.50 \$162.24

08-4251

- (1) Stationing faded at 60+00, 65+00, 75+00, 101+23 and 105+40.
- (2) Directional Arrows are down at station 116+27 on both banks and at station 124+82 on the south bank.
- (3) Check all signage throughout structure and replace and/or refurbish as needed.

Work Order Total: 22.00 \$374.42

08-4253

(1) Deep-rooted noted at stations; 51+00, 62+95, 64+35, 75+90, 87+31, and 91+06 all upstream crest. Cut, stump treat, remove and dispose of accordingly.

(2) Remove all vegetation, from inlet and outlet drains.

4/7

| | | |
|--------------------------|--------------|-----------------|
| Work Order Total: | 28.00 | \$508.52 |
|--------------------------|--------------|-----------------|

08-4254

Remove all trash and debris from the inlets, outlets and throughout the structure. Dispose of trash/debris accordingly.

| | | |
|--------------------------|--------------|-------------------|
| Work Order Total: | 65.50 | \$1,205.65 |
|--------------------------|--------------|-------------------|

08-4255

Check all gates throughout project that may have been vandalized post inspection and repair and/or refurbish as needed in reference to O&M SOP.

Note; lubricate all 3E59 locks with graphite.

| | | |
|--------------------------|-------------|-----------------|
| Work Order Total: | 8.00 | \$153.76 |
|--------------------------|-------------|-----------------|

09-2012

Sediment plugs in the invert at stations; 45+00, 47+71, 53+33, 60+83, 69+00, 75+90, 85+83, 96+80 and 105+40.

Remove all sediment/debris and disposed of accordingly.

| | | |
|--------------------------|--------------|-------------------|
| Work Order Total: | 68.00 | \$1,666.17 |
|--------------------------|--------------|-------------------|

09-4228

Throughout the structure repair / replace the the damaged and missing signs and stationing as needed.

| | | |
|--------------------------|-------------|----------------|
| Work Order Total: | 5.00 | \$80.95 |
|--------------------------|-------------|----------------|

09-4229

Remove the unwanted vegetation throughout the project and dispose of accordingly.

| | | |
|--------------------------|---------------|-------------------|
| Work Order Total: | 392.50 | \$5,222.24 |
|--------------------------|---------------|-------------------|

10-3050

Use this work order to charge all time to for the Deputy Sheriff patrolling and other associated activities.

| | | |
|--------------------------|-------------|---------------|
| Work Order Total: | 1.50 | \$0.00 |
|--------------------------|-------------|---------------|

10-5066

Use this work order for any maintenance performed to associated structure features of the Pass Mountain Diversion Channel Project project that were a direct result of the recent storm event that took place the week of January 17th to 24th. This includes any damage from strong winds, sediment & debris removal, erosion, etc.

| | | |
|--------------------------|--------------|-------------------|
| Work Order Total: | 46.00 | \$1,039.11 |
|--------------------------|--------------|-------------------|

10-8061

Treat project right-of-way for unwanted vegetation as per direction from T. Siegfried.

5/7

Work Order Total: 3.50 \$97.26

11-2048

Remove the deteriorated/rusted project sign and dispose of accordingly.

Work Order Total: 8.00 \$143.93

11-3050

Use this work order to charge all time for the Deputy Sheriff patrolling and other associated activities.

Work Order Total: 3.50 \$0.00

99-1853

CHECK ALL FENCING AND GATES (INCLUDING HORSE GATES) THRU OUT PROJECT. REPAIR OR REFURBISH AS NEEDED. LUBRICATE ALL LOCKS ON GATES. AT STA. # 73+00 THE HORSE GATE NEEDS NEW PADDING INSTALLED. VANDALIZED FENCE--VF-0302. VANDALIZED GATE VG-0302.

Work Order Total: 11.00 \$178.87

99-1854

CUT AND STUMP TREAT ALL DEEP ROOTED VEGETATION GROWING ON EMBANKMENT AREAS.

Work Order Total: 13.00 \$194.86

99-1855

CHECK ALL NO-TRESPASSING SIGNS AND STATIONING. REPLACE OR REFURBISH AS NEEDED ANY MISSING SIGNS OR STATIONING.

Work Order Total: 6.50 \$104.70

99-1856

AT ALL VEGETATIVE DRAINS, CLEAN UP AND REMOVE DEBRIS FROM INLETS AND OUTLETS.

Work Order Total: 9.00 \$128.58

99-1857

FILL AND COMPACT ALL RODENT AND ANIMAL HOLES THRU OUT PROJECT.

Work Order Total: 14.50 \$233.09

99-1858

AT STA. # 128+00 WEST BANK, REPAIR EROSION PROBLEM ON SLOPE. ***NOTE*** THIS SITE HAS BEEN REPAIRED PREVIOUSLY, MAKE SURE TO REPAIR CREST OF LEVEE TO ALLOW FOR PROPER DRAINAGE.

Work Order Total: 5.00 \$67.55

6/7

99-5032

INSTALL GRAVEL MULCH ON SLOPES OF LEVEE WHERE WORN PATHS EXIST FROM HORSE TRAIL SHORTCUTS IN CONJUNCTION WITH PARKS INSTALLING TRAIL SIGNS.

Work Order Total: 113.00 \$1,768.75

CS-0302

Work Order Total: 1.00 \$18.82

CT-0302

Work Order Total: 2.00 \$38.57

EF-0302

Work Order Total: 2.50 \$33.28

OI-0302

Work Order Total: 22.00 \$453.70

OI-1302

Work Order Total: 1.00 \$20.78

RS-0302

Work Order Total: 2.00 \$35.51

RT-0302

Work Order Total: 4.50 \$86.28

sf-0302

| | <u>Hours</u> | <u>Salary + Overhead</u> | |
|--|-----------------|--------------------------|-----|
| | 3.00 | \$67.12 | 7/7 |
| Work Order Total: | | | |
| swo-0104 | | | |
| Use this work order for Mosquito Abatement for the entire project. | | | |
| | 112.50 | \$2,466.03 | |
| Work Order Total: | | | |
| swo-0239 | | | |
| Use this work order to check the entire project during or after a storm event. | | | |
| | 10.00 | \$118.94 | |
| Work Order Total: | | | |
| TP-0302 | | | |
| | 4.50 | \$77.03 | |
| Work Order Total: | | | |
| TT-0302 | | | |
| | 59.00 | \$1,005.68 | |
| Work Order Total: | | | |
| tt-1302 | | | |
| | 8.00 | \$149.12 | |
| Work Order Total: | | | |
| VF-0302 | | | |
| | 1.00 | \$15.26 | |
| Work Order Total: | | | |
| Fiscal Year Totals: | <u>1,623.50</u> | <u>\$ 27,099.13</u> | |

SEDIMENT REMOVAL - LABOR

| | |
|--------------|--------------------|
| <u>207.5</u> | <u>\$ 4,318.24</u> |
| hours | Salary + Overhead |

Equipment Cost For Pass Mountain Diversion Channel

9/28/201

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|-------|---------|----------|-----------------|------------------------------------|
| 00-2469 32266 | 302 | 0 | 01/10/2001 | 13.00 | \$0.43 | jal | \$ 5.59 | 92CHEVY3/4TON 175HP |
| 00-2469 T0120 | 302 | 0 | 01/10/2001 | 2.50 | \$0.58 | jal | \$ 1.45 | STIHL WEED EATER |
| 00-2469 T0121 | 302 | 0 | 01/10/2001 | 2.50 | \$0.58 | kpc | \$ 1.45 | STIHL WEED EATER |
| Work Order Total: | | | | | | | \$8.49 | |
| 00-2470 32266 | 302 | 0 | 01/10/2001 | 12.00 | \$0.43 | jal | \$ 5.16 | 92CHEVY3/4TON 175HP |
| 00-2470 32266 | 302 | 0 | 01/11/2001 | 29.00 | \$0.43 | kpc | \$ 12.47 | 92CHEVY3/4TON 175HP |
| Work Order Total: | | | | | | | \$17.63 | |
| 00-2471 32266 | 302 | 0 | 01/10/2001 | 16.00 | \$0.43 | kpc | \$ 6.88 | 92CHEVY3/4TON 175HP |
| Work Order Total: | | | | | | | \$6.88 | |
| 01-8068 32803 | 302 | 0 | 01/18/2001 | 2.00 | \$0.39 | jhs | \$ 0.78 | 98 CHEVY 3/4 TON4X4 175 H.P. |
| 01-8068 32803 | 302 | 0 | 03/02/2001 | 47.00 | \$0.39 | jhs | \$ 18.33 | 98 CHEVY 3/4 TON4X4 175 H.P. |
| Work Order Total: | | | | | | | \$19.11 | |
| 02-2077 00466 | 302 | 1 | 03/14/2002 | 5.00 | \$35.87 | kpc | \$ 179.35 | 1994 CASE 821/Front-End Loader 4YD |
| 02-2077 32807 | 302 | 1 | 03/14/2002 | 21.00 | \$0.39 | dlb | \$ 8.19 | 88CHEVY1TON4X4CREW 175HP |
| 02-2077 45501 | 302 | 1 | 03/14/2002 | 39.00 | \$0.60 | dlb | \$ 23.40 | 1995 GM 10 YARD DUMP |
| Work Order Total: | | | | | | | \$210.94 | 02-2077 |
| 02-2082 32357 | 302 | 0 | 03/14/2002 | 25.00 | \$0.34 | etl | \$ 8.50 | 93CHEVY3/4TON4X4 175HP |
| Work Order Total: | | | | | | | \$8.50 | |
| 02-2083 42113 | 302 | 0 | 02/28/2002 | 55.00 | \$0.52 | kpc | \$ 28.60 | 1991 GM ASPEN DUMP TRUCK |
| 02-2083 32807 | 302 | 0 | 02/28/2002 | 23.00 | \$0.39 | dlb | \$ 8.97 | 88CHEVY1TON4X4CREW 175HP |
| 02-2083 T0121 | 302 | 0 | 03/04/2002 | 3.00 | \$0.58 | etl | \$ 1.74 | STIHL WEED EATER |
| 02-2083 HT016 | 302 | 0 | 03/04/2002 | 7.00 | \$0.35 | kpc | \$ 2.45 | HEDGE TRIMMER |
| 02-2083 HT027 | 302 | 0 | 03/04/2002 | 7.00 | \$0.35 | dlb | \$ 2.45 | HEDGE TRIMMER |
| 02-2083 32357 | 302 | 0 | 03/04/2002 | 22.00 | \$0.34 | etl | \$ 7.48 | 93CHEVY3/4TON4X4 175HP |
| 02-2083 32807 | 302 | 0 | 03/04/2002 | 23.00 | \$0.39 | dlb | \$ 8.97 | 88CHEVY1TON4X4CREW 175HP |
| 02-2083 32807 | 302 | 0 | 03/05/2002 | 25.00 | \$0.39 | dlb | \$ 9.75 | 88CHEVY1TON4X4CREW 175HP |
| 02-2083 HT016 | 302 | 0 | 03/05/2002 | 7.00 | \$0.35 | kpc | \$ 2.45 | HEDGE TRIMMER |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|-------|---------|----------|------------------|------------------------------------|
| 02-2083 HT027 | 302 | 0 | 03/05/2002 | 7.00 | \$0.35 | dlb | \$ 2.45 | HEDGE TRIMMER |
| 02-2083 32807 | 302 | 0 | 03/12/2002 | 30.00 | \$0.39 | dlb | \$ 11.70 | 88CHEVY1TON4X4CREW 175HP |
| 02-2083 00466 | 302 | 0 | 03/12/2002 | 3.00 | \$35.87 | kpc | \$ 107.61 | 1994 CASE 821/FRONT-END LOADER 4YD |
| 02-2083 32357 | 302 | 0 | 03/12/2002 | 25.00 | \$0.34 | etl | \$ 8.50 | 93CHEVY3/4TON4X4 175HP |
| 02-2083 00466 | 302 | 0 | 03/13/2002 | 3.00 | \$35.87 | kpc | \$ 107.61 | 1994 CASE 821/FRONT-END LOADER 4YD |
| 02-2083 32807 | 302 | 0 | 03/13/2002 | 43.00 | \$0.39 | dlb | \$ 16.77 | 88CHEVY1TON4X4CREW 175HP |
| 02-2083 32357 | 302 | 0 | 03/13/2002 | 25.00 | \$0.34 | etl | \$ 8.50 | 93CHEVY3/4TON4X4 175HP |
| 02-2083 32357 | 302 | 0 | 03/18/2002 | 11.00 | \$0.34 | etl | \$ 3.74 | 93CHEVY3/4TON4X4 175HP |
| Work Order Total: | | | | | | | \$339.74 | |
| <u>02-2084 32357</u> | 302 | 1 | 03/18/2002 | 21.00 | \$0.34 | etl | <u>\$ 7.14</u> | 93CHEVY3/4TON4X4 175HP |
| <u>02-2084 00466</u> | 302 | 1 | 03/18/2002 | 4.00 | \$35.87 | kpc | <u>\$ 143.48</u> | 1994 CASE 821/FRONT-END LOADER 4YD |
| <u>02-2084 32807</u> | 302 | 1 | 03/18/2002 | 25.00 | \$0.39 | dlb | <u>\$ 9.75</u> | 88CHEVY1TON4X4CREW 175HP |
| <u>02-2084 45501</u> | 302 | 1 | 03/18/2002 | 14.00 | \$0.60 | dlb | <u>\$ 8.40</u> | 1995 GM 10 YARD DUMP |
| <u>02-2084 42304</u> | 302 | 1 | 02/18/2003 | 85.00 | \$0.39 | gwh | <u>\$ 33.15</u> | 1993 CHEVY 1 TON 4X4 CREWCAB |
| Work Order Total: | | | | | | | \$201.92 | 02-2084 |
| 02-2085 T0120 | 302 | 1 | 02/27/2002 | 3.00 | \$0.58 | etl | \$ 1.74 | STIHL WEED EATER |
| 02-2085 T0121 | 302 | 1 | 02/27/2002 | 3.00 | \$0.58 | kpc | \$ 1.74 | STIHL WEED EATER |
| 02-2085 32807 | 302 | 1 | 02/27/2002 | 12.00 | \$0.39 | kpc | \$ 4.68 | 88CHEVY1TON4X4CREW 175HP |
| 02-2085 32357 | 302 | 1 | 03/05/2002 | 25.00 | \$0.34 | etl | \$ 8.50 | 93CHEVY3/4TON4X4 175HP |
| 02-2085 HT022 | 302 | 1 | 03/05/2002 | 6.00 | \$0.35 | etl | \$ 2.10 | HEDGE TRIMMER |
| 02-2085 HT022 | 302 | 1 | 03/07/2002 | 3.00 | \$0.35 | kpc | \$ 1.05 | HEDGE TRIMMER |
| 02-2085 HT026 | 302 | 1 | 03/07/2002 | 3.00 | \$0.35 | etl | \$ 1.05 | HEDGE TRIMMER |
| 02-2085 HT014 | 302 | 1 | 03/07/2002 | 3.00 | \$0.35 | dlb | \$ 1.05 | HEDGE TRIMMER |
| 02-2085 32807 | 302 | 1 | 03/07/2002 | 14.00 | \$0.39 | dlb | \$ 5.46 | 88CHEVY1TON4X4CREW 175HP |
| 02-2085 32357 | 302 | 1 | 03/07/2002 | 27.00 | \$0.34 | etl | \$ 9.18 | 93CHEVY3/4TON4X4 175HP |
| 02-2085 00466 | 302 | 1 | 03/11/2002 | 2.00 | \$35.87 | kpc | \$ 71.74 | 1994 CASE 821/FRONT-END LOADER 4YD |
| 02-2085 32807 | 302 | 1 | 03/11/2002 | 25.00 | \$0.39 | etl | \$ 9.75 | 88CHEVY1TON4X4CREW 175HP |
| 02-2085 HT022 | 302 | 1 | 03/11/2002 | 3.00 | \$0.35 | kpc | \$ 1.05 | HEDGE TRIMMER |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|--------|---------|----------|-----------------|---|
| 02-2085 HT026 | 302 | 1 | 03/11/2002 | 3.00 | \$0.35 | etl | \$ 1.05 | HEDGE TRIMMER |
| Work Order Total: | | | | | | | \$120.14 | |
| 02-8179 32803 | 302 | 0 | 06/10/2002 | 2.00 | \$0.39 | jhs | \$ 0.78 | 98 CHEVY 3/4 TON4X4 175 H.P. |
| Work Order Total: | | | | | | | \$0.78 | |
| 03-8182 32255 | 302 | 0 | 05/28/2003 | 29.00 | \$1.05 | jhe | \$ 30.45 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| Work Order Total: | | | | | | | \$30.45 | |
| 04-2327 31387 | 302 | 1 | 08/02/2004 | 30.00 | \$1.05 | ria | \$ 31.50 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$31.50 | |
| 04-2328 31387 | 302 | All | 08/02/2004 | 30.00 | \$1.05 | ria | \$ 31.50 | 2003 FORD 3/4 TON UTILITY |
| 04-2328 31387 | 302 | All | 08/11/2004 | 45.00 | \$1.05 | adg | \$ 47.25 | 2003 FORD 3/4 TON UTILITY |
| 04-2328 31387 | 302 | All | 08/12/2004 | 95.00 | \$1.05 | ria | \$ 99.75 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$178.50 | |
| 04-2329 31387 | 302 | All | 08/02/2004 | 26.00 | \$1.05 | ria | \$ 27.30 | 2003 FORD 3/4 TON UTILITY |
| 04-2329 00369 | 302 | All | 08/02/2004 | 1.00 | \$40.00 | tws | \$ 40.00 | TRAILER |
| 04-2329 32996 | 302 | All | 08/02/2004 | 125.00 | \$0.39 | tws | \$ 48.75 | 1999 CHEVY 1 TON 4X4 CREW |
| 04-2329 32996 | 302 | All | 08/03/2004 | 116.00 | \$0.39 | tws | \$ 45.24 | 1999 CHEVY 1 TON 4X4 CREW |
| 04-2329 00208 | 302 | All | 08/03/2004 | 1.00 | \$39.64 | tws | \$ 39.64 | SMALL TILT TRAILER |
| Work Order Total: | | | | | | | \$200.93 | |
| 05-4165 32807 | 302 | All | 10/04/2005 | 30.00 | \$0.39 | khk | \$ 11.70 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$11.70 | |
| 05-4166 32807 | 302 | All | 10/04/2005 | 33.00 | \$0.39 | dlb | \$ 12.87 | 88CHEVY1TON4X4CREW 175HP |
| 05-4166 00467 | 302 | All | 10/04/2005 | 4.00 | \$35.87 | kpc | \$ 143.48 | LOADER |
| Work Order Total: | | | | | | | \$156.35 | 05-4166 |
| 05-4167 31389 | 302 | All | 10/05/2005 | 11.00 | \$1.05 | kpc | \$ 11.55 | 2003 FORD 3/4 TON UTILITY |
| 05-4167 32807 | 302 | All | 10/05/2005 | 7.00 | \$0.39 | dlb | \$ 2.73 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$14.28 | |
| 05-4168 32807 | 302 | All | 09/29/2005 | 8.00 | \$0.39 | dlb | \$ 3.12 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$3.12 | |
| 05-4169 32807 | 302 | All | 09/29/2005 | 30.00 | \$0.39 | khk | \$ 11.70 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$11.70 | |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|--------|---------|----------|-------------------|-------------------------------|
| 05-4170 32807 | 302 | All | 10/03/2005 | 24.00 | \$0.39 | dlb | \$ 9.36 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$9.36 | |
| 05-4171 32206 | 302 | All | 07/16/2005 | 51.00 | \$0.46 | MNS | \$ 23.46 | 2002 CHEV. 1/2 TON TANKER |
| 05-4171 32206 | 302 | All | 07/19/2005 | 25.00 | \$0.46 | MNS | \$ 11.50 | 2002 CHEV. 1/2 TON TANKER |
| 05-4171 32206 | 302 | All | 07/20/2005 | 40.00 | \$0.46 | mns | \$ 18.40 | 2002 CHEV. 1/2 TON TANKER |
| 05-4171 00560 | 302 | All | 07/21/2005 | 6.00 | \$97.50 | mns | \$ 585.00 | JOHN DEERE TRACTOR/MODEL 6300 |
| 05-4171 00560 | 302 | All | 07/28/2005 | 5.00 | \$97.50 | mns | \$ 487.50 | JOHN DEERE TRACTOR/MODEL 6300 |
| 05-4171 32206 | 302 | All | 07/28/2005 | 43.00 | \$0.46 | mns | \$ 19.78 | 2002 CHEV. 1/2 TON TANKER |
| Work Order Total: | | | | | | | \$1,145.64 | |
| 06-4133 00467 | 302 | 1 | 06/19/2006 | 4.00 | \$35.87 | KPC | \$ 143.48 | LOADER |
| 06-4133 32807 | 302 | 1 | 06/19/2006 | 104.00 | \$0.39 | DLB | \$ 40.56 | 88CHEVY1TON4X4CREW 175HP |
| 06-4133 45501 | 302 | 1 | 06/19/2006 | 36.00 | \$0.60 | DLB | \$ 21.60 | 1995 GM 10 YARD DUMP |
| Work Order Total: | | | | | | | \$205.64 | <i>06-4133</i> |
| 06-4134 T0116 | 302 | 0 | 06/15/2006 | 3.00 | \$0.58 | ALD | \$ 1.74 | STIHL WEED EATER |
| 06-4134 32007 | 302 | 0 | 06/15/2006 | 90.00 | \$0.39 | ALD | \$ 35.10 | CHEVY 1 TON 4x4 CREW CAB |
| 06-4134 00357 | 302 | 0 | 06/15/2006 | 1.00 | \$46.00 | ALD | \$ 46.00 | TRAILER |
| 06-4134 00357 | 302 | 0 | 06/19/2006 | 1.00 | \$46.00 | ALD | \$ 46.00 | TRAILER |
| 06-4134 32007 | 302 | 0 | 06/19/2006 | 95.00 | \$0.39 | ALD | \$ 37.05 | CHEVY 1 TON 4x4 CREW CAB |
| 06-4134 T0116 | 302 | 0 | 06/19/2006 | 4.00 | \$0.58 | ALD | \$ 2.32 | STIHL WEED EATER |
| 06-4134 T0116 | 302 | 0 | 06/20/2006 | 3.00 | \$0.58 | ald | \$ 1.74 | STIHL WEED EATER |
| 06-4134 32007 | 302 | 0 | 06/20/2006 | 98.00 | \$0.39 | ald | \$ 38.22 | CHEVY 1 TON 4x4 CREW CAB |
| 06-4134 00357 | 302 | 0 | 06/20/2006 | 1.00 | \$46.00 | ald | \$ 46.00 | TRAILER |
| 06-4134 00357 | 302 | 0 | 06/21/2006 | 1.00 | \$46.00 | ald | \$ 46.00 | TRAILER |
| 06-4134 32007 | 302 | 0 | 06/21/2006 | 92.00 | \$0.39 | ald | \$ 35.88 | CHEVY 1 TON 4x4 CREW CAB |
| 06-4134 T0116 | 302 | 0 | 06/21/2006 | 4.00 | \$0.58 | ald | \$ 2.32 | STIHL WEED EATER |
| Work Order Total: | | | | | | | \$338.37 | |
| 06-4135 31387 | 302 | 0 | 06/15/2006 | 97.00 | \$1.05 | ADG | \$ 101.85 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$101.85 | |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|--------|---------|----------|-----------------|---|
| 08-4251 32995 | 302 | 0 | 11/06/2008 | 87.00 | \$0.39 | pps | \$ 33.93 | 1999 CHEVY I TON 4X4 CREW |
| 08-4251 32995 | 302 | 0 | 11/10/2008 | 36.00 | \$0.39 | zap | \$ 14.04 | 1999 CHEVY I TON 4X4 CREW |
| 08-4251 31387 | 302 | 0 | 11/17/2008 | 36.00 | \$1.05 | mrl | \$ 37.80 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$85.77 | |
| 08-4253 31387 | 302 | All | 11/17/2008 | 38.00 | \$1.05 | mrl | \$ 39.90 | 2003 FORD 3/4 TON UTILITY |
| 08-4253 31388 | 302 | All | 11/19/2008 | 104.00 | \$1.05 | dth | \$ 109.20 | 2003 FORD 3/4 TON UTILITY |
| 08-4253 31387 | 302 | All | 11/20/2008 | 40.00 | \$1.05 | mrl | \$ 42.00 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$191.10 | |
| 08-4254 32995 | 302 | All | 11/10/2008 | 41.00 | \$0.39 | zap | \$ 15.99 | 1999 CHEVY I TON 4X4 CREW |
| 08-4254 32995 | 302 | All | 11/17/2008 | 79.00 | \$0.39 | pps | \$ 30.81 | 1999 CHEVY I TON 4X4 CREW |
| 08-4254 T0124 | 302 | All | 11/17/2008 | 3.00 | \$0.60 | adg | \$ 1.80 | STIHL WEED EATER |
| 08-4254 T0125 | 302 | All | 11/17/2008 | 3.00 | \$0.60 | zap | \$ 1.80 | STIHL WEED EATER |
| Work Order Total: | | | | | | | \$50.40 | |
| 08-4255 31387 | 302 | 0 | 11/17/2008 | 36.00 | \$1.05 | mrl | \$ 37.80 | 2003 FORD 3/4 TON UTILITY |
| Work Order Total: | | | | | | | \$37.80 | |
| 09-2012 32200 | 302 | 1 | 03/10/2009 | 40.00 | \$1.01 | Pet | \$ 40.40 | 2002 Chevrolet 3/4 Ton Utility (Tanker) |
| 09-2012 00467 | 302 | 1 | 03/10/2009 | 5.00 | \$35.87 | Pet | \$ 179.35 | LOADER |
| 09-2012 41405 | 302 | 1 | 03/10/2009 | 28.00 | \$0.60 | KPC | \$ 16.80 | 1994 DUMP TRUCK 10 YARD |
| 09-2012 00031 | 302 | 1 | 03/10/2009 | 4.00 | \$31.50 | Pet | \$ 126.00 | CAT 140G BLADE 150 HP |
| 09-2012 00031 | 302 | 1 | 03/11/2009 | 2.00 | \$31.50 | Pet | \$ 63.00 | CAT 140G BLADE 150 HP |
| 09-2012 41405 | 302 | 1 | 03/11/2009 | 31.00 | \$0.60 | Pet | \$ 18.60 | 1994 DUMP TRUCK 10 YARD |
| 09-2012 00467 | 302 | 1 | 03/11/2009 | 7.00 | \$35.87 | KPC | \$ 251.09 | LOADER |
| 09-2012 32200 | 302 | 1 | 03/11/2009 | 25.00 | \$1.01 | Pet | \$ 25.25 | 2002 Chevrolet 3/4 Ton Utility (Tanker) |
| 09-2012 32200 | 302 | 1 | 03/12/2009 | 25.00 | \$1.01 | Pet | \$ 25.25 | 2002 Chevrolet 3/4 Ton Utility (Tanker) |
| 09-2012 00467 | 302 | 1 | 03/12/2009 | 8.00 | \$35.87 | KPC | \$ 286.96 | LOADER |
| 09-2012 41405 | 302 | 1 | 03/12/2009 | 60.00 | \$0.60 | Pet | \$ 36.00 | 1994 DUMP TRUCK 10 YARD |
| 09-2012 41405 | 302 | 1 | 03/16/2009 | 20.00 | \$0.60 | Pet | \$ 12.00 | 1994 DUMP TRUCK 10 YARD |
| 09-2012 00467 | 302 | 1 | 03/16/2009 | 2.00 | \$35.87 | KPC | \$ 71.74 | LOADER |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|-------------------------------------|----------|-------|------------|--------|---------|----------|----------------|---|
| 09-2012 32200 | 302 | 1 | 03/16/2009 | 35.00 | \$1.01 | Pet | \$ 35.35 | 2002 Chevrolet 3/4 Ton Utility (Tanker) |
| Work Order Total: \$1,187.79 | | | | | | | 09-2012 | |
| 09-4228 31713 | 302 | 0 | 12/16/2009 | 50.00 | \$1.50 | raz | \$ 75.00 | FORD F-350 UTILITY |
| Work Order Total: \$75.00 | | | | | | | | |
| 09-4229 31416 | 302 | 0 | 11/04/2009 | 86.00 | \$1.05 | raz | \$ 90.30 | FORD F-350 CREW CAB |
| 09-4229 31416 | 302 | 0 | 11/10/2009 | 82.00 | \$1.05 | raz | \$ 86.10 | FORD F-350 CREW CAB |
| 09-4229 31416 | 302 | 0 | 11/12/2009 | 91.00 | \$1.05 | raz | \$ 95.55 | FORD F-350 CREW CAB |
| 09-4229 31416 | 302 | 0 | 11/16/2009 | 82.00 | \$1.05 | raz | \$ 86.10 | FORD F-350 CREW CAB |
| 09-4229 T0145 | 302 | 0 | 11/16/2009 | 7.00 | \$0.70 | raz | \$ 4.90 | STIHL WEED EATER |
| 09-4229 T0133 | 302 | 0 | 11/16/2009 | 7.00 | \$0.60 | raz | \$ 4.20 | STIHL WEED EATER |
| 09-4229 S0089 | 302 | 0 | 11/16/2009 | 3.00 | \$1.00 | raz | \$ 3.00 | CHAIN SAW |
| 09-4229 T0106 | 302 | 0 | 11/16/2009 | 7.00 | \$0.58 | raz | \$ 4.06 | STIHL WEED EATER |
| 09-4229 HT012 | 302 | 0 | 11/16/2009 | 4.00 | \$0.35 | raz | \$ 1.40 | HEDGE TRIMMER |
| 09-4229 HT012 | 302 | 0 | 11/17/2009 | 4.00 | \$0.35 | raz | \$ 1.40 | HEDGE TRIMMER |
| 09-4229 S0089 | 302 | 0 | 11/17/2009 | 1.00 | \$1.00 | raz | \$ 1.00 | CHAIN SAW |
| 09-4229 T0133 | 302 | 0 | 11/17/2009 | 7.00 | \$0.60 | raz | \$ 4.20 | STIHL WEED EATER |
| 09-4229 T0145 | 302 | 0 | 11/17/2009 | 7.00 | \$0.70 | raz | \$ 4.90 | STIHL WEED EATER |
| 09-4229 48401 | 302 | 0 | 11/17/2009 | 103.00 | \$0.70 | dth | \$ 72.10 | ASPEN BRUSH TRAILER- INTERNATIONAL |
| 09-4229 31416 | 302 | 0 | 11/17/2009 | 102.00 | \$1.05 | raz | \$ 107.10 | FORD F-350 CREW CAB |
| 09-4229 31416 | 302 | 0 | 11/18/2009 | 110.00 | \$1.05 | raz | \$ 115.50 | FORD F-350 CREW CAB |
| 09-4229 48401 | 302 | 0 | 11/18/2009 | 105.00 | \$0.70 | dth | \$ 73.50 | ASPEN BRUSH TRAILER- INTERNATIONAL |
| 09-4229 48401 | 302 | 0 | 11/19/2009 | 113.00 | \$0.70 | dth | \$ 79.10 | ASPEN BRUSH TRAILER- INTERNATIONAL |
| 09-4229 31416 | 302 | 0 | 11/19/2009 | 103.00 | \$1.05 | raz | \$ 108.15 | FORD F-350 CREW CAB |
| 09-4229 31713 | 302 | 0 | 11/19/2009 | 130.00 | \$1.50 | mrl | \$ 195.00 | FORD F-350 UTILITY |
| Work Order Total: \$1,137.56 | | | | | | | | |
| 10-5066 31676 | 302 | All | 07/14/2010 | 47.00 | \$1.20 | KPC | \$ 56.40 | 2006 FORD 1 TON PICKUP |
| 10-5066 41525 | 302 | All | 07/14/2010 | 40.00 | \$0.90 | Ken | \$ 36.00 | 10 YARD DUMP TRUCK |
| 10-5066 00467 | 302 | All | 07/14/2010 | 6.00 | \$35.87 | Ken | \$ 215.22 | LOADER |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|--------|---------|----------|-----------------|---|
| 10-5066 32200 | 302 | All | 07/22/2010 | 109.00 | \$1.01 | Pet | \$ 110.09 | 2002 Chevrolet 3/4 Ton Utility (Tanker) |
| 10-5066 45819 | 302 | All | 07/22/2010 | 36.00 | \$1.57 | Bir | \$ 56.52 | 2008 FREIGHTLINER 4000 GALLON WATER TRUCK |
| 10-5066 00031 | 302 | All | 07/22/2010 | 2.00 | \$31.50 | Pet | \$ 63.00 | CAT 140G BLADE 150 HP |
| Work Order Total: | | | | | | | \$537.23 | 10-5066 |
| 10-8061 31417 | 302 | 0 | 10/18/2010 | 2.00 | \$1.05 | DCU | \$ 2.10 | FORD F-350 1 TON UTILITY |
| Work Order Total: | | | | | | | \$2.10 | |
| 11-2048 42103 | 302 | 0 | 04/07/2011 | 24.00 | \$0.50 | GWH | \$ 12.00 | 2001 CHEVY 1 TON CREW CAB |
| Work Order Total: | | | | | | | \$12.00 | |
| 99-1853 31317 | 302 | 0 | 11/15/1999 | 25.00 | \$0.40 | ETL | \$ 10.00 | 1993 FORD 1/2 TON 4X4 TRUCK |
| 99-1853 32807 | 302 | 0 | 11/15/1999 | 22.00 | \$0.39 | DLB | \$ 8.58 | 88CHEVY1TON4X4CREW 175HP |
| 99-1853 32807 | 302 | 0 | 11/24/1999 | 19.00 | \$0.39 | DLB | \$ 7.41 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$25.99 | |
| 99-1854 32807 | 302 | 0 | 11/16/1999 | 23.00 | \$0.39 | DLB | \$ 8.97 | 88CHEVY1TON4X4CREW 175HP |
| 99-1854 32807 | 302 | 0 | 11/18/1999 | 24.00 | \$0.39 | DLB | \$ 9.36 | 88CHEVY1TON4X4CREW 175HP |
| 99-1854 32807 | 302 | 0 | 11/22/1999 | 12.00 | \$0.39 | DLB | \$ 4.68 | 88CHEVY1TON4X4CREW 175HP |
| 99-1854 32807 | 302 | 0 | 11/23/1999 | 10.00 | \$0.39 | DLB | \$ 3.90 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$26.91 | |
| 99-1855 32807 | 302 | 0 | 11/16/1999 | 23.00 | \$0.39 | DLB | \$ 8.97 | 88CHEVY1TON4X4CREW 175HP |
| 99-1855 31317 | 302 | 0 | 11/16/1999 | 20.00 | \$0.40 | ETL | \$ 8.00 | 1993 FORD 1/2 TON 4X4 TRUCK |
| 99-1855 32807 | 302 | 0 | 11/17/1999 | 14.00 | \$0.39 | DLB | \$ 5.46 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$22.43 | |
| 99-1856 32807 | 302 | 0 | 11/17/1999 | 9.00 | \$0.39 | DLB | \$ 3.51 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$3.51 | |
| 99-1857 32807 | 302 | 0 | 11/22/1999 | 10.00 | \$0.39 | DLB | \$ 3.90 | 88CHEVY1TON4X4CREW 175HP |
| 99-1857 31317 | 302 | 0 | 11/22/1999 | 10.00 | \$0.40 | ETL | \$ 4.00 | 1993 FORD 1/2 TON 4X4 TRUCK |
| Work Order Total: | | | | | | | \$7.90 | |
| 99-5032 00466 | 302 | 0 | 11/22/1999 | 5.00 | \$35.87 | MNS | \$ 179.35 | 1994 CASE 821/Front-End Loader 4YD |
| 99-5032 32275 | 302 | 0 | 11/22/1999 | 45.00 | \$0.43 | MNS | \$ 19.35 | 92CHEVY3/4TON4X4TANKER 175HP |
| 99-5032 41401 | 302 | 0 | 11/22/1999 | 235.00 | \$0.60 | CFB | \$ 141.00 | 1994 FORD 10YD DUMP TRUCK |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|-------------------------------------|----------|-------|------------|--------|---------|----------|------------|---------------------------------------|
| 99-5032 45501 | 302 | 0 | 11/22/1999 | 167.00 | \$0.60 | JET | \$ 100.20 | 1995 GM 10 YARD DUMP |
| 99-5032 48111 | 302 | 0 | 11/22/1999 | 115.00 | \$1.31 | JBB | \$ 150.65 | 91IHC 3500GAL WATER TRUCK200HP |
| 99-5032 48111 | 302 | 0 | 11/23/1999 | 73.00 | \$1.31 | JBB | \$ 95.63 | 91IHC 3500GAL WATER TRUCK200HP |
| 99-5032 45501 | 302 | 0 | 11/23/1999 | 154.00 | \$0.60 | JET | \$ 92.40 | 1995 GM 10 YARD DUMP |
| 99-5032 32807 | 302 | 0 | 11/23/1999 | 17.00 | \$0.39 | DLB | \$ 6.63 | 88CHEVY1TON4X4CREW 175HP |
| 99-5032 41401 | 302 | 0 | 11/23/1999 | 230.00 | \$0.60 | CFB | \$ 138.00 | 1994 FORD 10YD DUMP TRUCK |
| 99-5032 32275 | 302 | 0 | 11/23/1999 | 29.00 | \$0.43 | MNS | \$ 12.47 | 92CHEVY3/4TON4X4TANKER 175HP |
| 99-5032 00466 | 302 | 0 | 11/23/1999 | 6.00 | \$35.87 | MNS | \$ 215.22 | 1994 CASE 821/FRONT-END LOADER 4YD |
| 99-5032 31317 | 302 | 0 | 11/23/1999 | 15.00 | \$0.40 | ETL | \$ 6.00 | 1993 FORD 1/2 TON 4X4 TRUCK |
| 99-5032 00466 | 302 | 0 | 11/24/1999 | 4.00 | \$35.87 | MNS | \$ 143.48 | 1994 CASE 821/FRONT-END LOADER 4YD |
| 99-5032 32275 | 302 | 0 | 11/24/1999 | 45.00 | \$0.43 | MNS | \$ 19.35 | 92CHEVY3/4TON4X4TANKER 175HP |
| 99-5032 45501 | 302 | 0 | 11/24/1999 | 34.00 | \$0.60 | JET | \$ 20.40 | 1995 GM 10 YARD DUMP |
| 99-5032 48111 | 302 | 0 | 11/24/1999 | 65.00 | \$1.31 | JBB | \$ 85.15 | 91IHC 3500GAL WATER TRUCK200HP |
| 99-5032 32807 | 302 | 0 | 11/24/1999 | 10.00 | \$0.39 | DLB | \$ 3.90 | 88CHEVY1TON4X4CREW 175HP |
| 99-5032 72202 | 302 | 0 | 11/24/1999 | 25.00 | \$0.31 | ETL | \$ 7.75 | 1992 CHEVY S-10 4X4 P/U-TANKER |
| 99-5032 32807 | 302 | 0 | 11/29/1999 | 28.00 | \$0.39 | DLB | \$ 10.92 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: \$1,447.85 | | | | | | | | |
| CS-030232804 | 302 | 0 | 10/19/1999 | 50.00 | \$0.39 | TOS | \$ 19.50 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| Work Order Total: \$19.50 | | | | | | | | |
| CT-030248801 | 302 | 0 | 08/23/2000 | 45.00 | \$0.82 | TOS | \$ 36.90 | 1988 IHC 2.5 TON 4X4 (CHEMICAL TRUCK) |
| Work Order Total: \$36.90 | | | | | | | | |
| OI-0302 31317 | 302 | 0 | 12/01/1999 | 5.00 | \$0.40 | ETL | \$ 2.00 | 1993 FORD 1/2 TON 4X4 TRUCK |
| OI-0302 32807 | 302 | 0 | 02/24/2000 | 38.00 | \$0.39 | ETL | \$ 14.82 | 88CHEVY1TON4X4CREW 175HP |
| OI-0302 32357 | 302 | 0 | 05/16/2000 | 13.00 | \$0.34 | ETL | \$ 4.42 | 93CHEVY3/4TON4X4 175HP |
| OI-0302 32807 | 302 | 0 | 08/08/2000 | 14.00 | \$0.39 | ETL | \$ 5.46 | 88CHEVY1TON4X4CREW 175HP |
| OI-0302 32807 | 302 | 0 | 01/17/2001 | 17.00 | \$0.39 | etl | \$ 6.63 | 88CHEVY1TON4X4CREW 175HP |
| OI-0302 32807 | 302 | 0 | 05/31/2001 | 19.00 | \$0.39 | etl | \$ 7.41 | 88CHEVY1TON4X4CREW 175HP |
| OI-0302 32807 | 302 | 0 | 08/07/2001 | 15.00 | \$0.39 | etl | \$ 5.85 | 88CHEVY1TON4X4CREW 175HP |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|--------------------------|----------|-------|------------|-------|--------|----------|----------------|---|
| OI-0302 32357 | 302 | 0 | 10/15/2001 | 27.00 | \$0.34 | etl | \$ 9.18 | 93CHEVY3/4TON4X4 175HP |
| OI-0302 32142 | 302 | 0 | 01/15/2002 | 10.00 | \$0.40 | etl | \$ 4.00 | 2001 CHEVY PICK UP |
| OI-0302 32357 | 302 | 0 | 04/09/2002 | 10.00 | \$0.34 | etl | \$ 3.40 | 93CHEVY3/4TON4X4 175HP |
| OI-0302 32142 | 302 | 0 | 07/10/2002 | 10.00 | \$0.40 | ETL | \$ 4.00 | 2001 CHEVY PICK UP |
| OI-0302 32357 | 302 | 0 | 01/28/2003 | 16.00 | \$0.34 | etl | \$ 5.44 | 93CHEVY3/4TON4X4 175HP |
| OI-0302 32206 | 302 | 0 | 04/15/2003 | 20.00 | \$0.46 | etl | \$ 9.20 | 2002 CHEV. 1/2 TON TANKER |
| OI-0302 32357 | 302 | 0 | 07/28/2003 | 21.00 | \$0.34 | etl | \$ 7.14 | 93CHEVY3/4TON4X4 175HP |
| Work Order Total: | | | | | | | \$88.95 | |
| OI-1302 32807 | 302 | 1 | 09/08/1999 | 20.00 | \$0.39 | ETL | \$ 7.80 | 88CHEVY1TON4X4CREW 175HP |
| OI-1302 32807 | 302 | 1 | 10/17/2000 | 14.00 | \$0.39 | DLB | \$ 5.46 | 88CHEVY1TON4X4CREW 175HP |
| Work Order Total: | | | | | | | \$13.26 | |
| RS-030232803 | 302 | 0 | 09/27/1999 | 17.00 | \$0.39 | JHS | \$ 6.63 | 98 CHEVY 3/4 TON4X4 175 H.P. |
| Work Order Total: | | | | | | | \$6.63 | |
| RT-030232803 | 302 | 0 | 01/10/2000 | 83.00 | \$0.39 | JHS | \$ 32.37 | 98 CHEVY 3/4 TON4X4 175 H.P. |
| RT-030272259 | 302 | 0 | 01/10/2000 | 66.00 | \$0.31 | GRD | \$ 20.46 | 1992 CHEVY S-10 4X4 P/U |
| Work Order Total: | | | | | | | \$52.83 | |
| sf-0302 31317 | 302 | 0 | 05/22/2002 | 16.00 | \$0.40 | etl | \$ 6.40 | 1993 FORD 1/2 TON 4X4 TRUCK |
| Work Order Total: | | | | | | | \$6.40 | |
| swo-010-32804 | 302 | All | 08/24/2004 | 23.00 | \$0.39 | jhe | \$ 8.97 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-31417 | 302 | All | 08/28/2004 | 30.00 | \$1.05 | tos | \$ 31.50 | FORD F-350 1 TON UTILITY |
| swo-010-32804 | 302 | All | 09/07/2004 | 6.00 | \$0.39 | jhe | \$ 2.34 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32255 | 302 | All | 09/22/2004 | 20.00 | \$1.05 | TOS | \$ 21.00 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| swo-010-32255 | 302 | All | 07/25/2005 | 55.00 | \$1.05 | tos | \$ 57.75 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| swo-010-32804 | 302 | All | 08/09/2005 | 10.00 | \$0.39 | tos | \$ 3.90 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 08/11/2005 | 60.00 | \$0.39 | tos | \$ 23.40 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 09/21/2005 | 32.00 | \$0.39 | tos | \$ 12.48 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 07/19/2006 | 15.00 | \$0.39 | tos | \$ 5.85 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 07/27/2006 | 40.00 | \$0.39 | mit | \$ 15.60 | 98 CHEVY 3/4 TON 4X4 175 H.P. |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|----------------|----------|-------|------------|-------|--------|----------|------------|---|
| swo-010-32804 | 302 | All | 08/22/2006 | 25.00 | \$0.39 | stm | \$ 9.75 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 08/23/2006 | 30.00 | \$0.39 | stm | \$ 11.70 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-32804 | 302 | All | 08/29/2006 | 30.00 | \$0.39 | stm | \$ 11.70 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-31629 | 302 | All | 09/06/2006 | 40.00 | \$1.35 | tos | \$ 54.00 | 2006 FORD F-350 PICK UP |
| swo-010-32804 | 302 | All | 09/14/2006 | 30.00 | \$0.39 | stm | \$ 11.70 | 98 CHEVY 3/4 TON 4X4 175 H.P. |
| swo-010-31629 | 302 | All | 05/01/2007 | 30.00 | \$1.35 | stm | \$ 40.50 | 2006 FORD F-350 PICK UP |
| swo-010-31043 | 302 | All | 07/16/2008 | 60.00 | \$0.00 | tos | \$ 0.00 | 2000 FORD F 150 PICK UP |
| swo-010-31634 | 302 | All | 07/18/2008 | 30.00 | \$1.35 | stm | \$ 40.50 | 2006 FORD F-350 PICK UP |
| swo-010-31634 | 302 | All | 07/21/2008 | 60.00 | \$1.35 | tos | \$ 81.00 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 08/07/2008 | 35.00 | \$1.35 | dcu | \$ 47.25 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 08/14/2008 | 35.00 | \$1.35 | dcu | \$ 47.25 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 08/28/2008 | 35.00 | \$1.35 | dcu | \$ 47.25 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 09/04/2008 | 40.00 | \$1.35 | dcu | \$ 54.00 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 09/18/2008 | 40.00 | \$1.35 | dcu | \$ 54.00 | 2006 FORD F-350 PICK UP |
| swo-010-32255 | 302 | All | 04/13/2009 | 27.00 | \$1.05 | stm | \$ 28.35 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| swo-010-32255 | 302 | All | 08/23/2010 | 56.00 | \$1.05 | JHE | \$ 58.80 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| swo-010-32255 | 302 | All | 09/08/2010 | 42.00 | \$1.05 | JHE | \$ 44.10 | 2002 3/4 Ton Utility (this has been replaced see 311166 5-2-2011) |
| swo-010-31634 | 302 | All | 09/21/2010 | 10.00 | \$1.35 | stm | \$ 13.50 | 2006 FORD F-350 PICK UP |
| swo-010-31634 | 302 | All | 09/23/2010 | 15.00 | \$1.35 | stm | \$ 20.25 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 09/28/2010 | 40.00 | \$1.35 | STM | \$ 54.00 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 10/05/2010 | 30.00 | \$1.35 | stm | \$ 40.50 | 2006 FORD F-350 PICK UP |
| swo-010-31043 | 302 | All | 10/19/2010 | 25.00 | \$0.00 | STM | \$ 0.00 | 2000 FORD F 150 PICK UP |
| swo-010-31629 | 302 | All | 10/27/2010 | 10.00 | \$1.35 | STM | \$ 13.50 | 2006 FORD F-350 PICK UP |
| swo-010-31629 | 302 | All | 11/08/2010 | 30.00 | \$1.35 | stm | \$ 40.50 | 2006 FORD F-350 PICK UP |
| swo-010-311166 | 302 | All | 07/05/2011 | 20.00 | \$1.05 | jhe | \$ 21.00 | 2011 FORD 1 TON UTILITY BED |
| swo-010-31714 | 302 | All | 07/11/2011 | 25.00 | \$1.50 | STM | \$ 37.50 | FORD F-350 UTILITY |
| swo-010-31634 | 302 | All | 07/25/2011 | 6.00 | \$1.35 | dtb | \$ 8.10 | 2006 FORD F-350 PICK UP |

| W.O. Number | Location | Reach | Date | Usage | Cost | Operator | Total Cost | Equipment |
|------------------------------|----------|-------|------------|-------|--------|----------|------------|---------------------------|
| swo-010-31634 | 302 | All | 08/02/2011 | 6.00 | \$1.35 | DTB | \$ 8.10 | 2006 FORD F-350 PICK UP |
| Work Order Total: \$1,081.59 | | | | | | | | |
| swo-023-42103 | 302 | All | 02/14/2005 | 25.00 | \$0.50 | gwh | \$ 12.50 | 2001 CHEVY 1 TON CREW CAB |

Work Order Total: \$12.50
Grand Total: \$9,543.42

SEDIMENT REMOVAL - EQUIPMENT COST

\$2,499.87

SUMMARY

SEDIMENT REMOVAL COSTS: Salary + Overhead + Equipment

| | |
|--------------------|-----------------------|
| <u>\$ 4,318.24</u> | Labor, page 7/7 |
| <u>\$ 2,499.87</u> | Equipment, page 11/11 |
| <u>\$ 6,818.</u> | total |
| <u>\$ 682.</u> | Average per year |
| per year | 2002 to 9/29/2011 |

Enclosures:

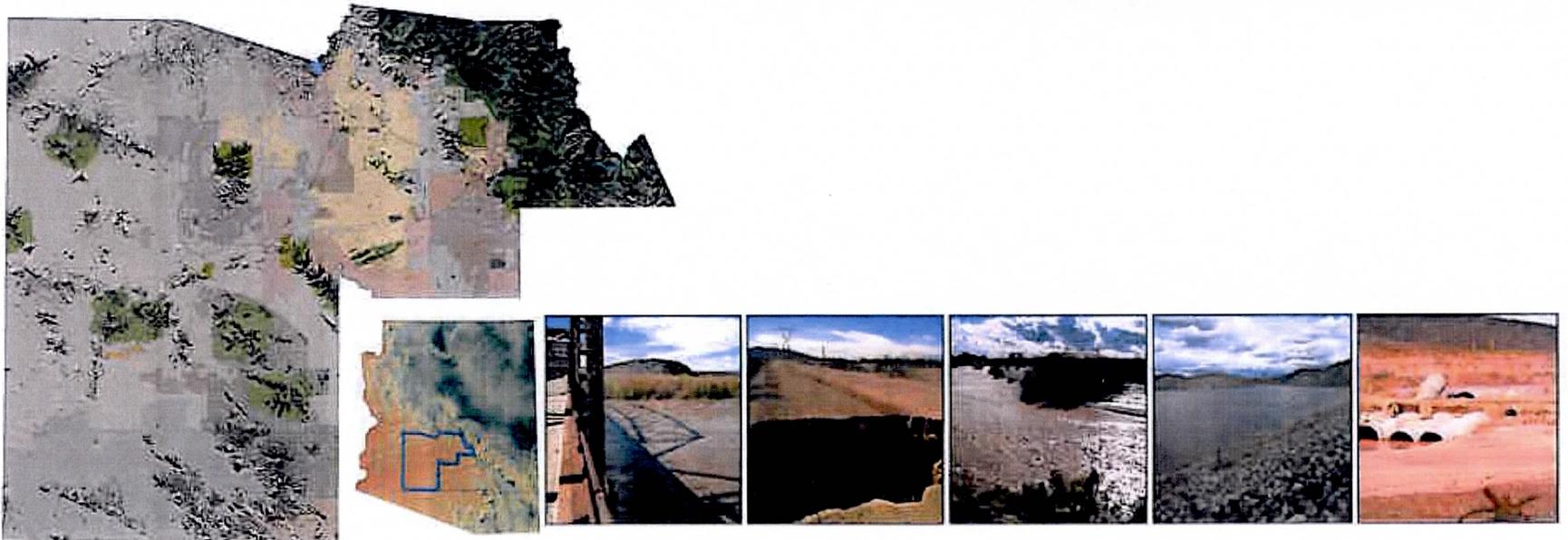
3. Pages depicting the Pass Mountain Diversion Channel from 2011 Flood Control Structures
Maintained by the Flood Control District of Maricopa County

Enclosures:



2011 Flood Control Structures

Maintained by the Flood Control District of Maricopa County



2801 West Durango Street, Phoenix, Arizona 85009, (602) 506-1501
www.fcd.maricopa.gov



EXAMPLE: MAP #116 SPOOK HILL FRs; 76TH ST BASIN



DESCRIPTION

The following map book represents a collaborative effort by the Operations & Maintenance (O&M) Division of the Flood Control District of Maricopa County (The District) and the Public Works Geographic Information Systems (GIS) Division to depict all flood control structures maintained by the District.

The Flood Control District Structures Map Book was developed for District employees to use as a reference tool. Each year, improvements are made to enhance the map book's effectiveness. This year, the new GIS software reduced the number of steps involved with the map production. Each map page is organized primarily to assist O&M staff members with ongoing field operations; however, many FCD employees outside of O&M or within the Public Works Agency departments have found the maps to be useful out in the field or in the office.

The types of flood control structures depicted in this map book include channels or levees created along the major riverbeds; underground and aboveground storm drains; dams, flood retaining structures and dikes; detention basins; and natural drainage features such as washes.

USE OF THIS DOCUMENT

District structures are listed alphabetically or are grouped together with a common feature description where multiple structures exist. In addition, many individual maps begin with the northernmost portion of the structure being depicted, moving south to follow the natural drainage pattern.

The map book begins with a general STRUCTURE INDEX map to orient the user according to the main features covered within the document. The District structures are listed alphabetically by the more common names used by District staff. Next, the TABLE OF CONTENTS provides the user with the map number (1-133) and corresponding title as it appears on each page of the map book. Finally, the DETAILED FEATURE INDEX at the end of the book represents a more comprehensive list for every occurrence of a particular structure within the entire map book.

This is the sixth edition of the Flood Control District Structures Map Book that is designed to provide staff with a photographic representation of flood control structures that is easy to use, both in the office and out in the field.

As in past years, the structures map book depicts roads maintained by the Maricopa County Department of Transportation (MCDOT) that appear in the widely-used Roadrunner map application at MCDOT. The MCDOT Streets are included as an important step in providing additional information for all Maricopa County Public Works' staff.

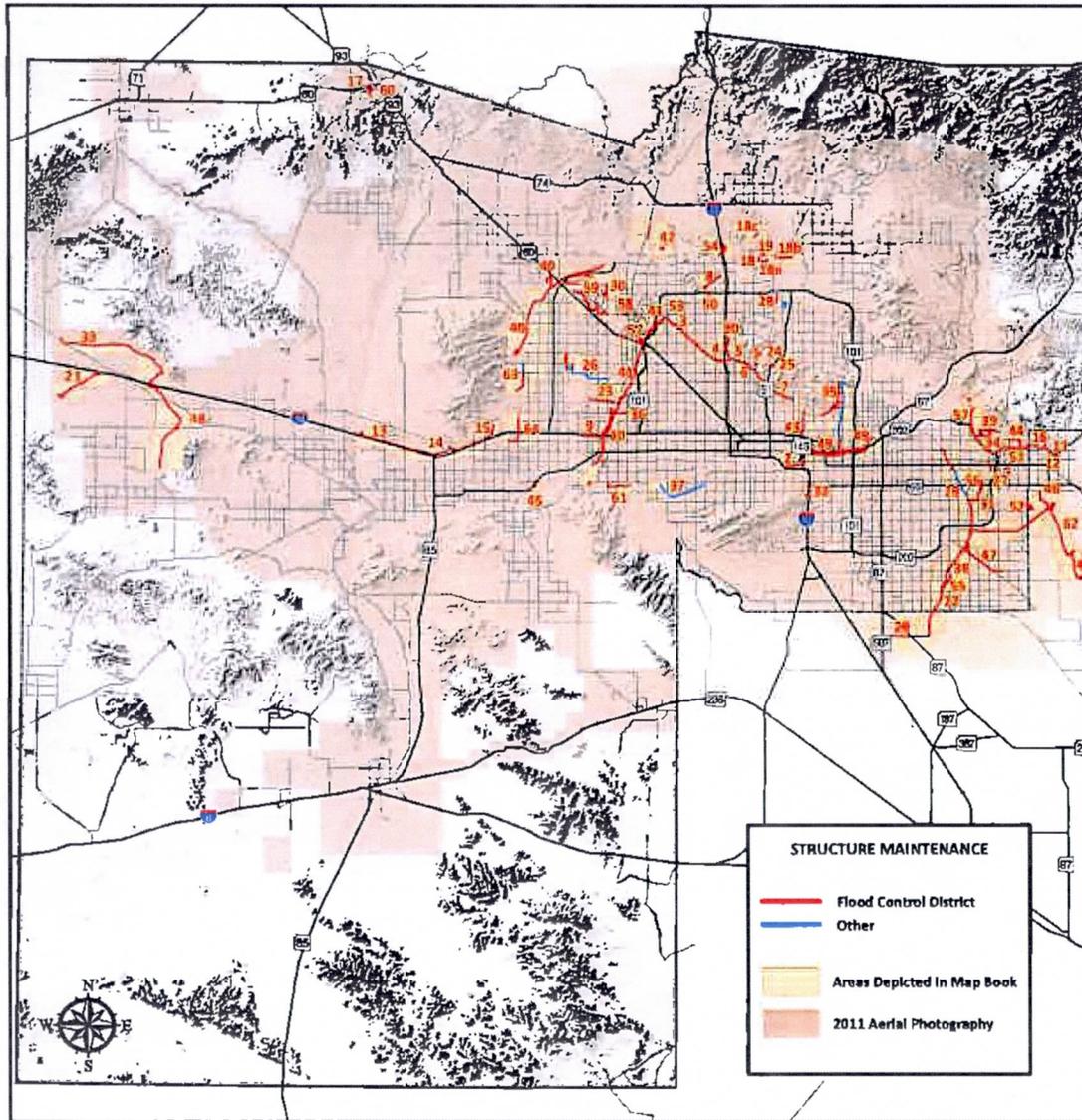
Disclaimer: The maps are intended for general reference only.

Updated: May 2011

CONTACT INFORMATION

For more information or to obtain a copy of this document, please contact:

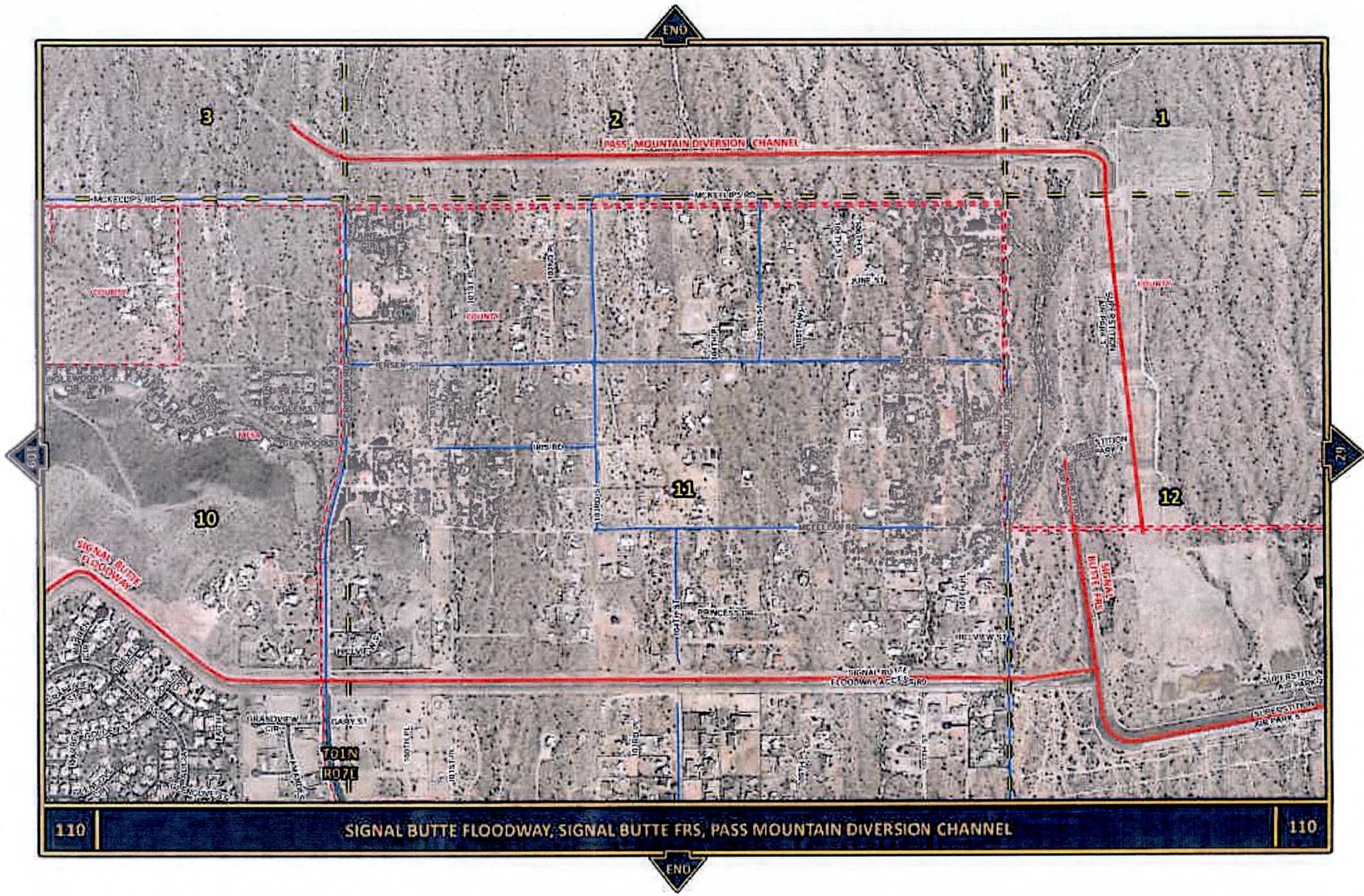
Jim Smith, (Acting) GIS Division Manager
 Public Works Department
 GIS Division
 2801 W. Durango St.
 Phoenix, AZ 85009
 (602) 506-5190



STRUCTURE INDEX 2011

- | | |
|--------------------------------------|---|
| 1. 10th St. Wash & Basins | 32. Guadalupe FRS & Drains |
| 2. 48th St. Drain | 33. Harquahala FRS |
| 3. ACDC Reach 1 | 34. Hermosa Vista & Hawes Road Improvements |
| 4. ACDC Reach 2 | 35. Indian Bend Wash |
| 5. ACDC Reach 3 | 36. Indian School Road Drain |
| 6. ACDC Reach 3 | 37. Laveen Area Conveyance Channel |
| 7. ACDC Reach 4 | 38. Lower Queen Creek Basin |
| 8. Adobe Dam | 39. McDowell Road Improvements |
| 9. ADOT Basins Reaches 16-19 | 40. McMicken Dam |
| 10. Agua Fria River Reaches 1-4 | 41. New River Channelization |
| 11. Apache Junction Floodway | 42. New River Dam |
| 12. Apache Junction FRS | 43. Old Cross Cut Canal |
| 13. Buckeye FRS #1 | 44. Pass Mountain Diversion Channel |
| 14. Buckeye FRS #2 | 45. Perryville Bank Stabilization |
| 15. Buckeye FRS #3 | 46. Powerline FRS |
| 16. Bulldog Floodway | 47. Rittenhouse FRS |
| 17. Casandro Wash Dam & Outlet | 48. Saddleback FRS |
| 18. Cave Buttes Dam | 49. Salt River Channel Levees |
| 18a. Cave Buttes Dam Dike #1 | 50. Scatter Wash Channel |
| 18b. Cave Buttes Dam Dike #2 | 51. Signal Butte FRS |
| 18c. Cave Buttes Dam Dike #3 | 52. Siphon Draw Basin |
| 19. Cave Creek Dam | 53. Skunk Creek Channelization |
| 20. Cave Creek Sediment Basin | 54. Skunk Creek I-17 Channel |
| 21. Centennial Wash Levee | 55. Sonoquul Wash Basin |
| 22. Chandler Heights Mitigation Site | 56. Sossaman Road Drain |
| 23. Colter Channel | 57. Spook Hill FRS |
| 24. Dreamy Draw Dam | 58. Sun City Drains |
| 25. Dreamy Draw Dike | 59. Sun City West Drains |
| 26. Dysart Drain | 60. Sunnycove & Sunset Dams |
| 27. East Mesa Drains | 61. Tres Rios |
| 28. East Fork Cave Creek Channel | 62. Vineyard FRS |
| 29. East Maricopa Floodway | 63. White Tanks FRS #3 |
| 30. El Mirage Drain | 64. White Tanks FRS #4 |
| 31. Guadalupe Box & Channel | |





Enclosures:

4. Sediment Yield Analysis for Pass Mountain Diversion Levee ID #291 Certification, Flood Control District of Maricopa County, November 3, 2011

Sediment Yield Analysis
For Pass Mountain Diversion Levee ID #291 Certification



Shimin Li, PhD, PE, Senior Civil Engineer
Bing Zhao, PhD, PE, Branch Manager
Engineering Application Development and River Mechanics Branch
Engineering Division
Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85009

November 3, 2011

Table of Contents

| | |
|---------------------|----|
| Purpose..... | 3 |
| Background..... | 3 |
| Hydrology..... | 5 |
| Sediment Yield..... | 13 |
| References..... | 14 |



Purpose

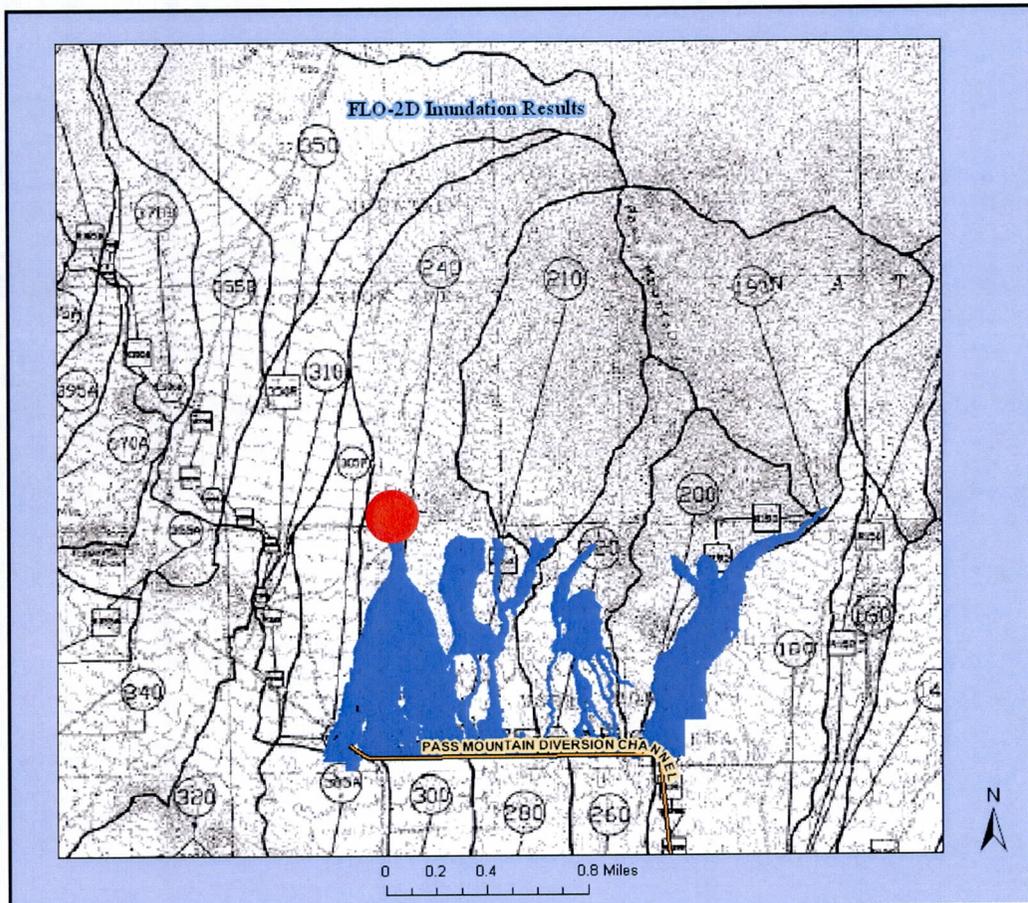
The purpose of this report is to address one of FEMA's review comments provided in the October 3, 2011 letter to Mr. Frank Brown of Flood Control District of Maricopa County (FCDMC) from Mr. Robert J. Bezek, Regional Engineer, Mitigation Division, FEMA regarding a report titled "Levee Certification Report – Pass Mountain Diversion Levee ID #291 – Maricopa County, Arizona" prepared by AMEC in June 2011. The FEMA's comment is as follows:

“Although the report explains that sediment is not an issue and the maintenance records do not show any major erosion or sedimentation problems, please address the concern that these areas may be active alluvial fans that could produce sediment that might impact the structure during the flood event. As long as the sediment is not so significant that it would impact the safety of the structure during the flood event, then it could be handled under the O&M plan, as part of their normal post-flood event maintenance.”

Background

AMEC's FLO-2D results display a distributary flow area (Figure 1). To address FEMA's concern for sediment, FCDMC performed a sediment yield analysis near the split flow location on the distributary flow area (see the red dot in Figure 1). This location is about 1 mile upstream of Pass Mountain Diversion Levee. To accomplish the sediment yield analysis, a hydrologic study is performed by using DDMSW 4.6.0 to estimate the peak discharges and volumes for the required storm events for sediment yield analysis since there is no hydrologic concentration point near this location in the original hydrologic study from the Spook Hill ADMP Update (Wood Patel, 2002). Sediment yield analysis is performed by using DDMSW 4.6.0.

Figure1. FLO-2D Inundation Area for Pass Mountain Division Levee ID #291



Hydrology

Figure 2 shows a portion of Spook Hill ADMP drainage map, which drains to Pass Mountain Diversion Levee (Wood Patel, 2002). DDMSW 4.6.0 software is used to prepare the HEC-1 input file and generate the peak flows and runoff volumes for a number of return periods. DDMSW is FCDMC's standard software for hydrologic modeling for floodplain delineation and river mechanics analysis for engineering design. The software can directly use land use, soil, and drainage basin GIS shape files. Figure 3 shows the drainage basin identified as 240a in this sediment yield analysis for the drainage outlet at the top of the distributary flow area.

Rainfall calculation for the drainage area 240a is based on NOAA 2 Rainfall Contours (1973) to be consistent with Spook Hill ADMP Update (Wood Patel, 2002). The four rainfall points for DDMSW Prefre model input are shown in Figure 4. Calculation of rainfall losses is based on the Green-Ampt method which requires land use data and soil data. Land use data are based on MAG 2000 land use data and are shown in Figure 5. Soil data are based on NRCS SSURGO soil data shown in Figure 6. However, soil data is not available for a small area. To create a soil type map for the drainage area 240a, the available soil type areas are extended and the resulting soil type map for the drainage area 240a is shown in Figure 7. Table 1 lists the hydrologic parameters for land uses of the drainage area 240a. Table 2 lists the hydrologic parameters for soils in the drainage area 240a. Clark unit hydrograph is used to produce the storm hydrographs of different return intervals. The length for time of concentration (Figure 8) is determined by using distance measuring tool provided in ArcGIS 10.0. The peak flows and runoff volumes for 24-hour storms of 2-yr, 5-yr, 10-yr, 25-yr, 50-yr and 100-yr return intervals are shown in Table 3. These results will be used for sediment yield analysis.

Table 1. Hydrological Parameters for Each Land Use Type

| Land use | Code | Area (mi ²) | Area % | IA (in) | RTIMP (%) | Vegetation Cover (%) | DTHET A | Kb |
|--------------------|------|-------------------------|--------|---------|-----------|----------------------|---------|-------|
| Active Open Space | 710 | 0.5368 | 79.2 | 0.35 | 5 | 90 | Normal | 0.024 |
| Passive Open Space | 730 | 0.1406 | 20.8 | 0.35 | 0 | 90 | Normal | 0.084 |

Table 2. Hydrological Parameters for Each Soil Type

| Soil ID | Area (mi ²) | Area in Percent | XKSAT (in/hr) | Rock % |
|---------|-------------------------|-----------------|---------------|--------|
| 64547 | 0.0036 | 0.5 | 0.11 | 0.00 |
| 64548 | 0.2834 | 41.8 | 0.06 | 0.00 |
| 64563 | 0.0382 | 5.6 | 0.14 | 25 |
| 64568 | 0.298 | 44.0 | 0.63 | 0.00 |
| 64598 | 0.0543 | 8 | 0.37 | 0.00 |

Table 3. Storm Flood Discharges and Volumes Calculated by HEC-1

| | Return Interval (year) | | | | | |
|--------------------|------------------------|-------|-------|-------|-------|-------|
| | 2 | 5 | 10 | 25 | 50 | 100 |
| Discharge (CFS) | 29 | 158 | 258 | 411 | 542 | 702 |
| Volume (Acre-Feet) | 3.63 | 11.69 | 17.10 | 24.16 | 30.88 | 37.66 |

Figure 2. Drainage Map for Pass Mountain Diversion Levee

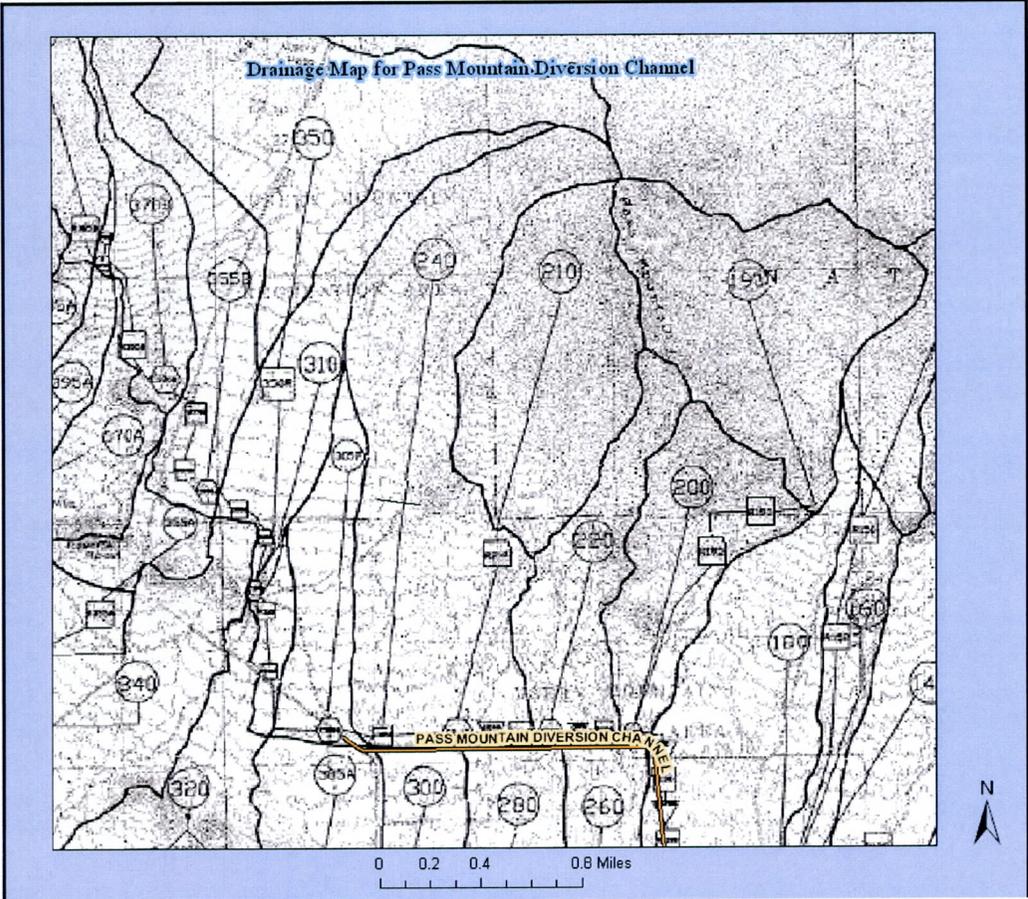


Figure 3. Drainage Area 240a for Sediment Yield Analysis (inside red line)

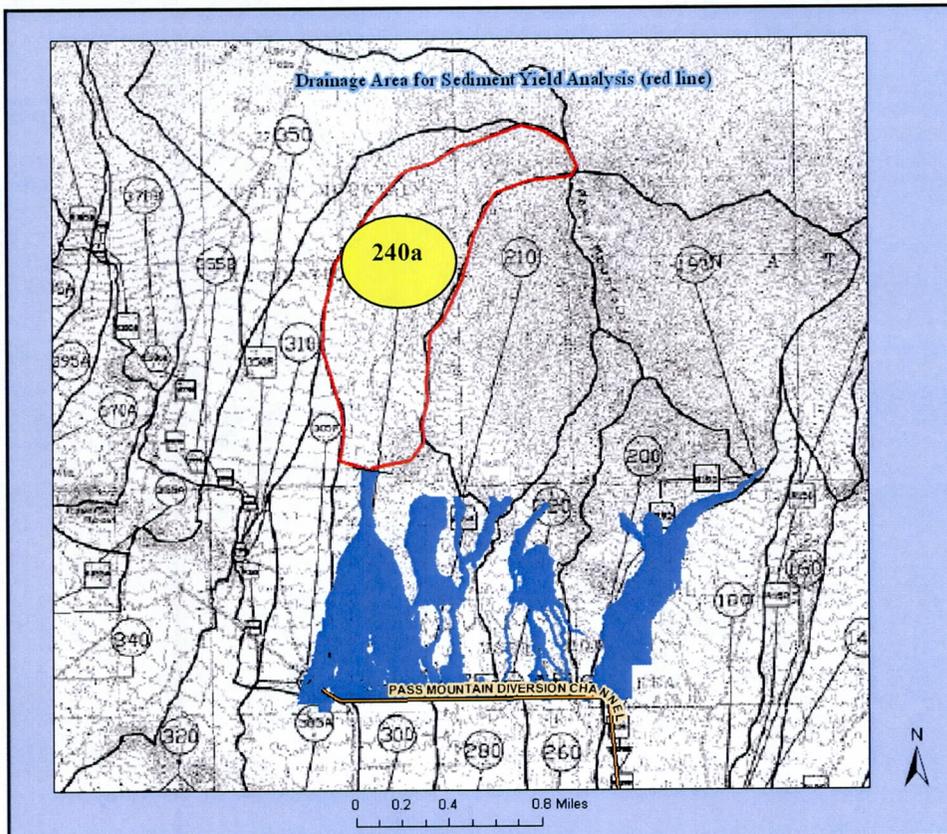


Figure 4. NOAA 2 Rainfall Points

The screenshot shows a software window titled "Flood Control District of Maricopa County - 240AHYDROLOGY" with a menu bar (File, Edit, Hydrology, Hydraulics, River Mechanics, Maps, Tools, Admin, Submittals, Window, Help) and a toolbar. The main window is titled "NOAA 2 Rainfall Data" and has two tabs: "List" and "Details". The "Details" tab is active and displays the following information:

Non Adjusted Point Rainfall (in)

| | 2-Year | 100-Year |
|---------|------------------------|--------------------------|
| 6-Hour | 1.18 | 3.15 |
| 24-Hour | 1.54 | 3.81 |

Below the table is a "Map" button.

Rainfall ID

Rainfall ID:

At the bottom of the window, there is a toolbar with buttons for "Rain ID", "Info", "Print...", "Graph", "Update", and "OK". The status bar at the very bottom shows "Projectpaths: (S:\Projectpaths)", "Record: EOF/47", "Record Unlocked", and "NUM".

Figure 5. Land Use Map

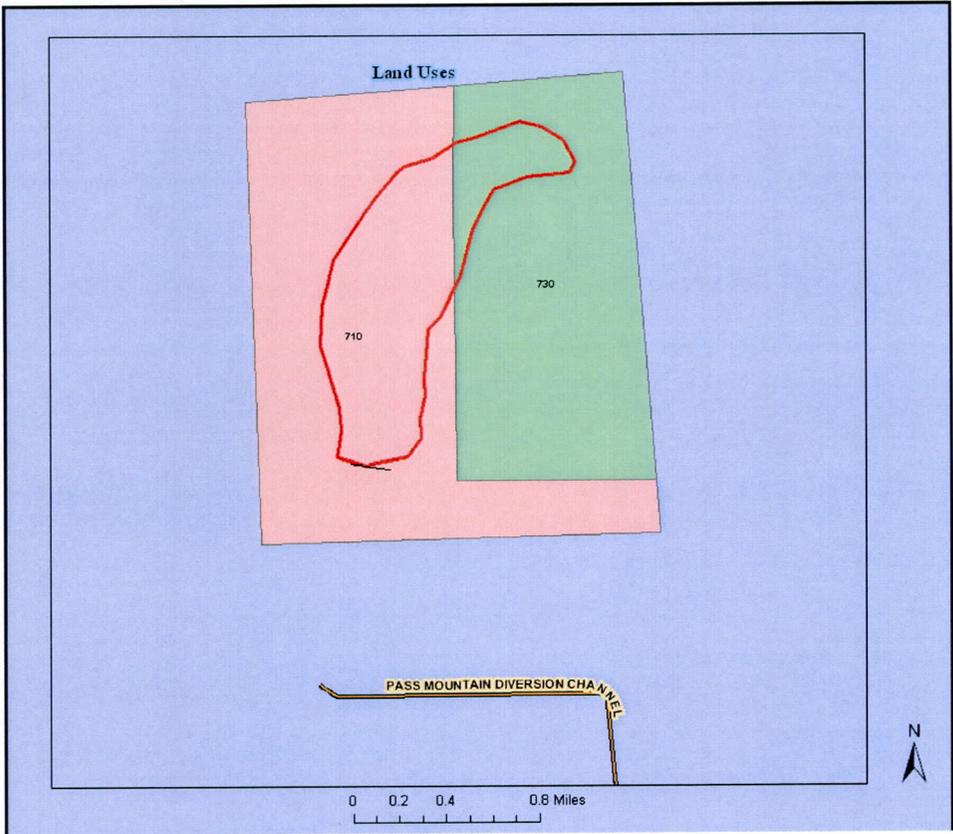


Figure 6. Available Soil Map

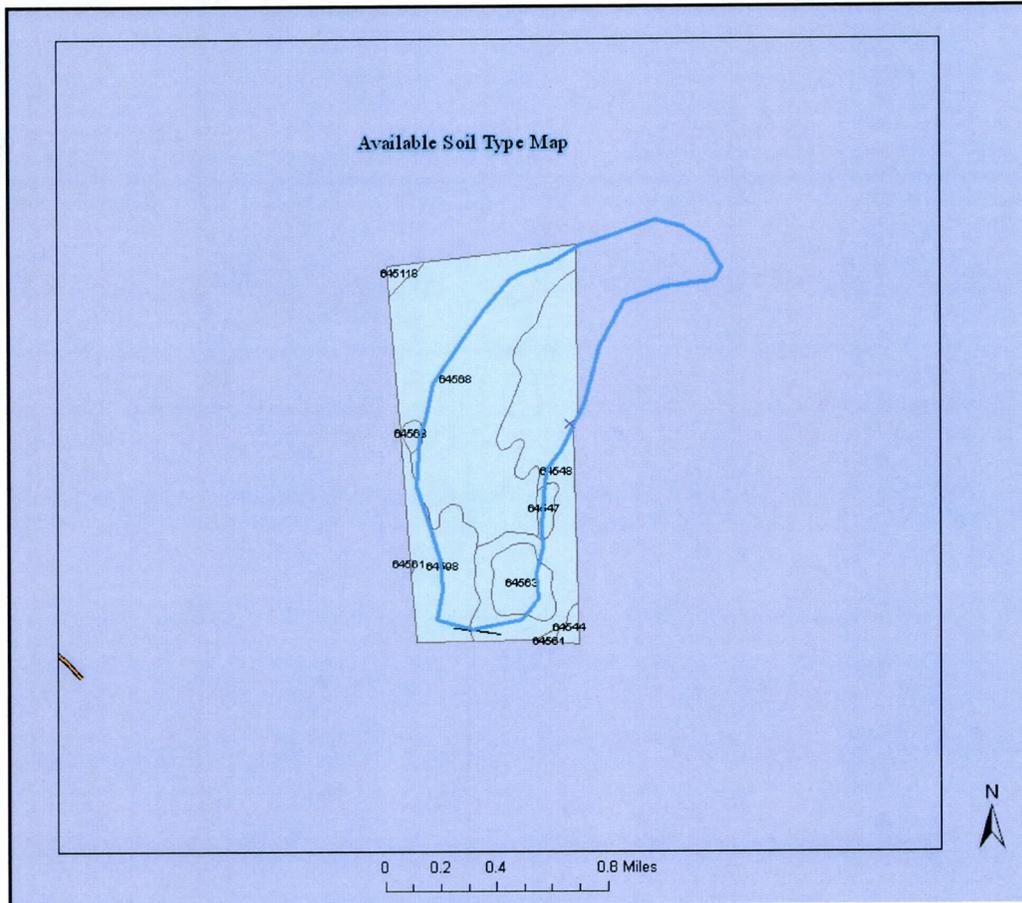


Figure 7. Extended Soil Type Map

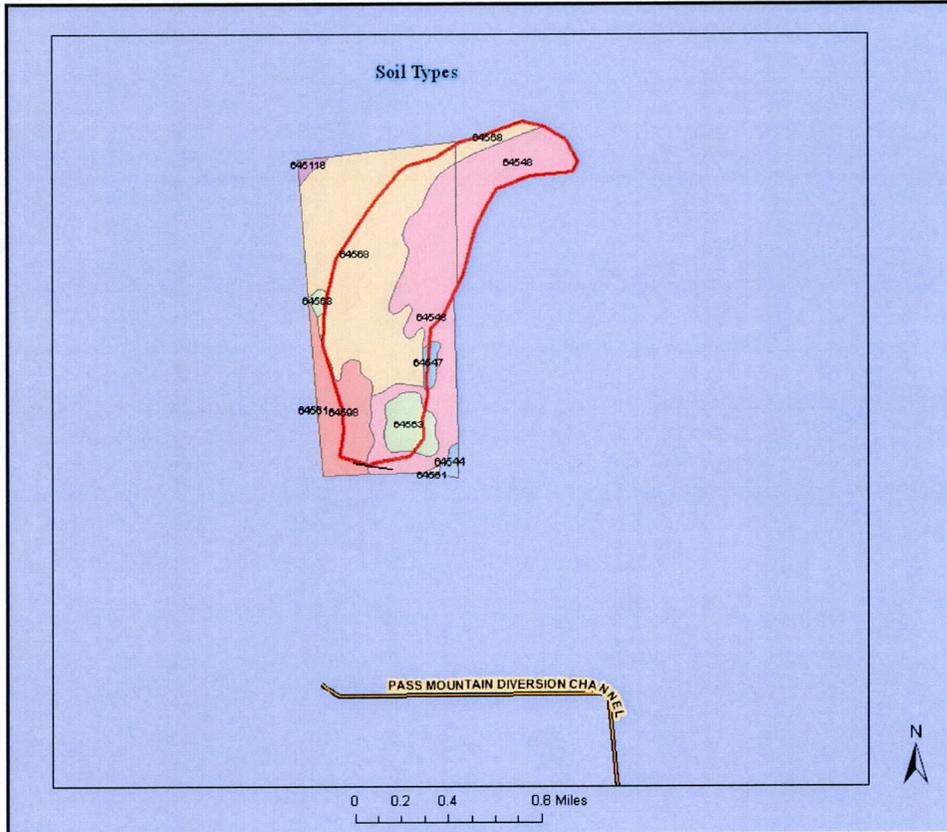
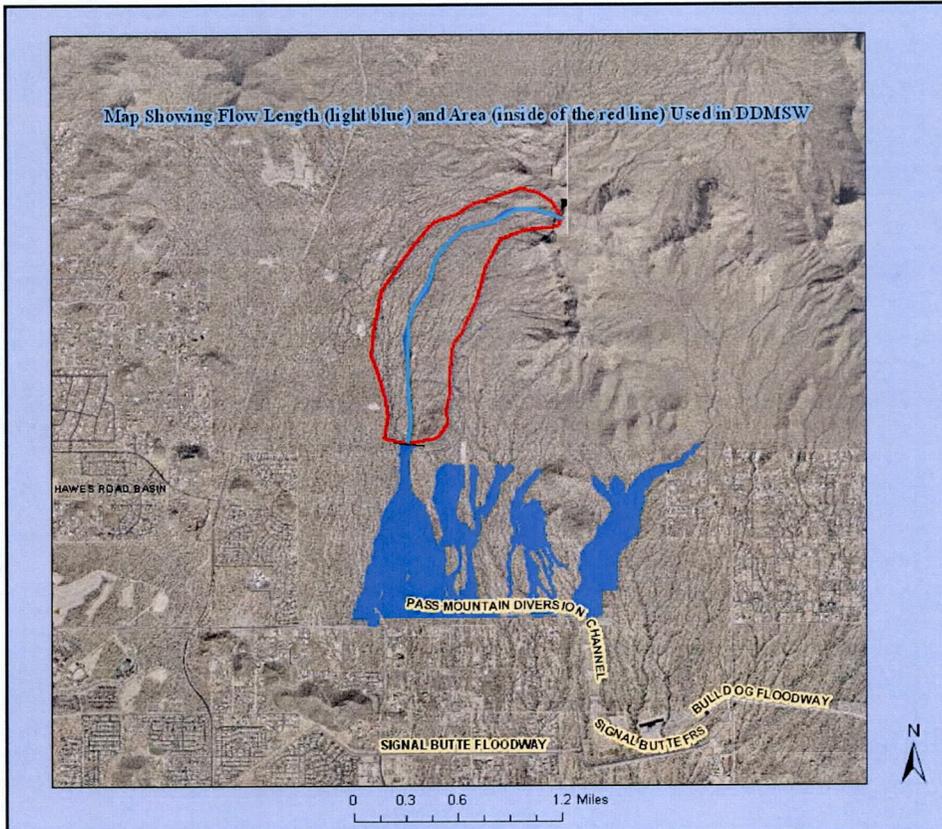


Figure 8. Time of Concentration Flow Length



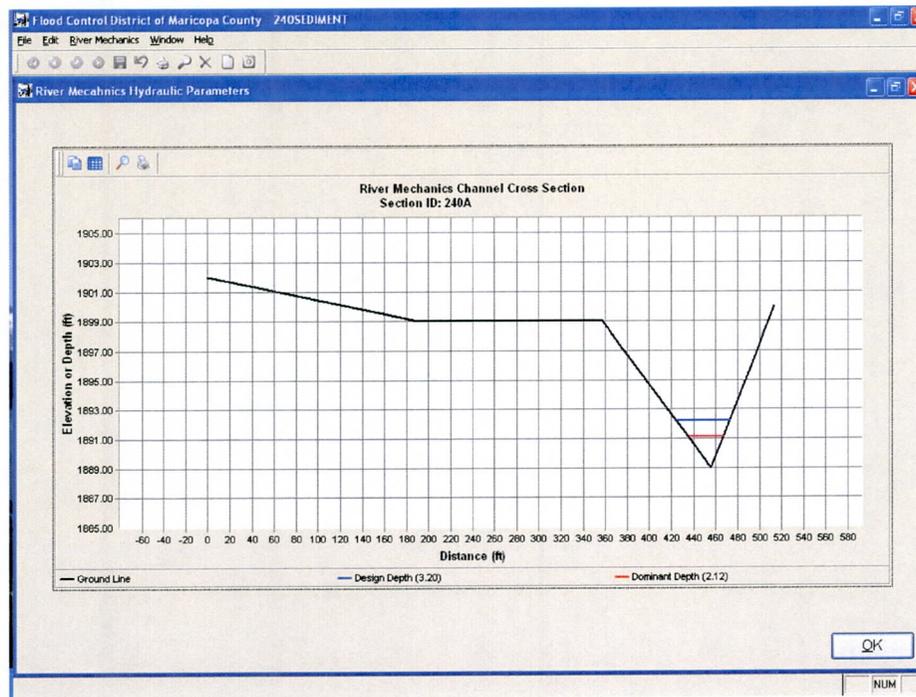
Sediment Yield

DDMSW 4.6.0 is used to calculate the sediment yield which includes wash load and total bed material load (FCDMC, 2010). The peak flows and runoff volumes from the hydrologic study are used. DDMSW 4.6.0 uses Modified Universal Soil Loss Equation (MUSLE) (SLA, 1985) to calculate the wash load and Zeller-Fullerton equation (Zeller and Fullerton, 1983) to calculate the total bed material load.

For the wash load calculation, the two topographic factors, slope length and slope are determined based on a Maricopa County-wide 10' contour map and aerial photos. They are determined via measuring the length of the line between the most distant boundary line of the drainage area 240a and a well-defined channel and taking the elevation difference between the two locations from the contour map.

For the total bed material load calculation, the wash cross section is selected right at the top of the distributary flow area. The cross section is obtained using ArcGIS 3D analysis tool and is based on a Maricopa County-wide 10' contour map shape file. The cross section is shown in Figure 9. The wash channel slope is determined via measuring distance between two contour lines selected near the top of the distributary flow area and via calculating the elevation difference of the two selected contour lines. Sediment size gradation input data, required for the bed material load calculation, are derived based on NRCS soil survey report issued April 1986 and titled "Soil Survey Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona." According to this report (page 275), the top 1 to 43" of type 48 soil has 20-30% of its particles passing #200 sieve and 45-55%

Figure 9. Wash Cross Section for Bed Material Load Calculation



passing #4 sieve. Based on these soil gradation values, D50 of 4.76 mm and D16 of 0.074 mm are assumed. D84 is calculated as 1.3 times D50 assuming the soil is well graded (FCDMC, 2010).

The hydraulic parameters used for sediment yield calculation are shown in the Figure 10.

The calculated sediment yields for storms of selected return intervals are shown in Figure 11. The annual sediment supply to the distributary flow area is 0.138 ac-ft. The 100-year flood sediment supply to the area is 1.028 ac-ft.

As can be seen, the sediment amount is not significant and therefore can be easily handled through O&M plan as part of normal post-flood event maintenance. It should be mentioned that the sediment yield results are for the location about 1 mile north of the levee. The actual sediment that may reach the levee may be much less since the distributary flow area is a depositional area. However, the FCDMC will conservatively assume that this insignificant amount of sediment will reach the levee and the sediment will be handled through post-flood event maintenance as part of FCDMC's O&M plan.

References

Bezek, R.J., 10-3-2011, Letter to Frank Brown, P.E., CFM, MCFCD

AMEC, June 14, 2011, Levee Certification Report, Pass Mountain Diversion Levee ID #291, Maricopa County, Arizona.

Flood Control District of Maricopa County, June 2010, Drainage Design Manual for Maricopa County, Arizona: Hydraulics.

Flood Control District of Maricopa County, April 2010, River Mechanics Manual for DDMSW.

Simons, Li & Assoc. (SLA), 1985. Design Manual for Engineering Analysis of Fluvial Systems, prepared for Arizona Department of Water Resources, Phoenix, AZ.

WOOD/Patel, September 2002, Spook Hill Area Drainage Master Plan Update, Appendix A Volume 1, HEC-1 Modeling Input Data & Output Files Level III.

US Department of Agriculture Soil Conservation Services, April 1986, Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona.

Figure 10. Hydraulic Parameters for Sediment Claculation

The screenshot shows the 'River Mechanics - Cross Section Hydraulics' window. On the left, a list of 'Cross Section ID' entries includes '240A'. The main area displays 'Hydraulic Parameters' for 'Cross Section ID: 240A'. The 'Data Source' is set to 'Calculate Data'. The parameters are organized into two sections: 'Entire Cross Section' and 'Main Channel (Bedform Scour)'. Each section has a table with 'Design' and 'Dominant' values. The 'Entire Cross Section' table includes parameters like Flow Rate, Slope, Manning's n, Wetted Perimeter, Hydraulic Depth, Wetted Area, Normal or Max Depth, and Velocity. The 'Main Channel (Bedform Scour)' table includes Hydraulic Depth, Velocity, and Froude Number. At the bottom, there are buttons for 'Import HEC-RAS', 'Info', 'Print...', 'Delete', 'Add', 'Graph', 'Update', and 'OK'. A 'NUM' indicator is visible in the bottom right corner.

| Entire Cross Section | | |
|--------------------------|----------|----------|
| | Design | Dominant |
| Flow Rate (cfs) | 702 | 236 |
| Slope (ft/ft) | 0.025000 | 0.025000 |
| Manning's n | 0.035 | 0.035 |
| Wetted Perimeter (ft) | 48.73 | 32.28 |
| Hydraulic Depth (ft) | 1.60 | 1.06 |
| Wetted Area (sq ft) | 77.22 | 33.89 |
| Normal or Max Depth (ft) | 3.20 | 2.12 |
| Velocity (ft/sec) | 9.09 | 6.96 |

| Main Channel (Bedform Scour) | | |
|------------------------------|--------|----------|
| | Design | Dominant |
| Hydraulic Depth (ft) | 1.60 | 1.06 |
| Velocity (ft/sec) | 9.09 | 6.96 |
| Froude Number | 1.27 | 1.19 |

Figure 11. Calculated Sediment Yield

Flood Control District of Maricopa County 240SEDIMENT

File Edit River Mechanics Window Help

River Mechanics - Sediment - MB: 01

List **Total** Wash Load Bed Load

ID
 Major Basin ID 01
 ID 1A

Calculate
 Wash Load
 Bed Load
 Return Periods for Analysis All

Sediment Yield Parameters

| Include | Q (cfs) | Volume (ac-ft) |
|--|---------|----------------|
| 2 Year <input checked="" type="checkbox"/> | 29 | 3.60 |
| 5 Year <input checked="" type="checkbox"/> | 158 | 11.70 |
| 10 Year <input checked="" type="checkbox"/> | 258 | 17.10 |
| 25 Year <input checked="" type="checkbox"/> | 411 | 24.20 |
| 50 Year <input checked="" type="checkbox"/> | 542 | 30.90 |
| 100 Year <input checked="" type="checkbox"/> | 702 | 37.70 |
| Design <input checked="" type="checkbox"/> | 702 | 37.70 |
| Annual <input checked="" type="checkbox"/> | | |

Sediment Yield (ac-ft)

| | Wash Load | Bed Load | Total Yield |
|----------|-----------|----------|-------------|
| 2 Year | 0.024 | 0.017 | 0.041 |
| 5 Year | 0.121 | 0.091 | 0.212 |
| 10 Year | 0.197 | 0.162 | 0.359 |
| 25 Year | 0.311 | 0.268 | 0.579 |
| 50 Year | 0.416 | 0.373 | 0.789 |
| 100 Year | 0.538 | 0.490 | 1.028 |
| Design | 0.538 | 0.490 | 1.028 |
| Annual | 0.076 | 0.062 | 0.138 |

Help Info Print... Delete Add MB Update OK

Projectpaths (S:\Projectpaths) Record: 47/47 Record Unlocked NUM

End Enclosures



FEMA

| | |
|---------------------------------|---------|
| FLOOD CONTROL DISTRICT RECEIVED | |
| OCT - 6 '11 | |
| CH & GM | FINANCE |
| PIO | R.E.D. |
| ADMIN | O & M |
| FMS | P & PM |
| ENG | FILE |
| CONTRACTS | |
| ROUTING | |

October 3, 2011

Frank Brown, P.E., CFM
Senior Civil Engineer
Flood Control District Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear Mr. Brown:

This letter is in reference to your submittal of a report prepared by AMEC Earth & Environmental, Inc., "Levee Certification Report - Pass Mountain Diversion Levee ID #291 - Maricopa County, Arizona" in June 2011. The AMEC study was submitted to demonstrate that the Provisionally Accredited Pass Mountain Diversion Levee (ID 291) meets the levee certification requirements outlined in the Code of Federal Regulation, Title 44, Section 65.10 (44 CFR 65.10).

We have completed our review of the submitted data in the enclosed document titled "Maricopa, AZ - Levee Certification Review Comments for Pass Mountain Diversion Levee ID 291". Prior to receiving approval for the levee certification study, all items listed in the review comments must be adequately addressed.

If you would like to discuss the review comments and available courses of action, please contact me, either by telephone at (510) 627-7274, or by email at robert.bezek@dhs.gov. We look forward to continuing the dialogue with your community to address this important matter.

Sincerely,

Robert J. Bezek, CFM
Regional Engineer
Mitigation Division

Enclosure: Maricopa, AZ - Levee Certification Review Comments for Pass Mountain Diversion Levee ID 291

Copies Furnished:
Brian Cosson, AZ DWR, NFIP Coordinator
Christopher J. Brady, City Manager, City of Mesa
Elizabeth Huning, City Engineer, City of Mesa
Robert L. Davies, AMEC Earth & Environmental, Inc.

memo

3/4

C. Tier 3 Review

- | | | |
|--|---|-----------------------------|
| Item 6: Levee System and Cross Reference Check | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| Item 7: Interior Drainage Analysis | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| Item 8: Structural Design Requirements | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 1) Closure Structure Data | | |
| 2) Embankment Protection | | |
| 3) Embankment and Foundation Stability | | |
| 4) Settlement | | |
| 5) All Other, as Applicable | | |

| | | |
|----------------------------|---|-----------------------------|
| Item 9: Inspection Reports | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
|----------------------------|---|-----------------------------|

D. Mapping the Levee

| | | |
|-----------------------------------|---|-----------------------------|
| Item 10: Final Completeness Check | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
|-----------------------------------|---|-----------------------------|

SPECIFIC COMMENTS ARE REFERENCED TO THE CHECKLIST ITEMS:

Specific comments related to the checklist items shown above are described in detail below:

1. Checklist Item No. A.2 (Freeboard Check) – Note, that Appendix B, the freeboard analysis was initially computed with HEC_RAS one dimensional, steady state model. The preliminary analysis results contained on Page B-1 of Appendix B indicates that the required freeboard is not met as several locations, near and upstream of the drop structures along the Diversion Channel. A revised analysis was completed using an unsteady flow, two dimensional model (FLO-2D). The results of this analysis (see Table C-1 of the reference report) show that the minimum freeboard is met at all locations except the first 3 section near the upstream end of the levee (Cross Sections 1-3). Note: The results for this analysis would have been similar if HEC-RAS one dimension unsteady flow had been used, due to the impact of the storage component in the analysis. Therefore, the 2D analysis is deemed acceptable for these freeboard computations. Also, although FLO-2D Version 2009.06 has not officially been accepted by FEMA, the results of the freeboard analysis would be the same either using the currently approved version of FLO-2D. See Comment 2 below for specific comments related to the three upstream sections and their freeboard.

4/4 memo

2. Checklist Item No. A.2 (Freeboard Check) – The referenced report explains that near the upstream reach of the Pass Mountain Diversion just upstream of Cross Section 1, runoff will flow around the end of the levee, which was originally considered to be the end of the levee; but upon further review the end of the levee was determined to be at Cross Section 4, where the levee freeboard exceeds the minimum requirement. As noted in the report, the flow depths and velocities in this area (upstream of the beginning of the diversion channel) are low and would not impact the stability of the levee embankment due to erosion or scour. Any flow escaping around the upstream of the levee would continue downslope as shallow overland flow, which is the recommended floodplain delineation in this area. Therefore, although the upstream end of the levee is not likely subject to significant flood depth or flow velocities, it is recommended that a special note be added to the Operation and Maintenance (O&M) Plan to make sure to monitor this location during any extreme flooding events. If any erosion impacts the embankment in this area or significant flood flows bypass (flow around the upper end of the levee) then appropriate actions should be implemented in accordance with the O&M Plan requirements.

Specifically, the O&M Plan should be revised to address the following issues:

- Need to acknowledge that the levee does not tie-in to high ground at the western (upstream) terminus, and
- That the District will monitor this area for during any significant events for erosion to the levee or any other condition which would endanger the integrity of the remaining levee, and
- Take any appropriate actions related to protection of this levee reach, and
- Provide any SFHAs that would result from flood flows passing around the diversion structure to the west.

Although the report explains that sediment is not an issue and the maintenance records do not show any major erosion or sedimentation problems, please address the concern that these areas may be active alluvial fans that could produce sediment that might impact the structure during the flood event. As long as the sediment is not so significant that it would impact the safety of the structure during the flood event, then it could be handled under the O&M plan, as part of their normal post-flood event maintenance.

We would be happy to discuss our review in further detail with you if you are interested. If you have any questions or comments regarding this memo, please contact me at slhoughland@mbakercorp.com. Please respond to the issues detailed above within 30 days of the date of this memo.



Flood Control District of Maricopa County

Board of Directors
Fulton Brock, District 1
Don Stapely, District 2
Andrew Kunasek, District 3
Max Wilson, District 4
Mary Rose Wilcox, District 5

www.fcd.maricopa.gov

2801 West Durango Street
Phoenix, Arizona 85009
Phone: 602-506-1501
Fax: 602-506-4601
TT: 602-505-5897

June 16, 2011

Ed Curtis, P.E., CFM
Senior Civil Engineer
Risk Analysis Branch, FEMA Region IX
U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

**Subject: Levee Certification Package for Pass Mountain Diversion Levee, PAL ID#291,
Levee Certification Report, June 2011**

Dear Mr. Curtis:

This letter is in response to the Provisionally Accredited Levee (PAL) agreement (attached) which Maricopa County and the City of Mesa entered into with the Federal Emergency Management Agency in June 2009 for the Pass Mountain Levee. The submittal package is being sent to you under separate cover and is the Levee Certification Report for Pass Mountain Diversion Levee, dated June 2011.

We ask that FEMA agree with Maricopa County that the Pass Mountain Diversion Levee is adequate per 44CFR §65.10 to provide protection from flooding during from the 1 percent annual chance flood, and ask that this levee be moved from Provisionally Accredited to Accredited status on the FIRM Panels.

If you have further questions concerning this submittal, please call me at 602-506-4617.

Sincerely,

A handwritten signature in cursive script that reads "Frank Edward Brown".

Frank Edward Brown, P.E., CFM
Senior Civil Engineer, Mitigation Planning & Technical Programs Branch,
Floodplain Management and Services Division

Cc: Sarah Houghland, Michael Baker Corporation (1 CD/DVD disk and 1 O&M disk)
Brian Cosson, AZ DWR, NFIP Coordinator
Christopher J. Brady, City Manager, City of Mesa
Elizabeth Huning, City Engineer, City of Mesa
Robert L. Davies, AMEC Earth & Environmental, Inc.

**Levee Certification Report
Pass Mountain Diversion Levee ID # 291
Maricopa County, Arizona**

Prepared for:

**Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85009**

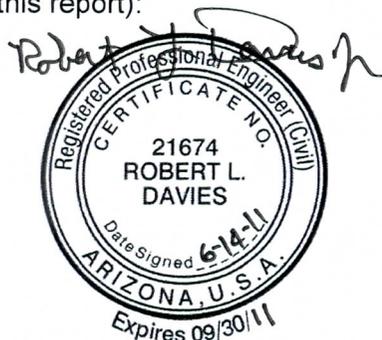
Prepared by:



**AMEC Earth & Environmental, Inc.
1405 West Auto Drive
Tempe, AZ 85284**

**AMEC Job Number 09-115-05010
June 14, 2011**

For Title 44 CFR 65.10 Criteria
Certification excluding Geotechnical
(see Section 9, this report):



For Title 44 CFR 65.10
Geotechnical Certification
(see Section 9, this report):

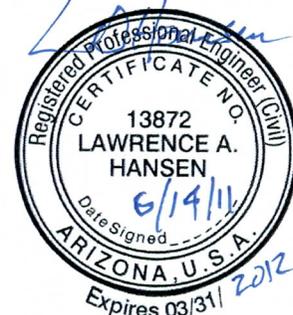


TABLE OF CONTENTS

| | Page |
|---|-------------|
| 1.0 OVERVIEW..... | 1 |
| 2.0 FIELD RECONNAISSANCE..... | 2 |
| 3.0 DATA COLLECTION..... | 2 |
| 4.0 EFFECTIVE HYDROLOGY..... | 3 |
| 5.0 FREEBOARD ANALYSIS..... | 3 |
| 6.0 FLO-2D MODEL..... | 4 |
| 7.0 ENGINEERING ASSESSMENTS..... | 4 |
| 7.1 TYPICAL LEVEE EMBANKMENT SECTIONS..... | 4 |
| 7.2 LEVEE EMBANKMENT SEEPAGE ANALYSIS..... | 4 |
| 7.3 TYPICAL EXISTING LEVEE EMBANKMENT STABILITY ANALYSIS..... | 5 |
| 7.4 SETTLEMENT ANALYSIS..... | 6 |
| 7.5 FEMA LEVEE CERTIFICATION..... | 7 |
| 8.0 CONCLUSIONS (PRIOR TO DETAILED FLO-2D ANALYSIS)..... | 7 |
| 9.0 TITLE 44 CFR 65.10 COMPLIANCE EVALUATION PASS MOUNTAIN DIVERSION..... | 7 |
| 10.0 CONCLUSIONS (POST-DETAILED FLO-2D ANALYSIS)..... | 8 |
| 11.0 REFERENCES..... | 9 |

LIST OF MAIN BODY REPORT FIGURES

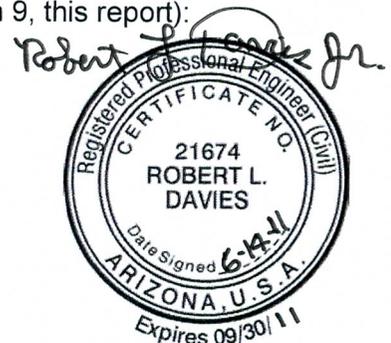
- Figure 1 Location Map
- Figure 2 Flood Insurance Rate Map
- Figure 3 Non-Levee Condition Floodplain

For Title 44 CFR 65.10 Criteria Certification excluding Geotechnical (see Section 9, this report):

LIST OF APPENDICES

- Appendix A MT2 Forms
- Appendix B Preliminary Freeboard Analysis (HEC-RAS)
- Appendix C FLO-2D Freeboard Analysis
- Appendix D Geotechnical Analysis
- Appendix E Email Correspondence and Meeting Minutes
- Appendix F Operations and Maintenance Plan
- Appendix G Technical Memorandums (Field Reconnaissance and Hydrology)
- Appendix H NOAA 14 Rainfall Data
- Appendix I Earthwork Calculations
- Appendix J As-Built Plans
- Appendix K Survey Report
- Appendix L Site Visit Photo Log

For Title 44 CFR 65.10 Geotechnical Certification (see Section 9, this report):



1.0 OVERVIEW

The Pass Mountain Diversion Levee is owned by Maricopa County and operated by the Flood Control District of Maricopa County (FCDMC). It is located in Township 1 North, Range 7 East, Sections 1 and 2, in the Gila and Salt River Baseline and Meridian, within the Utery Mountain Regional Park east of the intersection of McKellips Road and Crismon Road in Mesa, Arizona (see Figure 1). AMEC has performed a levee evaluation of the Pass Mountain Diversion Levee, which outlets to the Signal Butte Flood Retarding Structure (FRS). As part of FEMA's Provisionally Accredited Levee mandate, AMEC evaluated the certifiable status of this structure. The effective Flood Insurance Rate Map (Figure 2) credits the levee as providing flood protection and designates the floodplain as a 100-year Zone A floodplain in a special flood hazard area. A Non-Levee Condition Floodplain was also delineated previously per FEMA Procedure Memorandum No. 63 (Figure 3). Figure 3 depicts the floodplain extent if the levee were not constructed.

This structure was designed and constructed by the Natural Resources Conservation Service (NRCS) in the early 1980s. The levee being evaluated is 6,800 feet long with a height that ranges between 8 and 21 feet and averages 12 feet. The levee begins at the west end with a 10:1 slope from natural ground to the levee top and ends with the turn at the southward bend where the Signal Butte FRS channel begins (see Appendix J).

The evaluation criteria follow the National Flood Insurance Program levee requirements established in Title 44, Code of Federal Regulations Part 65.10 (44 CFR 65.10). AMEC followed a three-step evaluation process: a) evaluate existing data to determine if it is sufficient to certify the structure if required; b) perform some hydrology, hydraulic and geotechnical analysis to certify the structure; and c) propose mitigation measures to meet certification requirements if required. The HEC-RAS and FLO-2D hydraulic models were used to perform the hydraulic analysis. This report is being submitted in support of the levee certification process.

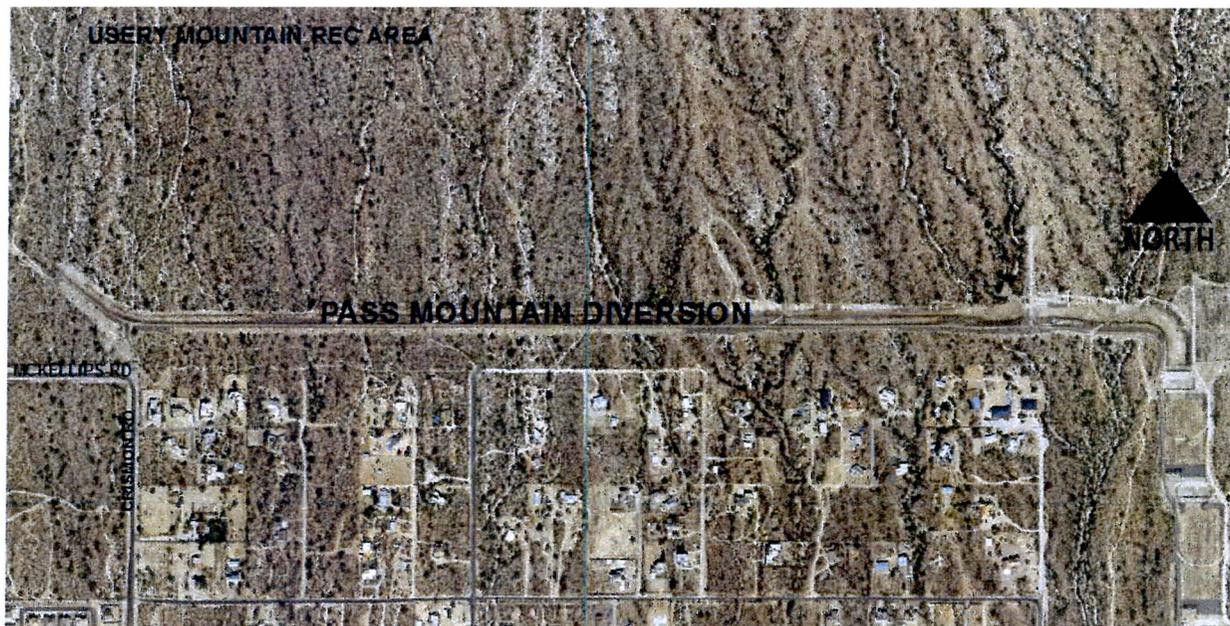


Figure 1 Location Map

2.0 FIELD RECONNAISSANCE

AMEC's field reconnaissance staff consisted of a multidisciplinary team (hydraulic and geotechnical) that walked the length of the embankment. The field reconnaissance team was composed of Mark Mayer, PE, with the FCDMC, and Robert Davies, PE, PH, CFM, and Stephen Hargus, PE, both of AMEC.

Visual observation of the embankment did not reveal any significant signs of erosion or distress. The crest of the diversion structure was clear of vegetation. Vegetation found at the embankment slopes consisted primarily of creosote and other small desert bushes. No deep-rooted species of vegetation were found growing on the embankment. In general, the diversion structure was in acceptable condition.

The only openings observed were 5 - 12-inch-diameter drain pipes that allow minor flows through the levee during storm events. Riprap has been provided at each pipe outlet for erosion protection. These outlets provide positive drainage sufficient to avoid any backwater effects to the Pass Mountain Diversion Channel. A negligible amount of nuisance runoff in the diversion channel will drain through these pipes since their upstream invert coincides with the invert of the channel. These pipes are likely to carry no more than 10 cubic feet per second during a 100-year flood, which is insignificant compared to the 100-year flow. The purpose of these pipes is to maintain connectivity with the natural upstream washes and to provide for floodwaters to discharge where it can be used by native plants and animals. The as-built drawings refer to these pipes as "vegetative outlets." The constructed channel does not have erosion protection except for grouted riprap protection at the drops, and the constructed channel is in good condition with little vegetation and no significant obstructions.

3.0 DATA COLLECTION

The FCDMC provided AMEC with much of the documentation needed to assess compliance with the National Flood Insurance Program (44 CFR 65.10), including design documents, as-builts, the *Spook Hill Area Drainage Master Plan [ADMP] Update* and the *Spook Hill Operation and Maintenance Plan*. Additionally, Robert Davies and Dr. Larry Hansen, PE, of AMEC visited the local NRCS office and obtained the geotechnical/geologic data reports and hydrology and hydraulics reports.

The 2-foot contours and 0.8-foot imagery data, dated 2009, obtained from the FCDMC were used to generate elevation data for the FLO-2D model use. Ten-foot contours and 0.8-foot imagery dated 2007 were also obtained from the FCDMC.

AMEC 2010 survey data at drop structures and along the channel and levee were used to code the channel and levee in the FLO-2D model. The top elevations of the levee along the diversion channel's right bank were collected at 50 foot intervals, and the channel's cross-sectional geometric data were surveyed at approximately every 300 feet.

4.0 EFFECTIVE HYDROLOGY

AMEC obtained hydrologic studies pertinent to the Pass Mountain Diversion, which include:

- *Spook Hill ADMP Update* (Wood Patel & Associates 2002)
- *Signal Butte FRS Design Report* (with Pass Mountain Diversion) (Soil Conservation Service [SCS] 1984)
 - The SCS hydrologic analysis and design were evaluated for the 100-year flood frequency, with a minimum freeboard of 2 feet. The TR-20 hydrologic model using the SCS curve number loss method was used for the rainfall-runoff evaluation.

It was determined that the effective hydrology for this structure is from the *Spook Hill ADMP Update*. This determination is based on the fact that this is the hydrology accepted by the FCDMC. The validation for using the *Spook Hill ADMP Update* hydrology for this levee certification analysis is explained in Appendices E and G.

The flows being used for this analysis are labeled in HEC-RAS as “ADMP Update.” The other flows, labeled “Structural Data” (taken from Table 1 of the *ADMP Level III Recommended Alternative Report*) and “SCS” (from the original SCS report) were input into HEC-RAS for comparison purposes. Each of these sources gives flows at certain points along the structure (as shown in the results schematics in Appendix B). At sections where no flow data were available, the flows from the existing studies were prorated by length along the structure as shown in the exhibit labeled “Pass Mountain Prorated Q’s.” (see Appendix G).

The effective Zone A floodplain delineation is based on the top-of-levee elevation projected upstream to the ground intersection. This has been verified with the 2009 topography and aerial photography data.

The NOAA 14 rainfall map was evaluated to determine the possible changes that would result to the hydrology if the new rainfall data were used. Since the *Spook Hill ADMP Update* used the 100-year, 24-hour peak storm, the rainfall depth from the *Spook Hill ADMP Update* was compared with the *Spook Hill ADMP* (3.81 inches), NOAA 14 (3.96 inches) and the current *Maricopa Drainage Design Manual* software (4.04 inches) (see Appendix H). It was determined based on the small difference between these values that this change in rainfall depth would not merit an update of the hydrology model.

5.0 FREEBOARD ANALYSIS

Pursuant to the 44 CFR 65.10(B)(1)(i) requirements for riverine levees, a minimum freeboard of 3 feet above the water surface level of the base flood must be provided, with 3.5 feet at the end of a levee. To determine the freeboard being provided by the levee during the base flood (100 years, 24 hours) a basic HEC-RAS model was created to produce a water surface profile to compare to the top-of-levee elevation (see Appendix B).

AMEC prepared a one-dimensional HEC-RAS steady-flow hydraulic model. The HEC-RAS summary is found in Appendix B. This diversion channel accepts inflow along its frontage to the

north, then flow is routed in an eastward direction and then southerly into the Signal Butte FRS. As the flow is conveyed through the channel to the east, it passes over three grouted riprap drop structures. At the upstream end of these drops is a 4- to 5-foot-high weir that ponds water until depths exceed the weir height. This creates a storage condition that is not accurately modeled in a steady flow HEC-RAS model. Sediment has accumulated over time upstream of each weir and downstream of each drop structure. To better model the two-dimensional flow entering the channel and the storage effects at the drops, a FLO-2D model was prepared (see Appendix C).

6.0 FLO-2D MODEL

The FLO-2D model version 2009 was used as the numerical model for the hydraulic analysis and levee freeboard analysis.

The FLO-2D computation domain covers the areas of portions of Pass Mountain watershed with approximately 1.4 square miles. It includes both channel and levee with a length of approximately 7,000 feet. The FLO-2D model grid size is 25 feet and the total element number is 60667. Figure C-2 shows the FLO-2D model domain at the project site. (See Appendix C for FLO-2D development specifics.)

7.0 ENGINEERING ASSESSMENTS

7.1 Typical Levee Embankment Sections

A representative existing levee embankment cross section was used for seepage, settlement and slope stability analysis (see Appendix J for as-built construction documents). The levee embankment section analyzed is 8 feet high on the water side and 10 feet high on the land side. It has a 2.5:1 (horizontal to vertical) waterside slope and a 3:1 landside slope. The crest width is 15 feet. The soils found on the embankment were found to be silty and sandy clays and were modeled as such.

7.2 Levee Embankment Seepage Analysis

Transient and steady-state seepage analyses were completed to assess the development of a phreatic surface within the downstream slope of the levee. Seepage analyses were completed using the two-dimensional finite element computer program SEEP/W (Geo-Slope International, Ltd. 2004a). SEEP/W is a computer code used to model the saturated and unsaturated flow of water within porous materials. Analyses were completed using quadrilateral elements to develop the finite element mesh, and solutions were obtained using four-point integration techniques.

Unsaturated and saturated hydraulic conductivity values for the various elements of the dam, and the foundation soils were assumed based on AMEC's experience with similar soils and engineering judgment. A saturated hydraulic conductivity of 1.0×10^{-4} centimeters per second (3.28×10^{-6} feet per second) was assigned to the embankment and foundation soils. The ratio of the horizontal to vertical hydraulic conductivity was assumed to be 10 for all materials.

The U.S. Army Corps of Engineers (USACE) defines steady-state seepage as the condition where the maximum water level can be maintained long enough to produce a full phreatic

surface through the dam (USACE 1970). The seepage analyses assumed the water surface was at the crest of the levee sections and therefore set the maximum water surface elevation at the levee crest, where that condition was met.

A transient seepage analysis was initially completed to ascertain if the soil on the water side of the levee would become saturated during the design flood event and if a full seepage condition would develop. The analyses assumed the water surface would be at the crest of the levee section for three days. The results of the analyses are presented in Appendix D. As indicated by Figure D-1, the phreatic surface does not fully penetrate the levee embankment.

A steady-state seepage analysis was then completed as a “worst case” scenario and to provide input for the stability analyses. As indicated by Figure D-2, if the “worst case” scenario were to develop, the phreatic surface would exit at the downstream toe of the levee section. A computed exit gradient of unity (1.0) is generally considered a state at which piping may occur (USACE 2005). An exit gradient of 0.34 was computed, representing an approximate factor of safety of 3 against piping at the downstream toe.

7.3 Typical Existing Levee Embankment Stability Analysis

Conventional static stability analyses of the typical levee section were performed using the computer program SLOPE/W (Geo-Slope International, Ltd. 2004b). The use of SLOPE/W makes it possible to easily analyze both simple and complex slope stability problems using a variety of methods to calculate the factor of safety.

The soil parameters used in the analyses were based on the results of AMEC’s experience with similar materials. The embankment and the foundation were assumed to have the same strength parameters, as indicated in the following table.

The soil strength parameters used in the stability analyses are summarized in the following table. Conservative strength parameters were selected because of the gravel content in the soils and its potential impact on the laboratory test results.

Embankment and Foundation Soil Strength Parameters

| | |
|-------------------------|-----|
| Moist Unit Weight (pcf) | 110 |
| Phi (degrees) | 33 |
| Cohesion (psf) | 200 |

Notes: pcf = pounds per cubic foot, psf = pounds per square foot

Analysis results for the typical levee section are presented in Figures D-3 through D-5 in Appendix D. A summary of the analysis results are presented in the following table.

Results of Slope Stability Analyses

| Description | Computed Factor of Safety | Minimum Required Factor of Safety |
|---|---------------------------|-----------------------------------|
| End of Construction, Water Side | 4.21 | 1.3 |
| Sudden Drawdown with Water Surface at Crest | 3.27 | 1.0 |
| End of Construction, Land Side | 4.08 | 1.3 |

Analyses were limited to the above cases for several reasons. The sudden-drawdown analysis used the phreatic surface determined by the transient seepage analysis. Considering the short duration of a flood event, and the limited penetration of the wetted surface during the event, the use of the transient phreatic surface was deemed more appropriate. Analysis of the steady-state seepage case for the land side of the levee was not completed for essentially the same reason. Pseudostatic analyses were not performed because of the low potential seismic loading (peak ground acceleration of 0.05) for the Phoenix area (U.S. Geological Survey 2002), and the relatively high factors of safety computed for the static analyses.

The computed factors of safety have been noted in the MT-2 forms provided in Appendix A. It should be noted that there are slight differences between the loading conditions cases in the MT-2 forms and those in USACE EM-1110-2-1913, Table 6-1, "Summary of Design Conditions," the reference listed in the MT-2 forms. The differences are (a) Table 6-1 does not include a condition for a critical flood stage; (b) Table 6-1 lists the steady seepage at flood stage as Case III, while the MT-2 forms list it as Case IV; and (c) Table 6-1 lists the earthquake as Case IV, while the MT-2 forms list it as Case VI.

7.4 Settlement Analysis

Settlement analysis of the levees was performed using standard penetration test (SPT) results corrected for overburden pressure and field procedures; methods of estimating elastic settlement for rectangular, rigid footings as presented by Schmertmann (1970) and Schmertmann et. al. (1978); and estimates of elastic modulus developed using correlations with SPT blow count and typical values for similar soils presented in the *Standard Specifications for Highway Bridges*, Article 4.4.7 (American Association of State Highway and Transportation Officials 2002); Bowles (1982); and Kulhawy and Mayne (1990).

A majority of the SPT results obtained had refusal blow counts (i.e., 50 blows for less than a 6-inch interval) after a depth of about 5 feet. Levee load and geometry were used to estimate the settlement. Settlement estimates are presented in the following table.

Results of Settlement Analysis

| Description | Estimated Settlement (inches) |
|---|-------------------------------|
| Estimated Settlement to Date (30 Years) | 0.76 |
| Estimated Settlement (100 Years) | 0.80 |

Settlement is anticipated to be immediate and essentially should have been complete upon the construction of the levees (as indicated in the above table). Moisture increases in supporting soils could result in further long-term settlement; however, it is likely that the soils have previously been wetted. Long-term settlement of the levee is not anticipated to be of significant magnitude, due to the favorable characteristics of the very dense site soils. The additional settlement is estimated to be less than 0.10 inch.

7.5 FEMA Levee Certification

The scope of the current study is to a level sufficient enough to pursue FEMA levee certification in accordance with 44 CFR 65.10. The Pass Mountain Levee meets the criteria listed for embankment and foundation stability and settlement. The required documentation, including the Operations and Maintenance Plan with the accompanying periodic inspections are also made available (Appendix F).

8.0 CONCLUSIONS (PRIOR TO DETAILED FLO-2D ANALYSIS)

At the upstream end of the diversion channel levee, the levee embankment ties into existing ground. The as-builts (see Appendix J) show a 10:1 start slope and 3:1 (horizontal to vertical) side slopes at the beginning of levee. AMEC considered extending the levee westward, however, such an extension would result in the same condition of flow bypass at the levee end at any flow rate.

The results of the preliminary HEC-RAS analysis show that the Pass Mountain Diversion meets the freeboard criteria for 44 CFR 65.10 for the length from approximately as-built Station 83+57 to 106+96, but does not meet the criteria for Stations 51+45 to 83+57. The HEC-RAS analysis showed that the Pass Mountain Diversion levee does not meet the minimum 3.5-foot freeboard requirement. The Pass Mountain Levee at these stations does meet the criteria listed for embankment and foundation stability and settlement.

9.0 TITLE 44 CFR 65.10 COMPLIANCE EVALUATION (POST-DETAILED FLO-2D ANALYSIS) PASS MOUNTAIN DIVERSION

| 44 CFR 65.10 Criteria | Appears Compliant | Appears Noncompliant | Not Applicable | Remarks |
|-------------------------------------|-------------------|----------------------|----------------|------------------------------------|
| Freeboard | X | | | Greater than 3.5 Feet at levee end |
| Closures | | | X | No Closures |
| Embankment Protection | X | | | Protection at Drops |
| Embankment and Foundation Stability | X | | | |
| Settlement | X | | | |
| Interior Drainage | | | X | No Interior Drainage |
| Operation Plans | X | | | |
| Maintenance Plans | X | | | |
| Floodwalls | | | X | No Structural Floodwalls |

Note: Freeboard Compliance Evaluation is based upon the detailed FLO-2D analysis (see Section 10 and Appendix C).

The HEC-RAS analysis outlined in Sections 5 and 8 was not entirely accurate because the hydraulic condition is not well represented with a 1-dimensional steady state hydraulic model. A FLO-2D analysis was deemed necessary to properly model the storage, unsteady flow and 2-dimensional characteristics of flow in this watershed.

10.0 CONCLUSIONS (POST-DETAILED FLO-2D ANALYSIS)

A FLO-2D model was created to model the freeboard adequacy. The results show that the levee freeboard along the diversion channel within the project site at all locations is over 3 feet, which meets the FEMA requirement for certifying a levee (Figure C-5 and Table C-1).

Table C-1 (Appendix C) lists levee freeboard at 20-30 foot intervals for the full length of the levee. The only location at which the levee freeboard for the Pass Mountain Diversion is less than 3 feet is the levee embankment terminus at XSEC 1 (see Table C-1, Figures C-8 through C-10). This is the location where the levee ties into the natural ground surface. Just upstream (West) of XSEC 1, runoff will flow around the end of levee as overland flow occurs at this location. Initially the end of the levee was considered to be XSEC 1, but upon closer review the end of levee is determined to be XSEC 4, where the levee top reaches the typical elevation between 1782 and 1783 feet and where the diversion channel begins (see Figure C-10).

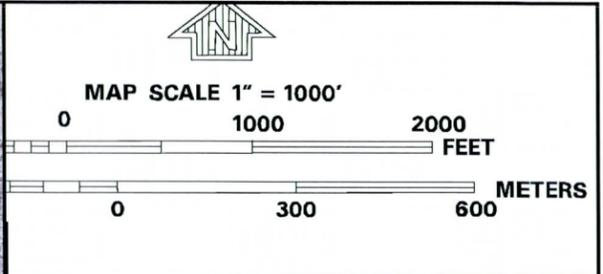
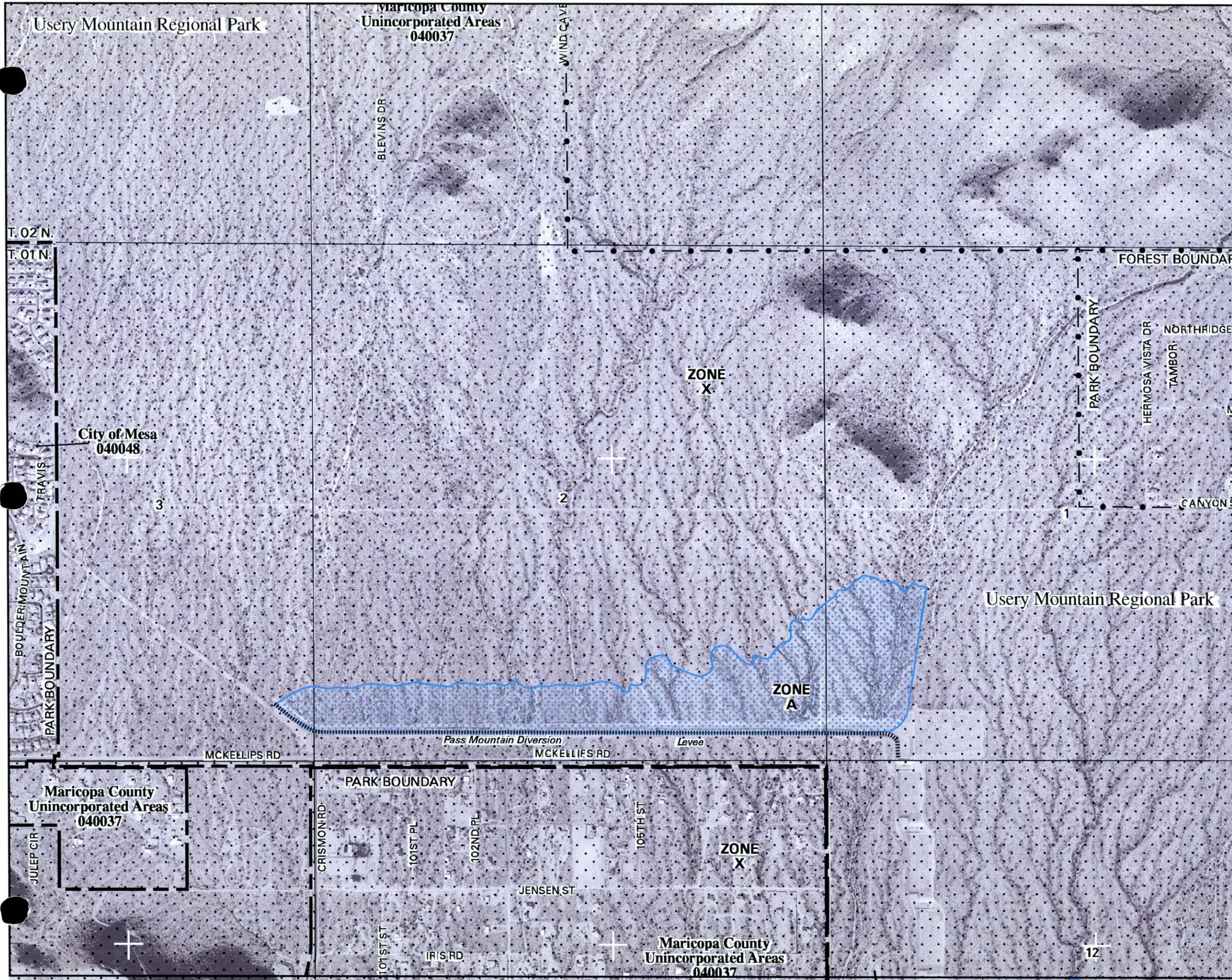
Scour was also evaluated qualitatively (based on velocity) at the beginning of the levee. Due to the low discharge (20 cfs), velocities (1-2 fps), and depth (0.5 ft) in the vicinity of the end of levee, scour is considered to have minimal impact on the embankment terminus.

11.0 REFERENCES

- American Association of State Highway and Transportation Officials. 2002. *Standard Specifications for Highway Bridges*. 17th edition. Washington, DC.
- Bowles, J.E. 1982. *Foundation Analysis and Design*. 3rd edition. New York: McGraw-Hill Book Co.
- FLO-2D Software Inc., *FLO-2D User manual*, 2009
- Geo-Slope International, Ltd. 2004a. *Seepage Modeling with Seep/W: An Engineering Methodology*. First Edition. Revision 1. Calgary, Alberta, Canada.
- Geo-Slope International, Ltd. 2004b. *Stability Modeling with Slope/W: An Engineering Methodology*. First Edition. Revision 1. Calgary, Alberta, Canada.
- Kulhawy, F.H., and P.W. Mayne. 1990. *Manual on Estimating Soil Properties for Foundation Design, Electric Power Research Institute, Palo Alto California*. Prepared by Geotechnical Engineering Group, Cornell University, Ithaca, New York. Report No. EL-6800. August.
- Schmertmann, J.H. 1970. Static Cone to Compute Static Settlement over Sand. *Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineers* 96 (SM3). May.
- Schmertmann, J.H., J.P. Hartman, and P.R. Brown. 1978. Improved Strain Influence Factor Diagrams. *Journal of the Geotechnical Engineering Division, Proceedings of the American Society of Civil Engineers* 104 (GT8). August.
- Soil Conservation Service (SCS). 1984. *Signal Butte FRS Design Report (with Pass Mountain Diversion)*.
- U.S. Army Corps of Engineers (USACE). 1970. *Stability of Earth and Rockfill Dams*. Engineering Design Manual No. EM 1110-2-1902: April.
- USACE. 2005. Design Guidance for Levee Underseepage. Engineering Technical Letter No. ETL 1110-2- 569. May.
- U.S. Geological Survey. 2002. *Probabilistic Hazard Curves for the 48 Coterminous States*.
- Wood Patel & Associates. 2002. *Spook Hill Area Drainage Master Plan Update*.



FIGURE



NFP

PANEL 2230F

**FIRM
FLOOD INSURANCE RATE MAP
MARICOPA COUNTY,
ARIZONA
AND INCORPORATED AREAS**

PANEL 2230 OF 4350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

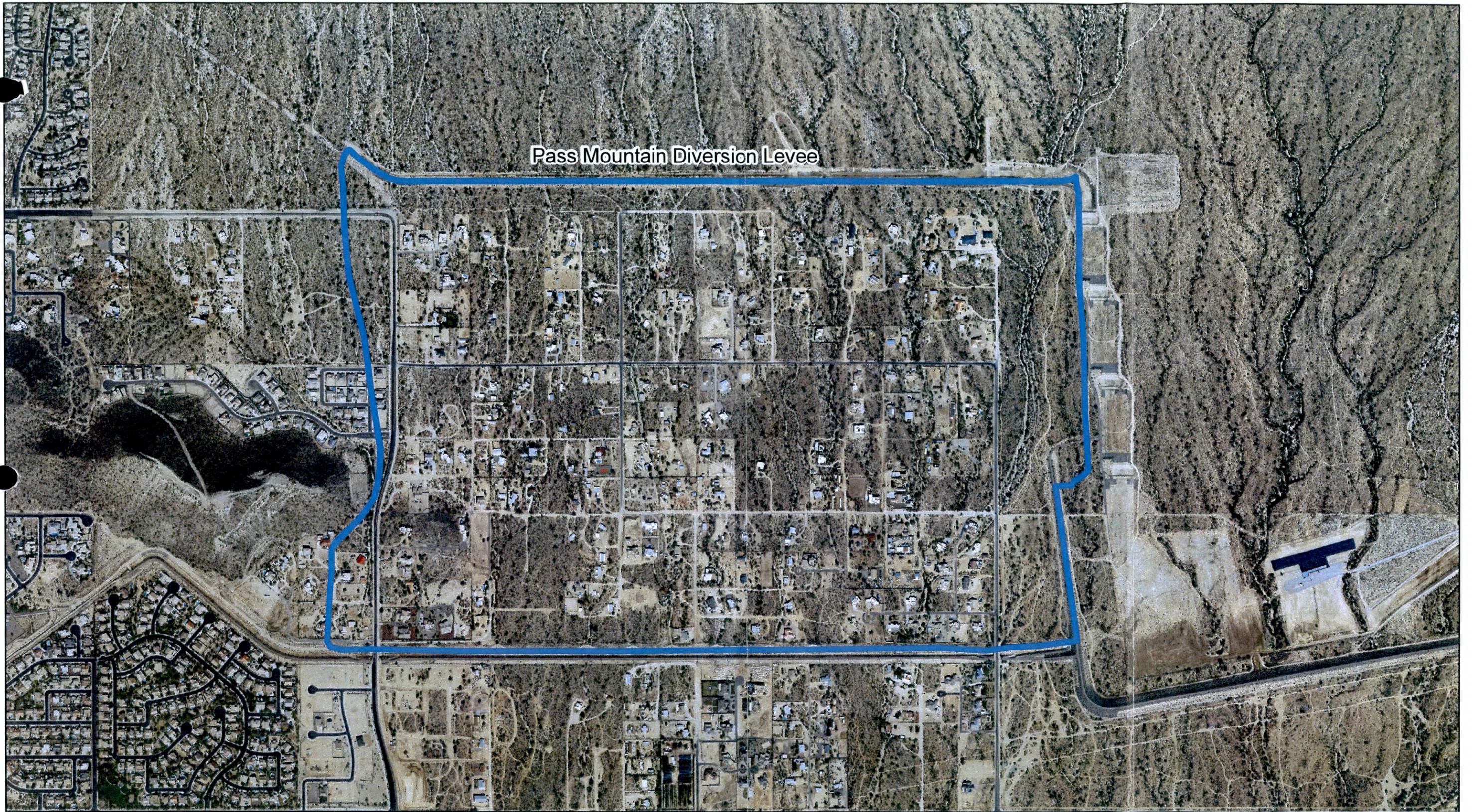
| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-----------------|--------|-------|--------|
| MARICOPA COUNTY | 040037 | 2230 | F |
| MESA, CITY OF | 040048 | 2230 | F |

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER
04013C2230F
MAP REVISED
SEPTEMBER 30, 2005**
Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Pass Mountain Diversion Levee

Legend
Non-Levee Condition Floodplain



1 inch = 800 feet

Figure 3 Non-Levee Condition Floodplain



APPENDIX A

MT-2 Forms

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 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 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, 500 C Street, SW, Washington DC 20472, 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.**

Flooding Source: **Various Ephemeral Washes**
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/Basin complete Section D
- Levee/Floodwall complete Section E
- Sediment Transport..... complete Section F (if required)

Description Of Structure

1. **Name of Structure:** Pass Mountain Diversion Levee

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

Location of Structure: McKellips Road/Crismon Road, Mesa, Maricopa County, Arizona

Downstream Limit/Cross Section: Station 112+52 (as-built)

Upstream Limit/Cross Section: Station 45+25 (as-built)

2. **Name of Structure:**

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. **Name of Structure:**

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

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure: Not Applicable

1. Accessory Structures

The channelization includes (check one):

- | | |
|--|--|
| <input type="checkbox"/> Levees [Attach Section E (Levee/Floodwall)] | <input type="checkbox"/> Drop structures |
| <input type="checkbox"/> Superelevated sections | <input type="checkbox"/> Transitions in cross sectional geometry |
| <input type="checkbox"/> Debris basin/detention basin [Attach Section D (Dam/Basin)] | <input type="checkbox"/> Energy dissipator |
| <input type="checkbox"/> Other (Describe): | |

2. Drawing Checklist

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

3. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the _____ -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):

4. 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.

C. BRIDGE/CULVERT

Flooding Source: Not Applicable

Name of Structure:

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):

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):

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

4. 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.

D. DAM/BASIN

Flooding Source: Not Applicable

Name of Structure:

- 1. This request is for (check one): Existing dam New dam Modification of existing dam
- 2. The dam was designed by (check one): Federal agency State agency Local government agency Private organization

Name of the agency or organization:

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

- a. 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 _____

- b. 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?

- 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 or downstream of the dam change?

- Yes No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

| FREQUENCY (% annual chance) | 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.
- structural floodwall
- Other (describe):

Station 45+25 to 112+52
 Station to
 Station to

c. Structural Type (check one):

- monolithic cast-in place reinforced concrete
- reinforced concrete masonry block
- sheet piling
- Other (describe): Earthen

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: 3-6
- 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: 3-6
- 3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers: n/a
- 4. A layout detail for the embankment protection measures. Sheet Numbers: n/a
- 5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers: n/a

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout

3.5 feet or more at the upstream end

4.0 feet within 100 feet upstream of all structures and/or constrictions N/A since no

- Yes No
- Yes No
- Yes No

structures or constrictions

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

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

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 |
|-----------------|--------------------|-------------------|--------------------------------------|------------------------|
| 70+33.00 | Right | Vegetative Outlet | 1767.4 (NGVD 29) | none |
| 75+90.00 | Right | Vegetative Outlet | 1767.4 (NGVD 29) | none |
| 85+83.00 | Right | Vegetative Outlet | 1756.3 (NGVD 29) | none |
| 92+10.00 | Right | Vegetative Outlet | 1756.2 (NGVD 29) | none |
| 105+40.00 | Right | Vegetative Outlet | 1748.1 (NGVD 29) | none |

(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 landside is: 3:1 (H:V)
- b. The maximum levee slope floodside is: 3:1 (H:V)
- c. The range of velocities along the levee during the base flood is: 1.3 fps (min.) to 6.2 fps (max.)
- d. Embankment material is protected by (describe what kind): earthen embankment, no protection except riprap at drops
- e. Riprap Design Parameters (check one): Velocity Tractive stress N/A
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)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

- 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: **Considered typical section**

Overall height: Sta. **N/A** ; height **12** ft.

Limiting foundation soil strength:

Sta. **NA** , depth to

strength $\phi = 33$ degrees, $c = 200$ psf

slope: SS = **3** (h) to **1** (v) downstream; **2.5** (h) to **1** (v) upstream

(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.):

Circular arc

- c. Summary of stability analysis results:

| Case | Loading Conditions | Critical Safety Factor | Criteria (Min.) |
|------|-------------------------------|---|-----------------|
| I | End of construction | 4.21 & 4.08 | 1.3 |
| II | Sudden drawdown | 3.27 | 1.0 |
| III | Critical flood stage | not done (see Section 7 of this report) | 1.4 |
| IV | Steady seepage at flood stage | not done (see Section 7 of this report) | 1.4 |
| VI | Earthquake (Case I) | not done (see Section 7 of this report) | 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: **SEEP/w computer program**

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

- f. Were uplift pressures at the embankment landside toe checked? Yes No **steady state seepage will**

- g. Were seepage exit gradients checked for piping potential? Yes No **not develop -see report**

- h. The duration of the base flood hydrograph against the embankment is **24** hours.

Attach engineering analysis to support construction plans.

See Report

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability **Not Applicable**

a. Describe analysis submittal based on Code (check one):

UBC (1988) or 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. Foundation bearing strength for each soil type: **N/A**

| 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: **N/A**

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

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 0.063 ft. to 0.067 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. N/A
Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed: Not applicable, no interior drainage ground slopes away from land side of levee
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 NoIf No for any of the above, attach explanation.
- f. 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 N/A

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.

E. LEVEE/FLOODWALL (CONTINUED)

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 Not Applicable
- 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 Not Applicable

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? Yes No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

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

F. SEDIMENT TRANSPORT

Flooding Source: Not Applicable, see report

Name of Structure:

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 acre-feet

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

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

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:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
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.

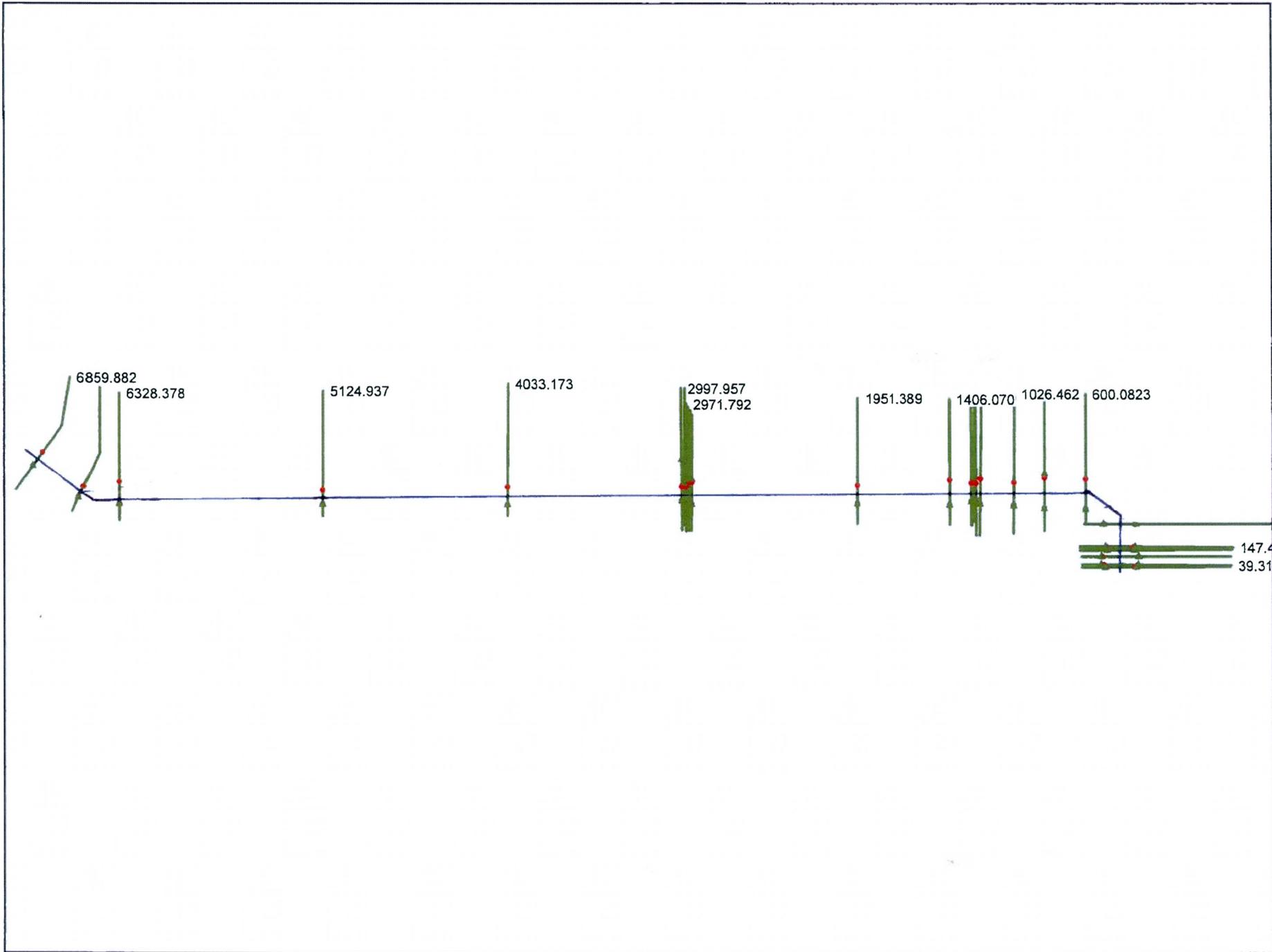


APPENDIX B

**Preliminary Freeboard Analysis
(HEC-RAS)**

HEC-RAS Plan: Plan 01 River: River Reach: One Profile: Spook Hill ADMP

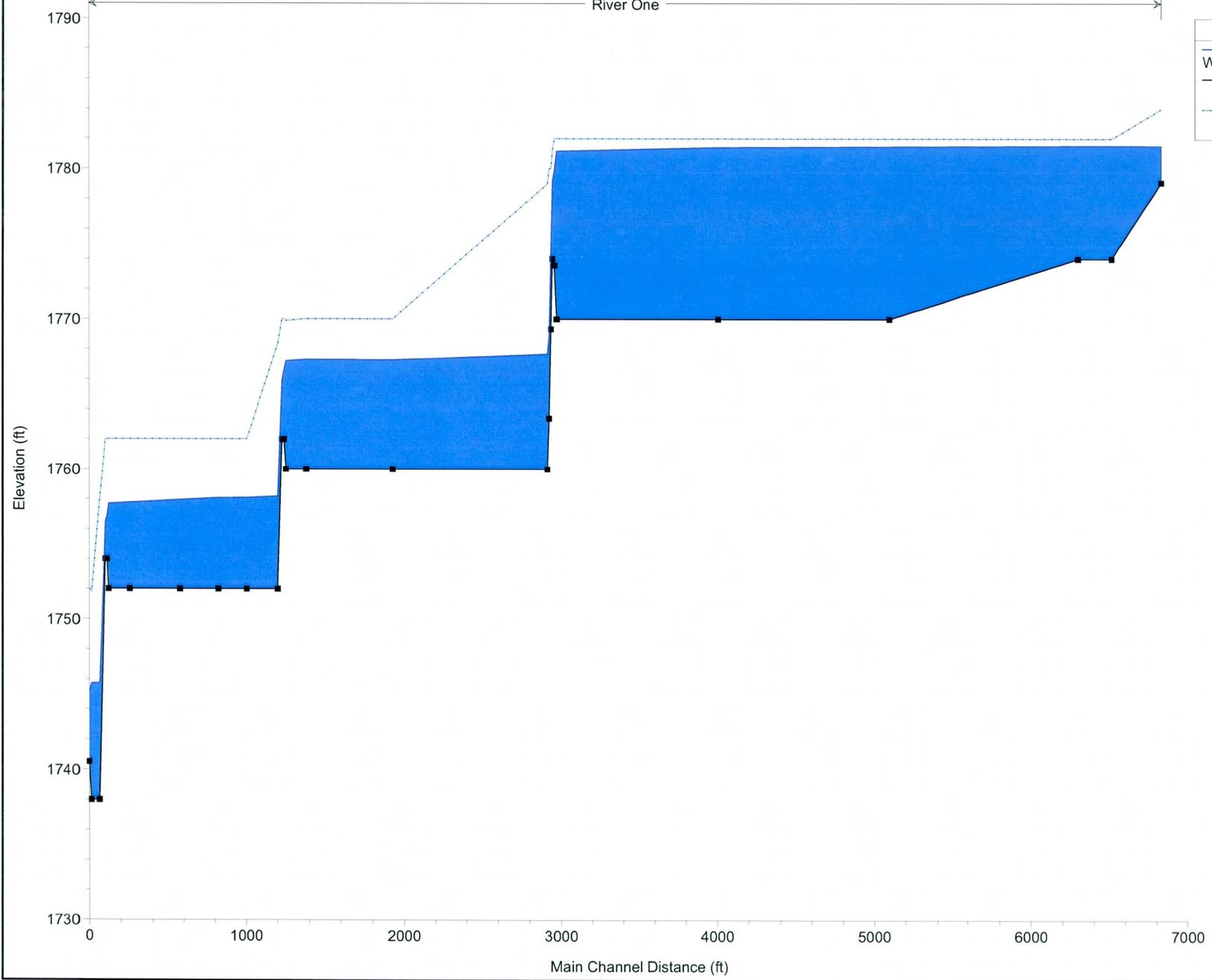
| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl | R. Freeboard (ft) |
|-------|-----------|-----------------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|----------------------|
| One | 6859.882 | Spook Hill ADMP | 257.00 | 1779.08 | 1781.52 | 1780.28 | 1781.54 | 0.000247 | 1.09 | 260.07 | 313.95 | 0.14 | 2.48 |
| One | 6542.361 | Spook Hill ADMP | 257.00 | 1774.00 | 1781.53 | 1776.28 | 1781.53 | 0.000004 | 0.27 | 1223.99 | 405.48 | 0.02 | 0.47 |
| One | 6328.378 | Spook Hill ADMP | 580.00 | 1774.00 | 1781.53 | 1775.58 | 1781.53 | 0.000009 | 0.48 | 1499.31 | 425.89 | 0.03 | 0.47 |
| One | 5124.937 | Spook Hill ADMP | 1783.00 | 1770.00 | 1781.48 | 1775.59 | 1781.50 | 0.000047 | 1.20 | 2056.50 | 507.83 | 0.08 | 0.52 |
| One | 4033.173 | Spook Hill ADMP | 2684.00 | 1770.00 | 1781.43 | 1774.95 | 1781.44 | 0.000049 | 1.35 | 2844.57 | 632.64 | 0.08 | 0.57 |
| One | 2997.957 | Spook Hill ADMP | 2684.00 | 1770.00 | 1781.17 | 1776.04 | 1781.32 | 0.000387 | 3.41 | 1005.48 | 769.81 | 0.22 | 0.83 |
| One | 2983.814 | Spook Hill ADMP | 2684.00 | 1773.57 | 1779.89 | 1779.10 | 1781.19 | 0.005755 | 9.15 | 293.18 | 452.08 | 0.78 | 2.11 |
| One | 2971.792 | Spook Hill ADMP | 2684.00 | 1774.00 | 1779.14 | 1779.14 | 1781.04 | 0.009765 | 11.05 | 242.84 | 405.55 | 1.00 | 2.09 |
| One | 2962.186 | Spook Hill ADMP | 2684.00 | 1769.34 | 1774.72 | 1774.72 | 1776.64 | 0.009853 | 11.12 | 241.39 | 238.33 | 1.00 | 5.28 |
| One | 2950.090 | Spook Hill ADMP | 2684.00 | 1763.39 | 1768.96 | 1768.96 | 1770.94 | 0.009851 | 11.29 | 237.64 | 158.57 | 1.00 | 11.04 |
| One | 2938.740 | Spook Hill ADMP | 2684.00 | 1760.00 | 1767.67 | 1764.99 | 1768.27 | 0.001934 | 6.23 | 430.76 | 80.44 | 0.47 | 11.31 |
| One | 1951.389 | Spook Hill ADMP | 955.00 | 1760.00 | 1767.26 | 1762.56 | 1767.31 | 0.000202 | 1.88 | 569.65 | 280.45 | 0.15 | 2.74 |
| One | 1406.070 | Spook Hill ADMP | 955.00 | 1760.00 | 1767.29 | 1760.42 | 1767.29 | 0.000005 | 0.35 | 2933.82 | 545.28 | 0.02 | 2.71 |
| One | 1276.984 | Spook Hill ADMP | 1484.00 | 1760.00 | 1767.19 | 1762.60 | 1767.28 | 0.000275 | 2.44 | 717.24 | 409.41 | 0.18 | 2.69 |
| One | 1264.677 | Spook Hill ADMP | 1484.00 | 1762.00 | 1766.63 | 1765.67 | 1767.22 | 0.003969 | 6.16 | 240.95 | 153.32 | 0.62 | 3.37 |
| One | 1251.942 | Spook Hill ADMP | 1484.00 | 1762.00 | 1765.86 | 1765.86 | 1767.08 | 0.011349 | 8.87 | 167.37 | 224.29 | 1.00 | 4.14 |
| One | 1225.164 | Spook Hill ADMP | 1484.00 | 1752.00 | 1758.19 | 1754.57 | 1758.33 | 0.000540 | 3.10 | 479.20 | 231.27 | 0.24 | 10.17 |
| One | 1026.462 | Spook Hill ADMP | 1484.00 | 1752.00 | 1758.09 | 1754.49 | 1758.22 | 0.000563 | 2.91 | 513.45 | 288.26 | 0.25 | 3.91 |
| One | 844.7913 | Spook Hill ADMP | 1484.00 | 1752.00 | 1758.08 | 1753.79 | 1758.14 | 0.000205 | 1.89 | 783.16 | 298.98 | 0.15 | 3.92 |
| One | 600.0823 | Spook Hill ADMP | 2264.00 | 1752.00 | 1757.94 | 1754.37 | 1758.06 | 0.000411 | 2.74 | 857.81 | 251.22 | 0.22 | 4.06 |
| One | 281.5316 | Spook Hill ADMP | 2264.00 | 1752.00 | 1757.76 | 1754.30 | 1757.91 | 0.000510 | 3.06 | 740.64 | 345.97 | 0.24 | 4.24 |
| One | 147.4524 | Spook Hill ADMP | 2264.00 | 1752.00 | 1757.68 | 1754.33 | 1757.84 | 0.000552 | 3.17 | 714.65 | 650.71 | 0.25 | 4.32 |
| One | 138.3202 | Spook Hill ADMP | 2264.00 | 1754.00 | 1756.95 | 1756.54 | 1757.76 | 0.006768 | 7.22 | 313.71 | 622.04 | 0.79 | 5.05 |
| One | 125.4350 | Spook Hill ADMP | 2264.00 | 1754.00 | 1756.48 | 1756.48 | 1757.62 | 0.011543 | 8.57 | 264.20 | 630.41 | 1.00 | 5.52 |
| One | 87.91686 | Spook Hill ADMP | 2264.00 | 1738.00 | 1745.75 | 1740.37 | 1745.83 | 0.000200 | 2.27 | 995.94 | 152.01 | 0.16 | 12.25 |
| One | 39.31203 | Spook Hill ADMP | 2264.00 | 1738.00 | 1745.74 | 1740.40 | 1745.82 | 0.000203 | 2.28 | 992.98 | 153.02 | 0.16 | 6.07 |
| One | 25.23701 | Spook Hill ADMP | 2264.00 | 1740.52 | 1745.22 | 1744.22 | 1745.77 | 0.003600 | 5.96 | 379.62 | 120.07 | 0.59 | 6.79 |



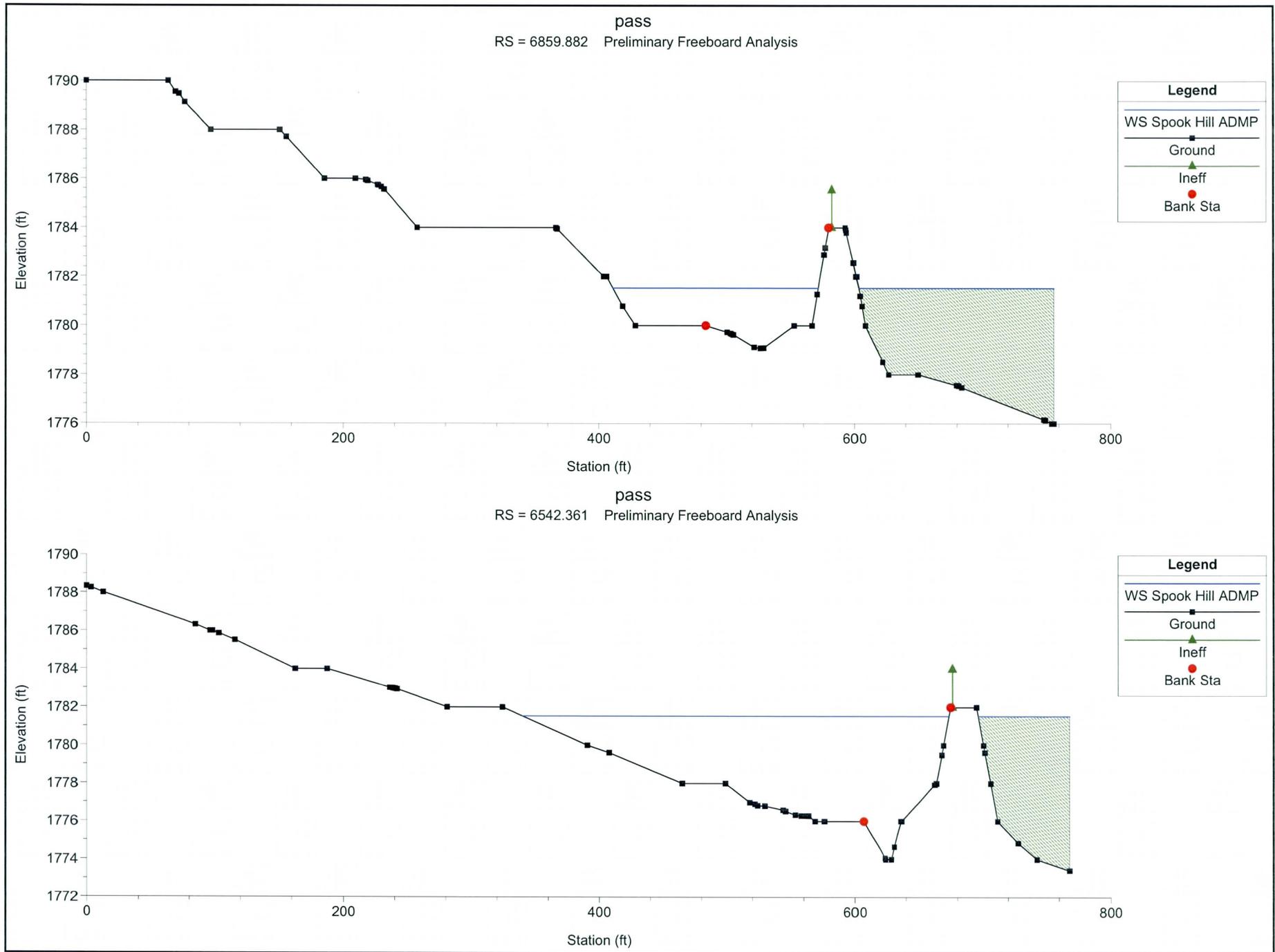
1 in Horiz. = 750 ft 1 in Vert. = 750 ft

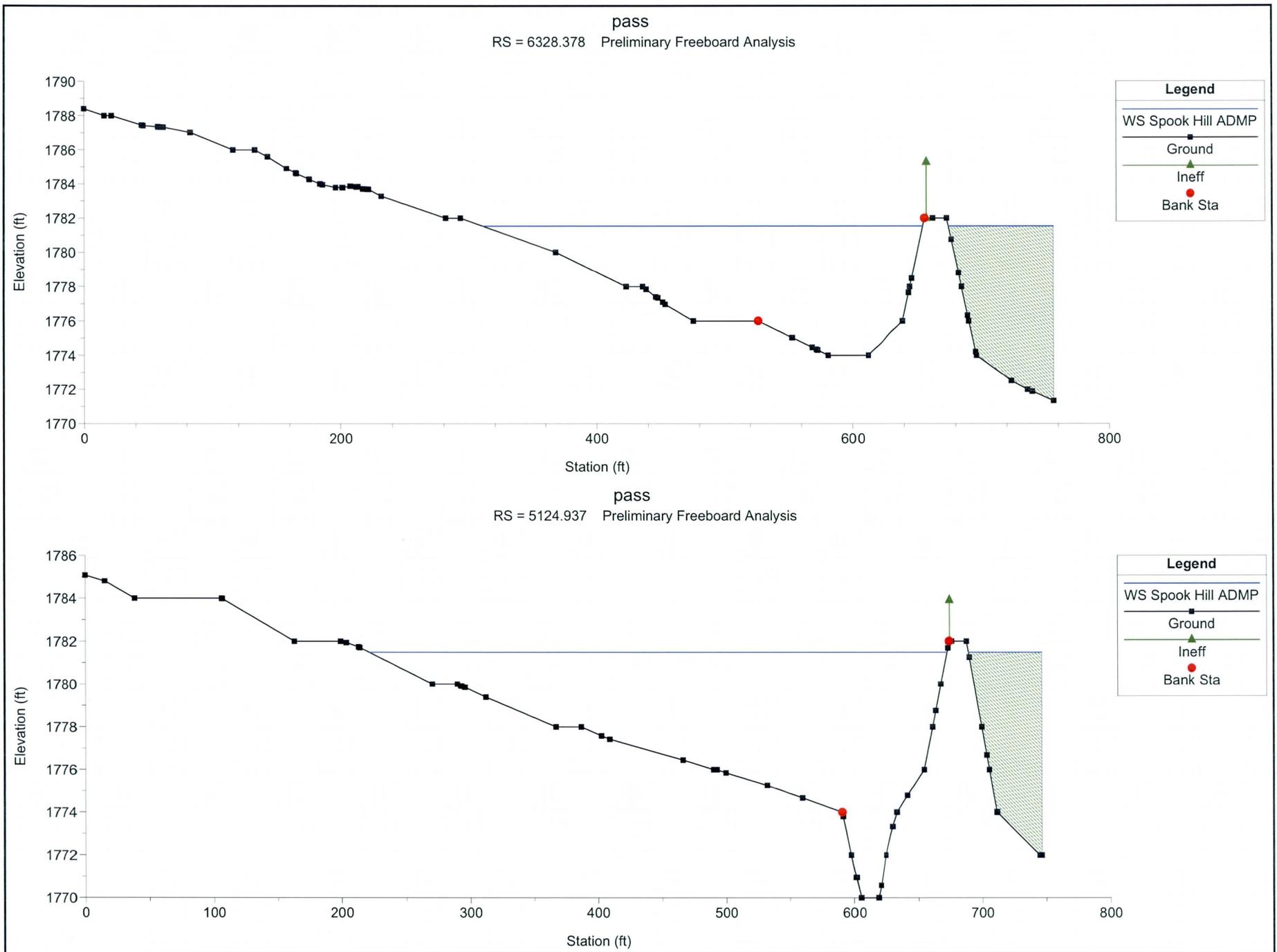
pass Preliminary Freeboard Analysis

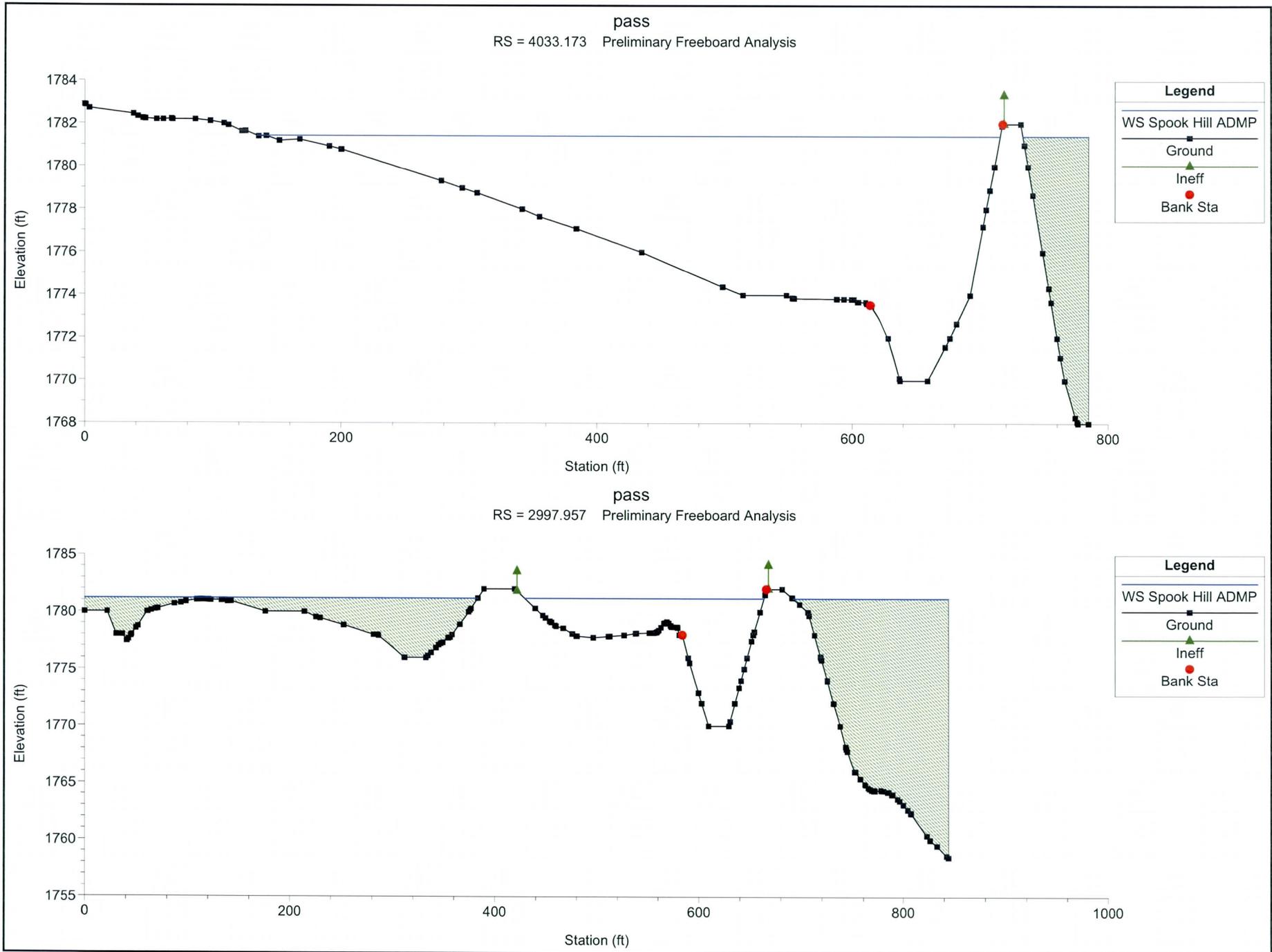
River One

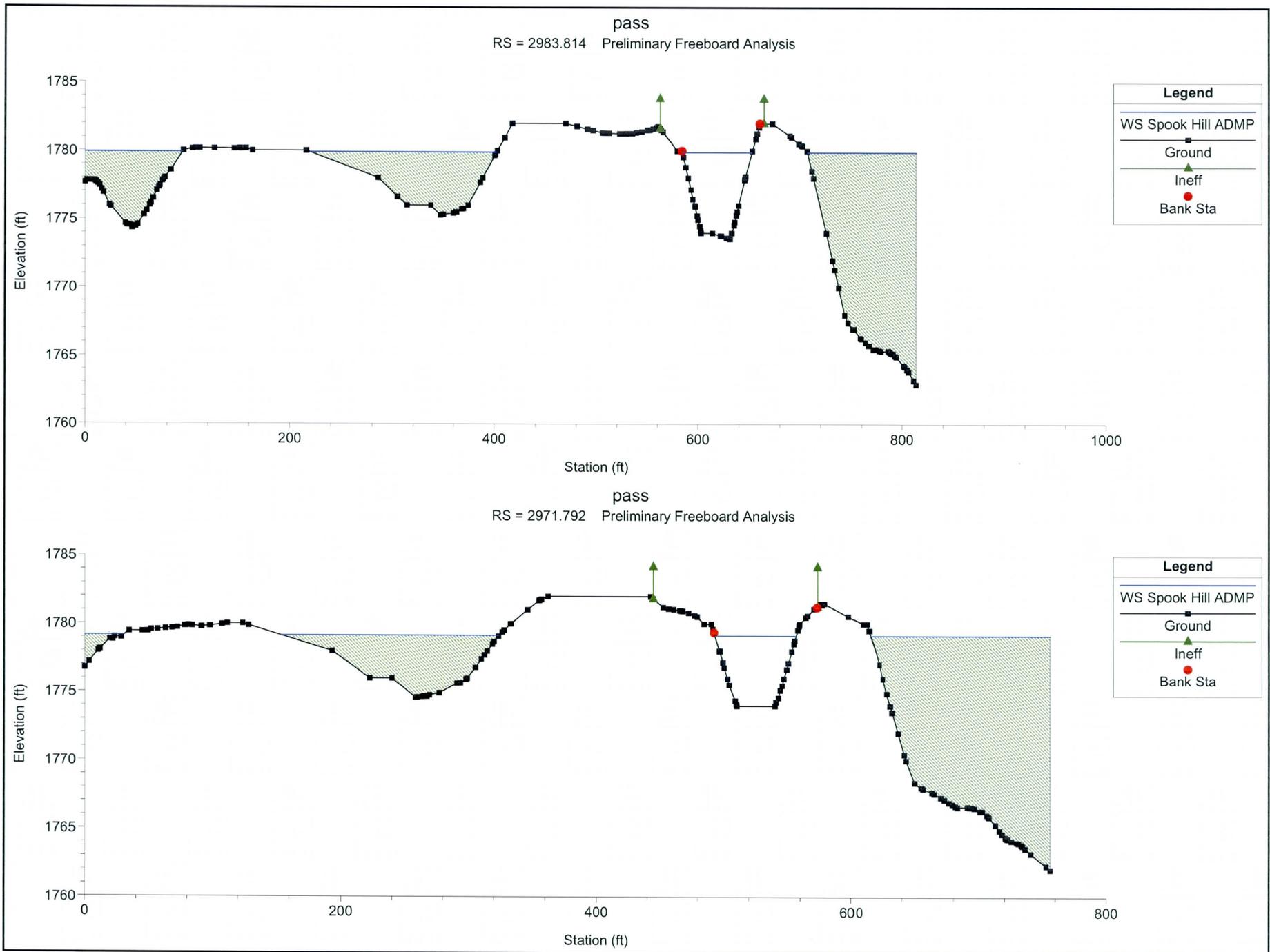


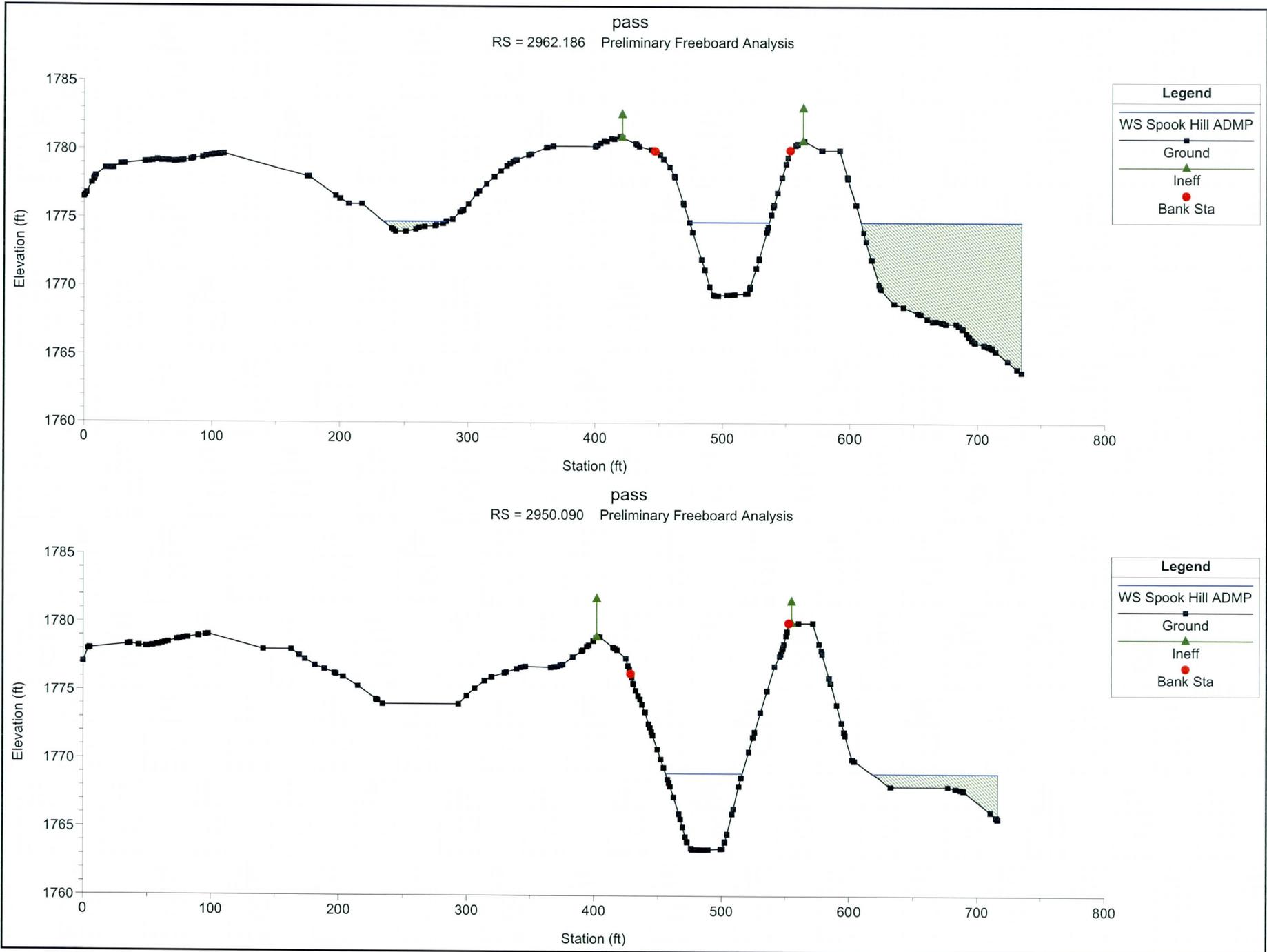
| Legend | |
|--------------------|-------|
| WS Spook Hill ADMP | ■ |
| Ground | — |
| ROB | - - - |

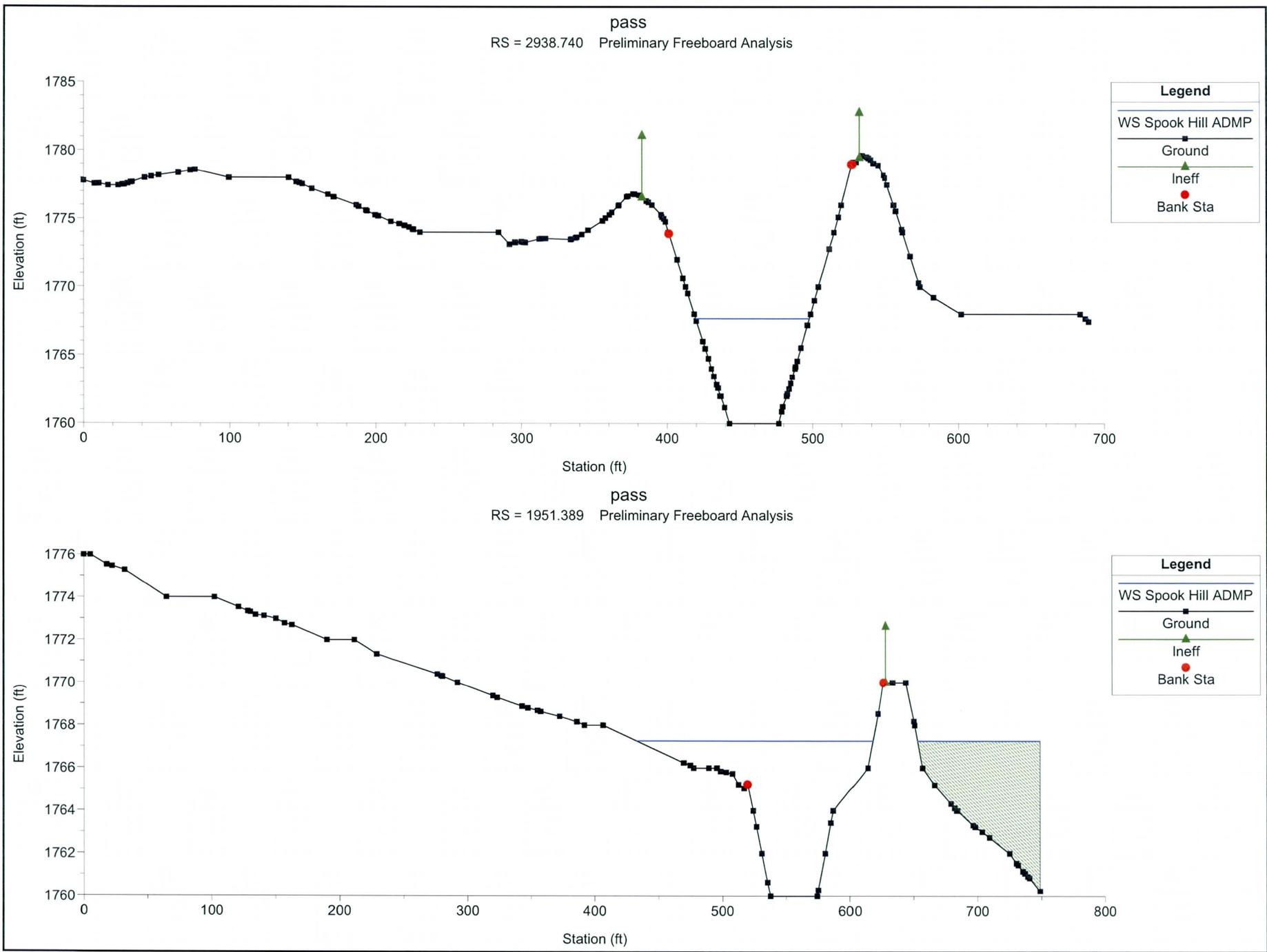


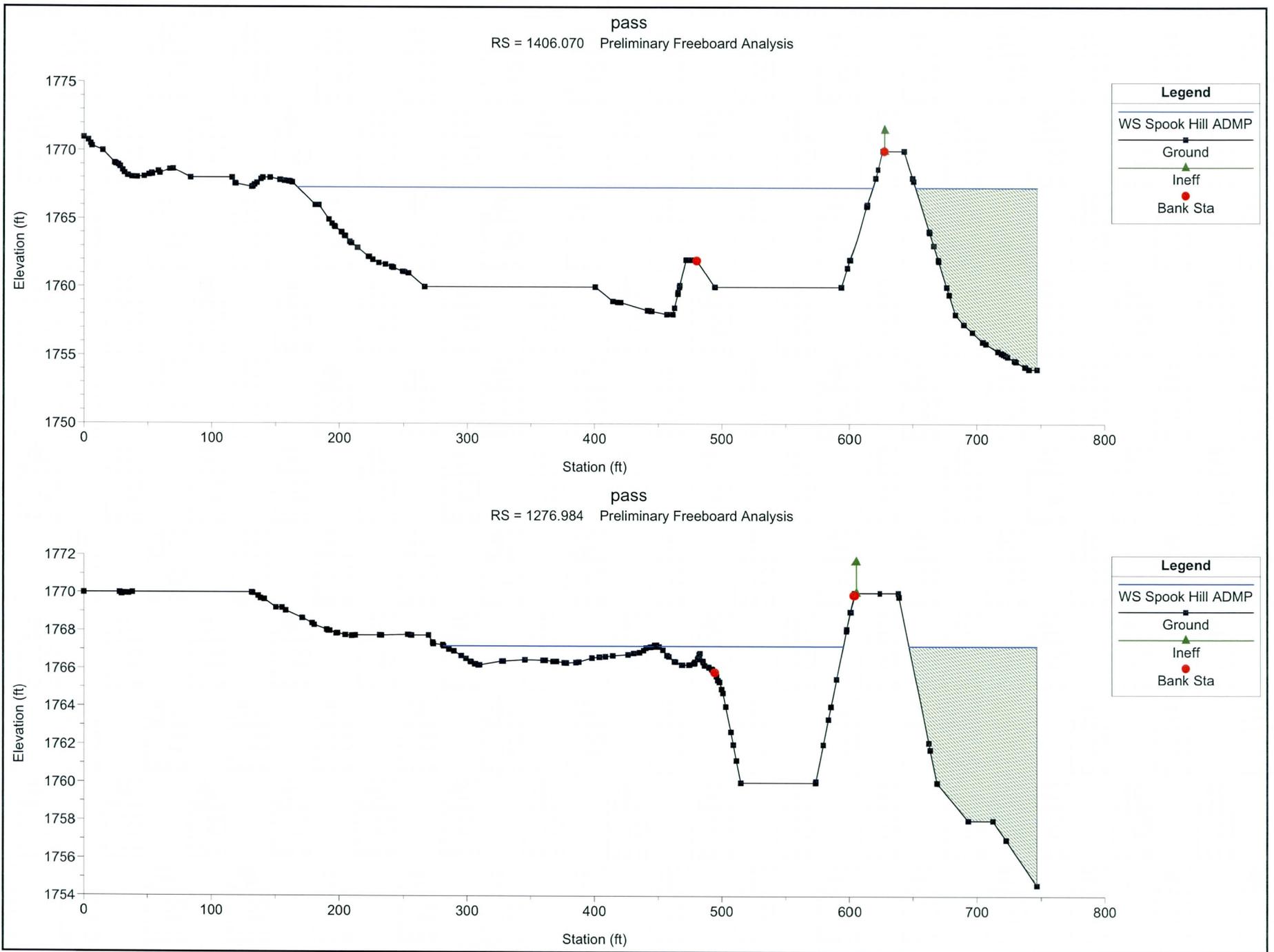


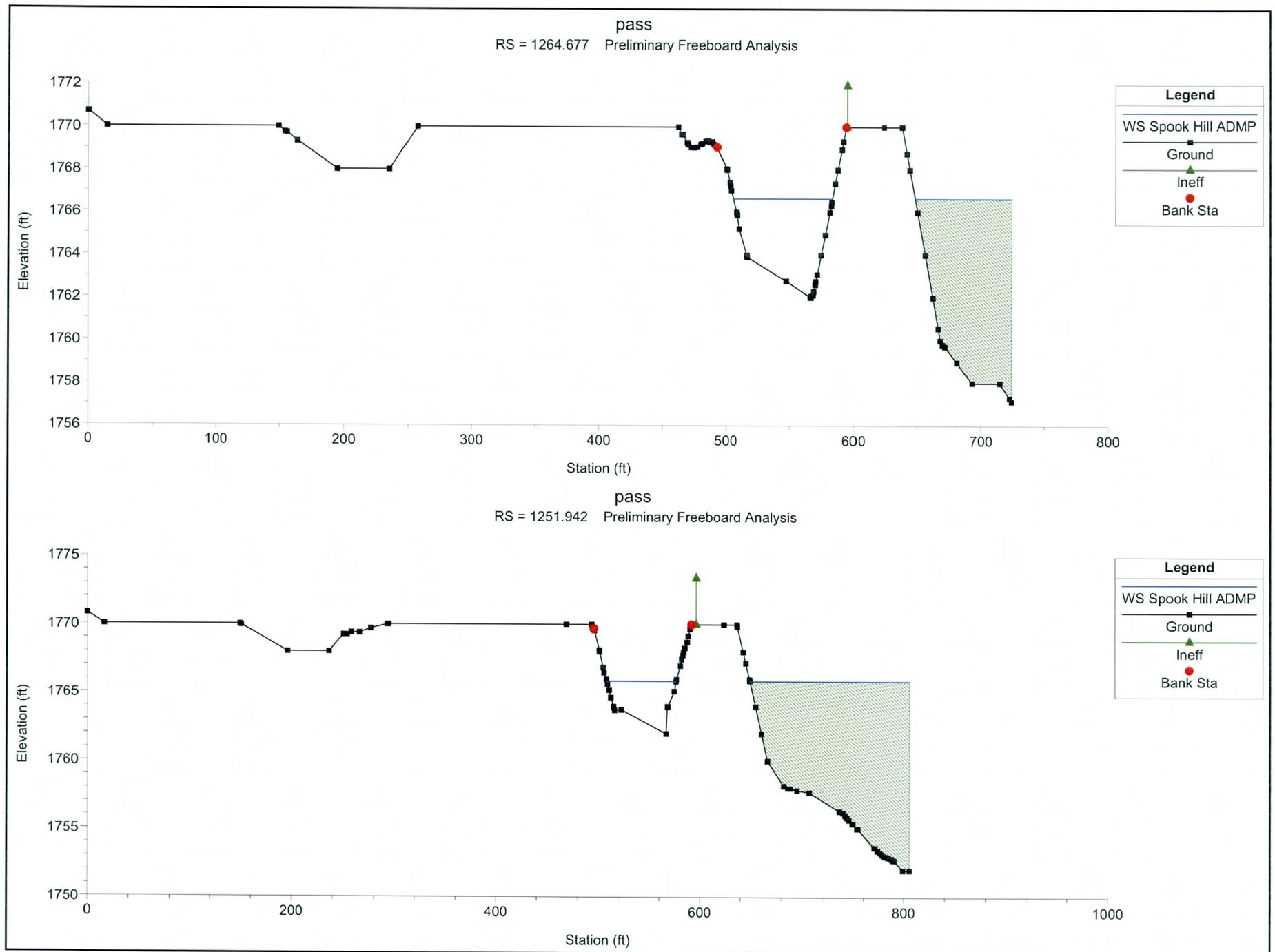


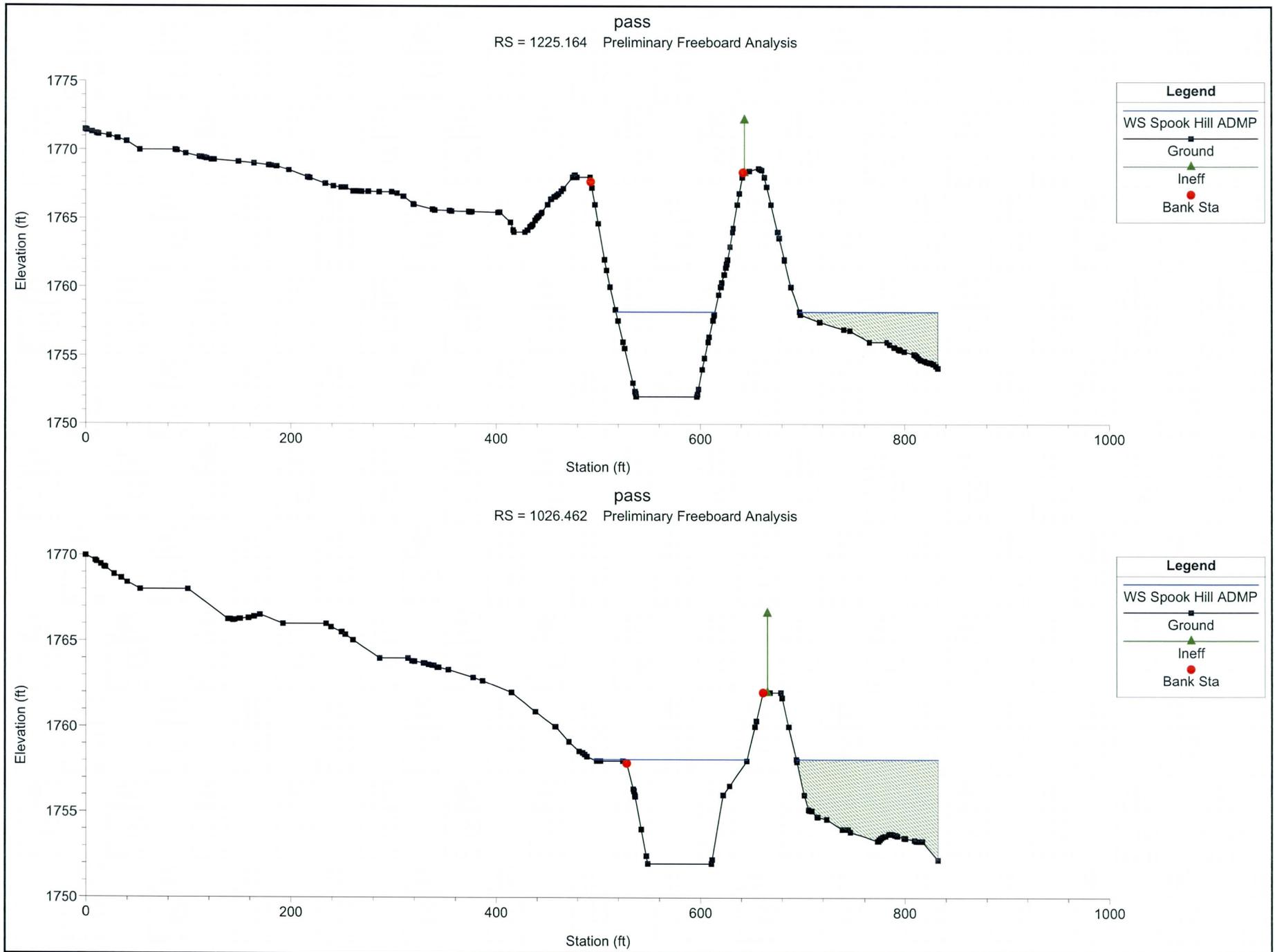


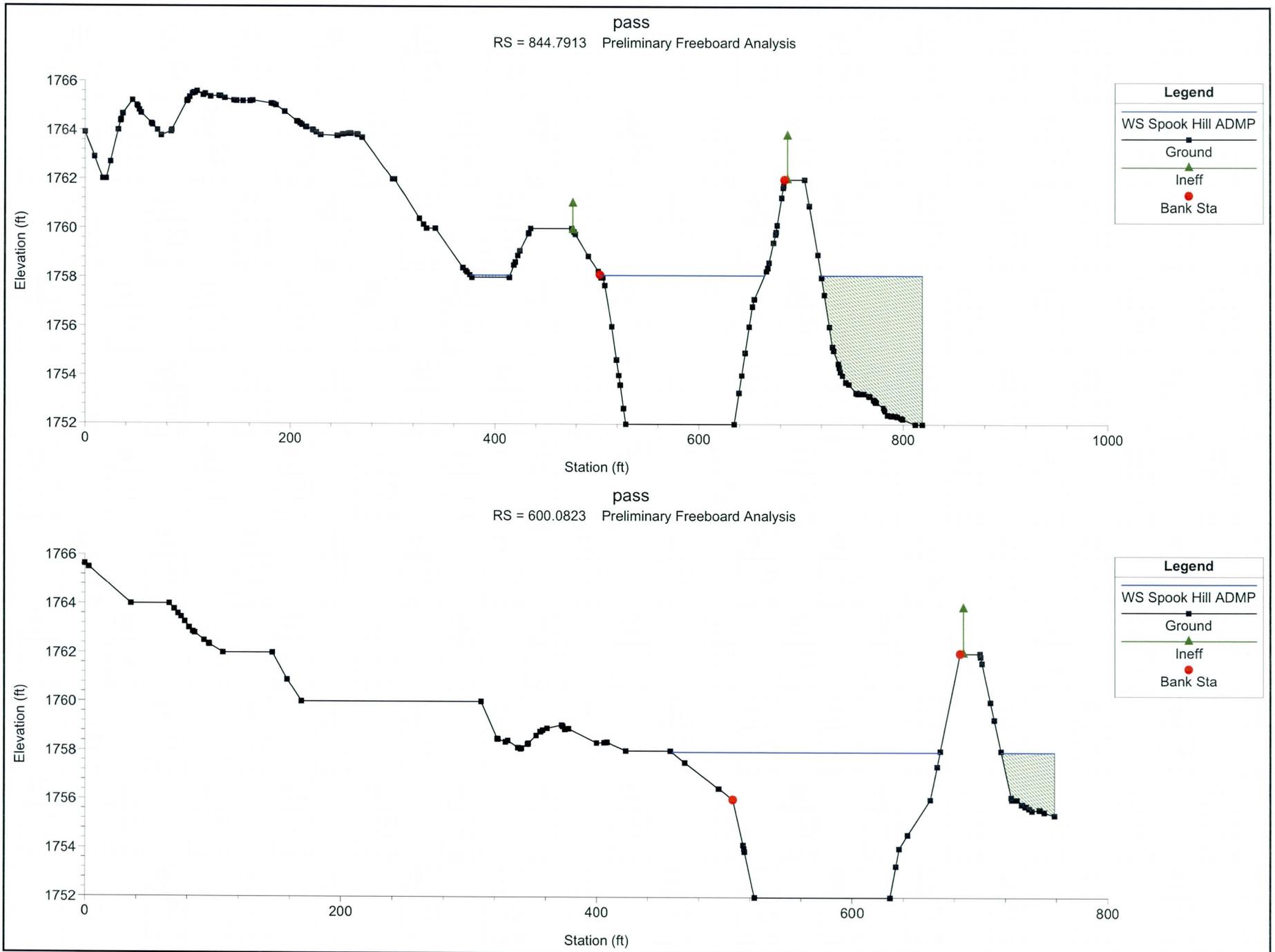


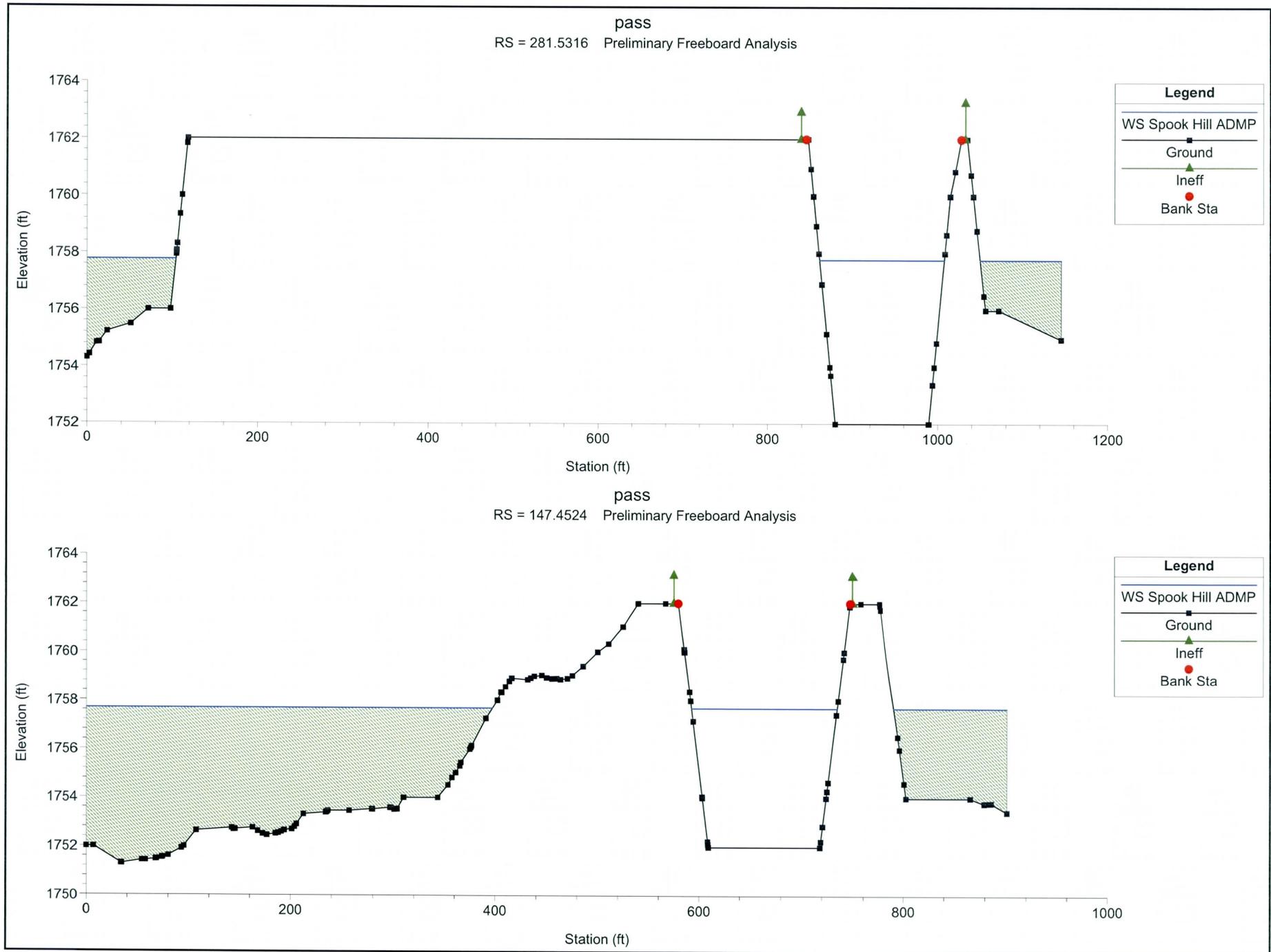


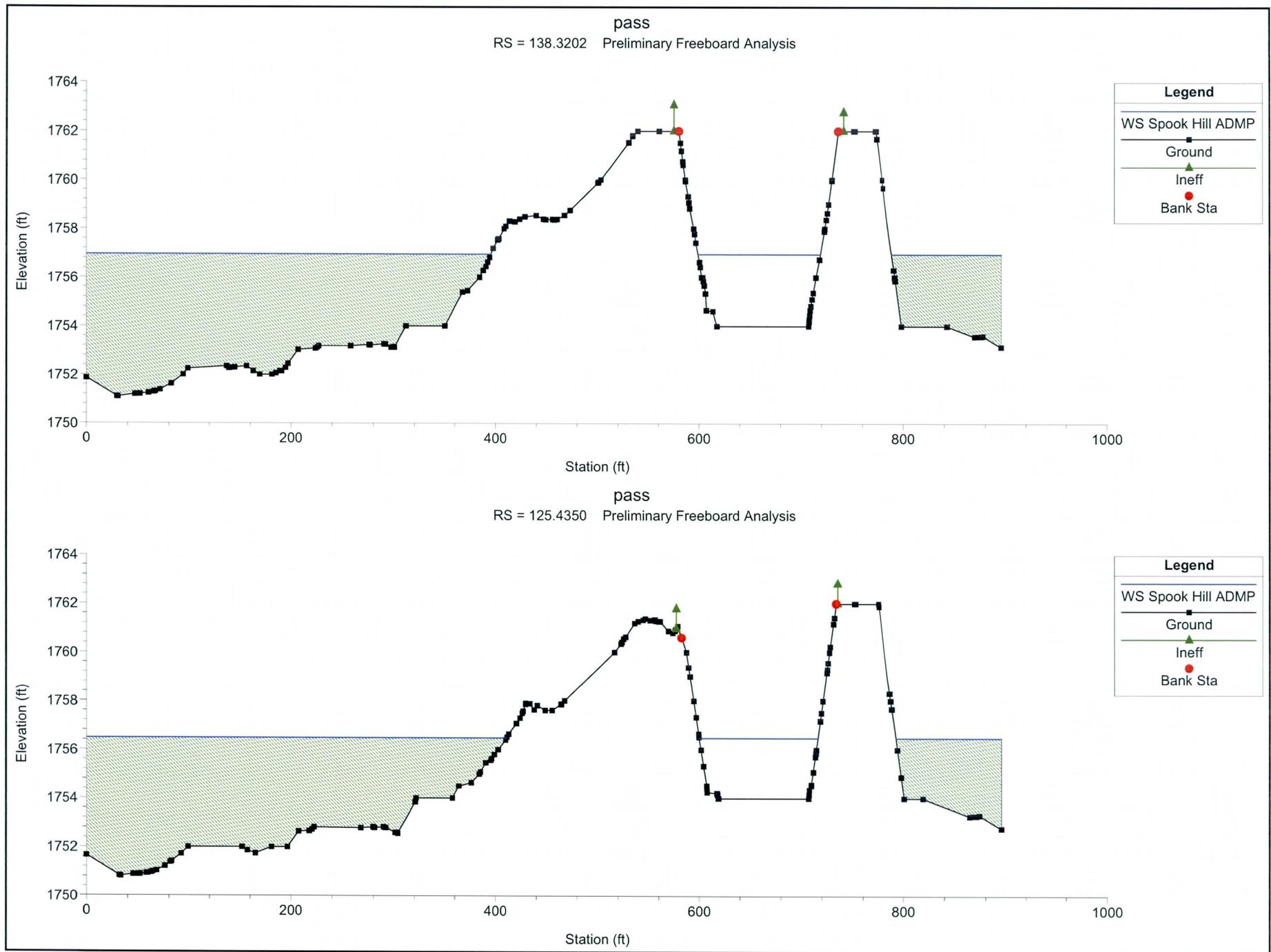


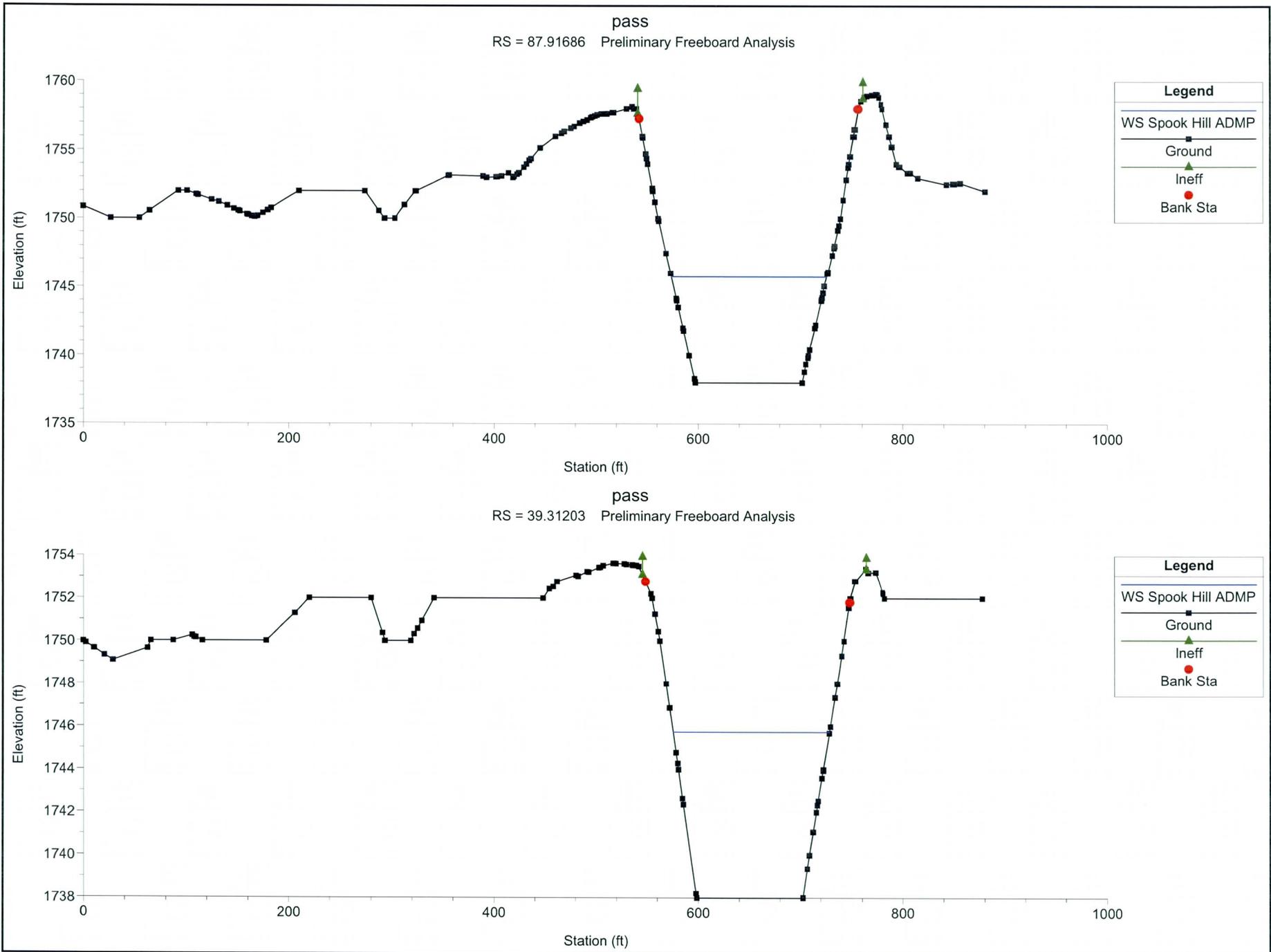






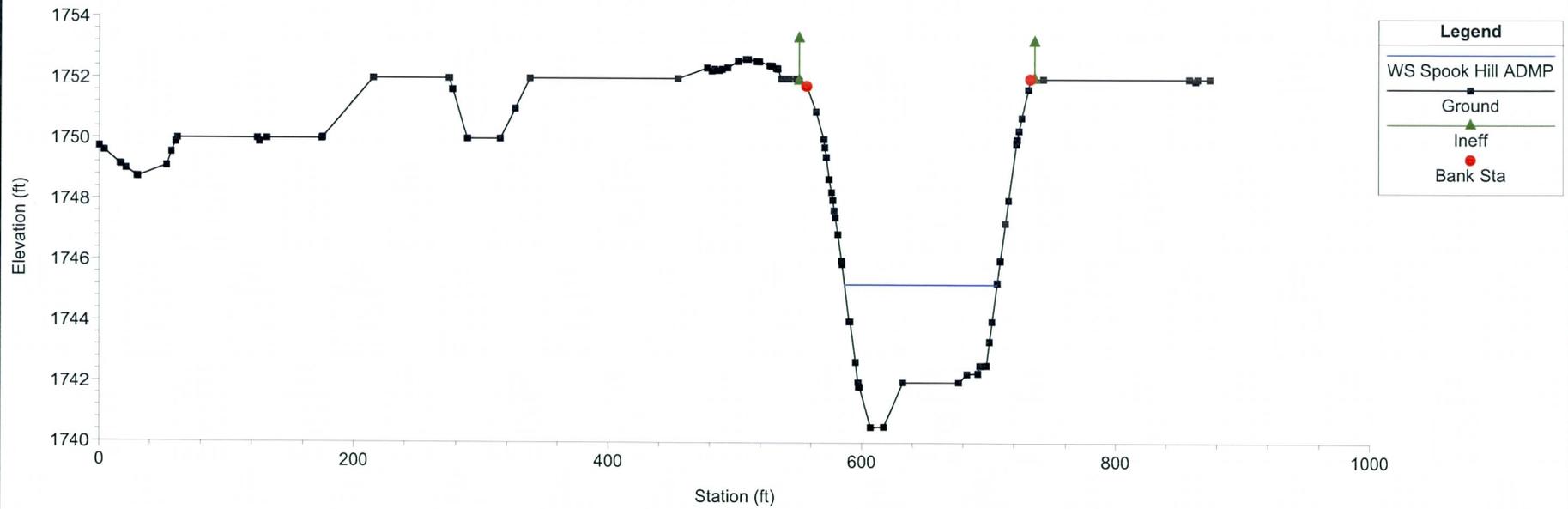






pass

RS = 25.23701 Preliminary Freeboard Analysis





APPENDIX C

FLO-2D Freeboard Analysis

Levee Certification
Pass Mountain Diversion
Mesa, Arizona

Freeboard Assessment

For Pass Mountain Diversion Outlet
Using FLO-2D Model

Prepared for:

Flood Control District of Maricopa County
2801 W. Durango Street
Phoenix, Arizona 85009



Submitted by:

AMEC Earth & Environmental, Inc.
1405 West Auto Drive
Tempe, AZ 85284

June 2011

TABLE OF CONTENTS

| | |
|--|---|
| INTRODUCTION | 3 |
| FLO-2D MODEL DEVELOPMENT | 3 |
| Terrain Data and Imagery | 3 |
| Channel and Hydraulic Structures..... | 3 |
| Levee | 4 |
| Hydraulic Parameters..... | 4 |
| Hydrology and Boundary Conditions | 4 |
| FLO-2D SIMULATION RESULTS | 5 |
| ASSESSMENT OF THE LEVEE FREEBOARD | 5 |
| REFERENCES | 6 |

LIST OF TABLES

Table C-1 Freeboard of Levee at Pass Mountain Diversion Channel

LIST OF FIGURES

- Figure C-1 Project Site
- Figure C-2 FLO-2D Model Domain
- Figure C-3 Maximum Flow Depth on the Floodplain and in the Channel for 100 Year Flood
- Figure C-4 Maximum Velocity Distribution for 100 Year Flood
- Figure C-5 Levee Freeboard Assessment for 100 Year Flood
- Figure C-6 Manning's n Value
- Figure C-7 Pictures
- Figure C-8 Embankment Terminus Cross-Sections
- Figure C-9 Embankment Terminus Topography
- Figure C-10 Levee and Channel Freeboard

INTRODUCTION

Pass Mountain Diversion Outlet was built in the early 1980's. It includes a diversion channel with a levee and several drop structures and an outlet downstream. The channel collects flows from the Pass Mountain watershed at the channel north bank (left bank) and directs the flow to the outlet downstream. The levee located on the channel right bank is approximately 1.4 miles long and 10 feet high, which helps prevent flooding of the urban area south of the channel. For more background on this project, refer to the Levee Certification Report, Section 1 Overview.

This project evaluates the FEMA certification requirements of the levee at Pass Mountain Diversion Outlet (PMDO). It determines the levee freeboard and other CFR 65.10 stipulations to assess if the levee meets federal requirements for minimum flood protection. This study includes creating a FLO-2D model to determine if adequate freeboard is available on the levee and along the diversion channel. The Levee on the project site is shown in Figure C-1.

This report documents the FLO-2D model and the numerical simulation results of the levee freeboard assessment.

FLO-2D MODEL DEVELOPMENT

The FLO-2D model version 2009 was used as the numerical model for the hydraulic analysis and levee freeboard analysis.

The FLO-2D computation domain covers portions of the Pass Mountain Watershed with an approximate area of 1.4 square miles (sq. mi.). It includes both channel and levee with a length of approximately 7000 feet. The model grid size is 25 feet and the total element number is 60667. Figure C-2 shows the FLO-2D model Domain at the project site.

Terrain Data and Imagery

The 2-foot contour mapping obtained from the Flood Control District of Maricopa County (FCDMC) was used for generating the elevation data for the FLO-2D model use.

AMEC survey data (2010) at drop structures and along the channel and levee was used for coding the channel and levee in the FLO-2D model. The top elevations of the levee along the diversion channel right bank were measured every 50 feet and the channel cross section geometric data were surveyed approximately every 300 feet.

Channel and Hydraulic Structures

The channel was coded into the FLO-2D model. The channel cross sections were generated using the HEC-GeoRAS program, version 4.2.93. These cross sections were then converted from the RAS model to the FLO-2D model channel cross sections for the 2D hydraulic analysis using the GDS graphic generator of FLO-2D.

There are three drop structures located within the project site. All of them were coded into the FLO-2D model using the rating table function showing the stage - discharge relationship. The rating table was created by setting a series of steady flow conditions in

the HEC-RAS model to approximate an unsteady flow. The average crest elevation at each structure location was calculated based on the AMEC 2010 survey data and were introduced into the model.

There are 5 – 1 foot diameter pipes which allow flows through the levee during small events. These pipes were not coded into the FLO-2D model as they are considered to be relatively small and as a conservative measure.

Levee

The FLO-2D model consists of approximately a 1.4-mile long levee. The top elevations of the levee were set based on the AMEC 2010 survey data. The levee freeboard adequacy was determined based on the FLO-2D model results.

Hydraulic Parameters

The model roughness parameter was set according to the landuse type found in the “Drainage Design Manual for Maricopa County” (2009). The roughness of 0.05 for the overland flow area was assigned which is smaller than the roughness value suggested by the FLO-2D User Manual (2009). This is considered to be conservative since this results in higher peak discharges and velocities in the diversion channel.

The channel was coded in the FLO-2D model as a compound channel. The artificial diversion channel is approximately 10 – 50 feet wide and 2 - 4 feet deep. The channel consists of earthen bottom and sides, for which a Manning’s n value of 0.02 was chosen. The channel overbank area was covered by scattered or light shrubs and trees and the Manning’s n value of 0.05 was used. The composite Manning’s n value of 0.035 was assigned as the roughness coefficient for the FLO-2D channel.

The channel laterally collects flow from washes upstream. At the collecting cross sections, the flow experiences redirection, contraction or expansion with a strong three dimensional feature of turbulent flow which yields a large resistance to flow. In addition, at several bigger wash confluences with the channel, the channel bottom is covered by some fine or middle size sand coming from the upstream watershed. Therefore, larger Manning’s n values were used at these locations to represent the resistance to flow.

The Manning’s n values used for the FLO-2D model were not calibrated in detail due to lack of the observed and gage data.

Froude number limits of 0.5 were set for both floodplain and channel to force subcritical flow. AMEC’s HEC-RAS analysis (December 2009) resulted in an average Froude number of 0.41 and setting the Froude number limits to 0.5 seems reasonable.

Floodplain and channel storage was considered by the FLO-2D model. The model default value of 0.1 was used, indicating that 10% of each grid element surface is not available for storage.

Hydrology and Boundary Conditions

Upstream Boundary:

The hydrological analysis results performed by Wood Patel (April, 2004) using the HEC-1 model were employed for this simulation. Hydrographs of 100-year flood for the sub-

basins of B240, B210, B220, B200 and B190 predicted by the HEC-1 Model were adopted for the model upstream boundary condition. Floodplain inflow conditions were set for these boundary conditions. If the channel at the location for introducing the inflow hydrograph is wider than the grid size of 25 feet, the hydrograph will be distributed to more than one inflow grids based on local channel and floodplain geometry.

Downstream Boundary Conditions:

Floodplain and channel outflow conditions with no hydrograph were used as the downstream conditions in the FLO-2D model. The flow was discharged out of the grid system as a normal depth flow.

To stabilize the FLO-2D model small amounts of flows were introduced into the channel which helps to build up a certain water depth in the channel. This aids in eliminating numerical problems due to a complex flow condition resulting from the channel collecting flow laterally. This may more realistically represent the variation of channel flow condition during a flood starting from a dry to wet condition gradually.

The infiltration and evaporation losses were not considered in the simulation. This is considered being conservative for inundation mapping purposes.

FLO-2D SIMULATION RESULTS

The 100 year flood event was simulated. The peak discharge for the 100 year flood events for the diversion channel is approximately 15 cfs at the upstream end of the levee and approximately 2000 cfs downstream at the outlet drop structure where the levee officially ends.

The storm water from Pass Mountain watershed flows into the diversion channel and the channel discharge gradually increases with time and distance along the channel. Several larger washes, such as Amigos Wash, Nighthawk Wash and Spillway Wash, contribute more storm water into the channel. The FLO-2D simulated the floodplain attenuation and shows that the peak discharges from subbasins arrive at the diversion channel at different times which reduces the flow concentration in the channel and increases the levee freeboard.

Figure C-3 presents the flow depth on the floodplain and in the channel and Figure C-4 presents the maximum velocity on the floodplain.

Notice that there is a discharge fluctuation at the end of the hydrographs of the drop structures. The Flo-2D simulation results are, however, considered as acceptable since this fluctuation has no influence on the levee freeboard assessment. Further model improvement is not required.

ASSESSMENT OF THE LEVEE FREEBOARD

The FLO-2D model estimated the freeboard adequacy. The results show that the levee freeboard along the diversion channel within the project site at all locations is over 3 feet, which meets the FEMA requirement for certifying a levee (Figure C-5 and Table C-1).

Table C-1 lists levee freeboard at 20-30 foot intervals for the full length of the levee. The only location at which the levee freeboard for the Pass Mountain Diversion is less than 3 feet is the levee embankment terminus at XSEC 1 (see Table C-1, Figures C-8 through C-10). This is the location where the levee ties into the natural ground surface. Just upstream (West) of XSEC 1, runoff will flow around the end of levee just as overland flow occurs at this location. Initially the end of the levee was considered to be XSEC 1, but upon closer review the end of levee is determined to be XSEC 4, where the levee top reaches the typical elevation between 1782 and 1783 feet and where the diversion channel begins.

Table C-1 summarizes the initial freeboard assessment results and Figure C-10 depicts the levee and channel profile with the FLO-2D water surface elevation.

REFERENCES

AMEC, Test Run for FROUDL. May, 2011 (DVD)

Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County, March 2009 (Draft)

FLO-2D Software Inc., *FLO-2D User manual*, 2009

US Army Corps of Engineers, Hydrologic Engineering Center, HEC-GeoRAS version 4.2.93

US Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System, Hydraulic Reference Manual., March 2008

US Army Corps of Engineers, *Hydrologic Engineering Center, HEC-1 Flood Hydrograph Package*, User manual.

Wood Patel & Associates, Spook Hill Area Drainage Master Plan Update, 2002.

Table C-1 FreeBoard of Levee at Pass Mountain Diversion Channel

Federal requirements for minimum flood protection: Minimum Three Feet Freeboard

Cross-Sections 1-3 shown for model correlation, levee starts at cross-section 4

| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 1 | 7079.29 | 7424 | 1780.79 | 5898 | 1783.2 | 2.41 | NA |
| 2 | 7024.09 | 7120 | 1779.76 | 5594 | 1783.96 | 4.2 | NA |
| 3 | 7003.05 | 6816 | 1779.34 | 5595 | 1782.7 | 3.36 | NA |
| 4 | 6984.34 | 6512 | 1777.84 | 5595 | 1782.7 | 4.86 | OK |
| 5 | 6936.44 | 6209 | 1777.67 | 4990 | 1782.43 | 4.76 | OK |
| 6 | 6909.23 | 5905 | 1777.65 | 4991 | 1782.3 | 4.65 | OK |
| 7 | 6882.91 | 5602 | 1777.64 | 4688 | 1782.26 | 4.62 | OK |
| 8 | 6847.43 | 5299 | 1777.64 | 4385 | 1782.15 | 4.51 | OK |
| 9 | 6812.26 | 4996 | 1777.64 | 4082 | 1782.2 | 4.56 | OK |
| 10 | 6795.09 | 4692 | 1777.64 | 4082 | 1782.2 | 4.56 | OK |
| 11 | 6759.09 | 4389 | 1777.64 | 3779 | 1782.18 | 4.54 | OK |
| 12 | 6731.26 | 4390 | 1777.64 | 3477 | 1782.23 | 4.59 | OK |
| 13 | 6702.1 | 4087 | 1777.64 | 3478 | 1782.24 | 4.6 | OK |
| 14 | 6678.21 | 4088 | 1777.64 | 3175 | 1782.03 | 4.39 | OK |
| 15 | 6654.56 | 4089 | 1777.64 | 3175 | 1782.03 | 4.39 | OK |
| 16 | 6622.54 | 3786 | 1777.65 | 2873 | 1782.22 | 4.57 | OK |
| 17 | 6599.18 | 3787 | 1777.64 | 2874 | 1782.23 | 4.59 | OK |
| 18 | 6558.46 | 3788 | 1777.65 | 2572 | 1781.97 | 4.32 | OK |
| 19 | 6533.75 | 4093 | 1777.65 | 2573 | 1782.13 | 4.48 | OK |
| 20 | 6507.78 | 4094 | 1777.65 | 2574 | 1782.12 | 4.47 | OK |
| 21 | 6483.35 | 3791 | 1777.65 | 2575 | 1782.1 | 4.45 | OK |
| 22 | 6458.09 | 3792 | 1777.65 | 2576 | 1782.08 | 4.43 | OK |
| 23 | 6433.17 | 3793 | 1777.65 | 2577 | 1782.07 | 4.42 | OK |
| 24 | 6408.48 | 3794 | 1777.65 | 2578 | 1782.07 | 4.42 | OK |
| 25 | 6383.07 | 3795 | 1777.65 | 2579 | 1782.1 | 4.45 | OK |
| 26 | 6357.75 | 3796 | 1777.64 | 2580 | 1782.12 | 4.48 | OK |
| 27 | 6333.31 | 3797 | 1777.64 | 2581 | 1782.15 | 4.51 | OK |
| 28 | 6308.15 | 3798 | 1777.64 | 2582 | 1782.17 | 4.53 | OK |
| 29 | 6283.5 | 3799 | 1777.64 | 2583 | 1782.19 | 4.55 | OK |
| 30 | 6258.6 | 3800 | 1777.63 | 2584 | 1782.18 | 4.55 | OK |
| 31 | 6233.08 | 3801 | 1777.63 | 2585 | 1782.15 | 4.52 | OK |
| 32 | 6207.87 | 3802 | 1777.63 | 2586 | 1782.13 | 4.5 | OK |
| 33 | 6182.73 | 3803 | 1777.63 | 2587 | 1782.11 | 4.48 | OK |
| 34 | 6158.22 | 3804 | 1777.63 | 2588 | 1782.1 | 4.47 | OK |
| 35 | 6132.7 | 3805 | 1777.63 | 2589 | 1782.09 | 4.46 | OK |
| 36 | 6108.73 | 3806 | 1777.63 | 2590 | 1782.08 | 4.45 | OK |
| 37 | 6083.84 | 3807 | 1777.63 | 2591 | 1782.07 | 4.44 | OK |
| 38 | 6058.1 | 3808 | 1777.63 | 2592 | 1782.06 | 4.43 | OK |
| 39 | 6032.94 | 3809 | 1777.63 | 2593 | 1782.04 | 4.41 | OK |
| 40 | 6008.03 | 3810 | 1777.63 | 2594 | 1782.06 | 4.43 | OK |
| 41 | 5983.25 | 3811 | 1777.63 | 2595 | 1782.09 | 4.46 | OK |
| 42 | 5957.55 | 3812 | 1777.63 | 2596 | 1782.12 | 4.49 | OK |
| 43 | 5933.06 | 3813 | 1777.64 | 2597 | 1782.15 | 4.51 | OK |
| 44 | 5908.54 | 3814 | 1777.63 | 2598 | 1782.16 | 4.53 | OK |
| 45 | 5883.11 | 3815 | 1777.63 | 2599 | 1782.12 | 4.49 | OK |

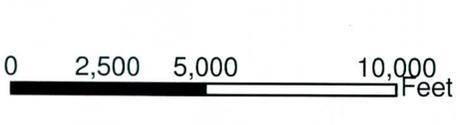
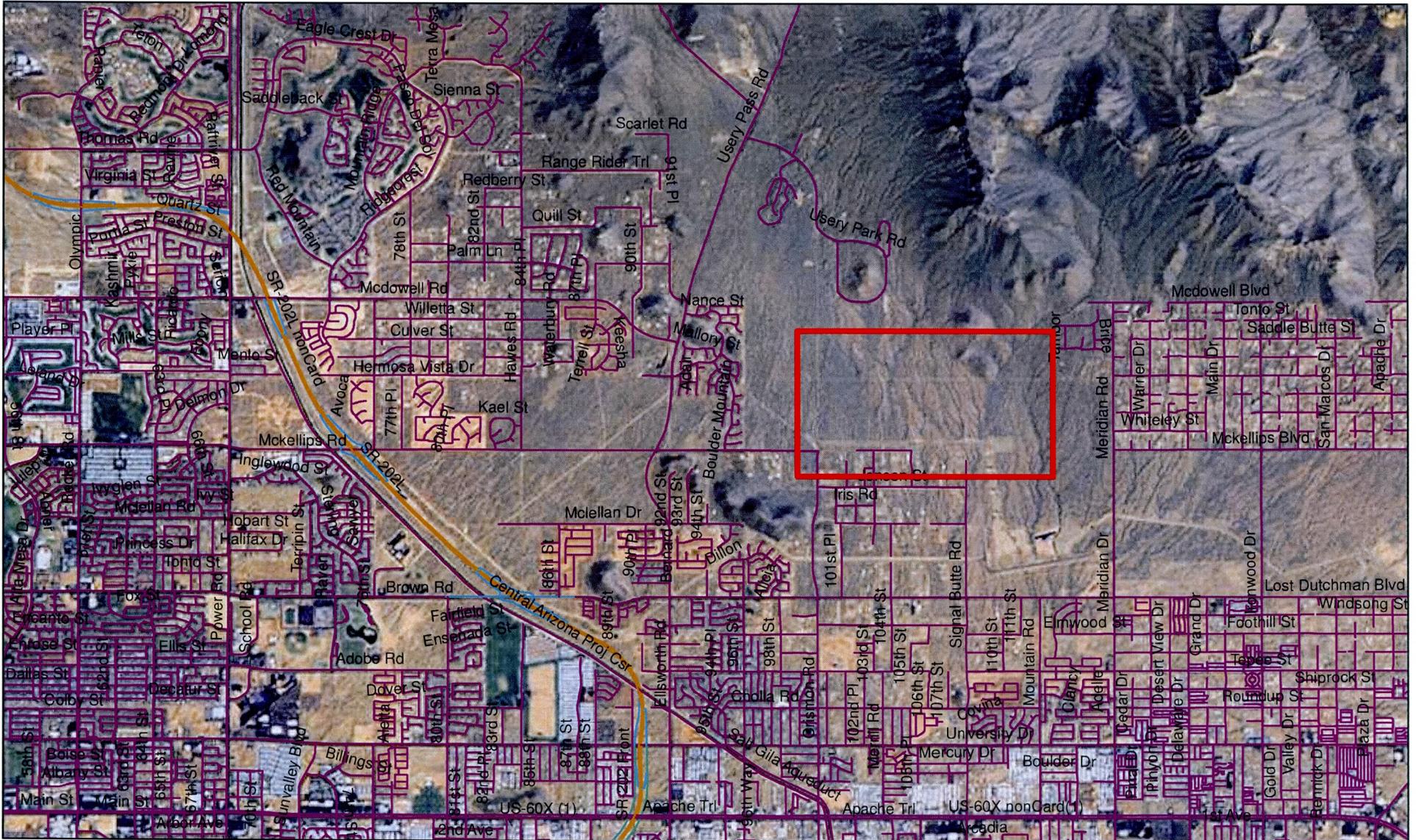
| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 46 | 5858.07 | 3816 | 1777.63 | 2600 | 1782.08 | 4.45 | OK |
| 47 | 5833.4 | 3817 | 1777.63 | 2601 | 1782.05 | 4.42 | OK |
| 48 | 5807.84 | 3818 | 1777.64 | 2602 | 1782.03 | 4.39 | OK |
| 49 | 5782.95 | 3819 | 1777.64 | 2603 | 1782.03 | 4.39 | OK |
| 50 | 5758.47 | 3820 | 1777.63 | 2604 | 1782.01 | 4.38 | OK |
| 51 | 5733.1 | 3821 | 1777.63 | 2605 | 1781.99 | 4.36 | OK |
| 52 | 5708.04 | 3822 | 1777.63 | 2606 | 1781.97 | 4.34 | OK |
| 53 | 5682.86 | 3823 | 1777.63 | 2607 | 1781.93 | 4.3 | OK |
| 54 | 5658.28 | 4128 | 1777.63 | 2608 | 1781.91 | 4.28 | OK |
| 55 | 5633.39 | 4129 | 1777.63 | 2609 | 1781.97 | 4.34 | OK |
| 56 | 5608.46 | 4130 | 1777.63 | 2610 | 1782.04 | 4.41 | OK |
| 57 | 5583.31 | 4131 | 1777.63 | 2611 | 1782.1 | 4.47 | OK |
| 58 | 5557.99 | 4132 | 1777.63 | 2612 | 1782.17 | 4.54 | OK |
| 59 | 5533.52 | 4133 | 1777.63 | 2613 | 1782.22 | 4.59 | OK |
| 60 | 5508.07 | 3830 | 1777.64 | 2614 | 1782.25 | 4.61 | OK |
| 61 | 5483.45 | 3831 | 1777.64 | 2615 | 1782.26 | 4.62 | OK |
| 62 | 5457.73 | 3832 | 1777.63 | 2616 | 1782.26 | 4.63 | OK |
| 63 | 5433.36 | 3833 | 1777.63 | 2617 | 1782.26 | 4.63 | OK |
| 64 | 5408.46 | 3834 | 1777.63 | 2618 | 1782.24 | 4.61 | OK |
| 65 | 5383.06 | 3835 | 1777.63 | 2619 | 1782.19 | 4.56 | OK |
| 66 | 5357.06 | 3836 | 1777.63 | 2620 | 1782.12 | 4.49 | OK |
| 67 | 5332.44 | 3837 | 1777.62 | 2621 | 1782.05 | 4.43 | OK |
| 68 | 5307.54 | 3838 | 1777.62 | 2622 | 1781.98 | 4.36 | OK |
| 69 | 5282.92 | 3839 | 1777.62 | 2623 | 1781.95 | 4.33 | OK |
| 70 | 5257.48 | 3840 | 1777.62 | 2624 | 1781.95 | 4.33 | OK |
| 71 | 5231.97 | 3841 | 1777.61 | 2625 | 1781.95 | 4.34 | OK |
| 72 | 5207.95 | 3842 | 1777.62 | 2626 | 1781.96 | 4.34 | OK |
| 73 | 5183.07 | 3843 | 1777.61 | 2627 | 1781.97 | 4.36 | OK |
| 74 | 5157.9 | 3844 | 1777.6 | 2628 | 1781.99 | 4.39 | OK |
| 75 | 5133.31 | 3845 | 1777.59 | 2629 | 1782.03 | 4.44 | OK |
| 76 | 5107.82 | 3846 | 1777.59 | 2630 | 1782.06 | 4.47 | OK |
| 77 | 5083.54 | 3847 | 1777.59 | 2631 | 1782.09 | 4.5 | OK |
| 78 | 5058.66 | 3848 | 1777.58 | 2632 | 1782.1 | 4.52 | OK |
| 79 | 5033.17 | 3849 | 1777.58 | 2633 | 1782.12 | 4.54 | OK |
| 80 | 5007.69 | 3850 | 1777.58 | 2634 | 1782.14 | 4.56 | OK |
| 81 | 4982.81 | 3851 | 1777.57 | 2635 | 1782.13 | 4.56 | OK |
| 82 | 4957.92 | 3852 | 1777.57 | 2636 | 1782.12 | 4.55 | OK |
| 83 | 4933.15 | 3853 | 1777.57 | 2637 | 1782.1 | 4.53 | OK |
| 84 | 4907.81 | 3854 | 1777.55 | 2638 | 1782.14 | 4.59 | OK |
| 85 | 4883.15 | 3855 | 1777.54 | 2639 | 1782.18 | 4.64 | OK |
| 86 | 4858.11 | 3856 | 1777.54 | 2640 | 1781.95 | 4.41 | OK |
| 87 | 4833.22 | 3857 | 1777.53 | 2641 | 1781.9 | 4.37 | OK |
| 88 | 4808.38 | 3858 | 1777.5 | 2642 | 1781.88 | 4.38 | OK |
| 89 | 4783.44 | 3859 | 1777.44 | 2643 | 1782.15 | 4.71 | OK |
| 90 | 4757.97 | 3860 | 1777.44 | 2644 | 1782.17 | 4.73 | OK |
| 91 | 4733.08 | 3861 | 1777.44 | 2645 | 1782.2 | 4.76 | OK |
| 92 | 4707.9 | 3862 | 1777.43 | 2646 | 1782.22 | 4.79 | OK |
| 93 | 4682.54 | 3863 | 1777.44 | 2647 | 1782.25 | 4.81 | OK |
| 94 | 4658.58 | 3864 | 1777.45 | 2648 | 1782.28 | 4.83 | OK |

| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 95 | 4632.55 | 3865 | 1777.44 | 2649 | 1782.32 | 4.88 | OK |
| 96 | 4607.79 | 3866 | 1777.43 | 2650 | 1782.36 | 4.93 | OK |
| 97 | 4582.61 | 3867 | 1777.43 | 2651 | 1782.39 | 4.96 | OK |
| 98 | 4557.81 | 3868 | 1777.43 | 2652 | 1782.37 | 4.94 | OK |
| 99 | 4532.67 | 3869 | 1777.42 | 2653 | 1782.34 | 4.92 | OK |
| 100 | 4508.26 | 3870 | 1777.42 | 2654 | 1782.31 | 4.89 | OK |
| 101 | 4483.49 | 3871 | 1777.43 | 2655 | 1782.27 | 4.84 | OK |
| 102 | 4458.3 | 4176 | 1777.42 | 2656 | 1782.21 | 4.79 | OK |
| 103 | 4433.52 | 4177 | 1777.41 | 2657 | 1782.16 | 4.75 | OK |
| 104 | 4408.75 | 4178 | 1777.42 | 2658 | 1782.13 | 4.71 | OK |
| 105 | 4384.08 | 4179 | 1777.41 | 2659 | 1782.11 | 4.7 | OK |
| 106 | 4359 | 4180 | 1777.41 | 2660 | 1782.1 | 4.69 | OK |
| 107 | 4332.46 | 4181 | 1777.41 | 2661 | 1782.09 | 4.68 | OK |
| 108 | 4307.96 | 3878 | 1777.42 | 2662 | 1782.08 | 4.66 | OK |
| 109 | 4283.17 | 3879 | 1777.41 | 2663 | 1782.06 | 4.65 | OK |
| 110 | 4258.38 | 3880 | 1777.41 | 2664 | 1782.04 | 4.63 | OK |
| 111 | 4233.98 | 3881 | 1777.4 | 2665 | 1782.02 | 4.62 | OK |
| 112 | 4208.02 | 3882 | 1777.39 | 2666 | 1782.04 | 4.65 | OK |
| 113 | 4183.63 | 3883 | 1777.39 | 2667 | 1782.01 | 4.62 | OK |
| 114 | 4158.06 | 3884 | 1777.39 | 2668 | 1782 | 4.61 | OK |
| 115 | 4133.63 | 3885 | 1777.39 | 2669 | 1781.96 | 4.57 | OK |
| 116 | 4108.46 | 3886 | 1777.38 | 2670 | 1781.94 | 4.56 | OK |
| 117 | 4082.94 | 3887 | 1777.37 | 2671 | 1781.93 | 4.56 | OK |
| 118 | 4057.42 | 3888 | 1777.36 | 2672 | 1781.91 | 4.55 | OK |
| 119 | 4033.31 | 3889 | 1777.35 | 2673 | 1781.95 | 4.6 | OK |
| 120 | 4008.15 | 3890 | 1777.35 | 2674 | 1782.03 | 4.68 | OK |
| 121 | 3982.64 | 3891 | 1777.34 | 2675 | 1782.08 | 4.74 | OK |
| 122 | 3958.19 | 3892 | 1777.34 | 2676 | 1782.13 | 4.79 | OK |
| 123 | 3932.67 | 3893 | 1777.33 | 2677 | 1782.18 | 4.85 | OK |
| 124 | 3908.2 | 3894 | 1777.33 | 2678 | 1782.19 | 4.86 | OK |
| 125 | 3883.05 | 3895 | 1777.32 | 2679 | 1782.06 | 4.74 | OK |
| 126 | 3858.22 | 3896 | 1777.31 | 2680 | 1782.04 | 4.73 | OK |
| 127 | 3833.08 | 3897 | 1777.31 | 2681 | 1782.03 | 4.72 | OK |
| 128 | 3808.25 | 3898 | 1777.3 | 2682 | 1782.03 | 4.73 | OK |
| 129 | 3783.11 | 3899 | 1777.27 | 2683 | 1782.07 | 4.8 | OK |
| 130 | 3757.97 | 3900 | 1777.27 | 2684 | 1782.11 | 4.84 | OK |
| 131 | 3733.82 | 3901 | 1777.27 | 2685 | 1782.16 | 4.89 | OK |
| 132 | 3708.38 | 3902 | 1777.25 | 2686 | 1782.17 | 4.92 | OK |
| 133 | 3683.56 | 3903 | 1777.25 | 2687 | 1782.18 | 4.93 | OK |
| 134 | 3657.96 | 4208 | 1777.25 | 2688 | 1782.18 | 4.93 | OK |
| 135 | 3632.91 | 4209 | 1777.25 | 2689 | 1782.18 | 4.93 | OK |
| 136 | 3608.14 | 4210 | 1777.23 | 2690 | 1782.17 | 4.94 | OK |
| 137 | 3583.34 | 3907 | 1777.2 | 2691 | 1782.15 | 4.95 | OK |
| 138 | 3560 | 3908 | 1777.18 | 2692 | 1782.12 | 4.94 | OK |
| 139 | 3533.81 | 3909 | 1777.17 | 2693 | 1782.1 | 4.93 | OK |
| 140 | 3508.08 | 3910 | 1777.16 | 2694 | 1782.08 | 4.92 | OK |
| 141 | 3483.57 | 3911 | 1777.14 | 2695 | 1782.06 | 4.92 | OK |
| 142 | 3458.38 | 3912 | 1777.13 | 2696 | 1782.04 | 4.91 | OK |
| 143 | 3433.19 | 3913 | 1777.12 | 2697 | 1782.01 | 4.89 | OK |

| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 144 | 3408.41 | 3914 | 1777.11 | 2698 | 1781.93 | 4.82 | OK |
| 145 | 3383.23 | 3915 | 1777.11 | 2699 | 1781.85 | 4.74 | OK |
| 146 | 3358.42 | 3916 | 1777.1 | 2700 | 1781.76 | 4.66 | OK |
| 147 | 3333.58 | 3917 | 1777.1 | 2701 | 1781.66 | 4.56 | OK |
| 148 | 3308.42 | 3918 | 1777.1 | 2702 | 1781.58 | 4.48 | OK |
| 149 | 3282.58 | 3919 | 1777.1 | 2703 | 1781.64 | 4.54 | OK |
| 150 | 3258.11 | 3920 | 1777.09 | 2704 | 1781.71 | 4.62 | OK |
| 151 | 3233.27 | 3921 | 1777.08 | 2705 | 1781.77 | 4.69 | OK |
| 152 | 3208.44 | 4226 | 1777.08 | 2706 | 1781.8 | 4.72 | OK |
| 153 | 3182.66 | 4227 | 1777.08 | 2707 | 1781.77 | 4.69 | OK |
| 154 | 3158.16 | 4228 | 1777.07 | 2708 | 1781.8 | 4.73 | OK |
| 155 | 3136.24 | 4229 | 1777.04 | 2709 | 1781.72 | 4.68 | OK |
| 156 | 3116.28 | 4230 | 1777 | 2710 | 1781.25 | 4.25 | OK |
| 157 | 3087.28 | 4231 | 1765.57 | 2711 | 1779.6 | 14.03 | OK |
| 158 | 3058.09 | 4536 | 1765.57 | 2712 | 1776.54 | 10.97 | OK |
| 159 | 3033.09 | 4537 | 1765.58 | 2713 | 1773.8 | 8.22 | OK |
| 160 | 3008.09 | 4538 | 1765.57 | 2714 | 1771.8 | 6.23 | OK |
| 161 | 2983.09 | 4539 | 1765.56 | 2715 | 1770.92 | 5.36 | OK |
| 162 | 2958.09 | 4540 | 1765.55 | 2716 | 1770.73 | 5.18 | OK |
| 163 | 2933.09 | 4541 | 1765.54 | 2717 | 1770.54 | 5 | OK |
| 164 | 2908.09 | 4542 | 1765.53 | 2718 | 1770.45 | 4.92 | OK |
| 165 | 2883.09 | 4543 | 1765.52 | 2719 | 1770.5 | 4.98 | OK |
| 166 | 2857.87 | 4544 | 1765.52 | 2720 | 1770.62 | 5.1 | OK |
| 167 | 2834.04 | 4545 | 1765.52 | 2721 | 1770.64 | 5.12 | OK |
| 168 | 2807.62 | 4546 | 1765.51 | 2722 | 1770.67 | 5.16 | OK |
| 169 | 2783.33 | 4547 | 1765.5 | 2723 | 1770.67 | 5.17 | OK |
| 170 | 2758.2 | 4548 | 1765.49 | 2724 | 1770.67 | 5.18 | OK |
| 171 | 2732.87 | 4245 | 1765.47 | 2725 | 1770.67 | 5.2 | OK |
| 172 | 2708.19 | 4246 | 1765.46 | 2726 | 1770.65 | 5.19 | OK |
| 173 | 2683.39 | 4247 | 1765.45 | 2727 | 1770.62 | 5.17 | OK |
| 174 | 2657.29 | 4248 | 1765.44 | 2728 | 1770.55 | 5.11 | OK |
| 175 | 2633.49 | 4249 | 1765.43 | 2729 | 1770.46 | 5.03 | OK |
| 176 | 2608.23 | 4250 | 1765.42 | 2730 | 1770.4 | 4.98 | OK |
| 177 | 2583.59 | 4251 | 1765.42 | 2731 | 1770.34 | 4.92 | OK |
| 178 | 2558.14 | 4252 | 1765.41 | 2732 | 1770.3 | 4.89 | OK |
| 179 | 2533.32 | 4253 | 1765.4 | 2733 | 1770.3 | 4.9 | OK |
| 180 | 2508.26 | 4254 | 1765.39 | 2734 | 1770.3 | 4.91 | OK |
| 181 | 2483.2 | 4255 | 1765.38 | 2735 | 1770.3 | 4.92 | OK |
| 182 | 2457.96 | 4256 | 1765.37 | 2736 | 1770.3 | 4.93 | OK |
| 183 | 2433.11 | 4257 | 1765.37 | 2737 | 1770.31 | 4.94 | OK |
| 184 | 2407.69 | 4258 | 1765.36 | 2738 | 1770.34 | 4.98 | OK |
| 185 | 2382.87 | 4259 | 1765.35 | 2739 | 1770.36 | 5.01 | OK |
| 186 | 2357.21 | 4260 | 1765.34 | 2740 | 1770.36 | 5.02 | OK |
| 187 | 2333.76 | 4261 | 1765.33 | 2741 | 1770.35 | 5.02 | OK |
| 188 | 2308.08 | 4262 | 1765.33 | 2742 | 1770.39 | 5.06 | OK |
| 189 | 2283.06 | 4263 | 1765.32 | 2743 | 1770.45 | 5.13 | OK |
| 190 | 2258.22 | 4264 | 1765.31 | 2744 | 1770.53 | 5.22 | OK |
| 191 | 2232.46 | 4265 | 1765.3 | 2745 | 1770.61 | 5.31 | OK |
| 192 | 2207.34 | 4266 | 1765.29 | 2746 | 1770.71 | 5.42 | OK |

| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 193 | 2183.47 | 4267 | 1765.29 | 2747 | 1770.74 | 5.45 | OK |
| 194 | 2158.06 | 4268 | 1765.28 | 2748 | 1770.7 | 5.42 | OK |
| 195 | 2132.21 | 4269 | 1765.27 | 2749 | 1770.67 | 5.4 | OK |
| 196 | 2107.81 | 4270 | 1765.26 | 2750 | 1770.62 | 5.36 | OK |
| 197 | 2082.69 | 4271 | 1765.25 | 2751 | 1770.58 | 5.33 | OK |
| 198 | 2058.38 | 4272 | 1765.25 | 2752 | 1770.59 | 5.34 | OK |
| 199 | 2032.23 | 4273 | 1765.24 | 2753 | 1770.67 | 5.43 | OK |
| 200 | 2007.92 | 4274 | 1765.23 | 2754 | 1770.72 | 5.49 | OK |
| 201 | 1983.26 | 4275 | 1765.22 | 2755 | 1770.77 | 5.55 | OK |
| 202 | 1957.86 | 4276 | 1765.21 | 2756 | 1770.81 | 5.6 | OK |
| 203 | 1933.66 | 4277 | 1765.2 | 2757 | 1770.85 | 5.65 | OK |
| 204 | 1907.81 | 4278 | 1765.19 | 2758 | 1770.97 | 5.78 | OK |
| 205 | 1882.64 | 4279 | 1765.18 | 2759 | 1770.8 | 5.62 | OK |
| 206 | 1857.48 | 4280 | 1765.17 | 2760 | 1770.7 | 5.53 | OK |
| 207 | 1833.08 | 4281 | 1765.16 | 2761 | 1770.81 | 5.65 | OK |
| 208 | 1807.87 | 4282 | 1765.16 | 2762 | 1770.76 | 5.6 | OK |
| 209 | 1784.24 | 4283 | 1765.16 | 2763 | 1770.61 | 5.45 | OK |
| 210 | 1758.08 | 4284 | 1765.15 | 2764 | 1770.46 | 5.31 | OK |
| 211 | 1733.08 | 4285 | 1765.15 | 2765 | 1770.29 | 5.14 | OK |
| 212 | 1708.08 | 4286 | 1765.15 | 2766 | 1770.19 | 5.04 | OK |
| 213 | 1683.08 | 4287 | 1765.15 | 2767 | 1770.18 | 5.03 | OK |
| 214 | 1658.08 | 4288 | 1765.15 | 2768 | 1770.16 | 5.01 | OK |
| 215 | 1633.08 | 4289 | 1765.15 | 2769 | 1770.16 | 5.01 | OK |
| 216 | 1608.08 | 4290 | 1765.15 | 2770 | 1770.19 | 5.04 | OK |
| 217 | 1583.07 | 4595 | 1765.15 | 2771 | 1770.22 | 5.07 | OK |
| 218 | 1558.07 | 4596 | 1765.15 | 2772 | 1770.4 | 5.25 | OK |
| 219 | 1533.07 | 4597 | 1765.14 | 2773 | 1770.57 | 5.43 | OK |
| 220 | 1508.47 | 4598 | 1765.14 | 2774 | 1770.71 | 5.57 | OK |
| 221 | 1483.24 | 4599 | 1765.13 | 2775 | 1770.84 | 5.71 | OK |
| 222 | 1457.44 | 4600 | 1765.12 | 2776 | 1770.93 | 5.81 | OK |
| 223 | 1432.71 | 4601 | 1765.12 | 2777 | 1770.97 | 5.85 | OK |
| 224 | 1401.03 | 4602 | 1765.1 | 2778 | 1770.98 | 5.88 | OK |
| 225 | 1382.65 | 4603 | 1756.6 | 2779 | 1770.6 | 14 | OK |
| 226 | 1358.45 | 4908 | 1756.57 | 2780 | 1767.6 | 11.03 | OK |
| 227 | 1333.65 | 4909 | 1756.53 | 2781 | 1765.2 | 8.67 | OK |
| 228 | 1308.22 | 4910 | 1756.52 | 2782 | 1763.5 | 6.98 | OK |
| 229 | 1283.01 | 4911 | 1756.51 | 2783 | 1762.4 | 5.89 | OK |
| 230 | 1257.92 | 4608 | 1756.5 | 2784 | 1762.06 | 5.56 | OK |
| 231 | 1233.27 | 4609 | 1756.51 | 2785 | 1762.14 | 5.63 | OK |
| 232 | 1208.07 | 4610 | 1756.47 | 2786 | 1762.25 | 5.78 | OK |
| 233 | 1183.07 | 4611 | 1756.48 | 2787 | 1762.31 | 5.83 | OK |
| 234 | 1158.07 | 4612 | 1756.48 | 2788 | 1762.39 | 5.91 | OK |
| 235 | 1133.62 | 4613 | 1756.47 | 2789 | 1762.46 | 5.99 | OK |
| 236 | 1108.07 | 4614 | 1756.46 | 2790 | 1762.47 | 6.01 | OK |
| 237 | 1083.08 | 4919 | 1756.45 | 2791 | 1762.47 | 6.02 | OK |
| 238 | 1057.98 | 4920 | 1756.46 | 2792 | 1762.57 | 6.11 | OK |
| 239 | 1032.94 | 4921 | 1756.44 | 2793 | 1762.65 | 6.21 | OK |
| 240 | 1007.44 | 4922 | 1756.44 | 2490 | 1762.75 | 6.31 | OK |
| 241 | 983.28 | 4923 | 1756.44 | 2491 | 1762.79 | 6.35 | OK |

| XSEC | Channel Station | Channel | | Levee | | Levee Freeboard | Status |
|------|-----------------|---------|-----------------------|-------|---------------------|-----------------|--------|
| | | Node | Maximum Water Surface | Node | Levee Top Elevation | | |
| | | | (ft) | | (ft) | (ft) | |
| 242 | 958.81 | 4924 | 1756.44 | 2492 | 1762.76 | 6.32 | OK |
| 243 | 933.96 | 4925 | 1756.45 | 2493 | 1762.72 | 6.27 | OK |
| 244 | 907.94 | 4926 | 1756.44 | 2494 | 1762.67 | 6.23 | OK |
| 245 | 882.59 | 4927 | 1756.43 | 2495 | 1762.62 | 6.19 | OK |
| 246 | 858.01 | 4928 | 1756.43 | 2496 | 1762.57 | 6.14 | OK |
| 247 | 832.83 | 4929 | 1756.42 | 2497 | 1762.53 | 6.11 | OK |
| 248 | 807.84 | 4930 | 1756.43 | 2498 | 1762.52 | 6.09 | OK |
| 249 | 782.86 | 4931 | 1756.43 | 2499 | 1762.5 | 6.07 | OK |
| 250 | 758.14 | 4932 | 1756.42 | 2500 | 1762.45 | 6.03 | OK |
| 251 | 732.79 | 4933 | 1756.41 | 2501 | 1762.4 | 5.99 | OK |
| 252 | 717.72 | 4934 | 1756.41 | 2501 | 1762.4 | 5.99 | OK |
| 253 | 699.16 | 4935 | 1756.4 | 2502 | 1762.48 | 6.08 | OK |
| 254 | 684.96 | 4936 | 1756.4 | 2502 | 1762.48 | 6.08 | OK |
| 255 | 665.63 | 4633 | 1756.39 | 2502 | 1762.48 | 6.09 | OK |
| 256 | 645.82 | 4634 | 1756.39 | 2502 | 1762.48 | 6.09 | OK |
| 257 | 599.37 | 4331 | 1756.41 | 2503 | 1762.49 | 6.08 | OK |
| 258 | 599.37 | 4332 | 1756.4 | 2503 | 1762.49 | 6.09 | OK |
| 259 | 576.1 | 4029 | 1756.4 | 2504 | 1762.4 | 6 | OK |
| 260 | 552.48 | 3726 | 1756.4 | 2504 | 1762.4 | 6 | OK |
| 261 | 537.32 | 3727 | 1756.4 | 2221 | 1762.06 | 5.66 | OK |
| 262 | 517.62 | 3424 | 1756.38 | 2221 | 1762.06 | 5.68 | OK |
| 263 | 502.92 | 3120 | 1756.37 | 2221 | 1762.06 | 5.69 | OK |
| 264 | 491.04 | 2816 | 1756.36 | 1937 | 1762 | 5.64 | OK |
| 265 | 476.21 | 2512 | 1756.4 | 1937 | 1762 | 5.6 | OK |
| 266 | 461.62 | 2228 | 1756.36 | 1937 | 1762 | 5.64 | OK |
| 267 | 445.88 | 1944 | 1756.36 | 1937 | 1762 | 5.64 | OK |
| 268 | 421.49 | 1660 | 1756.36 | 1653 | 1761.98 | 5.62 | OK |
| 269 | 395.81 | 1376 | 1756.36 | 1369 | 1762.08 | 5.72 | OK |
| 270 | 371.1 | 1092 | 1756.37 | 1085 | 1762.22 | 5.85 | OK |
| 271 | 346.18 | 808 | 1756.38 | 801 | 1762.4 | 6.02 | OK |
| 272 | 320.69 | 524 | 1756.38 | 517 | 1762.72 | 6.34 | OK |
| 273 | 295.95 | 240 | 1756.4 | 233 | 1762.86 | 6.46 | OK |
| 274 | 264.31 | 208 | 1756.4 | 201 | 1762.52 | 6.12 | OK |
| 275 | 246.33 | 176 | 1740.32 | 169 | 1763.6 | 23.28 | OK |
| 276 | 221.08 | 145 | 1739.66 | 136 | 1758.3 | 18.64 | OK |
| 277 | 195.88 | 113 | 1739.44 | 104 | 1758.3 | 18.86 | OK |
| 278 | 171.08 | 80 | 1739.14 | 73 | 1752 | 12.86 | OK |
| 279 | 146.01 | 48 | 1738.71 | 41 | 1754 | 15.29 | OK |



Maricopa County Flood Control District
 Provisionally Accredited Levee (PAL) certification
 Pass Mountain Diversion
 Mesa, Arizona



Figure C-1 Project Site

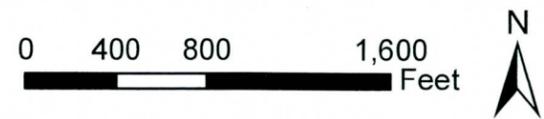
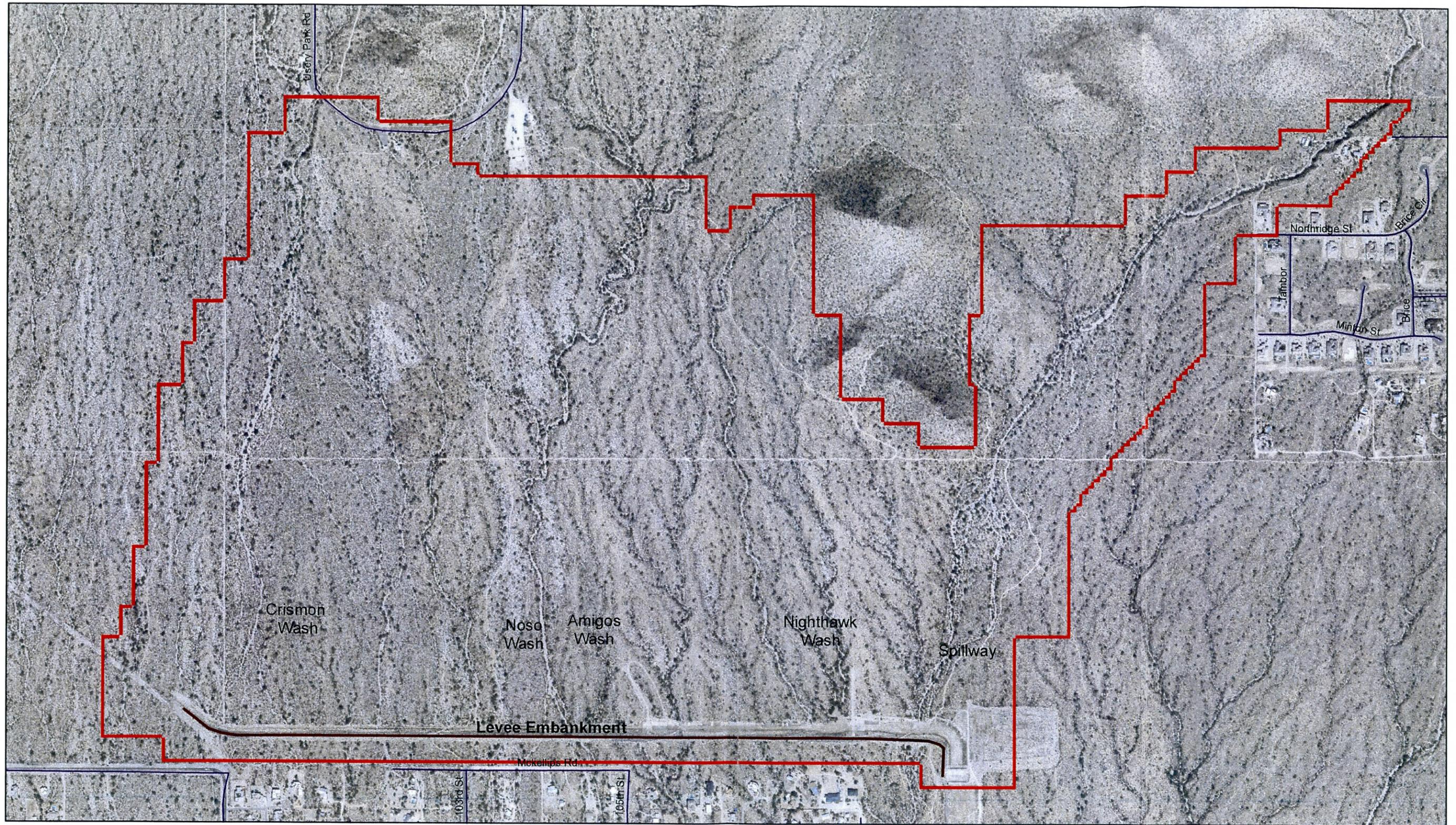
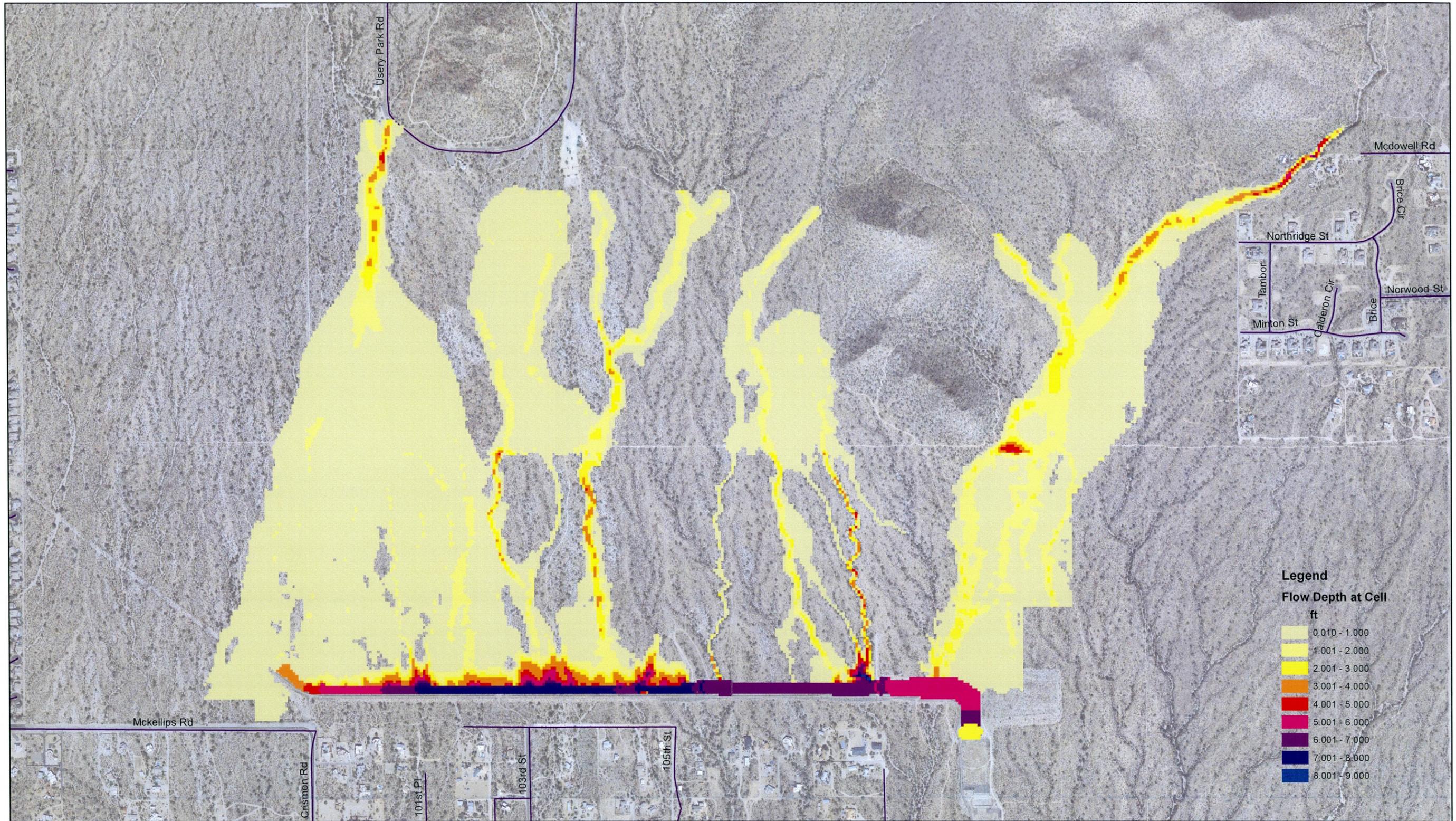


Figure C-2 FLO-2D Model Domain



0 400 800 1,600
 Feet



Figure C-3 Maximum Flow Depth on the Floodplain and in the Channel for 100 Year Flood

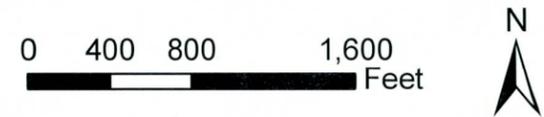
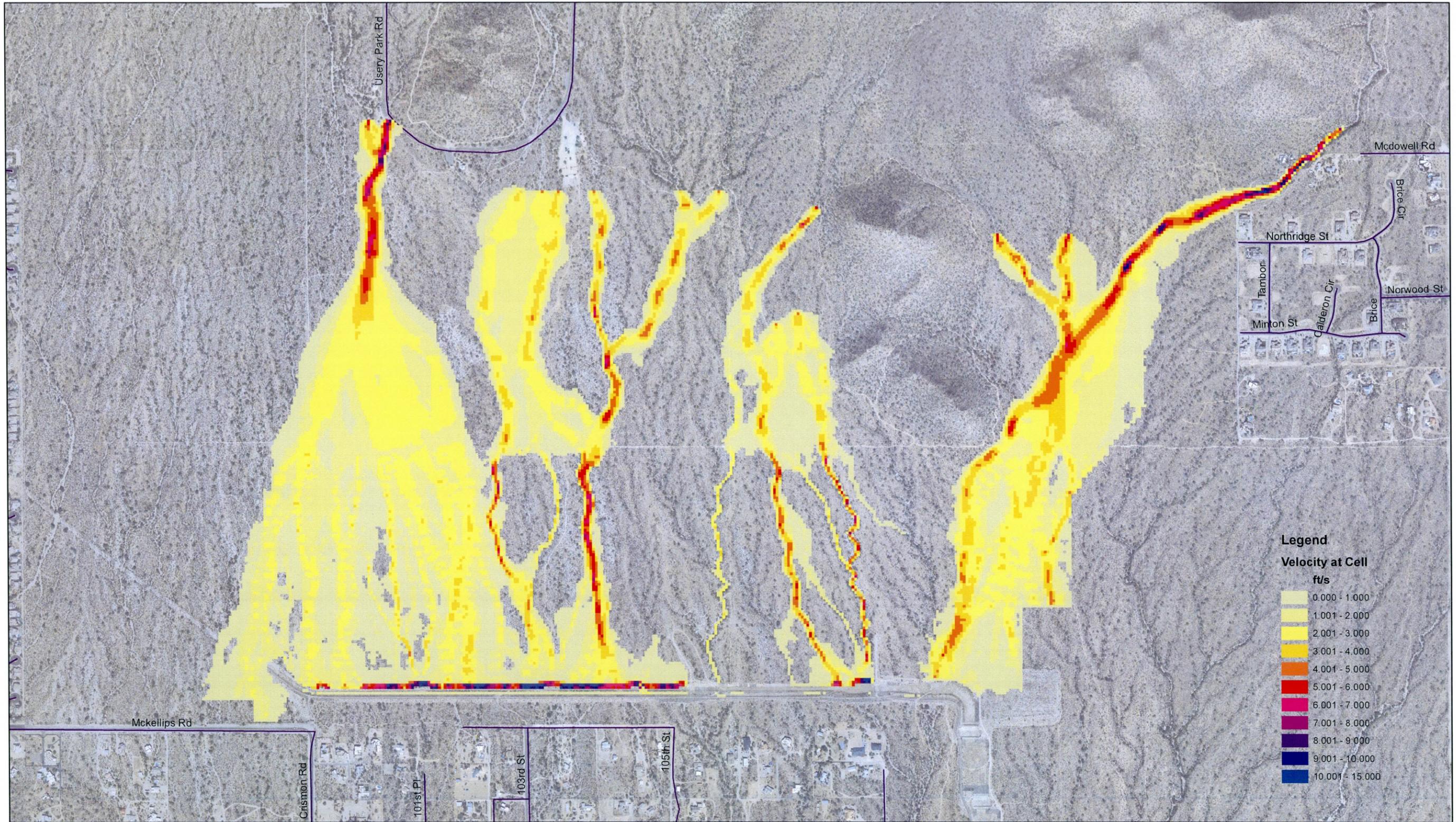


Figure C-4 Maximum Velocity Distribution for 100 Year Flood



Embankment Terminus
See Figure C-8 through C-10 and Table C-1

Legend
Levee Freeboard less than 3 feet
 2ft < freeboard < 3 ft
 1 ft < freeboard < 2 ft
 freeboard < 1 ft

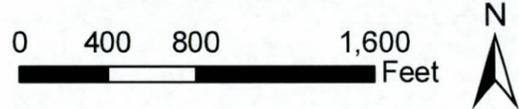


Figure C-5 Levee Freeboard Assessment for 100 Year Flood

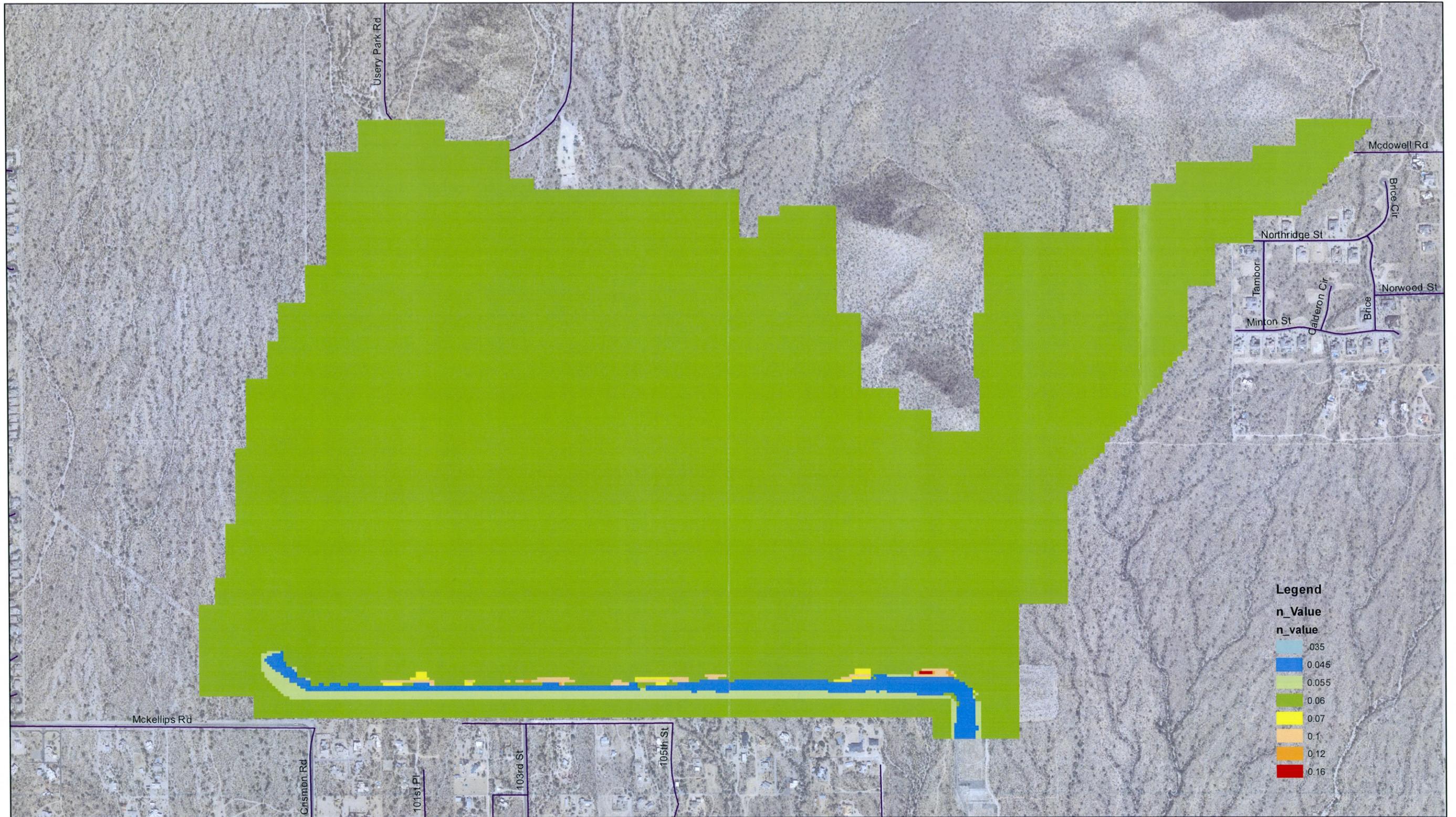


Figure C-6 Manning's n Value

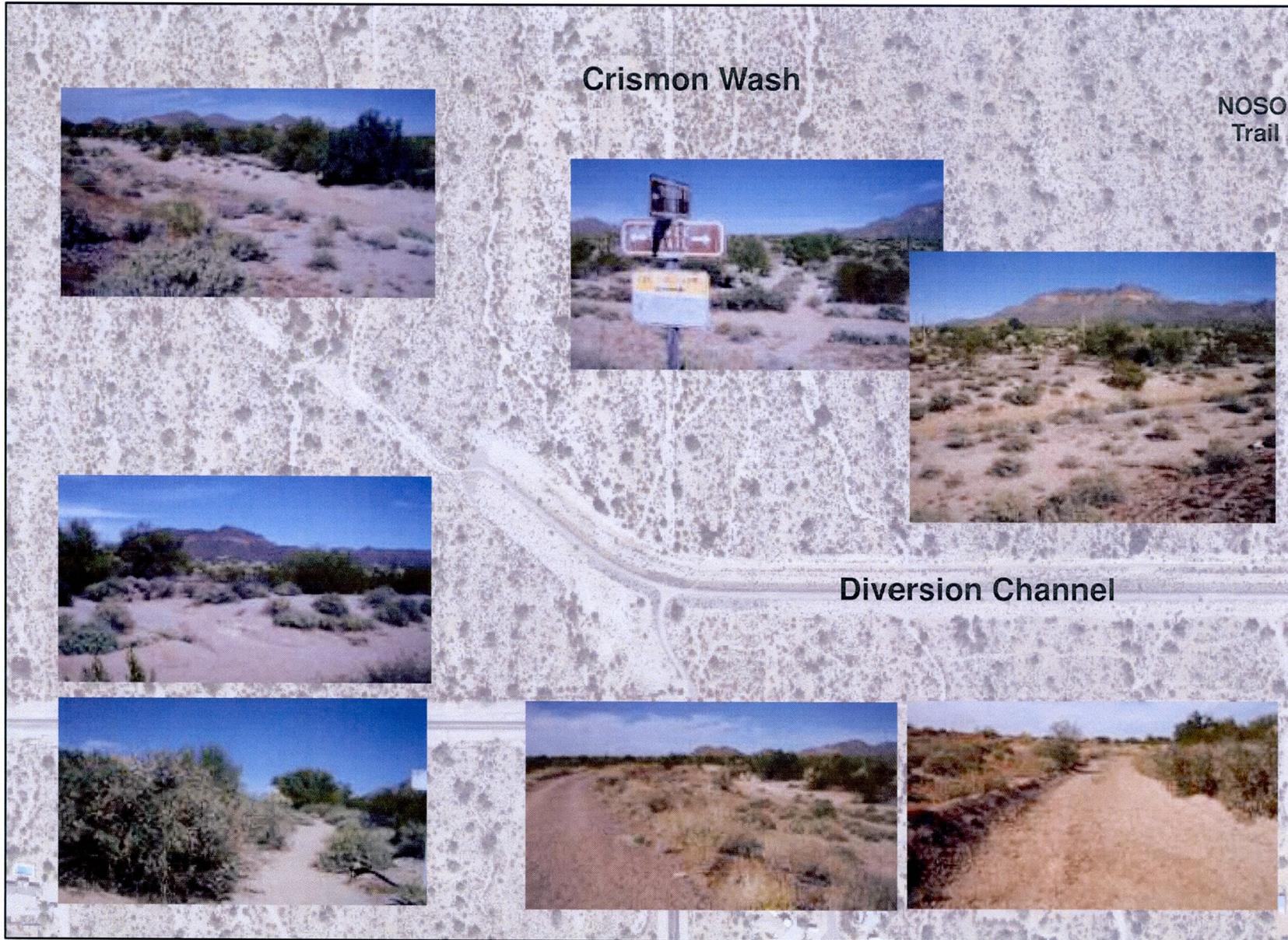


Figure C-7.1 Pictures - Upstream End of Diversion Channel

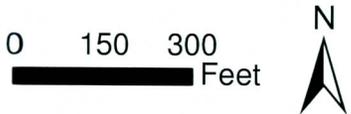
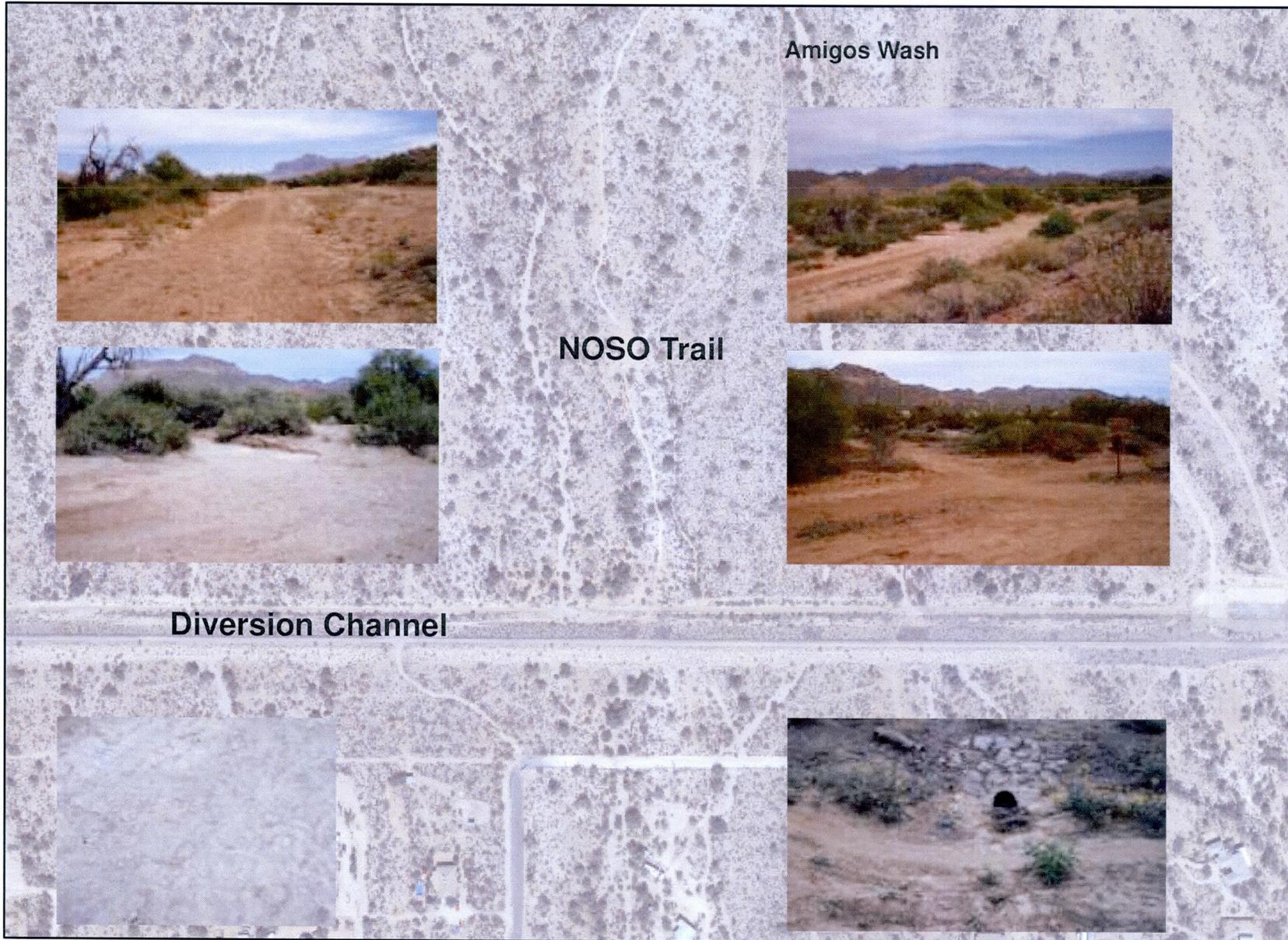
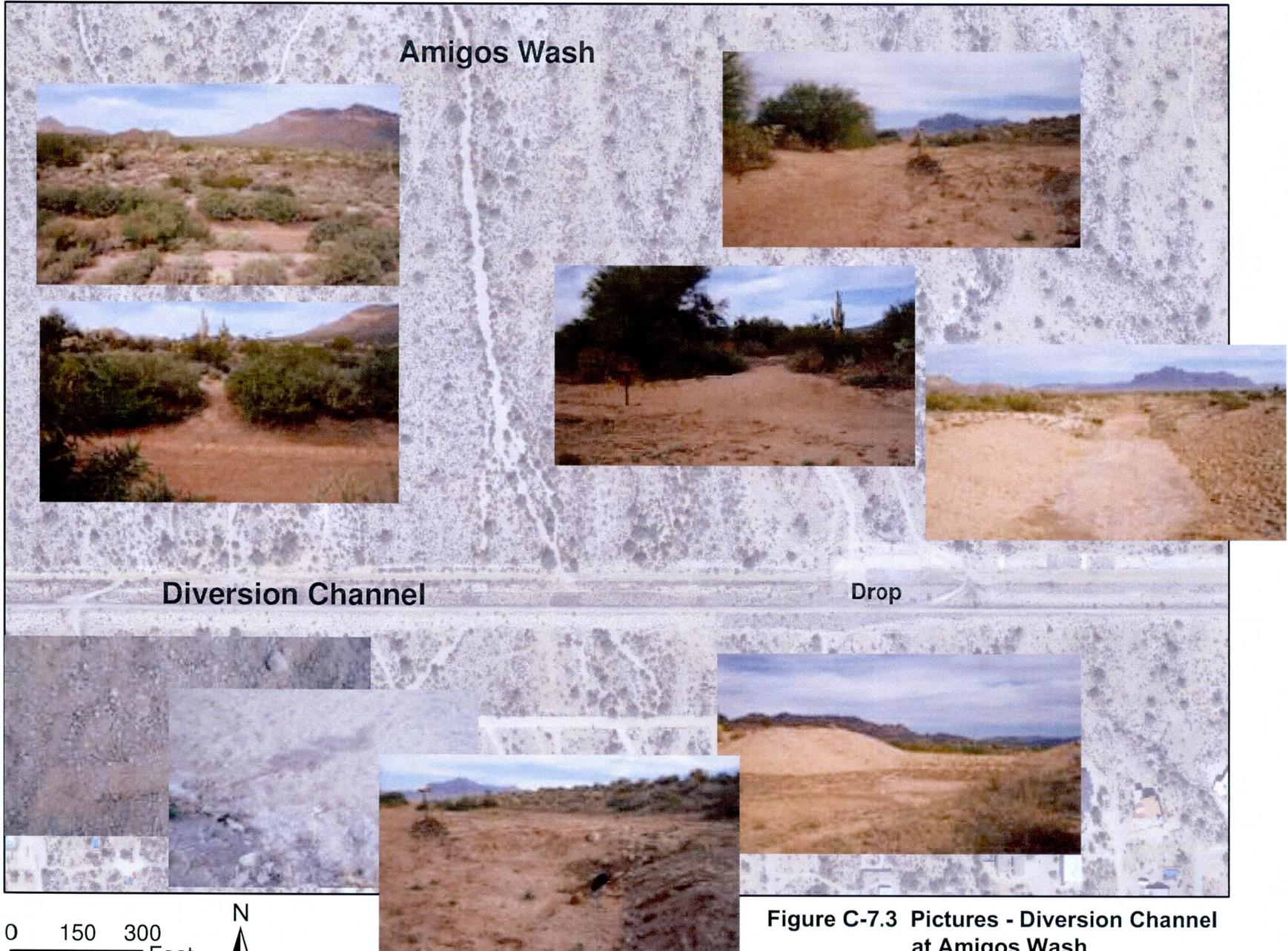


Figure C-7.2 Pictures - Diversion Channel at Noso Trail



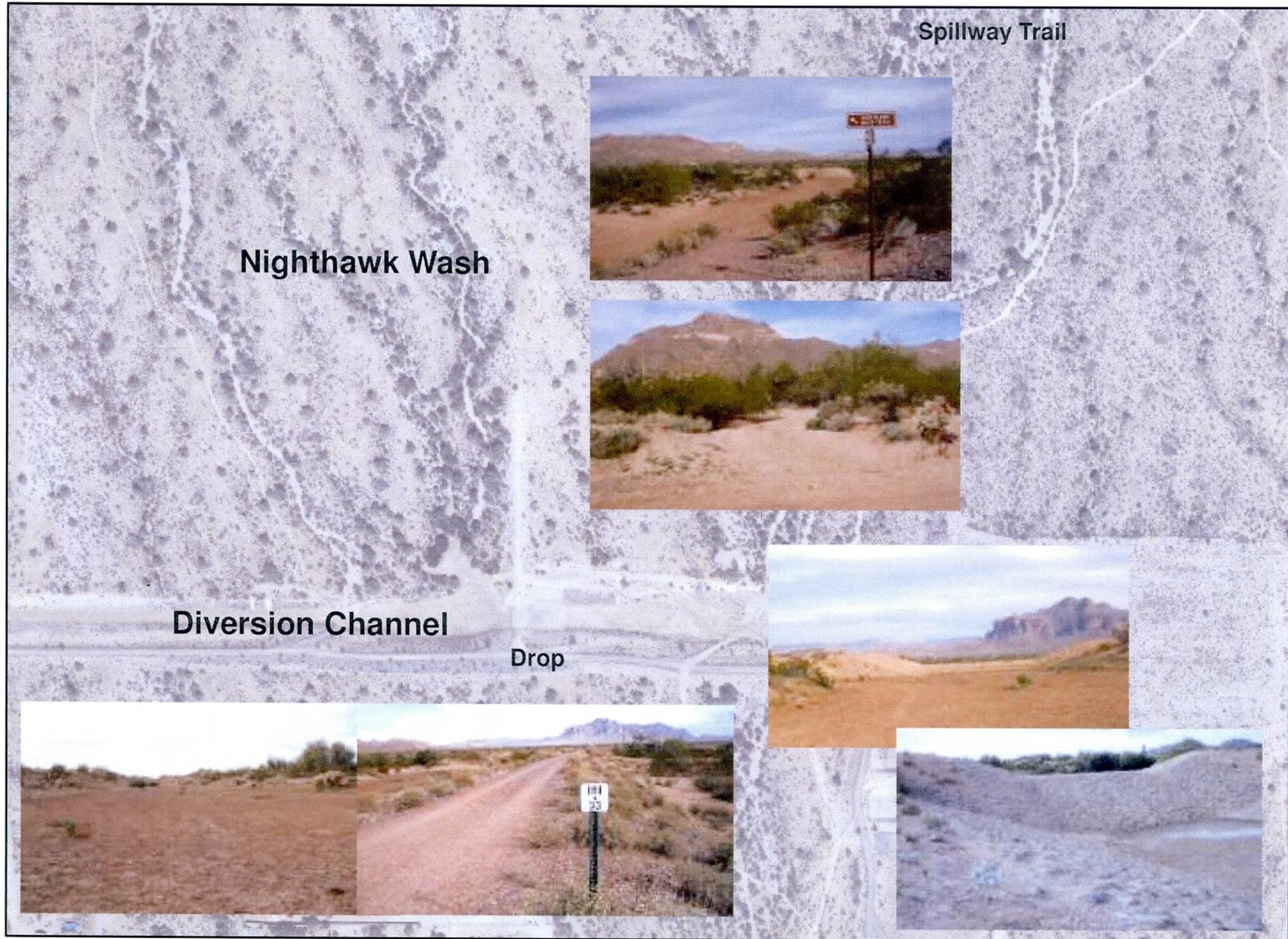


Figure C-7.4 Pictures - Diversion Channel at Nighthawk Wash

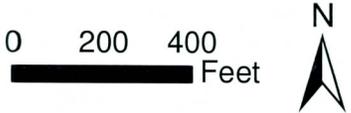
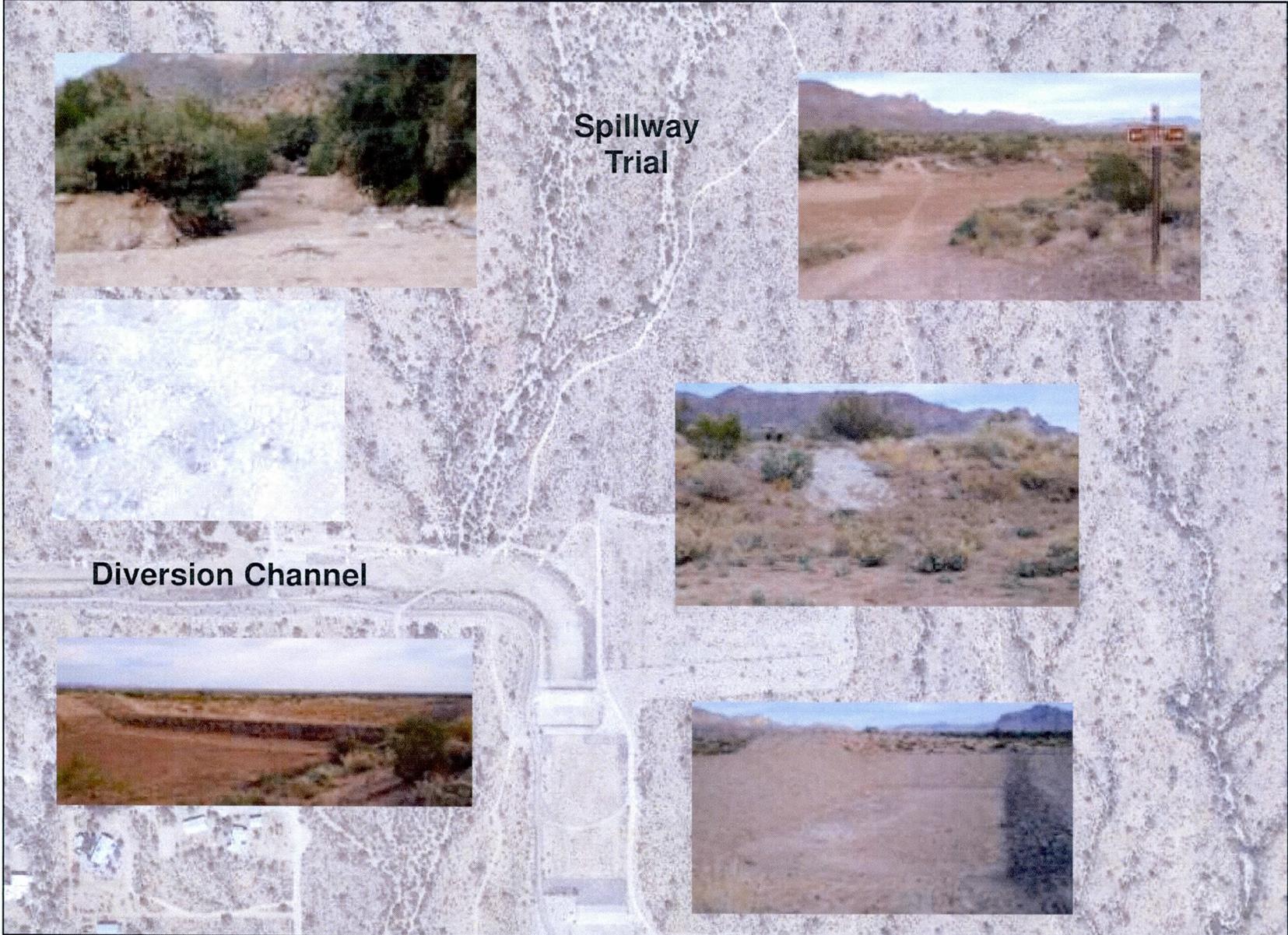


Figure C-7.5 Pictures - Diversion Channel at Spillway Trail

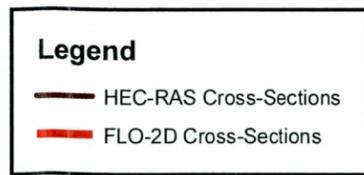
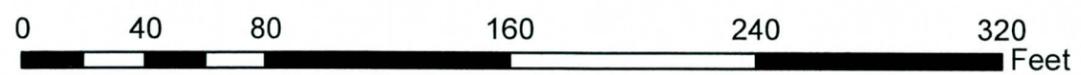
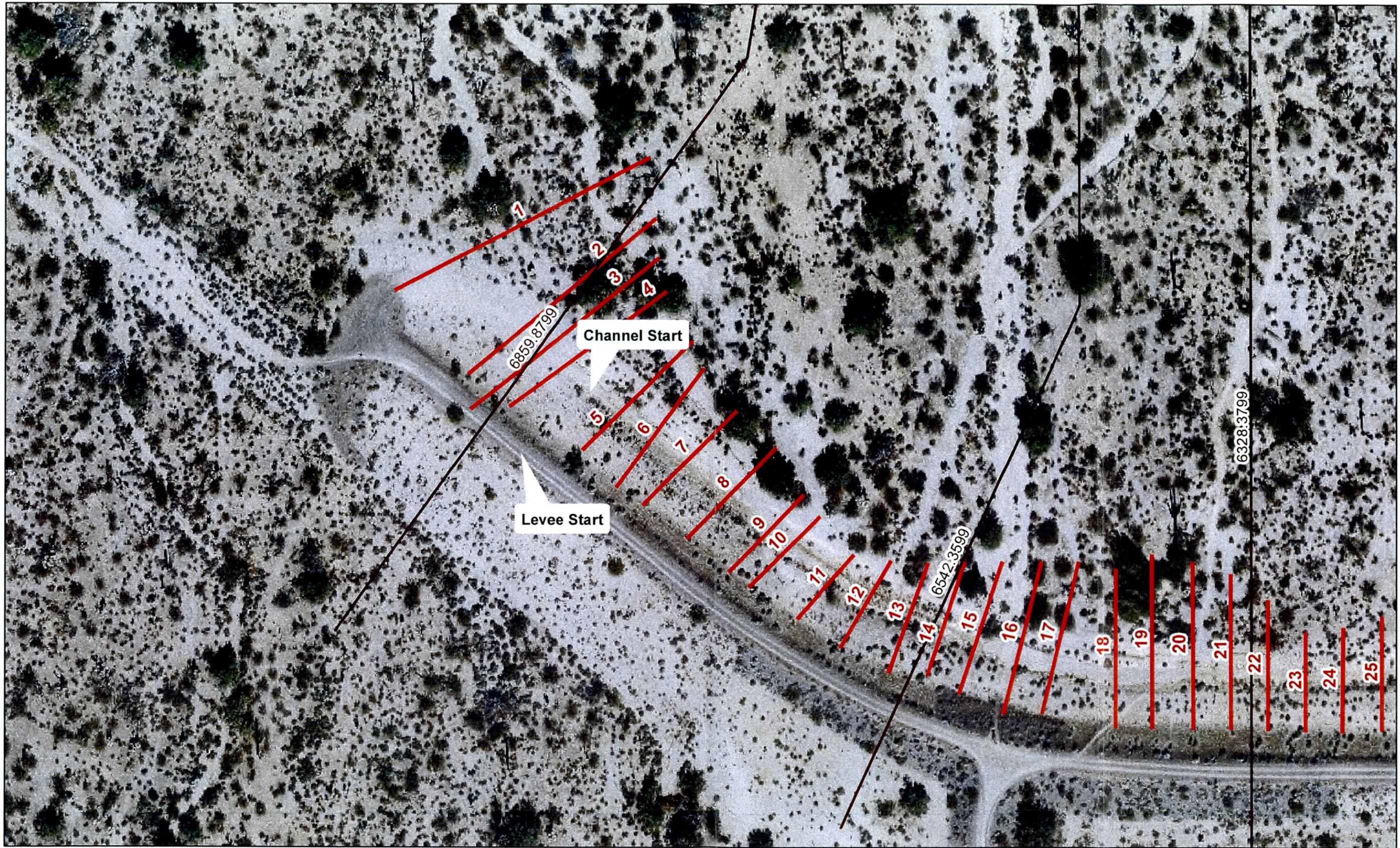


Figure C-8 Embankment Terminus Cross-Sections

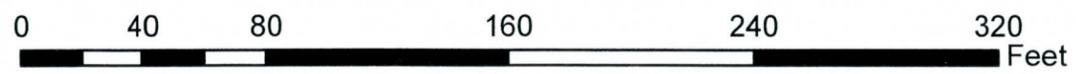
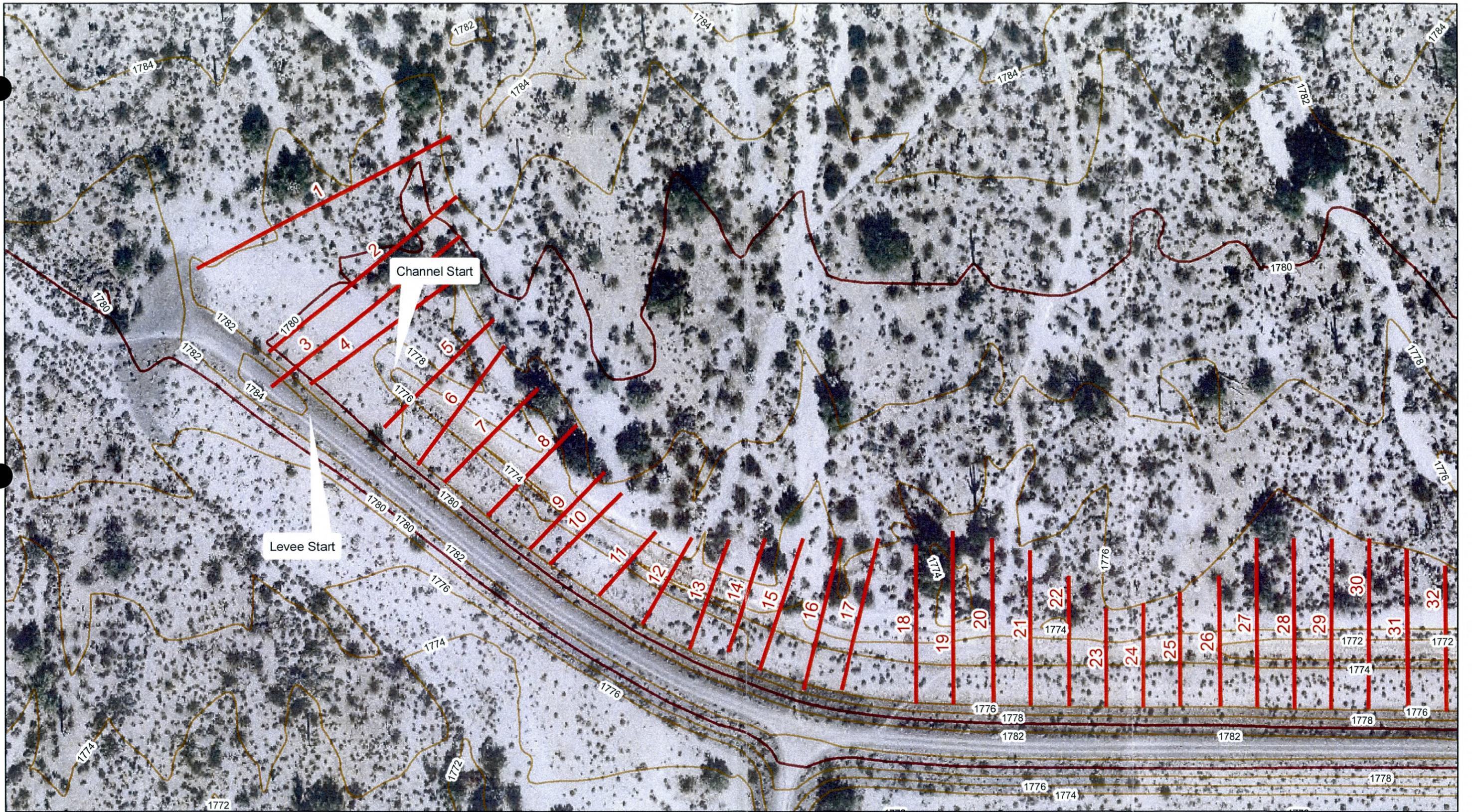


Figure C-9 Embankment Terminus Topography

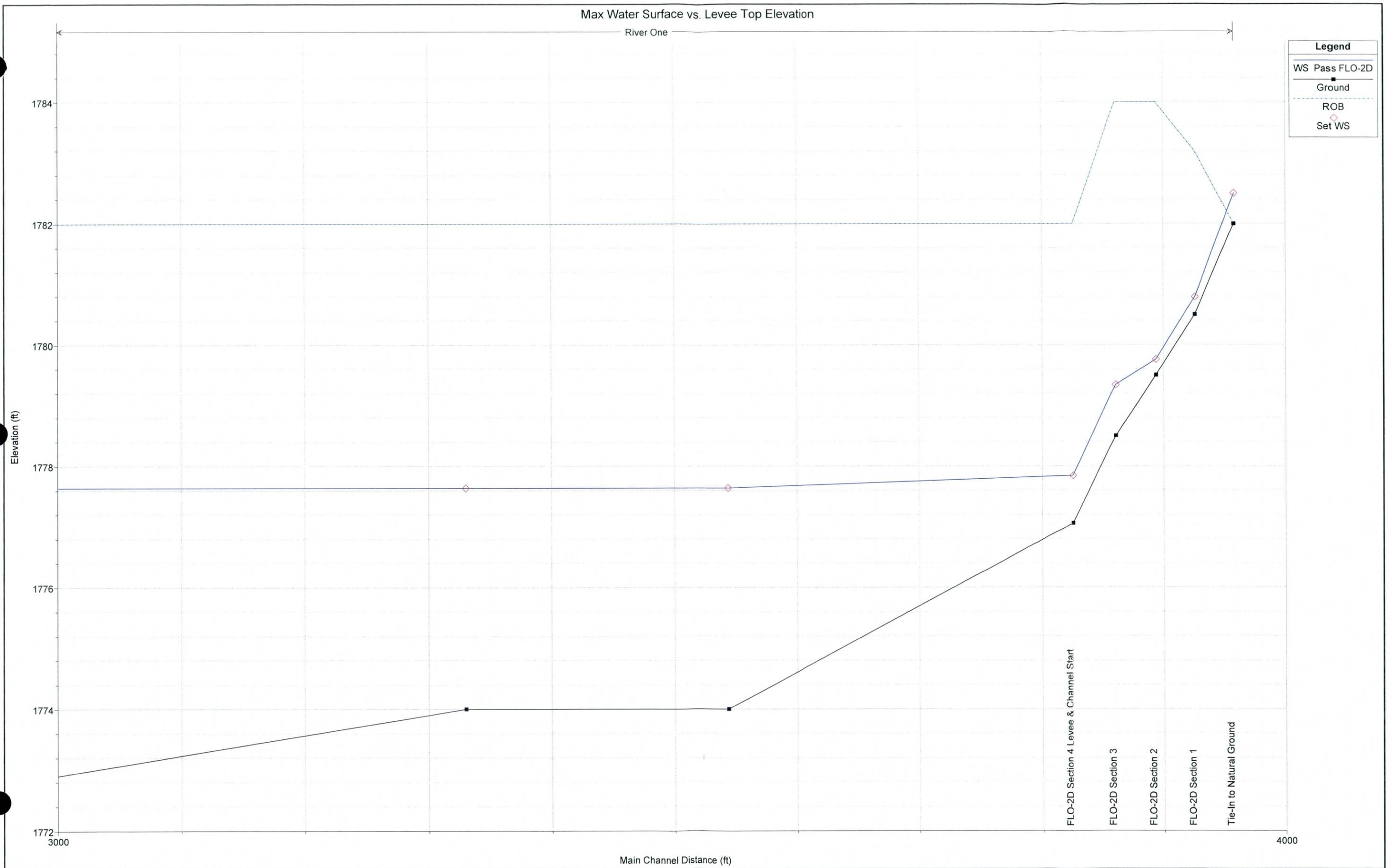


Figure C-10 Levee & Channel Profile



APPENDIX D

Geotechnical Analysis

Figure D-1

Pass Mountain Diversion - Job No. 09-115-05010
Transient Seepage Analysis (duration: 3 days)

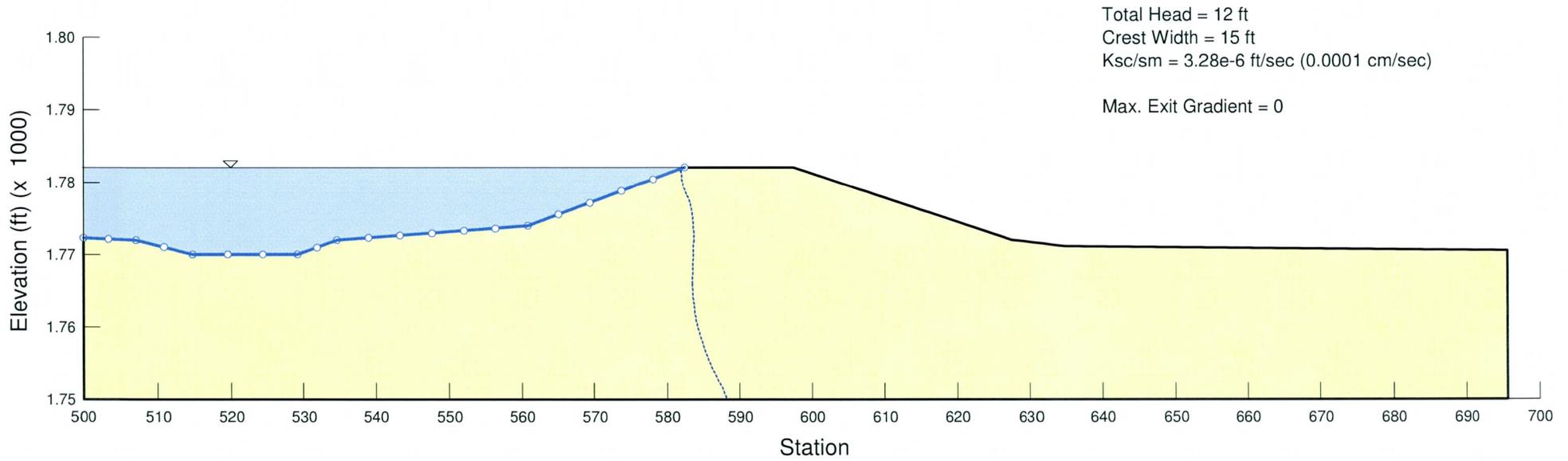


Figure D-2

Pass Mountain Diversion - Job No. 09-115-05010
Steady State Seepage Analysis

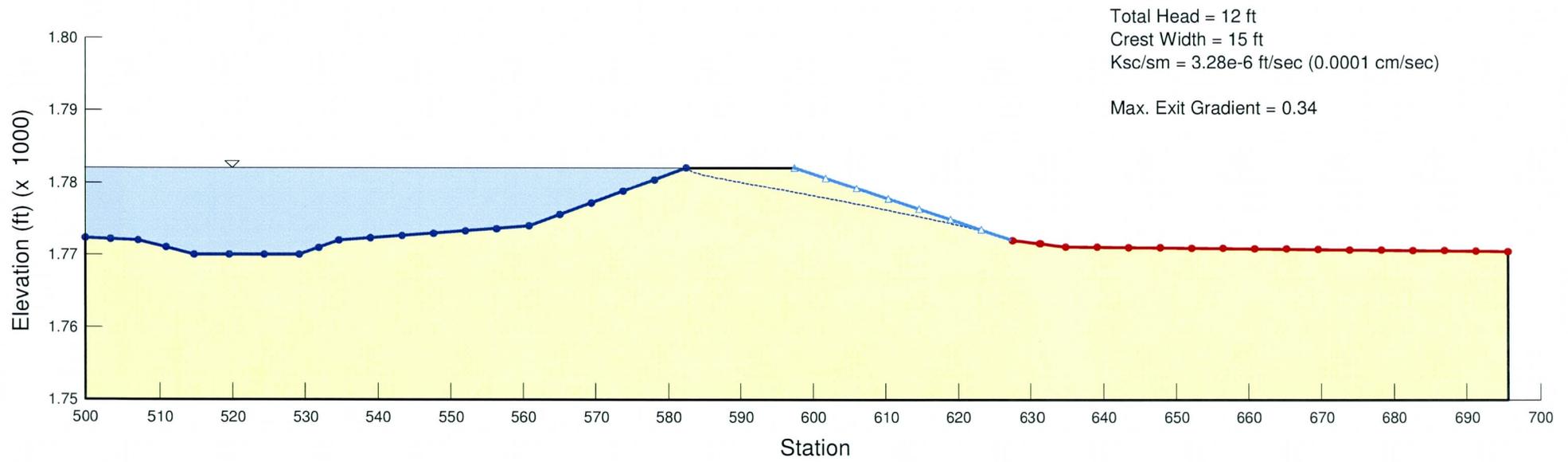


Figure D-3

Pass Mountain Diversion - Job No. 09-115-05010

End of Construction - Downstream

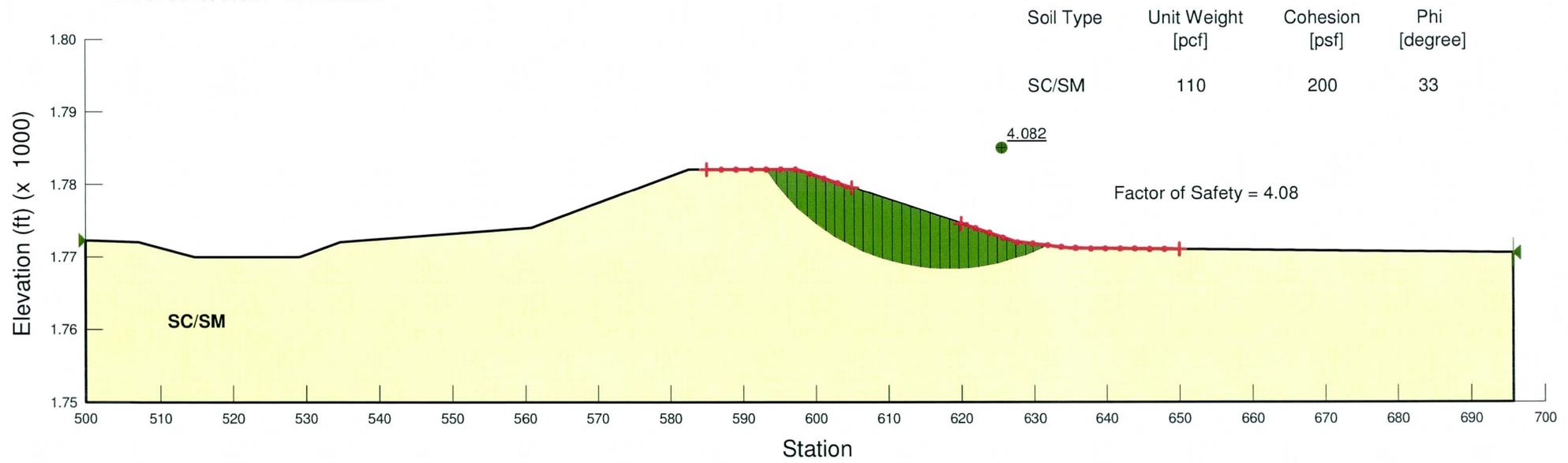


Figure D-4

Pass Mountain Diversion - Job No. 09-115-05010

End of Construction - Upstream

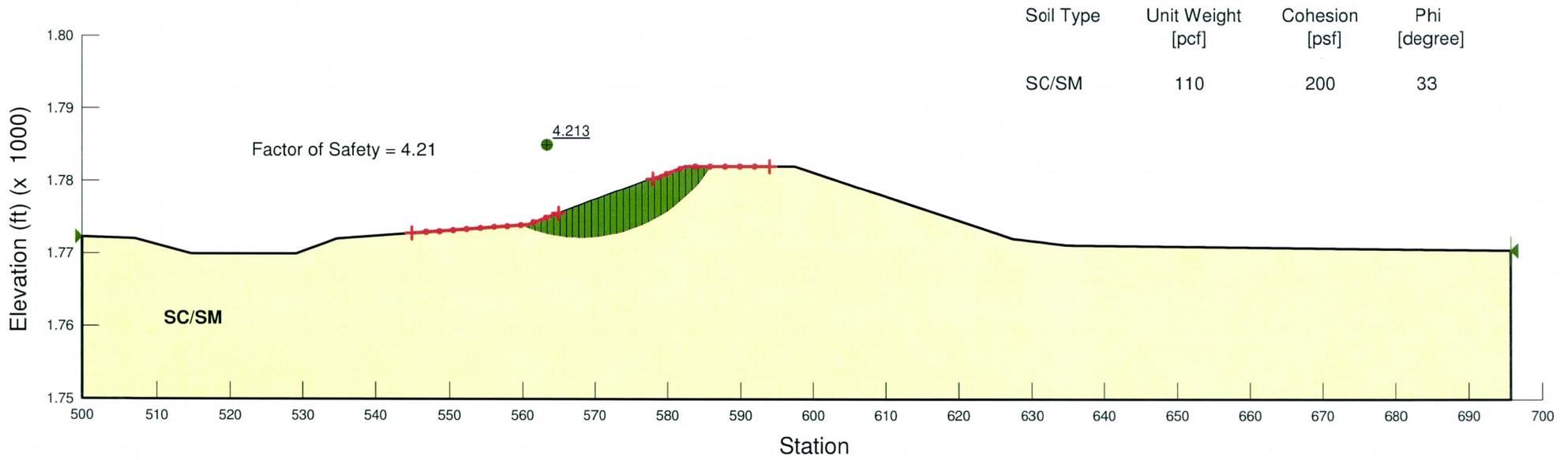
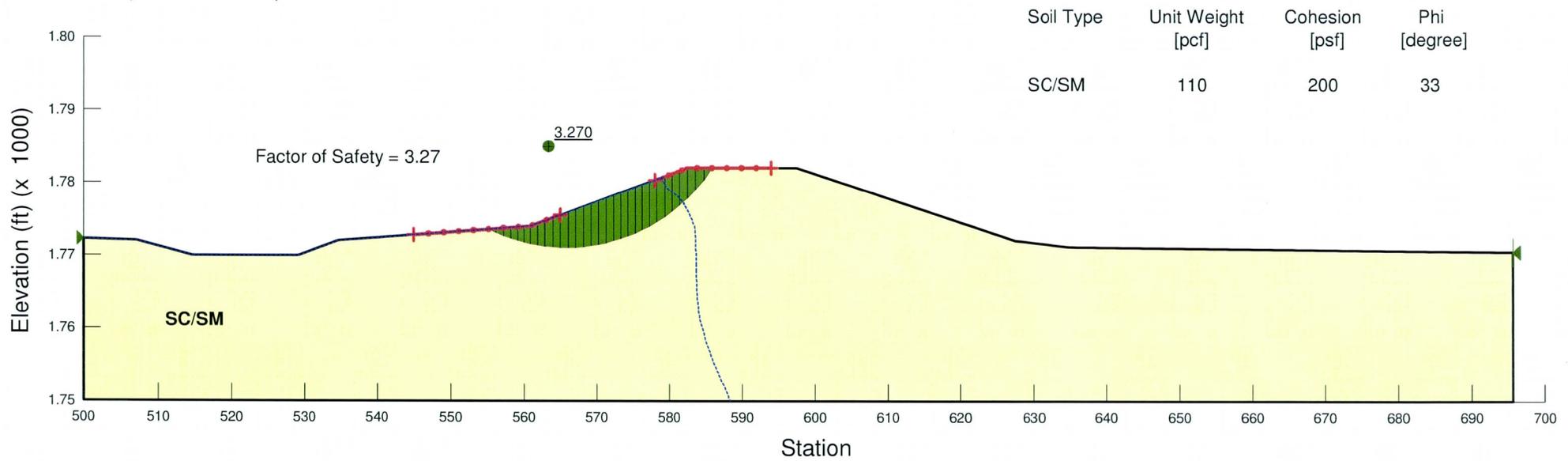


Figure D-5

Pass Mountain Diversion - Job No. 09-115-05010

Rapid Drawdown - Upstream





APPENDIX E

Email Correspondence and Meeting Minutes

Smith, Darren

From: Davies, Robert L (Tempe)
Sent: Tuesday, October 06, 2009 11:51 AM
To: Smith, Darren
Subject: FW: Pass Mountain Hydrology for Review
Attachments: image001.wmz

From: Mark Mayer - FCDX [mailto:mkm@mail.maricopa.gov]
Sent: Tuesday, October 06, 2009 11:30 AM
To: Davies, Robert L (Tempe)
Cc: Kenneth Rakestraw - FCDX
Subject: Pass Mountain Hydrology for Review

Bob:

See comments from Kenneth Rakestraw below. Kenneth feels that any further refinement of the hydrology, such as adding concentration points, may not yield significantly lower flows. He did state that NOAA 14 rainfall amounts are lower, but may not change the Q's much.

We'll be reviewing your hydraulic model data.



Mark Mayer
Civil Engineer - Senior
Flood Control District of Maricopa County
602-506-6726

From: Kenneth Rakestraw - FCDX
Sent: Monday, September 28, 2009 4:00 PM
To: Mark Mayer - FCDX
Cc: Amir Motamedi - FCDX
Subject: RE: Pass Mountain Hydrology for Review

Mark,

I have reviewed the flows included in the printout of HecRAS output as provided by AMEC in light of the data provided in the PDF file included in your email of Sept 22.

The flows shown are reasonable considering the method of linear interpolation used by AMEC and are suitable for use in the HecRAS analysis.

The information contained in this e-mail is intended only for the individual or entity to whom it is addressed. Its contents (including any attachments) may contain confidential and/or privileged information.

If you are not an intended recipient you must not use, disclose, disseminate, copy or print its contents.

If you receive this e-mail in error, please notify the sender by reply e-mail and delete and destroy the message.

Meeting and Decision Summary

Progress Meeting

Date: Friday 09/18/09

Flood Control District

Time: 1:30 pm

McMicken Conference Room

Attendees: Mark Mayer, Robert Davies, Darren Smith

Summary

| <i>Agenda Item</i> | <i>Summary</i> | <i>Action Items</i> |
|---------------------------|--|--|
| 1. Progress Update | <p>AMEC opened the meeting with a project update:</p> <ul style="list-style-type: none"> • Data collection complete • Hydrologic models substantially reviewed • Spook Hill ADMP substantially reviewed • HEC-RAS model created. This new model needed due to new mapping and the ability to create hydraulic profile. | |
| 2. Findings | <ul style="list-style-type: none"> • Hydraulic model shows freeboard < 3' up to STA 1264.68 (900' upstream of bend), after which the freeboard is >3' • Concern with accuracy of 2' contours (+/- 1' ?) • The Q's for the hydraulic model were pro-rated from the Spook Hill ADMP. Hydrology numbers need to be reviewed by FCD – they are of concern due to the lack of freeboard • Check NOAA 14 precipitation values against those used in ADMP | <p>65.10 states that for freeboard < 2', a risk/uncertainty analysis may be performed</p> <p>AMEC to check accuracy based on benchmark</p> <p>AMEC to provide a hydrology summary to FCD to assist with review</p> <p>AMEC to check this to determine effect on Q's</p> |
| | | |



APPENDIX F

Operations and Maintenance Plan

Operations & Maintenance Division



Standard Operating Procedures (SOP's), Deficiency Levels,
Maintenance Standards, and Standard Drawings.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Table of Contents

SECTION I:

| | |
|---|----|
| Standard Operating Procedure #1: Chain of Command | 1 |
| Standard Operating Procedure #2: Preparation Time For Maintenance Personnel | 3 |
| Standard Operating Procedure #3: Daily Vehicle Inspections | 4 |
| Standard Operating Procedure #4: Daily Team Activities Report | 5 |
| Standard Operating Procedure #5: Work Orders | 6 |
| Standard Operating Procedure #6: On the Job Training--for the O & M Division | 7 |
| Standard Operating Procedure #7: Check out procedures for FCD tools and/or equipment..... | 9 |
| Standard Operating Procedure #8: Controlled burning operations..... | 10 |
| Standard Operating Procedure #9: Inspections and Documentation | 11 |
| Standard Operating Procedure #10: Employee Work Clothes and Safety Equipment..... | 16 |
| Standard Operating Procedure #11: Material Safety Data Sheet..... | 18 |
| Standard Operating Procedure #12: Heat Stress Guidelines | 19 |
| Standard Operating Procedure #13: Reporting Vehicle Accidents | 21 |
| Standard Operating Procedure #14: Hazardous Materials Incidents | 23 |
| Standard Operating Procedure #15: Tailgate Safety Talks..... | 30 |
| Standard Operating Procedure #16: Radio Call-In | 31 |
| Standard Operating Procedure #17: Radio Use | 32 |
| Standard Operating Procedure #18: Flood Emergency Operations..... | 33 |
| Standard Operating Procedure #19: O&M Mosquito Treatment..... | 39 |
| Standard Operating Procedure #20: Pesticide Licensing and Chemical Usage..... | 40 |
| Standard Operating Procedure #21: Removal of Unwanted or Nuisance Vegetation..... | 42 |
| Standard Operating Procedure #22: Planting Technique for Landscape Replacements | 43 |
| Standard Operating Procedure #23: Protected Vegetation | 47 |
| Standard Operating Procedure #24: Staking of Landscape Trees | 48 |
| Standard Operating Procedure #25: Core Drain Marker Post's | 51 |
| Standard Operating Procedure #26: Subsidence Monument Marker Posts..... | 52 |
| Standard Operating Procedure #27: Stationing Procedures for Pertinent Structure Reference.... | 53 |
| Standard Operating Procedure #28: Procedures for the maintenance of unlined floodways | 54 |
| Standard Operating Procedure #29: Procedures for the repair of rodent or animal holes | 55 |
| Standard Operating Procedure #30: Dust Abatement..... | 56 |
| Standard Operating Procedure #31: Claims/Concerns from the Public | 61 |

SECTION II:

| | |
|------------------------------|----|
| SUBJECT: INDEX..... | 1 |
| #1. ACCESS GATES | 2 |
| #2. ACCESS ROADS..... | 3 |
| #3. RETENTION BASINS..... | 5 |
| #4. BUILDINGS..... | 6 |
| #5. BRIDGES & CATWALKS | 7 |
| #6. CATCH BASINS..... | 9 |
| #7. DAMS (FRS's) | 11 |
| #8. FENCING | 17 |
| #9. FLAP GATES..... | 18 |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| | |
|--|----|
| #10. HANDRAILS | 19 |
| #11. INLET & OUTLET STRUCTURES:..... | 20 |
| #12. CHANNEL & STORM DRAIN INVERTS..... | 21 |
| #13. LEVEES..... | 23 |
| #14. OUTLET TOWERS | 25 |
| #15. TRASH RACKS | 26 |
| #16. DAM RESERVOIRS..... | 27 |
| #17. FCDMC EXCESS LAND RIGHT-OF-WAY..... | 28 |
| #18. GENERAL SIGNS & STAFF GAGES..... | 29 |
| #19. CHANNEL & STORM DRAIN WALLS..... | 30 |
| #20. TRAILS | 31 |

SECTION III:

| | |
|---|----|
| FCDMC STANDARD DRAWINGS | 1 |
| SD#1 Gates- Smooth of Barbed Wire..... | 2 |
|Materials List..... | 3 |
|Swing Gate..... | 4 |
| SD#2 Fencing, Smooth or Barbed Wire | 5 |
| SD#3 Grouted Riprap Side Inlet Chute | 6 |
| SD#4 Embankment Backfilling..... | 7 |
| SD#5 Retaining Walls | 8 |
| SD#6 Staff Gages..... | 9 |
| SD#7 FCDMC Signs Right-Of-Way | 10 |
| SD#8 Wrought Iron Fence 1 of 8..... | 11 |
| Wrought Iron Fence 2 of 8..... | 12 |
| Wrought Iron Fence 3 of 8..... | 13 |
| Wrought Iron Fence 4 of 8..... | 14 |
| Wrought Iron Fence 5 of 8..... | 15 |
| Wrought Iron Fence 6 of 8..... | 16 |
| Wrought Iron Fence 7 of 8..... | 17 |
| Wrought Iron Fence 8 of 8..... | 18 |
| SD#9 Subsidence Markers..... | 19 |
| SD#10 Core Drain Markers | 20 |
| SD#11 Standard Break-Away Fence | 21 |
| SD#12 Standard Break-Away Pipe Rail Fence | 22 |
| SD#13 Sediment Gage..... | 23 |
| SD#14 Removable Bollard | 24 |
| SD#15 Observation Bridge at Adobe Dam..... | 25 |
| SD#16 Line and Fence Posts | 26 |
| SD#17 Equestrian Gate..... | 27 |
| SD#18 Stationing Placard..... | 28 |
| SD#19 Weldable Anchors | 29 |

SECTION IV:

| | |
|---|---|
| FCD Grouted Riprap Placement Notes..... | 1 |
| FCD Gated Outlet Positioning..... | 2 |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Type of Structure and Maintenance 4
Maintenance Definitions 17
ADWR-Rules and Regulations Pertaining to Dam Safety Procedures: 21
FCDMC STRUCTURE NOTIFICATION ELEVATIONS FOR 2005 23
FCD STRUCTURE NUMERICAL LISTING FOR 2005 24
Attachment: A: Schematic Organizational Chart 25

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #1

Subject: Chain of Command

PURPOSE: Define reporting responsibility within the Flood Control District (FCD) and the Operations and Maintenance Division (O&M)

PROCEDURE A: Organization Structure

1. The FCD is a municipal corporation and political subdivision of the State of Arizona, an entity that reports to and is governed by a Board of Directors, the members of which are also elected officials serving as the Board of Supervisors for Maricopa County.
2. A separate Flood Control Advisory Board (FCAB), comprised of appointed private citizens, (one citizen appointed by each Board of Director member), serve the Flood Control District of Maricopa County (FCDMC), officials as both an advisory and consulting group.
3. The FCD Chief Engineer and General Manager directs the District's operations. The reporting responsibility of this office is to the County Manager.
4. Under the Chief Engineer and General Manager there is the following organizational structure:
 - A. The Chief Engineer and General Manager directs the operations of six divisions:
 1. Administration
 2. Operations & Maintenance
 3. Engineering
 4. FMS
 5. Real Estate
 6. Planning & Projects Management
 - B. Within the Operations and Maintenance (O&M) Division there are five (5) branches, which report to the O&M Division Manager.
 1. Ecology
 2. Work Control
 3. Maintenance
 4. Administration
 5. Shop

A schematic organizational chart is attached (Attachment A) that depicts both the authorized position title and vertical/horizontal relationship definitions.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #1

Subject: Chain of Command

PROCEDURE B: Personnel Responsibility

1. Each employee's responsibilities is to be made in accordance with the vertical chain of command as presented herein.
 - A. Daily assignments and project goals will be given by the immediate supervisor.
 - B. In the event that an assignment is given by another supervisor of equal or higher level, the assignment shall be undertaken with the priority given by the assignor, notifying the employee's immediate supervisor as soon as possible of the situation.
 - C. The employee's position responsibilities may necessitate directing employee activity for personnel not his subordinate(s); such direction may be deemed necessary by an emergency or work conditions.
2. When such assignments are made, it is the responsibility of the assignor to make known the reason for such direction to the assignee's immediate supervisor as soon as possible.
3. Each employee is to discharge, to the best of his ability, the responsibility of his position, and report to his immediate supervisor.
 - A. Questions regarding position duties shall be directed to the immediate supervisor.
 - B. Any deviations from the established chain of command initiated by the employee, shall be reported to the employee's immediate supervisor at the first available opportunity, along with an explanation of the reason(s) for such action.
4. No one is authorized to bypass the chain of command, which is shown on attachment.

Attachment: A: Schematic Organizational Chart

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #2

SUBJECT: Preparation Time For Maintenance Personnel

PURPOSE: To Minimize Congestion In the Maintenance Yard(s) During The Work Day.

PROCEDURE A: Assignments

1. Each Team Leader, Work Crew Leader, Maintenance Technician, and any Equipment Operators working independently, will report to his/her Supervisor at the beginning of each workday.
2. Work Crew Leaders are to obtain their supplies at the beginning of the workday **prior** to departing. They are not to return to the Durango Complex with their crews unless:
 - A. Their assigned tasks require that they do. This can include educational training, special work assignments, etc.
3. Work Crew Leaders are to fuel their vehicles at the end of the workday.
4. Team Leaders and Equipment Operators are to obtain the tools and materials needed for the following day at the end of the workday. Equipment Operators are to fuel and prepare their vehicles/equipment at the end of the workday.
5. All materials, supplies, and tools needed are to be coordinated through either the shop personnel or the Work Control Center. In order to ensure that the needed items are available, as much lead-time as possible should be given when making your request.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #3

SUBJECT: Daily Vehicle Inspections

PURPOSE: To ensure vehicle is in a safe operating condition.

PROCEDURE A: Vehicles weighing one ton or less

1. The assigned operator of any motor vehicle shall perform the following daily checks prior to departing the FCD yard or storage area:

- A. Walk around the vehicle and check for:
 - 1. Fluid leaks
 - 2. Body damage
 - 3. Inspect tires for proper inflation or damage

- B. Check under the hood for the following:
 - 1. All fluid levels and add as necessary.
 - 2. Inspect all belts, hoses, and battery cables.

- C. Verify proper operation of the following:
 - 1. Headlights
 - 2. Tail lights
 - 3. Brake lights
 - 4. Turn signals and emergency flashers
 - 5. Windshield wiper
 - 6. Rotating beacon, if so equipped
 - 7. Shoulder harness/seat belts

PROCEDURE B: Other vehicles and/or equipment

- 1. The operator of any other type of vehicle shall perform pre-operational checks and inspections required for the specific vehicle and operating license.

- 2. A Driver's Vehicle Inspection Report is to be completed by the operator **DAILY**. The last recorded operator will be held responsible for any damage or deficiencies not noted on this report.

- 3. Upon completion of the inspections listed above, the operator will mark on the Daily Inspection Report that the inspection has been performed.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #4

SUBJECT: Daily Team Activities Report

PURPOSE: To record data from job assignments to include labor, material and equipment usage.

PROCEDURE: Employee Responsibility

1. Each General Maintenance Worker, Maintenance Specialist, Ecology Technician, Crew Leader, Shop Personnel, and all Equipment Operators (EO, HEO, and HEOSr.) will be responsible for completing a Daily Team Activities Report detailing his/her crews activities.
2. The responsible person will ensure that all recorded information is correct, neat and legible.
3. Record all information in the spaces provided such as Date, Team, Weather, Work Order Number, Personnel, and the hours worked for each Work Order. It is important to be accurate as to the hours charged. The correct starting and stopping time for each work order should also be noted.
4. Any time that is spent away from the job site should be noted on the report.
5. Personnel that are on personal leave, jury duty, military duty, or FML will have their time recorded under the Off-Duty Hour" sections.
6. List all materials used for each work order.
7. Mark appropriate box after completing equipment check. (See SOP #2)
8. For each Work Order, list the equipment number, the start and stop hours or miles, the total hours or miles used, and the operator initials. Rental equipment is charged by the day, regardless of the type of equipment unless otherwise directed.
9. The individual completing the form will legibly sign and date the report.
10. When applying chemicals, the same daily report is to be used.
11. Daily Reports are to be completed and turned in **prior** to the end of the workday.

Updated 09-24-07

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division
Standard Operating Procedure #5

SUBJECT: Work Orders

PURPOSE: To standardize the work order process

PROCEDURE: Work request

1. All Work Orders are to be initiated in the Work Control Center.
2. The Operations and Maintenance Division Manager shall approve all Work Orders which can also include the following:
 - A. Requests from other agencies or department outside the Flood Control District.
 - B. Jobs considered Capital Improvement Projects.
 - C. Any proposed modifications to the structure.
 - D. Projects of a significant nature that are not categorized as routine maintenance.
3. Work Orders are to be used for all work:
 - A. Tasks that can be completed in one (1) hour or less that a crew happens upon during their normal workday will utilize a standard work order (swo-....)
 - B. Citizen concern work orders will utilize the current year and the 1000 series (05-1...).
 - C. Regular work orders will utilize the current year and the 2000 series (05-2...).
 - D. Work orders generated by maintenance inspections will utilize the current year and the 4000 series (05-4...).
 - E. Work orders that are considered special in nature will utilize the current year and the 5000 series (05-5...).
 - F. Work orders that are generated for other departments both internally and externally will utilize the current year and the 6000 series (05-6...).
 - G. Work orders generated by the annual inspections will utilize the current year and the 7000 series (05-7...).
 - H. Work orders generated for Ecology will utilize the current year and the 8000 series (05-8...).
4. Team Leaders, Crew Leaders, or the responsible parties are to ensure that any support personnel correctly charge their time, materials, and equipment to the work order on their Daily Reports.
5. Team Leaders, Crew Leaders, or the responsible parties are to ensure that upon completion, the Work Order is signed and that the start and completion dates are accurate.
6. Crews are not to "hold" Work Orders. If it is apparent that the work orders will not be completed as scheduled, they should be returned to the Work Center for reassignment.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #6

SUBJECT: On the Job Training---for the Operations and Maintenance Division

PURPOSE: To Train Employees for Proficiency, Increased Productivity and Diversified Assignments

PROCEDURE A: Define job responsibilities, required skills, and their application regarding various job classifications within Flood Control District

1. Objectives of O.J.T.
 - A. Improve proficiency, productivity and aptitude of the employee.
 - B. Cross-trained employees are versatile and more easily deployed.
 - C. Provide for employee development/improvement of skills and familiarity of related equipment.
2. Position Description
 - A. Describe job requirements as per necessary skills, objectives, responsibilities, methodology and authority.
 - B. Explain procedures to accomplish job objectives, describing the performance requirements in detail. Refer to any applicable Standard Operating Procedures. (SOP's)
 - C. Review employee's previous understanding and skills developed applicable to the position being trained for.
3. On the Job Training for Individuals, Routine Positions
 - A. Prepare for Training: collect and prepare materials, tools and equipment necessary to conduct training.
 - B. Demonstrate method to employee.
 - C. Demonstrate job procedures and skills necessary to employee.
 - D. Observe the employee repeat the above demonstration.
 - E. Review the employee's performance and discuss any inadequacies in their performance.
 - F. Document any increased ability/understanding regarding job training received.
4. On the Job Training for Individuals: Flood Control Operation
 - A. Each FCD (O&M) employee authorized to operate a FCD or Maricopa County vehicle and/or equipment shall obtain a "Maricopa County Vehicle Use Permit" (MCVUP) card. An appropriate Arizona Commercial Drivers License (CDL) is needed prior to operating any vehicle, over 1 ton, and shall be carried with the employee while on duty.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #6

SUBJECT: On the Job Training---for the Operations and Maintenance Division

B. There are two levels of Operator training:

1. The first type of training is classroom instruction for light motor vehicles (cars to 1 ton trucks) which is a course in Defensive Driving, given by the County and must be completed by each employee driving any FCD vehicle.
2. A combination of classroom and field training /observation of the employee by the MCDOT Safety Office Equipment Instructor (Risk Management Department). Each type of heavy duty motor vehicle or equipment requires a separate training/education period. Successful completion of training by employee is documented by endorsement on their Maricopa County Vehicle Permit Card.
3. In the case of heavy-duty vehicles, (trucks greater than 1 ton and larger or any off-road construction equipment), the training is provided by the MCDOT Safety Office Equipment Instructor, or a designed deputy. Training must be successfully completed and documented on their Maricopa County Vehicle Permit in order for the employee to be authorized to operate the specific type of equipment they may be assigned.

***** Heavy Equipment Includes: Motor Graders, Dozers, Scrapers, Large Front End Loaders, etc. that require more experience to operate efficiently are restricted to licensed Operators only. Alternate Operators are seldom needed on this type of equipment.

- An arrangement for this type of training is to be approved by the O&M Division Manager.
- During this type of second level training the Operator's Handbook for the applicable equipment will be made available for the employee/trainee to read and understand.
- The Equipment Instructor shall review the employee's understanding of the Handbook and when the employee is considered knowledgeable, a field demonstration and practice on the equipment will be given to the employee.
- The Equipment Instructor will provide for a follow –up review of the employee's ability/understanding to operate the equipment on a periodical basis, or as required for personnel on alternate (underfill) status as an operator.
- Concern for the safety of the operator and those working around him prohibit OJT personnel from operating any equipment without authorization by their immediate supervisor.
- An Equipment Training Form (copy attached) must be completed by an employee before any equipment training is given by the MCDOT Equipment Instructor.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #7

SUBJECT: Check out procedures for FCD tools and/or equipment.

PURPOSE: To establish control and ensure proper care, repair and accountability of tools and/or equipment in the O&M Division.

PROCEDURE:

1. Team Leader/Work Crew Leader or designated person will request tools/equipment from Resource Coordinator.
2. The Resource Coordinator will check out each tool(s) or piece of equipment, maintain an accurate updated log and check each tool(s) or piece of equipment back into the shop.
3. Person returning checked out tool(s) or equipment will return it clean and operable. If any damage is sustained, ensure shop personnel are made aware of the damage.
4. Person returning checked out tool(s) or equipment will notify shop personnel if any tool or equipment is not operating properly or if any damage has occurred.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #8

SUBJECT: Controlled burning operations

PURPOSE: To establish a safe and efficient means to control burn vegetation.

PROCEDURE:

1. Personnel or crews requesting to burn will notify the O&M Administrative Coordinator. The O&M office will then make necessary telephone calls requesting permission to burn and notify the requestors by radio before or by 0800 hours.
2. Personnel must have the appropriate burning permit in their possession when burning. They will comply with all conditions set forth on the permit.
3. Personnel will not burn within 10' of fences, gates, or appurtenant structures. Debris from burning will be disposed of (i.e. by raking) and the area burned will be returned to as close to natural as possible.
4. When controlled burning in Pinal County, follow the burn permit stipulations. A water truck or backhoe must be on site for all controlled burning operations.
5. Discontinue all burning operations when wind conditions create a hazard.
6. Notify the O&M Administrative Coordinator when burning operations have ceased for the day.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #9

SUBJECT: Inspections and Documentation

PURPOSE: Document the Procedure for Tracking MFR Measures

PROCEDURE:

1. Annual Inspections:

The Work Control Center will conduct annual inspections of all of the Districts flood control facilities on an annual basis. The annual inspection will be documented in report form and reviewed by the O&M Division Manager. The report will include a statement concerning whether or not the structure will operate as designed. The inspection report will be filed away as a hard copy and an electronic form will also be documented and saved in the FCD share drive. Applicable copies of the inspection report will be mailed to the projects sponsoring agency, the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.

In addition, projects built by the U.S. Army Corps of Engineers require a semi-annual inspection and report.

The annual inspection team, for dams and FRS's, consists of a Public Works Inspector, Dam Safety Engineer, and two additional trained employees. The projects sponsoring agency, and the Arizona Department of Water Resources Dam Safety Section will be also be invited to attend the inspection.

2. Maintenance Inspections:

The Maintenance Inspections also occur on an annual basis. This inspection precedes the Annual inspection by six to eight weeks. The Work Control Center staff conducts the maintenance inspections. The inspection staff will provide a detailed report noting any maintenance deficiencies, continuous monitored concerns, and any dam safety anomalies observed during the inspection. From this report, work orders will be generated, some deferred and assigned accordingly. The maintenance inspection report will be filed away as a hard copy and an electronic form will also be documented and saved in the FCD share drive. Each work order will be assigned a priority rating. (See Attachment X)

Managing for Results (MFR) Measure:

All priority **#1-work orders** generated from the maintenance inspections shall be completed before the start of the scheduled annual inspections. When this condition is met, the structure has been maintained to District and sponsoring agencies standards.

See attached priorities and inspection schedule.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division
Standard Operating Procedure #9

SUBJECT: Inspections and Documentation

Deficiency Levels and Maintenance Standards (Priorities)

(During Inspections and Routine Maintenance)

SUBJECT: Index

PURPOSE: List titles of deficiency levels and maintenance standards

Function & Integrity-Priority #1

| Standard No. | Title | Revision Date | Reviewer |
|--------------|---------------------------------|---------------|----------|
| #7 | Dams | 2005 | CFK |
| #9 | Flap Gates | 2005 | CFK |
| #11 | Inlet & Outlet Structures | 2005 | CFK |
| #12 | Inverts-Channels & Storm Drains | 2005 | CFK |
| #13 | Levees | 2005 | CFK |
| #14 | Outlet Towers | 2005 | CFK |
| #15 | Trash Racks | 2005 | CFK |
| #16 | Reservoirs-Dams | 2005 | CFK |
| #19 | Channel & Storm Drain Walls | 2005 | CFK |

Security & Liability-Priority #2

| Standard No. | Title | Revision Date | Reviewer |
|--------------|--------------------|---------------|----------|
| #1 | Access Gates | 2005 | CFK |
| #3 | Retention Basins | 2005 | CFK |
| #4 | Buildings | 2005 | CFK |
| #5 | Bridges & Catwalks | 2005 | CFK |
| #6 | Catch Basins | 2005 | CFK |
| #10 | Handrails | 2005 | CFK |

Aesthetics-Priority #3

| Standard No. | Title | Revision Date | Reviewer |
|--------------|---------------------|---------------|----------|
| #2 | Access Roads | 2005 | CFK |
| #8 | Fencing | 2005 | CFK |
| #17 | Right-of-Way Vacant | 2005 | CFK |
| #18 | Signs & Staff Gages | 2005 | CFK |
| #20 | Trails | 2005 | CFK |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| MONTH | DATE | DAM | FEDERAL AGENCY | DISTRICT RESPONSIBLE ENGINEER | FY 04-05 INSPECTING ENGINEER |
|------------------|-------------------------------------|-----------------------|-----------------------|--------------------------------------|-------------------------------------|
| November 2004 | 8 th – 11 th | Buckeye FRS No. 1 | NRCS | B. Howey | M. Greenslade |
| | | Buckeye FRS No. 2 | NRCS | B. Howey | L. Lambert |
| | | Buckeye FRS No. 3 | NRCS | B. Howey | L. Lambert |
| | 15 th – 16 th | Saddleback FRS | NRCS | B. Howey | B. Howey |
| | | Harquahala FRS | NRCS | B. Howey | B. Howey |
| December 2004 | 6 th – 9 th | Guadalupe FRS | NRCS | L. Lambert | M. Greenslade |
| | | Spookhill FRS | NRCS | M. Greenslade | M. Greenslade |
| | | Apache Junction FRS | NRCS | M. Greenslade | M. Greenslade |
| | | Signal Butte FRS | NRCS | M. Greenslade | M. Greenslade |
| January 2005 | 10 th – 13 th | White Tanks FRS No. 3 | NRCS | L. Lambert | L. Lambert |
| | | White Tanks FRS No. 4 | NRCS | L. Lambert | L. Lambert |
| February 2005 | 7 th – 10 th | Powerline FRS | NRCS | L. Lambert | B. Howey |
| | | Vineyard FRS | NRCS | L. Lambert | B. Howey |
| | | Rittenhouse FRS | NRCS | L. Lambert | B. Howey |
| | 14 th – 15 th | McMicken Dam | USACE | M. Greenslade | M. Greenslade |
| March 2005 | 7 th – 10 th | Adobe Dam | USACE | L. Lambert | L. Lambert |
| | | Dreamy Draw Dam | USACE | L. Lambert | L. Lambert |
| | | Cave Buttes Dam | USACE | B. Howey | L. Lambert |
| | | New River Dam | USACE | M. Greenslade | L. Lambert |
| April 2005 | 4 th | Sunnycove FRS | NRCS | M. Greenslade | B. Howey |
| | | Sunset FRS | NRCS | M. Greenslade | B. Howey |
| | | Casandro Wash Dam | NRCS | M. Greenslade | B. Howey |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| Structure Name | Inspection Date |
|--|-----------------|
| Adobe Dam | October 2004 |
| Dreamy Draw Dam Semi-Annual | October 2004 |
| Cave Buttes Dam Semi-Annual | October 2004 |
| New River Dam Semi-Annual | October 2004 |
| ACDC & Cave Creek Arm Semi-Annual | October 2004 |
| Skunk Creek @I-17 Semi-Annual | October 2004 |
| New River Channel (COE sponsored area) Semi-Annual | October 2004 |
| | |
| Buckeye FRS #1 | November 2004 |
| Buckeye FRS #2 | November 2004 |
| Buckeye FRS #3 | November 2004 |
| Saddleback FRS | November 2004 |
| Harquahala FRS | November 2004 |
| | |
| Guadalupe FRS | December 2004 |
| Spook Hill FRS | December 2004 |
| Apache Jct. FRS | December 2004 |
| Signal Butte FRS | December 2004 |
| | |
| White Tanks FRS #3 | January 2005 |
| White Tanks FRS #4 | January 2005 |
| Harquahala Floodway | January 2005 |
| Saddleback Floodway | January 2005 |
| Centennial Wash Levee | January 2005 |
| | |
| Powerline FRS | February 2005 |
| Vineyard FRS | February 2005 |
| Rittenhouse FRS | February 2005 |
| McMicken Dam | February 2005 |
| | |
| Adobe Dam | March 2005 |
| Dreamy Draw Dam | March 2005 |
| Cave Buttes Dam | March 2005 |
| New River Dam | March 2005 |
| ACDC & Cave Creek Arm | March 2005 |
| | |
| Sunnycove FRS | April 2005 |
| Sunset FRS | April 2005 |
| Cassandro Wash Dam | April 2005 |
| Skunk Creek @ I-17 | April 2005 |
| New River Channel | April 2005 |
| Camelback Ranch Levee | April 2005 |
| Agua Fria River | April 2005 |
| | |
| Holly Acres | May 2005 |
| Perryville Riprap | May 2005 |
| Colter Channel | May 2005 |
| RID Overchute | May 2005 |
| Indian School Rd. Drain | May 2005 |
| Dysart Drain | May 2005 |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| Structure Name | Inspection Date |
|--|-----------------|
| El Mirage Drain | May 2005 |
| EMF | June 2005 |
| Spook Hill Floodway | June 2005 |
| Signal Butte Floodway | June 2005 |
| Bulldog Floodway | June 2005 |
| Pass Mountain Diversion Channel | June 2005 |
| Sun City Drains | July 2005 |
| Sun City West Drains | July 2005 |
| East Fork Cave Creek | July 2005 |
| 10 th Street Basins #1 & #2 | July 2005 |
| Paradise Valley Basin | July 2005 |
| Scatter Wash | July 2005 |
| Rittenhouse Road Drain | August 2005 |
| Sossaman Road Drain | August 2005 |
| Guadalupe Road Drain | August 2005 |
| Indian Bend Wash Project | August 2005 |
| Rio Salado | September 2005 |
| Old Cross Cut Canal | September 2005 |
| 48 th Street Drain | September 2005 |
| Adobe Dam Semi-Annual Inspection | October 2005 |
| Dreamy Draw Dam Semi-Annual Inspection | October 2005 |
| Cave Buttes Dam Semi-Annual Inspection | October 2005 |
| New River Dam Semi-Annual Inspection | October 2005 |
| ACDC & Cave Creek Arm | October 2005 |
| Skunk Creek @ I-17 | October 2005 |
| New River Channel (COE sponsored area) | October 2005 |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division
Standard Operating Procedure #10

SUBJECT: Employee Work Clothes and Safety Equipment

PURPOSE: To Issue Correct Clothing and Safety Equipment and Define Responsibility for Their Usage

PROCEDURE A: Clothing

1. Outer work clothes are provided both as a benefit to employees and for a public relations measure that identifies each employee to the general public.
2. Once an order for clothes has been placed, it takes three (3) to four (4) weeks to receive the first issue. During this time, the employee shall provide his /her own clothing at the employee's expense.
3. Each employee will be issued the following:
 - A. Ten (10) shirts – Shirts may be long or short sleeve, (employee's choice).
 - B. Ten (10) pairs of pants
 - C. Two (2) jackets
4. The O&M Shop Personnel assigned, North Yard, and East Yard Field Supervisor shall maintain records of clothing sizes.
5. The O&M Division will provide cleaning services for the issued clothing. Soiled clothing will be picked up on pre-arranged days according to each of the three work areas. During weeks in which holidays occur, changes in pickup will be posted. It is the responsibility of each employee to bring and pick up his/her clothing each laundry day.
6. Each employee will be expected to take care of his/her work clothes. Normal wear and usage is expected. However, repair or replacement of issued clothing as a result of abuse (as determined by the O&M Division Manager) will be at the employee's expense.
7. The O&M Shop Personnel assigned shall be contacted if any problems or questions arise.

PROCEDURE B: Personal Protective Equipment

1. Basic safety is the responsibility of each employee. Each employee can call upon their immediate Supervisor for necessary equipment, procedures, and /or personnel to create a safe work environment.
2. Safety equipment shall be utilized in all designated areas and/or for hazardous activities
3. O&M Shop Personnel will provide the following items for employee use:
 - A. First Aid Kit (installed in vehicles)
 - B. Eye Protection
 - C. Wet Weather Boots, Ponchos, slickers
 - D. Gloves
 - E. Dust/Fumes/Mist Respirator
 - F. Hard Hat
 - G. Ear Plugs
 - H. Safety Vest

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #10

SUBJECT: Employee Work Clothes and Safety Equipment

4. Employees needing to wear prescription safety glasses will be provided with them in accordance with District policy.
5. The use of District provided clothing and safety equipment is a mandatory condition of employment.
6. It is the responsibility of the Field Supervisor to ensure personal protective equipment is the appropriate type of PPE designated for the task, is made available, and is used at his/her job site.
7. All employees required to use Personal Protective Equipment must be trained in the proper wearing, usage, maintenance, limitations, care and disposal of Personal Protective Equipment: 1. Before use of PPE, 2. If any changes occur in the workplace rendering previous training obsolete, or if any changes in the types of PPE to be used render previous training obsolete, the employees must be retrained.
8. Employee's that are required to wear respirators must be in a respiratory protection program in compliance with 29 CFR 1910.134. This includes a medical evaluation, Cardio-pulmonary baseline function test, fit testing of respirators and training for employee on the respirators in use.

PROCEDURE C: Protective Footwear

1. Field Supervisors, Crew Leaders, Equipment Operators (3 titles), Maintenance Specialist, General Maintenance Workers, and all other personnel in similar field positions are required to wear steel-toed safety boots. These shall be at least a "3/4 boot" covering and supporting the employee's ankles. Toe guards will be worn at all times when operating jackhammers and pneumatic tampers.
2. Employees will be reimbursed for the cost of their boots (up to \$120.00) on an annual basis or as determined by District Policy. For specific details, employees should consult with their supervisor.

PROCEDURE D: Equipment Responsibility

1. Each employee shall list and sign for all District provided clothing and safety equipment on the form provided by the Resource Coordinator.
2. Upon employment termination, the employee shall return all District provided clothing and safety equipment. If any items are missing or not accounted for, their value will be deducted from the final paycheck.

Updated 12-4-07

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #11

SUBJECT: Material Safety Data Sheet

PURPOSE: To establish a standard procedure for properly obtaining, reviewing and filing MSDSs

REQUIREMENTS:

1. All hazardous materials purchased by FCD employees must have a current MSDS filed with:
 - A. Ecology Branch
 - B. O&M Public Works Supervisor – Shop

- 1) Buying a NEW product:

- A) Obtain a MSDS at the time of purchase.
 - B) If the seller does not have a MSDS, DO NOT buy the product, use an already approved product ONLY. Provide the Ecology Branch with the following information in order for a formal request for a MSDS may be made:
 - Product Name
 - Name and address of Distributor
 - Manufacturers name

- C). The ecology Branch will notify the O&M Division Manager when the MSDS has been obtained and the purchase may be made.

- C. Before using a new hazardous material, provide the Ecology Branch with the following information: (Note: use the New Hazardous Material Product form, See next page this S.O.P.)

1. Copy of MSDS
 2. Name of product
 3. Use(s) of product
 4. Where the product will be used (location(s))
 5. Where the product will be stored
 6. Job Title(s) of employee(s) that will be using the product

2. All employees using a hazardous material will have the proper MSDS on the job site. If a supervisor does not have a specific MSDS for a hazardous substance that is brought into the work area he will prohibit the use of the product on his job site until a proper MSDS is available on the site.

REFERENCES: Hazard Communication Plan for Maricopa County Division of Public Works, 10/03/88

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #12

SUBJECT: Heat Stress Guidelines

PURPOSE: HEAT STRESS GUIDELINES

A Heat Stress Index developed for the National Weather Service (NWS) is a new service provided in the Maricopa County area. The Index is compiled from information about heat-related deaths. The atmospheric conditions believed to have contributed to these deaths are temperature, humidity, sky condition and the general prevailing air mass. Based on this information a "Heat Advisory, High Heat Watch or Warning" could be issued by the NWS. Prior data shows that only about 4% of calendar days would be affected by these conditions.

Causal Factors:

1. Each division should determine work operations that place employees in areas at risk of being affected by heat stress and provide annual training to help them understand their responsibilities to withstand working in the heat.
2. Employees should seek a physician's advice about their medical history and current medications that may predispose them to heat related illness.

Control:

1. Each division should determine acclimation criteria for current employees, new employees, inmates, hosts, temporary help, and employees returning from extended leave.
2. Encourage workers to wear lightweight, loose fitting, light-colored clothing or issued work clothes.
3. The Agricultural Health and Safety Center, the National Weather Service, the US Air Force and the University of Minnesota Extension Service recommend natural fibers, such as cotton.

Fluid Replacement:

1. Chilled water/fluids should be consumed in small, frequent amounts, 8 oz. to 16 oz., each 30 minutes. Workers should be cautioned against drinking too much water, which could increase fluid loss.
2. FCD shop personnel will provide enough ice to chill the water in available water coolers.
3. Encourage employees to seek a physician's advice about individual appropriate electrolyte replacement.
4. Each work crew exposed to extreme heat working conditions should have a minimum of 2.5 gallons of water available, per person per day, plus 5 gallons of rescue water.
5. There should be a minimum of 2.5 gallons of usable water and 2.5 gallons of rescue water available for single persons on field vehicles.
6. When a crew uses all drinking water except the 5-gallon rescue water, they should stop work and replenish their drinking water supply.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #12

SUBJECT: Heat Stress Guidelines

Administration Controls:

1. Training - Employees shall be informed of these guidelines and requirements.
2. On days when the heat index is in the "Severe" category, employees shall alternate work and rest periods. Rest periods shall be taken in a shaded area (15 minutes or more in every hour).
3. If an employee is suspected of suffering from heat stress/stroke call "911" and also inform "61 Flood Control."
4. No employee suspected of being ill from heat stroke should be sent home or left unattended unless released by a qualified medical professional.
5. On days when the heat index is in the "Severe" category, employees in areas identified as at risk of being affected by heat stress/stroke should not be allowed to work alone.

Reduced Work Days:

1. On days of extreme heat (heat index in the "Extreme" category) work crews shall discontinue work at 1 pm and return to their reporting facility.
2. The supervisor will provide specific work instructions.
3. The department will coordinate training or other work activities.

Attachments:

OSHA Facts Sheet 95-16

http://climate.geog.udel.edu/~jdwatts/index_web/

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #13

SUBJECT: Reporting Vehicle Accidents

PURPOSE: Describe content and method of reporting facts for vehicular accidents

PROCEDURE A: Method of Reporting:

1. An accident is defined as an incident that rearranges ANY part of the vehicle, its accessories (either inside or outside the vehicle or contents within the vehicle). Employees must report any accident/injury to his/her supervisor. Any accident not reported or covered up may result in severe disciplinary action.
2. An Accident Report Form is defined as the Risk Management Department triplicate form No. 7500-005 R12-81.
 - A. Copies of the Accident Report form can be found inside each FCDMC vehicle. The FCD Shop supervisor is responsible for maintaining forms in each vehicle.
 - B. The form is to be completed by your immediate supervisor, after investigation of the accident, and consultation with the employee.

PROCEDURE B: When an accident occurs on FCD facilities:

1. Notify immediate supervisor or use vehicle radio and call "61 Flood Control." Refer to the "Radio Usage Procedures" SOP #17 for additional information concerning use of the radio to report accidents.
2. In serious accidents, do not move the vehicle unless instructed to do so by an FCD supervisor, police or emergency workers.
3. An investigation of the accident will be conducted by the supervisor and the Accident Report form is to be completed by the supervisor that same day.

PROCEDURE C: When an accident occurs on a public highway or any other private or public area:

1. Use vehicle radio if operational and call "61 Flood Control" providing the following information:
 - A. Code 961 for an accident without injuries
 - B. Code 962 for an accident involving injuries.
 - C. Location of the accident:
 - 1) Federal highway; (interstate) give highway number and the number of the nearest mile marker if possible, or approximate distance and direction from the nearest crossroad.
 - 2) State highway; give highway name/number and distance to the nearest crossroad.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure #13

SUBJECT: Reporting Vehicle Accidents

- 3) County highway; give road name/number and distance to nearest crossroad.
- 4) City street; give the street and nearest the crossroad or an adjacent street number.
 - a) Give the number of vehicles involved.
 - b) Give the ownership of involved vehicle(s), (Federal, State, County, or private).
 - c) Provide the accident circumstances, for example
 - Are traffic lanes blocked?
 - Are power lines down?
 - Any spilled fuel or other fire hazard present?
 - Description of traffic conditions, heavy or light.
 - Description of weather conditions.
 - Other conditions or circumstances that conventional rescue/law enforcement response.
2. In serious accidents, do not move the vehicle unless instructed to do so by a police officer.
3. Do not discuss the accident with anyone except a police officer or an FCD supervisor.
4. The office will contact emergency and/or law enforcement authorities, as the situation warrants. Supervisors are responsible for contacting MCDOT-Safety when their employees are involved in any accident, regardless of the extent of damage.
5. Employees may be required to submit to a physical examination that will include a drug and alcohol test. Supervisors are required to follow the Maricopa County Substance Abuse Policy.
6. The supervisor will conduct an investigation of the accident and review the events surrounding the accident with the employee on the day the accident occurred. Supervisors are to submit a completed accident report form to the office in a timely manner in order to meet the 24-hour requirement for reporting accidents to Risk Management.
7. The supervisor and employee will be required to attend the next Accident Review Board to review the circumstances of the incident.
8. Any accident involving contract laborers must be reported to Staff Mark.
9. It is imperative that the Division Manager or his designee be promptly notified in the event of **any** accident involving the District.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #14

Subject: Hazardous Materials Incidents

PURPOSE:

- 1) To establish Standard Operations Procedures for Emergency Response to any Hazardous Materials Incident within Maricopa County Flood Control District.
- 2) To provide safety procedures for Maricopa County Flood Control District employees to follow when internal or external hazardous material incidents occur.

The Flood Control District of Maricopa County shall utilize the following Standard Operating Procedures for Emergency Response of Hazardous Materials to ensure proper emergency response procedures and the safety of all employees is observed when a response to a hazardous chemical/incident may be required within the Flood Control District.

DEFINITIONS:

1) EXTERNAL INCIDENT:

A hazardous material incident that occurs on county properties or right-of-way, away from any existing county facility.

- A. Where the County is directly involved, caused or is part of a traffic accident involving a hazardous material.
- B. When a report or request for assistance in the clean up of an incident created by a private citizen, involving known or unknown substances or notice of illegal dumping of chemicals.

2) INTERNAL INCIDENT:

Hazardous material incidents, (spills, or hazardous release of any gas, liquid or vapor involving a hazardous material) that occur within any Maricopa County facility, to include but not limited to the Department of Transportation Procurement facility, Facilities Management facility, Equipment Services facility, Vector Control storage area, or the Medical Examiners offices.

3) HAZARDOUS MATERIAL:

Any material that can significantly contribute to an increase in serious, irreversible or incapacitating illness; pose substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed; or material that has a characteristic of ignitability, corrosivity, reactivity, or toxicity.

4) LIFE THREATENING:

Any hazardous material that is a threat to human life or health when released into the environment.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure # 14

5) NON-LIFE THREATENING:

Any hazardous material that is hazardous in nature but is NOT an immediate threat to human life, i.e., oil or diesel fuels.

6) BLOODBORNE PATHOGENS:

Pathogenic microorganisms that are present in human blood and can cause disease in humans, to include but are not limited to hepatitis B virus (HBV) and human immunodeficiency virus.

7) OTHER POTENTIALLY INFECTIOUS MATERIALS (OPIM):

The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, pleural fluid, any body fluid that is visibly contaminated with blood, and ALL body fluids in situations where it is difficult or impossible to differentiate between body fluids.

8) CONTAMINATED:

The presence or the reasonably anticipated presence of blood or “Other Potentially Infectious Materials” on any item or surface.

9) CONTAMINATED SHARPS:

Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken glass tubing, broken glass vials.

10) DECONTAMINATION:

The use of physical or chemical means to remove, inactivate, or destroy Bloodborne Pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal.

11) PPE:

Personal Protective Equipment

12) REGULATED WASTE:

Liquid or semi-liquid blood or Other Potentially Infectious Materials; contaminated items that would release blood or OPIM in a liquid state or semi- liquid state if compressed; items that are caked with dried blood or OPIM and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or OPIM.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure # 14

HAZARDOUS MATERIALS “EXTERNAL or INTERNAL” INCIDENTS

1. External Safety Procedures for spills on Maricopa County properties, right of way and facilities.

A. When the County is directly involved, caused, or is part of a traffic accident involving a hazardous material.

B. When a report or request for assistance in the clean up of an incident created by a private citizen, involving known or unknown substances, or notice of Illegal dumping of chemicals.

2. EMERGENCY NOTIFICATION:

Notify the immediate supervisor if a hazardous material incident occurs.

- A. Report what type material is leaking and where, as well as the size of the spill and rate of flow.
- B. The supervisor will use the Material Safety Data Sheet (MSDS) OR Department of Transportation Emergency Response Guidebook to determine if the material is life threatening or non-life threatening.
- C. The supervisor will determine whether or not the immediate employees can contain the spill or if an Emergency Response Team is needed.
- D. The supervisor will immediately notify the appropriate agencies (only when Life threatening, or in the event of a chemical reaction or fatality), “61” Office, Emergency Services by dialing “9-9-1-1” or “9-1-1”, and the Safety Division at **(602) 506-7179**. Advise that there is a hazardous material spill and give the following information:

- Name of the person calling and department.
- What hazardous material has been spilled?
- Source of the hazardous material (i.e., vehicle, container, etc.).
- Where the spill is located.
- When the spill occurred (time).
- What has been done to control or contain the spill?

3. CONTAIN THE SPILL.

ATTENTION! Employees are to contain only if determined by supervisor to be safe. In ALL OTHER circumstances, employees must have Emergency Response Team contain the spill.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure # 14

Use the Material Data Safety Sheet (MSDS) or Department of Transportation Emergency Response Guidebook to identify proper protective equipment and to understand what hazards are associated with the hazardous material and what to do to contain the spill.

4. CONTAINMENT PROCEDURES:

- When determined by the supervisor (SAFE) stop the source of the leak. Close the valves, pumps, or whatever may be allowing the material to spill.
- Cover drains or other possible escape routes to waterways.
- Patch holes with patch kits, valve pluggers, or whatever is available for safe patching.
- Contain the spill by the best method that may be available by:
 1. Building a dike to keep spilled liquid from getting into water.
 2. Channeling the spill to a place where it will not spread, by diking or pumping, or opening a trench to a secure spot.
 3. Placing an empty container under the leak.
 4. Use absorbent materials to soak up the spill.

5. SPILL OF A PETROLEUM PRODUCT (i.e., gas, oil, hydraulic fluid) of less than 1 gallon: Following procedures must be followed

- Place a piece of plastic on the ground, away from the spill and with a SHOVEL scrape up the spill contents and place it on the plastic.
- Contact the **Safety Division Hazardous Materials Consultant** for further guidance. **(602) 506-7179** or **(602) 723-7057**.

PREVENTION:

1. TO PREVENT SPILLS:

- Make sure containers are intact and are stored to prevent spills or external damage.
- Ensure containers are marked correctly and are segregated with compatible materials only.
- Always remember hazardous spills can cause a fire, explosion, or release of toxic substances into the air or water that can affect not just you, but others in the surrounding area.
- Inspect vehicles and equipment for possible leaks or damaged hoses that contain hazardous material.
- Always carry MSDS's of all hazardous materials carried on vehicles to include proper safety equipment.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure # 14

HAZARDOUS MATERIALS “ILLEGAL DUMP ” INCIDENTS

In the event of locating or uncovering a container or containers where possible hazardous chemicals may be present on Maricopa County Properties and Right Of Way, the following procedures must be followed:

1. If operating equipment/machinery and a container is uncovered by the equipment/machinery, stop operation of the machinery/equipment and notify the immediate supervisor with the following information:
 - Location
 - Type of container (i.e., 55 gallon or 5 gallon drum, metal, plastic, tanker)
 - If liquid is present describe the color of the liquid
 - Indicate if any odor or reaction has occurred
2. Supervisor will contact emergency services immediately. If a reaction or fatality has occurred call “9-9-1-1” or “9-1-1”. If there is no reaction or fatality associated with the container, **contact the Safety Division Hazardous Materials Consultant at (602) 506-7179.**
3. All equipment/machinery in contact with the container or liquid will be marked off and secured until an appropriate Hazardous Materials Responder identifies the contents.

HAZARDOUS MATERIALS “BIOHAZARD ” INCIDENTS

In the event of locating or uncovering any possible contaminated sharps or possible bloodborne pathogen or other potentially infectious materials that may be present on Maricopa County Properties and Right Of Way, the following procedures must be followed:

1. Contaminated Sharps collection and disposal

When determined by the crew lead/supervisor to be safe, collect and dispose of the contaminated sharps items as regulated waste.

To collect contaminated sharps the following process must be used:

- Identify the contaminated sharps items to be collected and disposed of.
- Wearing puncture resistant gloves, and using mechanical means such as safety tongs, shovel and dust pan, pick up the contaminated sharps item and place in the appropriate sharps container provided.
- Do not touch the item with bare hands during collection and/or disposal.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Standard Operating Procedure # 14

- Under no circumstances shall any sharps item be bent, broken, recapped, or removed during collection for disposal by any Maricopa county employee.
- The appropriate sharps container for placement of the sharps shall be marked/labeled as bio-hazardous in orange or red-orange coloring and lettering and symbols in contrasting color, and shall be puncture resistant and leak proof.
- Sharps collection containers shall remain closed and secured after each use.
- Sharps collection containers shall be disposed of when full, by delivering or having it collected by, a pre-determined county bio-hazardous waste contractor approved for regulated waste disposal.

2. Bloodborne Pathogens and Other Potentially Infectious Materials, decontamination, collection and disposal

When determined by the crew lead/supervisor to be safe, decontaminate, collect and/or dispose of the BBP/OPIM as follows:

Determine location and amount of BBP/OPIM exposure.

- If larger than 55 gallon drum for waste disposal, employee shall immediately stop the process and notify the supervisor.
- If larger than 55 gallon drum for waste disposal, supervisor shall notify a predetermined contractor to decontaminate, collect and dispose of BBP/OPIM.

If exposure to BBP/OPIM is less than 55 gallon drum for waste disposal, it must be decontaminated, collected and disposed of by Flood Control employee for Maricopa County by using the following procedures:

- Employees must first decontaminate the area or item by using a 1:10 solution of bleach.
- Employees must use PPE recommended by bleach Manufacturer / Material Safety Data Sheet Information. The following PPE must be worn when decontaminating and BBP/OPIM area or item:
 - Safety glasses or goggles
 - Chemical gloves
- Bleach solution shall be diluted by using 1 part bleach to 10 parts water and should be immediately applied to the exposed area or item.
- Bleach solution shall remain on area or item for at least 10 minutes to allow for decontamination process to complete.
- After decontamination process is complete:
 - Small decontaminated surface areas shall be wiped down with clean towels with disposal of towels being placed in red bio-hazardous waste bags and placed in secondary leak proof container with lid for disposal drop off to or collection by the predetermined bio-hazardous waste disposal contractor.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure # 14

- Decontaminated items shall be placed in red bio-hazardous waste bags and placed in secondary leak proof container with lid for disposal drop off to or collection by the predetermined bio-hazardous waste disposal contractor.
- All human and animal waste shall be decontaminated, bagged or contained in a closed, leak proof container and disposed of in normal waste disposal.

SAFETY ALWAYS! At no time will a Maricopa County employee handle or attempt to move containers abandoned or uncovered. Report illegal dumpsites to the Safety Division with a good location and marking. If and when possible, obtain as much information about the container at a distance with little or no risk to all.

For further information and training in spill containment and illegal dumpsites, contact the **Maricopa County Risk Management Safety Division, Hazardous Materials Consultant at (602) 506-7179.**

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #15

SUBJECT: Tailgate Safety Talks

PURPOSE: To Promote Better Safety Habits For District Employees

PROCEDURE:

1. On the first day of each workweek, all Team Leaders and Work Crew Leaders will give a (10) ten-minute safety talk at the work site. The talks will be given following the subjects outlined in the most current Tailgate Safety Manual. However, Team Leaders and Crew Leaders should also address any additional concerns or job related safety hazards at this time.
2. Employees are encouraged to speak up about safety hazards. The Team Leader will direct group participation and comments on near accidents that happened in the past as related to the work at hand.
3. Always demonstrate the proper use of safety equipment by having an employee show its use and work application.
4. For the benefit of all personnel, demonstrate the use of tools that will be utilized on the job site.
5. Any questions or concerns that the Team Leader cannot address should be directed to the O&M Supervisor.
6. All employees are required to **legibly** sign the Safety Meeting Attendance Sheet.

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

Standard Operating Procedure #16

SUBJECT: Radio Call-In

PURPOSE: To provide a standard call-in procedure for O&M personnel operating independently in the field.

Procedure:

1. The Public Works Area Supervisors or Team Leader shall indicate those personnel who will be operating independently by placing an asterisk (*) next to their name on the weekly work schedule.
2. O&M personnel operating independently will call the Administrative Coordinator (210) or one of the Work Control Staff (230, 231, or 232) at 10:00 a.m., 12:00 p.m., and 2:00 p.m.
3. The Administrative Coordinator shall notify the respective Supervisor by radio if contact is not established with any person reported to be operating independently by 10:30 a.m., 12:30 p.m., or 2:30 p.m. for follow-up.

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

Standard Operating Procedure #17

SUBJECT: Radio Use

PURPOSE: Communication

Procedure: Radio Communications

1. Radios are installed in all Flood Control District vehicles, for use in daily work requirements. These units are configured with Flood Control District (FCD), MCDOT, Equipment Services, and Emergency Services.

- | | |
|--------------------------|-------------------|
| • Flood Control District | 6-1 Flood Control |
| • MCDOT | 6-1 Office |
| • Equipment Services | 6-1 Shop |
| • Emergency Services | E.S. Base |

2. The radio system consists of repeaters located on mountaintops throughout the County. The Smart Zone system is a wide area “trunked” radio system. Trunking is the automatic sharing of a small number of communication channels between a large numbers of users. It Distributes message traffic among the available channels for efficiency and reduces waiting time For an open channel.

A normal trunked system consists of one site (typically located on a mountain top, tall tower, or a tall building) used to provide communications to a specific geographic area. The Smart Zone System utilizes four different mountain top sites to provide coverage to a major portion of Maricopa County. Smart Zone uses site locations at Thompson Peak, White Tanks, Yarnell, and Oatman.

Radio Communication Procedure

1. Radios are installed in all Flood Control District vehicles for use in daily work requirements or official business only.
2. Radios should be checked prior to departing the yard each morning to ensure proper operation.
3. The radio is to be left on and monitored throughout the workday.
4. When transmitting, use your normal voice. Do not shout or yell.
5. Speak clearly and be brief.
6. Never use profane, obscene, vulgar, or abusive language on the radio.
7. Know what you plan to say and the call number of which you are calling before you key the mike.
8. Make certain the airway is clear before you begin transmitting.
9. Identify yourself first by call number and then request the desired party by their call number.
10. Make certain to clear the airway when you have finished with your transmission. (Only the person who **initiated** the call is to clear the net.)

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

Standard Operating Procedure #17

SUBJECT: Radio Use

11. In the event of an emergency, contact the Operations and Maintenance Division #210, the Shop #250, or an Operations and Maintenance Supervisor.
12. During an emergency situation, DO NOT use the net for routine business and DO NOT break in to offer advice or opinion! In an emergency situation, the radio is to be used only by the individual at the scene of the emergency and the person directing emergency response personnel (firemen, police, ambulance, etc...).

Standard Operating Procedure #18

SUBJECT: Flood Emergency Operations

PURPOSE: To Define Duties and Responsibilities for O&M Personnel during Flood Emergency Conditions

Procedure A:

1. Each employee will be assigned to one of the defined observation teams to serve as "Flood Water Personnel." Each team will have specific observation points assigned, for which the employee will observe and report data as observed.
 - A. The assignment listing is provided on the "Flood Emergency Staff List."
 - B. The observation points are established by the Alert Branch.
 - C. The specific duties to be performed at each observation point will be found in the "Flood Watch Assignment Book" and in the "Site Specific Packet."
 - The "Flood Watch Assignment Book" contains both photographs of the site and data gages, which are to be documented and monitored.
 - The "Site Specific Packet" contains detailed instructions to be followed for each observation point and a listing of both primary and secondary sites.
 - D. The SWS personnel may define additional task (s) for any observation point at the time of team activation which shall be completed in addition to those listed in the "Flood Watch Assignment Book."
 - E. All personnel shall evaluate their personnel safety consideration when undertaking both defined and special assignments.

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

2. Flood Watch Personnel (FWP) will be assigned a FCD vehicle equipped with the following items:
 - A. Mobile 2-way radio
 - B. Rotating warning light
 - C. Most FCD vehicles are also equipped with a commercial radio for use in monitoring local emergency frequency available to the general public.
 - D. For off highway locations, a four-wheel drive vehicle will be assigned.

Standard Operating Procedure #18

SUBJECT: Flood Emergency Operations

3. Each observation team will be assigned a Flood Watch Box. The Public Works Supervisor Shop is responsible for storing and maintaining such boxes. Each flood watch box measures about eighteen (18) inches in dimension, is locked with the "3E59" key, and shall contain the following:

| | |
|-------------------------|-------------------------|
| A. Flashlight | Reminder Pickup |
| B. Spot Flood Lamp | P. Traffic Cones (4) |
| C. Flares (8) | Q. Barricades (2) |
| D. Pig Tail Adaptor | R. Team #3 Only |
| E. Soft Rope | Crank For Gated Outlets |
| F. Safety Vests (2) | |
| G. Vinyl Poncho (2) | |
| H. Surveillance Reports | |
| I. Call Numbers | |
| J. Accident Reports | |
| K. Pens (2) | |
| L. Highway Map | |
| M. Light Bulb (Replace) | |
| N. Rags | |
| O. Life Preserver | |
4. FWP are charged with the responsibility of knowing and understanding the contents of the flood watch boxes including how to travel to the assigned area prior to any flood event.
5. FWP shall return items to the Flood watch Box after use in a neat and clean state.
 - A. A photo book of each observation point is maintained by the O&M Division Manager for

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

- use in becoming familiar with the applicable site and general area. FWP are required to visit their assigned area for orientation/training purposes.
- B. FWP shall update themselves periodically with the current assignment of their respective observation team.
6. Rain gear and personal clothing suitable for working outdoors during stormy periods are the responsibility of the FWP, although the FCD Senior Resource Coordinator/staff can provide additional rain gear; however.

Standard Operating Procedure #18

SUBJECT: Flood Emergency Operations

7. Personnel will maintain FCD radio contact at all times beginning with a preliminary radio check to “61 Flood Control” prior to departing the Flood Control District complex.
- A. Refer to “Radio Usage Procedures” SOP #17 for additional instruction.
- B. Upon arrival at assigned observation point, FWP will observe, record, and report by radio the following data:
- Team number
 - Observation point
 - Stream flow characteristics:
 - a. Stream and/or staff gage reading(s) to be measured in feet or elevation depending on the structure.
 - b. Stream gage condition, (rising, falling, or steady).
 - c. Estimated velocity, feet per second.
 - d. Weather conditions (raining or not; light or hard).
- C. The need for extended conversations should be made by cellular phone, if practical. REMEMBER, THE PUBLIC AND THE NEWS MEDIA ARE MONITORING YOUR RADIO TRANSMISSION.
- D. Prior to departing from your assigned observation area, check in with “61 Flood Control” to notify the FCD that you are leaving and to receive any special instructions and clearance.
8. Any unusual or changing conditions having a significant potential to be life threatening or

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

dangerous to the general public will be reported immediately.

9. When the FCD vehicle is so equipped, the local AM radio station shall be monitored for general public broadcasts that may conflict with observed conditions. Should conflicting information be heard it shall be reported to "61 Flood Control."
10. In severe situations, personnel will be required to go on twelve-hour shifts, generally from 0600 to 1800 hours. Personnel will report to FCD Headquarters or Civil Defense Headquarters, 2035 N. 52nd Street, Phoenix, as directed by the Chief, Operations and Maintenance Division, at the beginning of the shift.

Standard Operating Procedure #18

SUBJECT: Flood Emergency Operations

11. If a life-threatening situation occurs in your vicinity and you can assist without endangering yourself, do so, but use good judgment and keep safety in mind at all times.
12. FWP must understand and be experienced with the hazards of driving in rainy/foggy/snowing weather. Typical hazards can include:
 - A. Downed power/utility lines.
 - B. Flooded dip crossings.
 - C. General public vehicle accidents.
13. Flooded steams or dip crossings and impounded water behind structures at road crossings where a potential hazard exists for public traffic will be reported by radio to the MCDOT ("61-Office") so that traffic control devices can be installed.
14. Do not divulge any information or give opinions to the news media or the general public; refer them to FCD Public Information office @ (602) 506-2983.
15. Maintain adequate vehicle fuel reserve during your shift and fill the fuel tank at the end of your shift.
16. Arrange for restocking of the flood watch box if any supplies or equipment replacement is needed.

FLOOD WATCH ASSIGNMENT AND RESPONSIBILITES

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

O&M Field Supervisor

- To assign areas that have been repaired or reconstructed to senior operators for transport on rotating schedule. Review and evaluate all assigned reports.
- Flood Watch Team Leaders will inspect drainage of various locations and structures that have been repaired or reconstructed and will complete a report on performance of repair work and note and prioritize any deficiencies.

Standard Operating Procedure #18

SUBJECT: Flood Emergency Operations

Team Leaders

These field supervisors will update flood emergency staff list at least three times a year; all areas will be fully manned at all times. Each area is assigned a monitoring crew and the supervisor will make certain any emergency equipment is ready for use. Members of each team must be familiar with their areas. Storm surveillance and any work request forms must be properly completed, and each report checked to verify that all areas have been reported. Before each team departs, the supervisor is to verify that all members are present or substituted and the proper paper work is in their possession.

Work Control Center Supervisor/Staff

The Work Control Center will assist the field observers in obtaining equipment, materials, and other resources for emergency repairs to District structures and will keep accurate logs of incoming calls. In addition, the WCC will monitor the various team locations movements as they make observations and inspections during the emergency.

All flood watch vehicles will be manned by two or more staff members:

| | |
|----------------|-----------|
| Utility trucks | 2 or more |
| Crew cabs | 3 or more |

All other vehicles must have supervisor approval to be used.

This memo in no way supersedes the FCD procedures and policies that must be met during storm

MARICOPA COUNTY FLOOD CONTROL DISTRICT
Operations and Maintenance Division

surveillance.

Attachment A: Flood Emergency Staff List

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Operations Division

Standard Operating Procedure #19

SUBJECT: O&M Mosquito Treatment

PURPOSE: To Outline Responsibilities for Mosquito Control for Flood Control Structures

Procedure: Notify the Ecology Team Leader of any actual or potential mosquito breeding concerns.
FCD Ecology 506-4105.

- a) Give the following information:
 - A. Location of the concern i.e. City, Zip Code, major cross streets, breeding source.
 - B. Notify Vector Control if the concern is located in an area which is not a Flood Control maintained structure or right-of-way (Vector Control **506-6616**).
 - C. Action will be confirmed by Vector Control to Flood Control office.
2. Refer to the Districts Mosquito Management Program

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operation and Maintenance Division

Standard Operating Procedure #20

Subject: Standard Operating Procedure (SOP) for Pesticide Licensing and Chemical Usage

Purpose: The Operations & Maintenance Division requires a license for specific positions. When a licensing requirement exists the following SOP will apply:

Procedure:

1. The O&M Division Manager will decide whether a pesticide license is required per job classification on an “as needed” basis.
2. If a pesticide license is required for a specific job, O&M will pay all registration, testing, and certification fees. All pesticide technical training manuals needed to study for the pesticide license test will be provided by the Ecology Branch of O&M. Time involved in testing for the pesticide license shall be paid for by the Flood Control District.
3. The Ecology Field Supervisor will oversee all personnel with Certified Pesticide Licenses.
4. An employee must pass two (2) separate tests in order to receive their pesticide certification. A passing score of seventy-five percent (75%) is required on each test. The two tests consist of:
 - B0- CORE Materials- Laws and Regulations
 - B3- Right-of-Way and/or Weed Certification

If any one of the two tests is failed, a retake will be rescheduled for that particular test. All testing and rescheduling will be coordinated through the Qualifying Party Licensee in the Ecology Branch of O&M.

5. The Ecology Field Supervisor shall coordinate all training, testing, paying of fees, and distribution of up-to-date technical training manuals.
6. The Pesticide Certification License, if required, must be obtained during the original probation period.
7. To retain the Pesticide Certification License, each qualified employee shall take six (6) Continuing Educational Units (CEU's) within the twelve (12) months prior to the renewal date of their license (Arizona State Statute, Section 32-2319). A CEU is one (1) hour. At least one (1) hour of the six CEU's must be directly related to the pesticide classification that the applicator is certified in. Per the Ecology Technician job description, members of the Ecology Branch are required to obtain twelve (12) CEU's per twelve-month period.

Updated 10-15-07

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operation and Maintenance Division

Standard Operating Procedure # 20

Subject: Standard Operating Procedure (SOP) for Pesticide Licensing and Chemical Usage

8. All CEU training fees and license renewal fees shall be paid by the O&M Division.
9. All training, seminars, etc. shall be given by an instructor who is certified and registered with the SPCC.
10. The Ecology Field Supervisor is responsible for coordinating CEU training classes and seminars.
11. CHEMICAL USAGE: A pesticide applicator WILL NOT handle or apply any pesticide or herbicide until:
 - (a) They have in their possession a Material Safety Data Sheet (MSDS) for the chemical they intend to use and a specimen label.
 - (b) They have demonstrated to their Field Supervisor that they are familiar with the MSDS and label information included on the product packet. This includes knowledge of environmental dangers, exposure and toxicity, first aid treatment, and basic knowledge of the chemicals properties; e.g., aquatic or non-aquatic use, systemic or contact penetration, mixture rate, re-entry time into treated area, etc.
 - (c) All chemicals will be stored, transported, marked with identification, and applied in accordance with all SPCC, State, Federal, Occupational Safety and Health Organization (OSHA), and Environmental Protection Agency (EPA) laws and bylaws.
 - (d) All equipment used for spraying will be working properly and calibrated in accordance with the equipment Operational Manual.
12. Qualifying Party members of the Ecology Branch will issue chemicals to applicators in the various yards.
13. The Ecology Field Supervisor shall be responsible for monitoring chemical inventory and usage. The Operations Shop will be responsible for equipment maintenance.
14. The Ecology Branch will apply spot spraying that requires over two and a half gallons of herbicides.

Updated 10-15-07

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #21

SUBJECT: Removal of Unwanted or Nuisance Vegetation

PURPOSE: To standardize the removal of unwanted, deep-rooted, or nuisance vegetation on FCD structures and right-of-way.

PROCEDURE: Deep Rooted Vegetation

1. The following species have been determined to be deep-rooted and will not be acceptable on all FCD dams, dikes, levees, and earthen slopes:
 - a) Desert Broom
 - b) Ironwood Trees
 - c) Mesquite Trees
 - d) Palo Verde Trees
 - e) Salt Cedar

Deep-rooted vegetation is defined as trees and shrubs having a woody structure penetrating below a 3' ft. depth.

Plants will be stump cut flush with the soil surface and a suitable herbicide will be applied to the stump immediately.

All trees will be kept a minimum of 20' ft. from the toe of the dams, levees, and dikes.

Any tree branches or foliage canopy that reduce the roadway clearance to less than 14' ft. above the road surface or which reduce the width to less than 12' feet, must be trimmed or removed.

2. Deep rooted trees must not be allowed on embankments because they limit access and visibility, and can pose potential hazards by toppling in windstorms, fill cracking by root invasion, or openings of seepage paths by root decay. Any vegetation with an extensive root system or prevents a clear view of the embankment or abutment areas should be removed.
3. **Maintenance of unlined floodways.** To ensure that the integrity of the structure is preserved and that the floodway will function as designed.
 - a) Unwanted vegetation will be removed or destroyed within the flow line of the floodway, collection ditches, or side inlet basins. Remove any trash or debris that may impede flows. If grasses are established, maintain to a height of 6" inches.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #22

SUBJECT: Planting Technique for Landscape Replacements

PURPOSE: To establish a standard procedure for plant replacement in A) irrigated and B) non-irrigated landscapes.

A) PLANTING PROCEDURES FOR IRRIGATED LANDSCAPES:

MATERIALS NEEDED:

1. 1, 5 or 15 gallon replacement plants
2. Organic mulch (1.5 or 3 ft³ size bags)
3. Stakes and staking materials
4. Utility knife and extra blades
4. 6' x 6' plastic sheeting or tarp

PLANTING PROCEDURE:

1. Plants to be replaced will be flagged in the field. Distribute replacement plants next to their flagged counterparts.
2. Strip any existing decomposed granite from a 3-4 foot diameter area, centered around the base of the flagged plant. Stockpile DG on one side of the planting area.
3. Cut the flagged plant off close to its base, discard.
4. Carefully probe the soil to locate irrigation tubing. Ideally, the tubing should be located within 4" of the ground surface. Carefully lift the ring-shaped irrigation tubing (or spaghetti tubing) from the soil and place it on one side of the planting site, DO NOT disconnect any portion of the tubing. It may be necessary to gently anchor the tubing to prevent it from interfering with the planting process.
5. Remove the remaining stump and root-ball of the flagged plant, discard and proceed to excavate hole. Place all excavated material on 6' x 6' plastic sheeting or tarp. Size the hole as indicated below:
 1. For 1 gallon size transplant-(2 to 3x diameter of container)
 2. For 5 gallon size transplant-(2 to 3x diameter of container)
 3. For 15 gallon size transplant-(2 to 3x diameter of container)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #22

SUBJECT: Planting Technique for Landscape Replacements

6. On plastic sheeting or tarp, thoroughly mix the excavated soil with the following:
 - a. Backfill hole with native soil and old root-ball soil mix. Add additional fill as needed to bring to grade.
7. Reposition ring-shaped irrigation tubing (or spaghetti tubing) no deeper than 4” and no less than 1” below the ground surface. It may be necessary to increase the diameter of the excavated hole to accommodate the irrigation tubing.
8. Just prior to planting, lay each plant on its side and carefully cut the bottom off of the container using the utility knife. Avoid putting any pressure on the container, this pressure could cause the container to deform, and the root-ball to break. Plants with damaged root-balls do not generally survive. Gently remove the bottom of the container.
9. Do not pick up the plants by their stems, instead handle the plant by the sides of the container, while supporting the bottom of the root-ball with hands and gently place plant into the hole. Slit one side of the container with the utility knife, remove and discard the container pieces.
10. Shovel the remaining backfill material around the plant root-ball, gently by thoroughly compacting the soil around the root-ball as you go. (Large boxed plants-fill hole with water and add backfill to remove air pockets.)
11. Water the plant using a quick coupler and a hose.
12. If appropriate, replace the stockpiled decomposed granite around the base of the plant, creating a smooth even surface.
13. Stake trees only if necessary.

B) PLANTING PROCEDURE FOR NON-IRRIGATED LANDSCAPES:

MATERIALS NEEDED:

5 gal replacement plants and/or 15 gal replacement plants

1. Osmocote fertilizer (14-14-14)
2. Clean gravel approximate size 1” x 1”
3. Utility knife - extra blades
4. 1 2-cup measuring cup
5. 1 Wheelbarrow
6. Water truck (use only “clean” water)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #22

SUBJECT: Planting Technique for Landscape Replacements

PLANTING PROCEDURE:

1. Plants to be replaced will be flagged in the field. Distribute replacement plants next to their flagged counterparts.
2. Remove flagged plants and discard, then proceed to excavate hole. Size hole as indicated below:
 - For 5 gallon size transplants-(2 to 3x diameter /depth of container
 - For 15 gallon size transplants-(2 to 3x diameter /depth of container
3. Remove all rocks larger than 1" x 1" from excavated material.
4. Fill holes with clean water and allow to drain.
5. Remove approximately 2' ft. to 3" ft. of soil from excavated material and set aside for berm construction (see step #10).
6. Thoroughly mix remaining excavated material with the following amendments:

| | |
|--|--|
| <u>For 5 gallon transplants</u> | <u>For 15 gallon transplants</u> |
| 1.5 cups of Osmocate fertilizer | 2.5 (1.5 ft ³ bag of organic mulch. |
| 3 cups of Osmocote fertilizer | Or: 1 (3ft ³) bag |
| Or: 0.5 (3ft ³) bag | |
7. Fill the hole as necessary (approximately 1/3 of the total volume) with the mixed backfill and gently compact, so that the top of the replacement root-ball is flush with the finished grade .
8. Just prior to planting, lay each plant on its side and carefully cut the bottom off of the container using the utility knife, Avoid putting undo pressure on the container, this pressure could cause the container to deform, and the root-ball to break. Plants with damaged root-balls do not generally survive. Gently remove the bottom of the container.
9. Do not pick up the plants by their stems, instead handle the plant by the sides of the container. While supporting the bottom of the root-ball with hands and gently place plant into the center of the hole. Slit one side of the container with the utility knife, remove and discard the container pieces.
10. Shovel the remaining mixed backfill material around the plant root-ball, gently but thoroughly compacting the soil around the root-ball as you go.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #22

SUBJECT: Planting Technique for Landscape Replacements

11. Form tree well 3' feet in diameter for each plant. For plants positioned on embankments, form berm around the downslope perimeter of each well only. For plants positioned off-slope, form berm completely around the tree well. Berm will be approximately 5" high by 6" wide (at the base). Compact berm thoroughly.
12. Fill tree well with gravel uniformly to a 4" depth. Gravel should be hand-placed around the base of the plant.
13. Gently fill tree wells completely with water using FCD water truck. Allow water to completely drain; and fill a second time. Do not blast water at the base of the plant.
14. Stake trees only if necessary.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #23

SUBJECT: Protected Vegetation

PURPOSE: To identify desirable plant species that should be preserved during vegetation clearing operations.

The following species are considered desirable to provide wildlife habitat. These species are not considered to obstruct flows. However, no stands will be left which will block or divert flows. Removal of these species will be done **only** under special direction from the Environmental Branch and only with a written work order.

Common Name

Scientific Name

Willow
Cottonwood
Cat-tails

Salix nigra
Populus fremontii
Typha Species

Updated 11-5-07

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #24

SUBJECT: Staking of Landscape Trees

Purpose: To establish a uniform standard for proper tree support that minimizes tree damage from improper or unnecessary staking and guying techniques.

Materials: Stakes (Lodgepoles): treated for water and insect resistance
2" diameter x 6', 8', or 10' length.

Wire: Galvanized & Annealed 12 gauge wire

Rubber Hose: 1/2" I.D. (Inner Diameter) Garden Hose, Wirecutters,.

Pole Pounder, Flat Head Screwdriver (optional), Gloves

Principals of Staking:

1. While staking is often necessary to provide support for newly planted trees, not all trees may require it. Rule of thumb: If the tree can support itself, don't stake it. Regular flexing and motion caused by the wind produces plant hormones responsible for increasing trunk caliper. A young tree standing alone with its top free to move becomes a stronger tree better able to withstand the elements.

2. Staking effects tree growth. Compared to unstaked trees, staked trees are taller, somewhat weaker trees with smaller root systems and less trunk taper (the caliper of the trunk does not vary from base to the top as it would normally). Containerized nursery trees that have been tied to a center pole exhibit lack of trunk taper- their trunk caliper is often the same from tree base to the top of the center pole.

3. The staking technique utilized can enhance or deter a tree's future performance in the landscape. Most problems seen in trees 1-4 years after installation can be directly related to improper staking &/or restaking techniques:

- a) Lodgepoles driven through rootballs
- b) Guy wires pulled rigidly tight, not allowing the tree any movement necessary for trunk development. Loose yet secure guys are needed to yield strong trunks capable of self support and removal of stakes.
- c) Trunk girdling by guy wires too small or not removed
- d) Failure to return to tree site to remove stakes.
- e) Failure to quickly restake trees that have fallen down or are leaning, allowing them to remain in that position for extended periods of time.
- f) Improper placement of stake or guy wire in tree canopy resulting in rubbing abrasions to the tree.

4. The tree should remain staked for the shortest amount of time. Staking reduces trunk movement and bending, the natural stresses that promote trunk taper and caliper development. The faster the tree can be self-supporting and have the stakes removed, the better it is for the tree.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #24

SUBJECT: Staking of Landscape Trees

Staking Precedent:

1. Trees that have fallen down or are leaning will be restaked immediately.
2. A newly planted tree will be supported (if required) by the staking procedure outlined here. Nursery stakes left on after planting or center pole staking is an unacceptable manner of staking.

Staking Procedure:

1. Place stakes at an equal distance on both sides of the tree (a minimum of 6" outside the rootball), forming a straight line with the trunk. Position the stakes to minimize damage to the tree. If possible, stakes should be placed at right angles to prevailing winds. Be consistent with directional orientation of the lodgepoles throughout the staked area. Do not orientate E-W first tree, then N-S the second tree.
2. With a pole pounder, drive stakes through plant pit (not through the rootball) and into the undisturbed ground below pit (min. 4"). Desired stake height after driving would have the top of the stake positioned just below or near the lowest tree branch. This may not always be possible with smaller tree sizes, such as 5 gal. containers. In that instance, if staking is required, position the stake height to allow for tree growth.
3. Determine the proper height to place the top guy wire along the trunk to yield maximum support for the tree. Where possible, position top guy wire loop above the first scaffold branch. Wrap 1/2" I.D. rubber hose pre-threaded with single strand wire inside around the trunk to form a circle. Twist wire to close and secure the loop. This loop should be independent of the side wire, allowing for reuse. Make sure the loop is not too small and maintains at least a 4" minimum I.D. for smaller trees. Larger trees will require a bigger loop to allow the trunk freedom of movement. Secure the loop to the stakes with double strand wire making sure not to have the wires so tight that movement is not allowed. This can be achieved by running a strand of wire from the stake through the notched opening of the loop to pass under the wire (already inside the loop) and back to the stake. Fasten wires to the stake by wrapping the wire around the stake several times and twisting close. The additional wire wrapped around the stake provides the added length required for future loosening. Install the lower loop in the same manner, positioning it halfway between the top guy and the ground. Staple guy wires to lodgepoles by utilizing a staple gun loaded with 1/2" staples. This will help prevent the guy wires from slipping down the lodgepole.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #24

SUBJECT: Staking of Landscape Trees

4. Check back later in the year to make sure:
 - a. The tree has not outgrown the ring.
 - b. The wire and stakes are in good condition and not broken.
 - c. The tree still needs to be staked-if not remove staking
5. Double trunk and Multi-trunk trees require additional leaders to be staked and loop wires to be joined but otherwise follow the general principals above.

Figures Accompanying Text:

Figure 1: Staking Detail

Figure 2: Tree Guying Detail

Figure 3: Hose Loop Detail

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #25

SUBJECT: Core Drain Marker Post's

PURPOSE: To identify and locate core drains on FCD structures.

PROCEDURE A:

Install a 3"x 5'6" standard sign post, 18" in the ground at toe area of downstream slope.

PROCEDURE B:

For Tile or PVC core drains install post 12" in front of drain offset in either direction by 12" from center of drain with intent to protect the drain from heavy equipment.

PROCEDURE C:

For (various size) rock core drains at toe area of structures, install post at center point of rock at the end of rock furthest from the structure.

PROCEDURE D:

Install all marker posts straight and parallel to the structure, so delineator can be installed on each side of post, facing traffic from both directions paralleling the structure.

PROCEDURE E:

Install a "1-Ball Red" Delineator on each side of post, and flush to the top of the post. Red has been designated as the color to identify core drains.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #26

SUBJECT: Subsidence Monument Marker Posts

PURPOSE: To establish a uniform subsidence marker post to identify subsidence markers that are located either on the crest or toe of the structures.

PROCEDURE A.

Install a 3" x 5'6" standard channel post, 18" in the ground on shoulder of crest and downstream side of structure within 4" of monument, with the intent to protect monument from damage during grader work and other heavy equipment operation.

PROCEDURE B.

Install post's straight and parallel to the structure on the shoulder of crest and downstream slope, so that delineators can be installed on each side of post to face traffic in each direction, paralleling the structure.

PROCEDURE C.

Use a 1-ball yellow delineator on each side of the marker post.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #27

SUBJECT: Stationing Procedures for Pertinent Structure Reference

PURPOSE: To Identify Locations for Reference and Maintenance Functions and Repairs

PROCEDURE A.

1. Stationing is required every 500' ft. on FCD structures, preferably to be installed on the crest of a dam, levee, or dike if applicable.
2. All Principal Spillways and vegetative/irrigation gated outlets need stationing to be identified on the headwalls and at gated lifting units located on crest.
3. All other pertinent structures; side inlets, drop inlets, drains, etc. associated with FCD structures need stationing installed either on concrete surfaces or sign placards.
4. Linear stationing located on shoulders of crest and upstream or downstream ROW needs to be installed on a 2" x 5" channel post installed 18" into the ground. A 6" x 6" placard need to be installed flush to top of the sign post and facing traffic parallel to the structure. Snap off or bend down any excess thread of installation bolts on each placard. Install correct stationing numbers with 2" black numbers centered on white face of placard. Check the "As-builts" of the structure for correct stationing reference.

PROCEDURE B.

In the event changes in sequence of stationing on structures with more than one reach, stationing numbers may not correspond between reaches, follow the procedure below.

At the point where stationing sequence changes-install:

(2) two 6"x 6" placards on both sides of the sign post, one directly under the other (4 in total). Indicate on the top placard the different stationing numbers and on bottom placards, the end of reach and the opposite side begin the next reach.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #28

SUBJECT: To insure that the integrity of the structure is preserved and that the Floodway will function as designed.

PURPOSE: Procedures for the maintenance of unlined floodways

PROCEDURE A.

1. Nuisance or high unwanted vegetation.

Remove and or destroy any woody vegetation within the flow area of the floodway, of the floodway, collection ditches, or side inlet basins. Also, remove trash/debris that will impede flows in these areas. If grasses are established, maintain to the height to six inches.

2. Sediment/silt deposits.

Remove accumulated deposits of loose material to obtain designed grades and cross sections. Loose deposited materials shall not be used for repairs within the floodway unless tested and meets the earth fill criteria in the construction specifications. Depending on the amount of accumulation in the invert, a sediment survey may be required. Ensure any 404 permits are in order to perform the job. The lead operator shall keep a copy the 404 with him at all times.

3. Erosion/deep rills. Contact the Work Control Center for job assessment.

A sample of the stockpiled material that will be used for the repair of the erosion/rills will be submitted for a proctor test through coordination by the Work Control Center. Once the proctor test is completed, repairs of eroded areas may begin by replacing displaced material with approved proctored material. Moisture conditioned material will be placed in lifts not to exceed 6" inches. Each lift will have a compaction test required to meet 95% density or in accordance with the project's specified requirements. If the compaction lift does not meet the 95% criteria, the tested lift will be removed, reprocessed and re-installed accordingly and re-tested. 5 ea. nuclear compaction tests to 1 ea. sand cone test will be the normal. A daily field report(s) will be submitted by the consultant once the job scope is completed along with the density results report. Compaction equipment to be used will be approved through coordination with the Work Control Center as the job plan dictates.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #29

SUBJECT: To insure that the integrity of the structure is preserved.

PURPOSE: Procedures for the repair of rodent or animal holes.

PROCEDURE A.

Procedure: Rodent Control

- 1) Gophers can damage the structure by burrowing deep holes with more than one outlet. These can be identified by fresh mounds of soil.
- 2) Ground squirrels can also damage structures even with insignificant numbers and must be treated accordingly.
- 3) After rodent activity has been treated and controlled, holes are to be excavated, filled and compacted with proper density.

Procedure: Rodent & Animal Hole Repair

- 1) Excavate hole to bottom of cavity and remove all loose material.
- 2) Compact bottom area of cavity after applying adequate moisture to achieve 95% compaction.
- 3) The removed clean material may be used again and blended with other suitable material as needed.
- 4) Mix material and add enough water for optimum density.
- 5) Fill in cavity with no more than a six inch compacted lift of material to achieve 95% density using a hand tamper or pneumatic "Pogo" type compactor.
- 6) *See standard drawing #4 for compaction procedures.

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division**

Standard Operating Procedure #30

SUBJECT: Dust Abatement

PURPOSE: The District possesses an Earthmoving Block permit that includes all District structures. The Block permit includes a dust control plan employees are to follow to reduce fugitive dust. The purpose of this SOP is to better define the planning and implementation of the dust control plan before, during and after conducting any dust generating activity.

PROCEDURE A: Employee Responsibility.

General Dust Control Plan for Routine O&M Work

| Activities | Primary Control Measures | Contingency Control Measures |
|--|---|---|
| Grading/Excavation/Trenching/ Backfilling | Watering by Truck / Prewet work zone | <ul style="list-style-type: none"> • Dust suppressant application • Increase frequency and intensity of water during high wind conditions. • Temporarily cease work. • Automatic sprinkler or spray bar. |
| Unpaved Haul Roads or Equipment Paths | <ul style="list-style-type: none"> • Watering by Truck / Prewet work zone. • Limit vehicle access/reduce vehicle speed (Signs must be posted) • Gravel Pad / Stabilized entrance | <ul style="list-style-type: none"> • Dust suppressant application • Increase frequency and intensity of water during high wind conditions. • Temporarily cease work. • Vacuum/Wet broom any track out daily |
| Access Points | Same measures as haul roads above. | Same measures as haul roads above. |
| Material Handling | Watering by Truck / Prewet work zone | <ul style="list-style-type: none"> • Increase frequency and intensity of water during high wind conditions. • Temporarily cease work. |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| | | |
|--|--|---|
| Hauling | <ul style="list-style-type: none"> • Watering by Truck / Prewet work zone • Freeboard of not less than 3” on haul trucks. • Cover haul trucks with tarp or other enclosure. | <ul style="list-style-type: none"> • Increase frequency and intensity of water during high wind conditions. • Temporarily cease work. |
| Clearing Vegetation /weed control including disking and mowing operations. | <ul style="list-style-type: none"> • Watering by Truck / Prewet work zone | <ul style="list-style-type: none"> • Increase frequency and intensity of water during high wind conditions. • Temporarily cease work. • Automatic sprinkler or spray bar. • Hand Cut vegetation |

General Guidance and Definitions

Opacity

Rule 310, Section 301-Opacity Limitations for Dust Generating Operations requires generated dust to be less than 20% opacity. As a general rule of thumb, if at any time you can see dust being generated by equipment operations, it is already at least 10% opacity. (Maricopa County Guidance for Dust Control Permit)

Effective Watering

- 1) Wet the area to depth of cuts or equipment penetration 15 to 30 minutes prior to the start of work. (Dust Devil Academy)
- 2) Apply water at the end of the day to soak the next day’s work area overnight. (Dust Devil Academy)
- 3) During grading, apply water in sufficient quantity to maintain a moist surface using a water truck. (Dust Devil Academy)
- 4) Water must be applied continuously in front of or in conjunction with a scraper/grader/dozer. (Maricopa County Guidance for Dust Control Permit)

Track out

- 1) Gravel Pad is a stabilized construction entrance, designed to remove mud and dirt from tires of vehicles leaving the construction site. Use between one and three inch diameter washed well graded gravel or crushed rock. The gravel should be 30 feet wide by 50 feet long, and a minimum of 6 inches deep.
- 2) Grizzly (rails pipes or grates) used to dislodge mud, dirt and debris from tires and undercarriage of vehicles prior to leaving the work site.
- 3) Paving from the point of the intersection with a paved public roadway at least 100 feet back onto the site, with a width of at least 20 feet.
- 4) Clean up of track out, carryout and spillage is required immediately.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Chemical Stabilizers (Dust Palliative)

- 1) All chemical stabilizers used must be in compliance with all applicable environmental laws.
- 2) Surfactant, or surface-active agent, makes water more effective. Water becomes “wetter” by lowering its surface tension. Drops of water spread out and contact surfaces more effectively. (Maricopa County Guidance for Dust Control Permit)
- 3) Crusting agents are binding agents used for long-term surface stabilization. (Maricopa County Guidance for Dust Control Permit)
- 4) Foaming Agents are primarily high foaming surfactants and may contain wetting and binding agents. (Maricopa County Guidance for Dust Control Permit)

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division**

Daily Recordkeeping Log For Rule 310

Maricopa County's Rule 310 (Fugitive Dust Sources) requires that you keep a daily log recording the actual implementation of control measures identified in your Dust Control Plan. Write "yes" or "no" for each question, in the table below. If you write "no", for any question, please explain.

Contractor: _____ **Project Location:** _____

Name Of Person Completing Recordkeeping Log: _____ **Earthmoving Permit Number:** _____

| | Monday Yes / No | Tuesday Yes / No | Wednesday Yes / No | Thursday Yes / No | Friday Yes / No | Saturday Yes / No | Sunday Yes / No |
|--|--------------------|---------------------|-----------------------|----------------------|--------------------|----------------------|--------------------|
| Controlling excessive dust on unpaved parking lots? | | | | | | | |
| Controlling dust on haul roads and access roads? | | | | | | | |
| Controlling dust on inactive portions of construction site? | | | | | | | |
| Maintaining at least 3" freeboard on haul trucks and covering haul trucks that leave the site? | | | | | | | |
| Covering loads contained in haul trucks? | | | | | | | |
| Preventing dirt from spilling onto paved public roadways? | | | | | | | |
| Using a trackout control device? | | | | | | | |
| Using water to control dust on active portions of site? | | | | | | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Standard Operating Procedure #31

SUBJECT: Claims/Concerns from the public

PURPOSE: To provide guidance for handling concerns, inquiries, and/or claims from the public

GENERAL:

1. The primary rule to remember when dealing with the public is to conduct business in a calm, professional manner—no matter what the emotional state of the person making the inquiry or concern may be.
2. The second rule to remember is that under no circumstances should the individual making the claim or concern be passed from one person or agency to another.

PROCEDURES: In general:

1. All phone inquiries will be referred to the Work Control Center Supervisor.
2. All web based inquiries will be checked on a daily basis by the Work Control Center Supervisor.
3. Upon receipt of a concern, if the Work Control Center Supervisor is not available to receive the call immediately, the person receiving the call will complete the name and telephone number portion of the Citizen Inquiry Form (see attachment) as well as a brief explanation of the inquiry. This information captures the basic data necessary to take action. It is the recipient's responsibility to defuse the situation and obtain sufficient information to determine who should receive the inquiry, claim or concern.

FOLLOW-UP: After receipt of inquiry:

1. The Work Control Center Supervisor will record a detailed report of the concern or complaint by speaking with the Citizen who prompted the inquiry.
2. A Work Control Center Inspector will investigate the inquiry visually on-site. They will then report their findings to the Work Control Center Supervisor.
3. The Work Control Center Supervisor will generate a Work Order based on the findings reported by the Inspector.
4. The Maintenance Supervisor will forward the Work Order to the appropriate crew to ensure completion of the job. The crew will have 21 days to complete the task.
5. Once all work has been completed, the Work Control Center Supervisor will call the Citizen to confirm the completion of the work requested.

NOTE:

The Work Control Center Supervisor is authorized to delegate these responsibilities to the appropriate person as he/she sees fit, to ensure a timely and accurate level of customer service and satisfaction.

DEFICIENCY and MAINTENANCE STANDARDS
Operations and Maintenance Division

SUBJECT: INDEX

PURPOSE: List Titles of Deficiency Levels and Maintenance Standards
Number Title

1. Access Gates
2. Access Roads
3. Retention Basins
4. Buildings
5. Bridges & Catwalks
6. Catch Basins
7. Dams
8. Fencing
9. Flap Gates
10. Handrails
11. Inlet/Outlet Structures
12. Inverts-Channels & Storm Drains
13. Levees
14. Outlet Towers
15. Trash Grates
16. Reservoirs/Dams
17. Right-of-Way Vacant
18. General Sign & Staff Gage
19. Channels & Storm Drain Walls
20. Trails

DEFICIENCY LEVELS and MAINTENANCE STANDARDS
Operations and Maintenance Division

#1. ACCESS GATES

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------------------|--|---|
| A. General | 1. Damaged or missing members. | |
| | a. Missing gates, panels, or locks | a. Replace with standard panel and appropriate locks (3E-59 or 3E-56) |
| | b. Broken or missing gate hinges | b. Replace or repair as needed |
| | c. Members bent or out of alignment causing the gate not to function properly. | c. Repair members and align accordingly |
| | d. Large space or opening under gate panel | d. Standard calls for 4" inches of clearing |
| | e. Large voids or erosion around gate post/braces | e. Fill in holes flush & compact to grade with natural fill |
| B. Chainlink & Wire gates | 1. Rusty surfaces | |
| | a. Rusty surfaces that affect the integrity of the existing gate fabric or wire. | a. Remove damaging rust and either repaint or replace damaged gate fabric or wire. |
| | b. Holes in chain link gate fabric of more than 6" wide and 12" long | b. Repair or replace damaged section as needed |
| | c. Chain link gate fabric stretched or bent out more than 6" inches | c. If possible refurbish stretched out chain link fabric or replace sections as needed. |
| | d. Gates out of adjustment more than 2" inches | d. Adjust gates to within 1/2" inch. |
| | e. Loose or sagging smooth or barbed wire more than a 2" inch sag | e. Re-stretch wire to remove sag in wire fence. |
| | f. Missing strands of wire. | f. Re-install missing strands to match up to existing fence. |
| C. Pipe Gate | 1. Surface paint. | |
| | a. 25% of overall surface of pipe gate needing re-painting | a. Remove any peeling paint, primer and re-paint as needed. |
| | b. Rusty surface | b. Remove rust, primer and paint. |

DEFICIENCY LEVELS AND MAINTENANCE STANDARD
Operations and Maintenance Division

#2. ACCESS ROADS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|---|---|--|
| A. General | 1. Unsightly condition visible to public (paralleling residences, streets, bridge crossings, etc....). | |
| | a. Trash/debris, or litter along an access road. | a. Remove trash & debris. |
| | b. Unwanted or high vegetation. | b. Cut, remove, or chemical spray and follow up if needed for control. |
| | c. Large rocks or debris. | c. Remove rocks/debris. |
| | 2. Health hazard | |
| | a. Animal droppings | a. Remove and dispose of accordingly. |
| | b. Garbage, dead animals causing unpleasant odors or attracting insects | b. Remove and dispose of accordingly. |
| | 2. Restricted roadway | |
| | a. Any storm debris, or trash that reduces the driving width to less than 10' ft. | a. Clear debris /trash from roadway for access. |
| | 3. Shoulder erosion | |
| | a. Erosion within 1' ft. of the roadway more than 8" inches wide and 12" deep | a. Repair with natural fill and compact as needed. |
| B. Asphaltic Concrete | 1. Vegetation concerns | |
| | a. Unwanted or high vegetation | a. Cut, remove and chemical spray if needed |
| | 2. Cracks | |
| | a. Cracks wider than a 1/4" inch. | b. Repair cracks with a suitable fill material. |
| | 3. Potholes | |
| | a. Potholes no larger than 6" inch in diameter | c. Repair & compact potholes with SS1 oil and coldpatch mix. |
| | 4. Depressions or settlement. | |
| | a. Depressions on the surface deeper than 4" inches. | a. Clean area and fill and compact with SS1 oil & coldpatch material as to re-establish surface area to flush conditions with existing road. |
| C. Concrete & Grouted riprap ramps | 1. Cracks | |
| | a. Cracks wider than 1/2" inch | a. Fill with a suitable filler material. |

DEFICIENCY LEVELS AND MAINTENANCE STANDARD
Operations and Maintenance Division

#2. ACCESS ROADS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------------------|---|--|
| Graded earth/unimproved roads | 1. Ruts | |
| | a. Ruts that are more than 4" inches deep and 8" inches wide. | a. Utilize motor grader rippers to remove ruts and holes, moisture condition properly and re-grade surface to uniform condition. If needed import suitable fill material to re-establish road. Ensure proper dust control methods. |
| | 2. High vegetation | |
| | a. High weeds growing in the road exceeding 6" inches tall. | a. Cut and remove nuisance vegetation as needed from roadway. |

DEFICIENCY LEVELS AND MAINTENANCE STANDARDS
Operations & Maintenance Division

#3. RETENTION BASINS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------------|---|--|
| A. Earthen | 1. Vegetation | |
| | a. High or unwanted vegetation taller than 2' ft. | a. Mower operations or hand cut to manage high vegetation to acceptable standard of 6" inches. |
| | b. Deep-rooted vegetation (Palo Verde, Mesquite, Ironwood, and Salt Cedar trees). Remove or destroy all woody vegetation within the sediment basin. | b. Any volunteer growth that is not part of the original project landscape will be cut, stump treated and removed if needed. All herbicide treatment should be environmentally friendly (consult with Ecology Branch). |
| | c. Citizen concerns regarding unpleasant odors from stagnant water or annoying insects or other pests. | c. Treat area for insects and schedule follow up treatments as needed. Remove any stagnant water by pumping out with water truck or portable pump. |
| | d. Dead animals. | d. Remove and dispose of dead animal accordingly. |
| | b. Trash & debris. | b. Remove trash/debris and dispose of accordingly. |
| | 2. Pollutants | |
| | a. Oil, gas, or other contaminants. | a. Contact Bob Stevens FCDMC @ 602-506-4073 & Hazardous Material Emergency 602-506-7179 for instructions and dispose of accordingly. |
| | 3. Sediment | |
| | a. Accumulated silt/sediment in basin invert that adversely affects the integrity of the structure. | a. Remove silt/sediment to restore basin to original or baseline conditions. |
| B. Concrete Lined Basin | 1. Sediment | Concrete lined basins are generally self-cleaning, although excess sediment should be removed for the inspection of the concrete works. |
| | a. Accumulated sediment/silt on the concrete apron. | a. Remove & dispose of accordingly. |
| | 2. Stagnant water | |
| | b. Citizen concerns regarding unpleasant odors from stagnant water or annoying insects or other pests. | b. Treat area for insects and schedule follow up treatments as needed. Remove any stagnant water by pumping out with water truck or portable pump. |
| | 3. Cracks | |
| a. Cracks wider than a 1/4" | a. Cracks should be cleaned out and sealed with a suitable filler material. | |

DEFICIENCY LEVELS AND MAINTENANCE STANDARDS
Operations and Maintenance Division

#4. BUILDINGS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|----------------------------------|---|--|
| A. General | 1. Paint peeling, chipping or blistering. | |
| | a. For buildings visible to the public, deterioration of the paint or protective coating that has affected 10% of a surface area. | a. Resurface with uniform protective coating. |
| | 2. Obscene graffiti | |
| | a. Obscene graffiti | a. Remove or paint over |
| | 3. Holes, splits, and cracks | |
| | a. Holes, splits or cracks that allow moisture to penetrate to the interior. | a. Fill with a suitable filler material to prevent moisture access. |
| | 4. Insects (pests) | |
| | a. Insect infestation such as wasps, bees, cockroaches, etc. | a. Treat with proper pesticide and schedule follow up treatments as needed. |
| | b. Presence of rats or mice | b. Treat for rodents and schedule follow up treatments as needed. |
| B. Metal exterior surface | 1. Damage to metal works. | |
| | a. Bent in or out surface more than 3" inches within a diameter of 24" inches. | a. Refurbish so as to establish surface deformation of less than 1/2" inch |
| | b. Rust that is affecting more than 10% of a surface area | b. Remove rust and refurbish with uniform protective coating. |
| C. Concrete surface | 1. Loose or missing concrete | |
| | a. Loose or missing concrete more than 1/2" deep | a. Clean damaged area and patch in place with suitable patch material (dry patch, rockite, concrete, etc...) |
| D. Doors | 1. Damage | |
| | a. Door hardware that is broken, missing, bent, or defective that prevent the door from opening, closing, or locking properly | a. Replace, or repair damaged parts, service as needed so that door will properly secure. |
| E. Roof leaks | 1. Leaks | |
| | a. Leaks which allow moisture to penetrate to the interior | a. Repair, refurbish or replace roof parts as needed to prevent moisture from penetrating to the interior. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#5. BRIDGES & CATWALKS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------|--|---|
| A. General | 1. Settlement or movement on piers or abutments | |
| | a. Settlement or movement that could lead to or cause failure. | a. Repair any voids or sinkholes caused by subsidence by either filling with an approved slurry mix and or excavation and fill & compact to proper grade, so piers or abutments are on stable footings. |
| | b. Erosion around the abutments and piers that could cause subsidence | b. Repair any voids caused erosion by either filling with an approved slurry mix and or excavation and fill & compact to proper grade, so piers or abutments are on stable footings. |
| | 2. Safety hazard | |
| | a. Holes or obstacles that could be dangerous to vehicles or personnel | a. Fill in and compact any holes with native fill and remove any obstacles that could be dangerous to vehicles or personnel |
| | 3. Trash & debris | |
| | a. Trash or debris that would obstruct or limit the use of the catwalk or bridge decking | a. Clear/remove any debris from catwalk or bridge. |
| | 4. Loose or damaged handrails | |
| | a. Loose guard rails or handrails | a. Repair loose or damaged members or replace as needed. |
| | 5. Graffiti | |
| | a. Obscenities | a. Repaint or remove as needed. |
| B. Metal | 1. Structural damage | |
| | a. Bent or deformed structural members that are bent out of shape more than 2” inches | a. Refurbish, repair or replace structural members to acceptable standard of 1/2” |
| | b. Broken or missing members | b. Repair or replace as needed |
| | c. Deterioration of the paint that has affected an area of more than 25% | c. Apply uniform protective coating applied to address deterioration. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#5 BRIDGES & CATWALKS

| | | |
|--------------------|--|---|
| C. Wooden | 1. Deteriorated paint or protective coating | |
| | a. Peeling, scaling or chipping that has affected 30% or more of the surface area. | a. Remove deterioration concern by scraping or sanding surface and applying a protective new coating of paint. |
| | 2. Structural damage | |
| | a. Cracks or splitting of wood surface. | a. Refurbish by filling in cracks with suitable fill material or replacing wood as needed. |
| | b. Damage from dry rot. | b. If applicable treat dry wood with a suitable protective coating or replace in kind. |
| | c. Termite or insect infestation. | c. Treat with appropriate pesticide and continue follow up treatments as needed. |
| | d. Broken or missing members. | d. If applicable, refurbish the wood surface or replace as needed. |
| | e. Exposed nails. | e. Drive the nails back into the wood surface so heads of the nails are flush with surface. |
| D. Concrete | 1. Structural damage. | |
| | a. Chipped out pieces or sections of concrete. | a. Patch areas of concrete surface to meet existing surface conditions. |
| | b. Exposure of reinforcing steel. | b. Remove any rust from exposed steel if applicable. Prepare the surface by cleaning thoroughly and patch the areas of concern to meet the existing conditions. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#6. CATCH BASINS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--|---|---|
| A. General | 1. Trash & Debris | |
| | a. Trash & debris located at the inlet of the catch basin opening. | a. Remove obstructions so flows are not restricted. |
| | b. Unwanted vegetation restricting the catch basin inlet. | b. Remove unwanted vegetation from inlet. |
| | 2. Settlement or movement | |
| | a. Settlement or movement of walls or invert that has a difference or separation more than 1/2" inch. | a. Stabilize condition to no more than 1/4" inch difference or separation. This could involve repairing voids and or erosion sheet flow damage. |
| | 3. Fire Hazard | |
| | a. Presence of chemicals, such as gasoline or oil | a. Contact Bob Stevens FCDMC @ 602-506-4073 & Hazardous Material Emergency 602-506-7179 for instructions and dispose of accordingly. |
| | 4. Vegetation | |
| | a. Vegetation growth in the joints that is more than 6" tall | a. Cut and remove vegetation from joints and if applicable treat with proper herbicide. |
| B. Steps | 1. Defective or missing steps | |
| | a. Defective or missing step(s) that are broken or missing. | a. Repair or replace so that step(s) are structurally adequate. |
| C. Catch basins with metal grates | 1. Safety hazard | |
| | a. Safety hazard where grate opening is wider than design | a. Restore to design condition. |
| | b. High or lower than design elevation | b. Correct to elevation difference of no more than 1/4" inch than surrounding area |
| | 2. Settlement or movement | |
| | a. Separation of more than 1/2" between apron & frame | a. Stabilize condition to no more than 1/4" inch. |
| | 3. Trash & debris | |
| | a. Trash/debris that is restricting more than 20% of the grate surface | a. Remove obstructions so that flows are not restricted |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#6. CATCH BASINS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|---|---|--|
| C. Catch basin with metal grates | 1. Safety hazard | |
| | a. Grate with opening wider than design. | a. Restore to original design. |
| | b. Higher or lower than the surrounding surface grade. | b. Elevation restored to a difference of no more than 1/4" than surrounding grade. |
| | 2. Settlement or movement | |
| | a. Separation of more than 1/2" between frame and apron. | a. Reset frame & apron to allow no more than 1/4" separation. |
| | 3. Trash & debris | |
| | a. Trash & debris that is restricting more than 20% of the grate surface. | a. Remove trash and debris to allow for proper drainage. |
| | 4. Damaged or missing | |
| | a. Broken member of the grate. | a. Repair or replace as needed. |
| | b. Missing grate | b. Re-install or replace as needed. |

DEFIENIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|---|---|---|
| A. Concrete Spillways & Aprons | 1. Cracks. | |
| | a. Cracks wider than 1/4" inch | a. Clean properly & fill in with a suitable filler material. |
| | 2. Erosion, spalling, or chipping. | |
| | a. Damage that is more than 2" inches deep & 2 sq. ft. which exposes reinforcing steel | a. Remove any rust from exposed steel, clean properly, and patch damaged area. |
| | b. Chipping or spalling along expansion joint edges which is more than 2" inches deep and 5' ft. long | b. Clean and repair damaged area to flush with existing concrete |
| | 3. Missing or deteriorated joint sealer. | |
| | a. Missing joint filler material which allows passage of water or earth material. | a. Remove damaged material, clean out joint & replace with new joint filler material. If needed, install backer-rod to fill wide gaps then seal as needed. |
| | b. Vegetation in joints | b. Remove unwanted vegetation from joints and treat with proper herbicide if applicable. |
| | 4. Settlement or movement. | |
| | a. Subsidence that has settled or uplifted concrete more than 2" inches | a. Repair any hollow areas exposed underneath concrete structure to stabilize the spillway/apron if possible. If needed, cut out and remove uplifted sections and replace damaged concrete. |
| | 5. Trash & debris. | |
| | a. Trash/debris on spillway or apron. | a. Remove trash/debris or sediment and sweep clean. |
| | 6. Deep-rooted vegetation | |
| | a. Deep-rooted vegetation located in emergency spillway. | a. Cut & stump treat as need. Remove any large root systems. Fill & compact holes accordingly. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|------------------------------|---|---|
| B. Pipes | 1. Obstructions. | |
| | a. Blockage which reduces discharge from pipe. | a. Remove blockage to ensure proper unrestricted flows. This concern can be accumulated sediment, organic debris, rock or other foreign matter. |
| | b. Loose or leaking pipes which allows water to escape around the outside of the pipe | b. Secure loose pipe in place to control or prevent water leakage |
| C. Piezometers | 1. Damaged or vandalized. | |
| | a. Bent or damaged to prevent from obtaining accurate measurements. | a. Notify Dam Safety Branch. Repair or replace piezometer as per instructions from Dam Safety. |
| | b. Vandalized protective metal covers. | b. Notify Dam Safety Branch. Replace or re-secure as needed. |
| D. Principal Spillway | 1. Structural integrity. | |
| | a. Cracks in the concrete works or deterioration. | a. Clean & seal any cracks wider than ¼" inch with suitable fill material. |
| | b. Walls, floor, or ceiling chipped or spalled | b. Repair with patch work to restore to original surface. |
| | c. Cracks that allow seepage to penetrate causing rust, deterioration, etc. | c. Remove any visible rust and prepare surface for patch or crack seal with a suitable fill material. |
| | 2. Conduit | |
| | a. Blockage from accumulated sediment or organic debris. | a. Remove and clean conduit so as not restrict any flows. |
| | b. Cracks that allow seepage to penetrate the conduit causing rust, deterioration, etc. | b. Remove any visible rust and prepare surface for patch or crack seal with a suitable fill material. |
| E. Stilling Basin | 1. Structural integrity. | |
| | a. Cracks that allow seepage to penetrate causing rust, deterioration, etc. | a. Remove any visible rust and prepare surface for patch or crack seal with a suitable fill material. |
| | b. Damaged dissipaters. | b. Repair with patch work to restore to original surface. |
| | c. Stagnant water causing breeding grounds for mosquito's or other pests. | c. Pump out stagnant water; remove accumulated sediment, trash and organic debris. Sweep clean so concrete works can be inspected. |

DEFIENIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------------|--|---|
| F. Crest of dam | 1. Structural integrity | |
| | a. Access road damaged or needing additional plating. | a. Re-grade access road and install additional safe all-weather access plating. Fill in vehicle ruts and small depressions. |
| | b. Stationing, survey monuments, project signs, damaged or missing. | b. Refurbish or replace missing signs according to as-builts and identify with SOP. |
| | c. Transverse, longitudinal cracks, depressions, holes or other questionable findings. | c. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. |
| | d. Unwanted vegetation. | d. Cut & remove weeds taller than 18" inches and chemically spray with appropriate herbicide. |
| | e. Rodent activity. | e. Document stationing reference and where activity is prevalent (upstream shoulder, downstream shoulder). This concern will be assigned to the Ecology Branch for treatment. |
| G. Slopes of dam | 1. Structural integrity | |
| | a. Inadequate slope protection. | a. Install slope protection to match existing slope (riprap, gravel mulch, etc...). |
| | b. Slope protection displacement or movement (depressions, slides, sloughing, etc...). | b. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. |
| | c. Rodent activity. | c. Document stationing reference and where activity is prevalent (shoulder, mid-slope, toe). This concern will be assigned to the Ecology Branch for treatment. |

DEFIENIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--|--|---|
| G. Slopes of dam. (continued) | 1. Structural integrity | |
| | d. Deep erosion or rilling on slopes | d. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. Dam Safety must approve repair. If erosion/rill is deeper than 2' ft. deep, a proctor test must be taken. Compaction lifts will not be more than 6" high and compaction tests will be administered on every lift and a 95% result or better must be obtained to continue each lift. Unless otherwise specified 5 nuclear compaction tests to 1 sand cone test will be the normal. |
| H. Low flow channel | 1. Structural integrity. | |
| | a. Inadequate slope protection on channel slopes. | a. Install slope protection to match existing slope (riprap, gravel mulch, etc...). |
| | b. Slope protection displacement or movement (depressions, slides, sloughing, etc...). | b. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. |
| | c. Rodent activity. | c. Document stationing reference and where activity is prevalent (shoulder, mid-slope, toe). This concern will be assigned to the Ecology Branch for treatment. |
| | d. Deep erosion or rilling on slopes of channel. | d. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. If erosion/rill is deeper than 2' ft. deep, a proctor test must be taken. Compaction lifts will not be more than 6" high and compaction tests will be administered on every lift and a 95% result or better must be obtained to continue each lift. Unless otherwise specified nuclear compaction tests will be suffice. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--|---|--|
| H. Low flow channel (continued) | 1. Structural integrity | |
| | e. Deep-rooted vegetation and or high vegetation. | e. Cut, stump treat, and remove deep-rooted vegetation so as not to allow trees to impede flows. If high vegetation becomes an issue, either mower or disking is encouraged for control. |
| | f. Sediment/silt plugs. | f. Remove plugs and re-store invert back to baseline condition. |
| | g. Trash/debris in low flow. | g. Remove and dispose of accordingly. |
| I. Other | 1. Approach channel to principal spillway. | |
| | a. Obstructions | a. Remove accumulated sediment, debris, trash, deep-rooted vegetation so as not to disrupt flows into the inlet structure. |
| | 2. Principal spillway trash racks. | |
| | a. Obstructions | a. Remove any obstructions from the trash rack that could cause water flow restrictions. |
| | b. Rust or deterioration | b. Remove rust as needed as provide protective coating to protect metal works surface. |
| | 3. Outlet channel. | |
| | a. Blockage. | a. Remove any obstructions that could cause water flow restrictions. |
| | b. Deep-rooted vegetation | b. Cut, stump treat, and remove deep-rooted vegetation so as not to allow trees to impede flows. |
| | c. Sediment/silt plugs. | c. Remove plugs and re-store invert back to baseline condition. |

DEFIENIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#7. DAMS (FRS's)

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------|--|--|
| I. Other (cont'd) | 1. Structural integrity | |
| | d. Deep erosion or rilling on slopes of outlet channel. | d. Provide proper stationing and describe the concern with accurate measurements. Take photographs and log the concern and return to the Work Control Center. If erosion/rill is deeper than 2' ft. deep, a proctor test must be taken. Compaction lifts will not be more than 6" high and compaction tests will be administered on every lift and a 95% result or better must be obtained to continue each lift. Unless otherwise specified nuclear compaction tests will be suffice. |
| | 3. Transverse or longitudinal cracks | |
| | a. Transverse or longitudinal cracks located on the crest or toe of the levees. | a. Record the station of the crack. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of crack. Include photograph, inspector, date, and structure. |
| | 4. Other | |
| | a. Report any other dam safety related concerns (sink holes, depressions, slides, or other anomalies). | a. Record the station of the concern. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of depression. Include photograph, inspector, date, and structure. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#8. FENCING

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------|--|--|
| A. General | 1. Missing or broken parts. | |
| | a. Any defects in the fence line that permits easy access into a District right-of-way. | a. Repair or replace damaged fencing. |
| | 2. Erosion | |
| | a. Erosion more than 4" deep x 18" wide which allows for an opening underneath the fence line. | a. Fill & compact the depression under the fencing. |
| B. Wire Fences | 1. Damaged parts or members | |
| | a. Posts that are out of plumb. | a. Straighten out the post. |
| | b. Top railing bent out of shape more than 3" inches. | b. Repair or replace as needed. |
| | c. Fabric material stretched out of shape by more than 6" inches. | c. Attempt to re-stretch fabric in place or replace. |
| | d. Missing or loose tension wires. | d. Re-stretch tension wire accordingly. |
| | e. Missing or loose barbed wire causing a sagging affect. | e. Re-stretch wire if possible, if not replace as needed. |
| | f. Deterioration or rust occurring on posts, hinges, panels, etc. | f. Refurbish by removing rust, apply protective coating if applicable, and re-paint. If not applicable, replace as needed. |
| C. Wooden Fences | 1. Loose, damaged, or missing members. | |
| | a. Loose or missing members that cause the fence to lean or sag more than 3" inches. | a. Refurbish by re-nailing, stapling, or replacing loose members. Adjust fence as needed to proper alignment. |
| | b. Damage from weather. | b. Refurbish or replace as needed. |
| | c. Damage from termites. | c. If possible treat wooden fence and or replace sections or members as needed. |
| D. Masonry fences | 1. Cracks, movement, or subsidence. | |
| | a. Surface cracks wider than 1/2" across the full height of the fence. | a. Attempt to seal any cracks wider than 1/8" inch. Fill cracks with suitable fill material. |
| | b. Fence is leaning and out of alignment. | b. Replace sections of panels as needed. |
| D. Masonry fences | 2. Loose or missing masonry | |
| | a. Loose or missing masonry. | a. Re-mortar the loose masonry or replace any missing masonry. |
| | b. Spalled or chipped sections of masonry. Holes in the masonry. | b. Repair damaged pieces if possible. Patch holes as needed. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#9. FLAP GATES

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|----------------|---|--|
| General | | |
| | 1. Loose anchor bolts | |
| | a. Loose anchor bolts | a. Refasten bolts securely in place |
| | b. Missing, broken or bent frame or parts that prevent the gate from functioning properly | b. Repair or replace damaged parts & ensure the frame is structurally sound & functioning properly |
| | c. Flap gate "frozen" and not able to open & close freely | c. Service and lubricate to function properly |
| | 2. Trash/debris | |
| | a. Trash/debris that prevents the flap gate from opening or closing | a. Remove as needed to function as designed. |
| | 3. Painted flap gates | |
| | a. Paint is peeling off the flap gate. | a. Clean, remove any rust and re-apply a protective coating. |
| | 4. Graffiti | |
| | a. Graffiti present on the flap gate metal works. | a. Remove or paint over to match in kind. |

DEFICIENCY LEVELS and MAINTENANCE STANDARDS
Operations and Maintenance Division

#10. HANDRAILS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------|--|---|
| A. General | 1. Loose, damaged or missing members | |
| | a. Loose, damaged, broke, or missing members | a. Tighten, repair or replace as needed so that handrail is structurally sound |
| | b. Surface defects, sharp edges, metal burrs, or splinters that could cause injury | b. Remove sharp edges, burrs, or splinters so surface is free of these hazards. |
| | 2. Deteriorated paint or protective coating | |
| | a. Peeling or chipping paint that has affected 25% of surface | a. Recoat and or paint to acceptable conditions |
| B. Metal | | |
| | 1. Rusty surfaces | |
| | a. Rusty surface that affected more than 10% of the surface | a. Surface should be uniformly coated |
| C. Wooden | 1. Damaged member | |
| | a. Cracking or splitting of a wooden member which causes sagging of the handrail more than 2" inches | a. Structurally adequate member in place with alignment to within 1/2" inch |
| | | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#11. INLET & OUTLET STRUCTURES:

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|---------------------------|---|---|
| A. General | 1. Trash & debris | |
| | a. Trash & debris that obstructs the inlet or outlet more than ¼ the height or diameter of the structure. | a. Inlet/outlet clear & free of restriction so as not to restrict flows. |
| | 2. Rodents/animals | |
| | a. Holes or diggings caused by burrowing animals. | a. Area adjacent to structure free of holes and burrowing animals by initial treatment and follow up for control. |
| | 3. Erosion | |
| | a. Erosion around the wingwalls or headwalls that create voids leading to the result of undermining or unwanted settlement. | a. Fill & compact voids or holes with proper moisture conditioned material. Lifts should not exceed 6" inches and density results at 95%. |
| | 4. Settlement or movement. | |
| | a. Settlement or movements that have dropped or uplifted the structure facing or base more than 3" inches. | a. Structure should be re-installed firmly and bedded in place. |
| | 5. Vegetation | |
| | a. Vegetation 18" tall closer than 2 feet apart located on the apron or within 5' ft. of the structure. | a. Remove vegetation as needed. If applicable, apply proper herbicide to control unwanted vegetation growth. |
| B. Concrete | 1. Structural damage | |
| | a. Parts of the structure that is cracked, chipped, broken off, or spalled more than 2" deep & 6" in diameter. | a. Remove any damaged pieces or sections; clean thoroughly, patch, replace, or repair as needed. |
| | 2. Graffiti | |
| | a. Obscenities | a. Re-paint areas of surface affected to match in kind the surroundings. |
| C. Rock or masonry | 1. Structural damage | |
| | a. Any missing and loose rock or block sections of the structure. | a. Remove any damaged pieces or sections; clean thoroughly, patch, replace, or repair as needed. |
| D. Metal | 1. Worn or deteriorated | |
| | a. Eroded, rusted, or worn conditions that affect the structural integrity of the inlet/outlet. | a. Repair, refurbish, or replace as needed. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#12. CHANNEL & STORM DRAIN INVERTS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-----------------------------|---|--|
| A. General | 1. Trash, litter, & debris. | |
| | a. Trash & debris restricting the intake into a storm drain. | a. Remove any obstructions from inlets and dispose of accordingly. |
| | b. Debris/trash which impedes flows in a channel invert. | b. Remove any obstructions from the invert and dispose of accordingly. |
| | c. Citizen concerns involving foul odors or unsightliness. | c. Remove trash, litter, or debris from premises that are causing concern. |
| | d. Mud or sediment deposits which restrict 10% or more of the structure. | d. Remove accumulated sediment and dispose of accordingly. |
| | d. Vegetation in excess of 2" inches high protruding through cracks or expansion joints. | d. Cut & remove protruding vegetation and chemically treat if applicable. |
| | e. Pondered water complaints of foul odors or insects. | e. Pump out water with water truck or portable pump. If not practical, treat for vector concerns and schedule follow up treatments as needed. |
| | f. Dead animals. | f. Remove dead animal and dispose of accordingly. |
| | g. Pollution-any hazardous materials. | g. Contact Bob Stevens FCDMC @ 602-506-4073 & Hazardous Material Emergency 602-506-7179 for instructions and dispose of accordingly. |
| B. Improved channels | 1. Deterioration concerns. | |
| | a. Reinforcement exposed. | a. Remove exposed rust, refurbish, and or repair by patching areas of exposed reinforcement. |
| | 2. Cracks. | |
| | a. Cracks wider than 3/8" wide x 6" inches deep | a. Cracks in the invert and slopes should be cleaned out and sealed with a suitable filler material. |
| | b. Cracks wider than 1/4" wide that go completely through the concrete less than 6" inches thick. | b. Cracks in the invert and slopes should be cleaned out and sealed with a suitable filler material. |
| | 3. Settlement or movement. | |
| | a. Movement or settlement that has displaced the invert facing more than 4" from grade elevation. | a. Attempt to restore securely bedded within 1/4" of grade. If not, remove either by saw cutting or jack hammer methods. Repair damaged section. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#12. CHANNEL & STORM DRAIN INVERTS

| TYPE | DEFICIENCY NOTED | MAINTENACE STANDARD |
|--------------------------------------|---|--|
| C. Grouted riprap | 1. Missing riprap or dislodged riprap. | |
| | a. Missing grouted riprap | a. Clean out area where rock is missing; re-install missing or dislodged riprap with proper grout application. Ensure to use a concrete glue to assist in repair. |
| D. Unimproved channel invert. | 1. Obstructions. | |
| | a. Deep-rooted vegetation (Palo Verde, Mesquite, Ironwood, and Salt Cedar trees). Remove or destroy all woody vegetation within the sediment basin. | a. Any volunteer growth that is not part of the original project landscape will be cut, stump treated and removed if needed. All herbicide treatment should be environmentally friendly (consult with Ecology Branch). |
| | b. Vegetation or debris which restricts more than 10% of channel capacity. | b. Remove restrictions and dispose of accordingly. |
| E. Asphaltic concrete | 1. Erosion concerns | |
| | a. Sheet flow erosion causing damage to the asphalt structure. | a. Repair erosion by filling and compacting with proper moisture conditioned material. If needed, re-grade shoulder to drain properly. |
| | b. Settlement or movement causing damage to asphalt structure. | b. Cut out damaged section of asphalt and replace accordingly by using SS1 oil and cold patch or hot mix asphalt. |
| F. Concrete low flow | 1. Vegetation. | |
| | a. High vegetation growing in joints. | a. Remove vegetation so joints are free of vegetation and root growth. Chemically treat if applicable. |
| | b. Damage from flows to the curbing which does not confine flows as designed. | b. Repair or replace damaged curbing to contain designed flows. |
| G. Low flow channel | 1. Trash, debris or silt. | |
| | a. Trash, debris or silt plugs that cause flows to divert out of defined low flow. | a. Remove restrictions so that flows stay within defined area. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#13. LEVEES

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|---|--|---|
| A. General right-of-way | 1. Trash & Debris | |
| | a. Trash, litter, and debris creating an unsightly condition. | a. Remove & dispose of accordingly. |
| | 2. Fencing damage | |
| | a. Nuisance vegetation taller than 18" inches. | a. Cut vegetation and chemically spray treatment if applicable. |
| | b. Cut or damaged fencing or gates. | b. Repair or replace damaged fencing or gates to set standards. |
| | c. Damaged signs or stationing. | c. Re-furbish or replace as needed any damaged signs. |
| | 3. Rodents | |
| a. Rodents/animals creating holes or burrows on the crest or embankments. | a. Treat with proper rodenticides and schedule follow up treatments as needed. | |
| B. Concrete/soil cement structures | 1. Structural damage. | |
| | a. Cracks 1/8" inch or wider on the concrete which can expose reinforcement. | a. Clean out and fill in cracks with suitable fill material. |
| | b. Erosion, spalling, or deterioration which affects the structural integrity. | b. Repair erosion from runoff/sheetflow. Repair areas where spalling or deterioration has occurred. |
| | c. Broken or missing protective facing which could allow water or rust to become a concern to the structure. | c. Repair or patch as needed to stabilize concerns. |
| | 2. Graffiti | |
| a. Obscene material /writings | a. Remove or re-paint as needed to match to existing conditions. | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#13. LEVEES

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|----------------------|--|---|
| Earthen levee | 1. Structural Damage | |
| | a. Erosion from sheet runoff causing deep rills on crest or slopes of levee. | a. If erosion/rill is deeper than 2' ft. deep, a proctor test must be taken. Install moisture conditioned material in lifts not to exceed more than 6" high and compaction tests will be administered on every lift and a 95% result or better must be obtained to continue each lift. Unless otherwise specified nuclear compaction tests will be suffice. |
| | b. Plating material on the access road on the crest of the levee is displaced or missing. Plating missing on the access ramps. | b. Re-grade to design elevation with motor grader by bringing back into place any displaced material from the shoulder. If needed, re-install ABC material on the crest as needed to re-establish safe all-weather access. |
| | c. Slope protection missing or displaced. | c. Re-install gravel mulch, loose riprap, or grouted riprap as needed. |
| | 2. Deep-rooted vegetation | |
| | a. Deep-rooted vegetation located on the crest or slopes. | a. Cut & stump treat as need. Remove any large root systems. Fill & compact holes accordingly. |
| | 3. Transverse or longitudinal cracks | |
| | a. Transverse or longitudinal cracks located on the crest or toe of the levees. | a. Record the station of the crack. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of crack. Include photograph, inspector, date, and structure. |
| | 4. Other | |
| | a. Report any other dam safety related concerns (sink holes, depressions, slides, or other anomalies). | a. Record the station of the concern. Give location; crest, upstream shoulder, downstream shoulder, mid-slope, or toe of levee. Take measurements to include; diameter size, and depth of depression. Include photograph, inspector, date, and structure. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#14. OUTLET TOWERS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|--------------------------|---|--|
| A. General | 1. Trash & Debris | |
| | a. Trash or debris that is restricting inflows. | a. Remove & dispose of accordingly. |
| | 2. Subsidence | |
| | a. Any depressions, holes and or other questionable conditions in the immediate area. | a. Dam Safety Branch will investigate these concerns and recommend repair method. If hole or depression is deeper than 2' ft. deep, it will be excavated; material proctored, filled in lifts not to exceed 6" inches, and compacted to 95%. |
| | 3. Graffiti | |
| | a. Obscene material or writings. | a. Remove obscenities and repaint to match existing structural conditions. |
| | 4. Vegetation | |
| | a. Vegetation higher than 2' ft. tall which can create vector issues and sediment accumulation. | a. Implement either mower operations or hand cut vegetation to acceptable standards. |
| B. Concrete | 1. Structural damage | |
| | a. Concrete surfaces which have been damaged due to deterioration or vandalism. | a. Patch or repair areas on the tower surface to match existing structural conditions. |
| C. Metal surfaces | 1. Structural damage | |
| | a. Surface caved in or bent. | a. Repair areas on the metal surface to match existing structural conditions. |
| | 2. Deterioration | |
| | a. Rusted or oxidized surface. | b. Remove rust or oxidation and match surface to existing conditions. |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#15. TRASH RACKS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-----------------------|--|--|
| A. General | 1. Loose, bent, broken or missing members | |
| | a. Frame or bar members bent out of shape or alignment. | a. Repair or replace frame to original design. |
| | b. Any missing or broken parts of the grate. | b. Repair or replace as needed. |
| | c. Breakaway pin missing. | c. Re-install breakaway pin to secure the grate. |
| | d. Trash or debris resulting in flow restrictions. | d. Remove blockage so as to flows are not impeded. |
| | 2. Deteriorated paint or protective coating. | |
| | a. Paint or protective coating that is peeling, rusting or oxidized. | a. Remove damaged surface paint, coating, or rust and refurbish as needed. |
| | | |

DEFICIENCY LEVELS and MAINTENANCE STANDARDS
Operations and Maintenance Division

#16. DAM RESERVOIRS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------|--|--|
| A. General | 1. Pollution | |
| | a. Oil, gas, or other contaminants. | a. Contact Bob Stevens FCDMC @ 602-506-4073 & Hazardous Material Emergency 602-506-7179 for instructions and dispose of accordingly. |
| | b. Citizen concern for the removal of dead animals. | b. Remove and properly disposal of dead animal. |
| | 2. Safety or health hazard. | |
| | a. Rodents or insects causing a health hazard to District personnel or the Public. | a. Treat area with proper pesticide to ensure control of the nuisance. |
| | 3. Ponded water | |
| | a. Obstruction or sediment plugs creating ponds. | a. Remove obstructions and or plugs so water can flow accordingly. |
| | | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#17. FCDMC EXCESS LAND RIGHT-OF-WAY

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------|---|---|
| A. GENERAL | 1. Illegal dumping | |
| | a. Illegal dumping of trash & debris. | a. Pick up and dispose of properly all illegal discarded material. |
| | 2. Health or safety concens | |
| | a. Dead animals, garbage attracting insects or other pests. | a. Pick up and dispose of dead animal(s), garbage to rectify health hazard. |
| | 3. High vegetation. | |
| | a. High vegetation taller than 18”. | a. Depending of size of lot, either hand cut or arrange for mower operations. If applicable treat with proper herbicide for weed control. |
| | 4. Damaged signs | |
| | a. Missing or vandalized signs. | a. Re-install or refurbish damaged signs as needed. |
| | 5. Fencing | |
| | a. Cut or damaged fencing or gates. | a. Repair damaged fencing or gates to ensure District property is in compliance to PM-10 compliance. |
| | 6. Dust | |
| | a. Fugitive dust concerns. | a. Options are to water down area of concern, or apply approved soil stabilizer, and or install plating material to conform to PM-10 standards. |
| | | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#18. GENERAL SIGNS & STAFF GAGES

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-----------------------------------|---|---|
| A. General | 1. Illegible information | |
| | a. Faded lettering, peeling, or chipping which has caused the sign to be illegible. | a. Refurbish or replace sign as needed. |
| | b. Graffiti or vandalism which covers up the sign so that it can't be read. | b. Refurbish or replace sign as needed. |
| | c. High or dense vegetation that restricts the sign from being read. | c. Thin out or remove vegetation that is restricting the sign. |
| | d. Sign or stationing is missing. | d. Reinstall missing signs as per specifications. |
| | 2. Deteriorated paint or protective coating. | |
| | a. Protective coating/paint is peeling or rusting. | a. Remove any rust that may be present, apply proper primer, and repaint. |
| | 3. Loose, bent, broken or split sign support channel or posts. | |
| | a. Loose bolts or anchors which cause signs to move, tilt, or fall over. | a. Sign & mounting supports should be tightened and secured in place. |
| | b. Bent, broken, or split so that the sign information is illegible. | b. Refurbish or replace sign as needed. |
| B. Staff gage metal tubing | 1. Staff gage is out of level or alignment. | |
| | a. Staff gage is out of level more than 1/2" inch. | a. Attempt to re-level staff gage metal tube. If unsuccessful, reinstall the staff gage so that it is level & plumb according to standard drawing #6. |
| | | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#19. CHANNEL & STORM DRAIN WALLS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-----------------------------|---|--|
| A. Concrete | 1. Structural Damage | |
| | a. Cracks wider than ¼" inch. | a. Clean out the crack and apply suitable filler material. |
| | b. Spalling or chipping that is greater than 2" deep or which exposes reinforcement. | b. Remove any rust that may be present, clean damaged portion thoroughly, and patch accordingly with an approved product (dry patch product, rock-ite, etc.). Ensure the usage of a concrete glue to assist in adhering to the wall. |
| | c. Chipping or spalling along an expansion joint or edge which is more than 1" deep. | c. Properly clean & remove damaged section along expansion joint. Patch damaged area to restore to original condition. |
| | d. Missing expansion material or separation at the joint which permits passage of filler or backfill material. | d. Clean out the joint and replace missing expansion material (if needed, add "backer-rod" to fill any large gaps). |
| | 2. Voids behind walls. | |
| | a. Voids behind concrete walls. | a. Excavate the void to the termination point. If the void is less than 4' feet deep; remove any loose material, add moisture to the void by wetting the cavity, install moisture conditioned material in lifts not to exceed 6" and compact to 95% density. If voids are deeper than 4' feet deep, contact Engineering and they will recommend a repair method. |
| | 3. Vegetation | |
| | a. Vegetation in the expansion joints. | a. Cut and remove vegetation, if applicable, apply proper herbicide to control vegetation. |
| | 4. Grouted riprap | |
| a. Loose or missing riprap. | a. Clean out areas where riprap is missing, re-install rock and grout in place. Ensure to use a concrete glue in the mix. | |
| 5. Weep holes | | |
| a. Animal guards missing. | a. Re-install missing animal guards. | |
| b. Blockage | b. Remove any restrictive material and clean out as needed. | |

DEFICIENCY LEVELS and MAINTENANCE STANDARD
Operations and Maintenance Division

#20. TRAILS

| TYPE | DEFICIENCY NOTED | MAINTENANCE STANDARD |
|-------------------|---|--|
| A. General | 1. Restricted access or safety hazard | |
| | a. Debris, rock, or slide material which reduces the width of the trail by 25%. | a. Remove restrictions so as to allow the usage of the trail. |
| | b. Trees or branches that reduce the trail vertical clearance to less than 14' feet above the road surface. | b. Cut, trim or remove branches to meet standard. |
| | c. Rock slides from steep walls that block the trail | c. If needed, close the trail with barricades. Use proper equipment for the removal & disposal of fallen rock. Re-open the trail once hazard has been removed. |
| B. Earthen | 1. Erosion | |
| | a. Ruts, depressions or holes in the trails which can create a safety hazard. | a. If the ruts are numerous, arrange for equipment to remove the ruts and restore trail to original condition. If the ruts are few and can be done by hand, rake out the ruts and install native fill as needed for restoration. |
| | 2. Vegetation | |
| | a. Weeds or brush higher than 18" inches. | b. Either hand cut to acceptable standard (4" inches or less), or mow high vegetation. If applicable spray with appropriate herbicide for weed control. |
| | | |

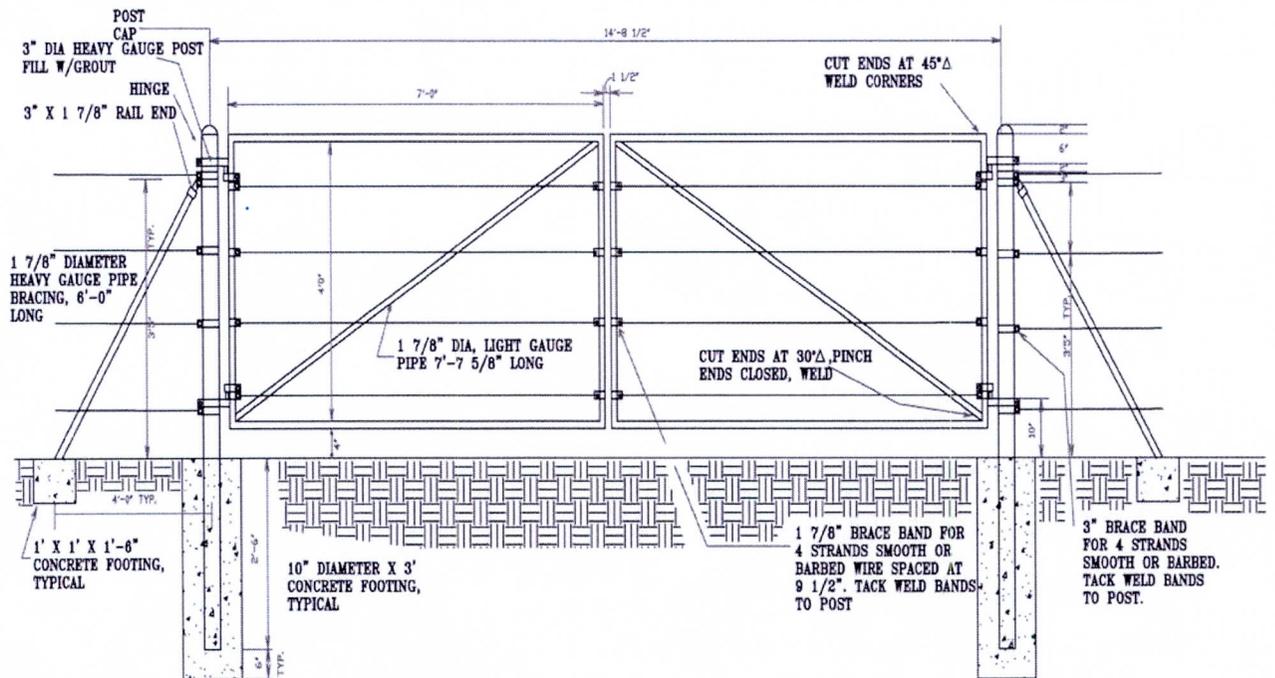
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

FCDMC STANDARD DRAWINGS

The standard drawings are a tool to be used by the various FCDMC branches for the purpose of having uniformity in the construction and installation of these commonly used items on FCD property. These drawings give details to FCD field personnel, contractors, and others for the specifications, and materials needed for their proper installation. These standard drawings can also be used in conjunction with the Standard Operating Procedures. Below is a listing of the various standard drawings:

- Standard Drawing #1: Gates-Smooth or Barbed Wire.
- Standard Drawing #2: Fence- Smooth or Barbed Wire.
- Standard Drawing #3: Grouted Riprap Side Inlet Chute.
- Standard Drawing #4: Embankment Backfilling.
- Standard Drawing #5: Retaining Walls.
- Standard Drawing #6: Staff Gages.
- Standard Drawing #7: FCDMC Signs Right-of-Way
- Standard Drawing #8: Wrought Iron Fence
- Standard Drawing #9: Subsidence Markers
- Standard Drawing #10: Core Drain Markers
- Standard Drawing #11: Standard Break-Away Fence
- Standard Drawing #12: Standard Break-Away Pipe Rail Fence
- Standard Drawing #13: Sediment Gage
- Standard Drawing #14: Removable Bollard
- Standard Drawing #15: Observation Bridge at Adobe Dam
- Standard Drawing #16: Line and Fence Posts
- Standard Drawing #17: Equestrian Gate
- Standard Drawing #18: Stationing Placard
- Standard Drawing #19: Weldable Anchors

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



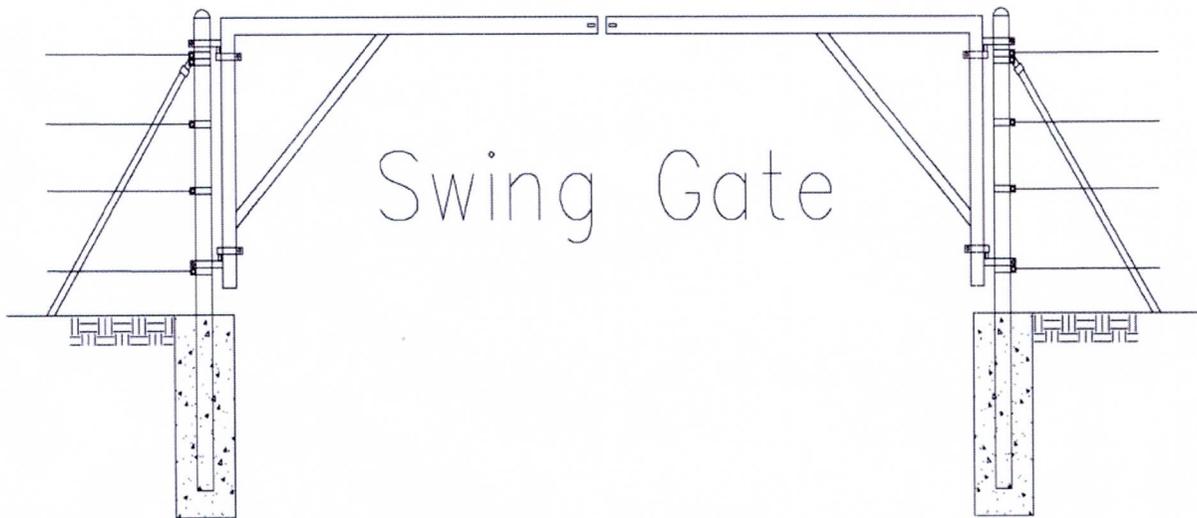
SD#1 Gates- Smooth of Barbed Wire

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

| MATERIALS LIST | | |
|----------------|--|---|
| QTY | ITEM | NOTES |
| 2 | 3" HEAVY GAUGE POSTS, 7' LONG | |
| 2 | POST CAPS | |
| 4 | 1 7/8" LIGHT GAUGE PIPE 4' LONG | 1. PUT SLIGHT SLOPE ON TOP OF FOOTINGS. |
| 4 | 1 7/8" LIGHT GAUGE PIPE 7' LONG | |
| 2 | 1 7/8" LIGHT GAUGE PIPE 7'-7 5/8" LONG | 2. GATE DIAGONAL BAR IS ABOUT 7'- 7 5/8" MUST BE FIELD CUT TO FIT. |
| 2 | 1 7/8" HEAVY GAUGE PIPE 6'-0" LONG | |
| 4 | HINGES 3" X 1 7/8" | |
| 16 | BRACE BAND 1 7/8" | |
| 8 | BRACE BAND 3" BARBED OR SMOOTH WIRE | 1, 2, 3, CONCRETE MIX 1 PART CEMENT 2 PARTS SAND 3 PARTS AGGREGATE |
| 1 | GALVANIZED CHIN ABOUT 19" LONG | ADD WATER TO ACHIEVE WORKABILITY, NO MORE THAN 6" SLUMP. |
| 1 | PADLOCK # 3E59 | |
| 2 | RAIL ENDS 3" X 1 7/8" | |
| 16 | CARRIAGE BOLTS 5/16" X 2" | |

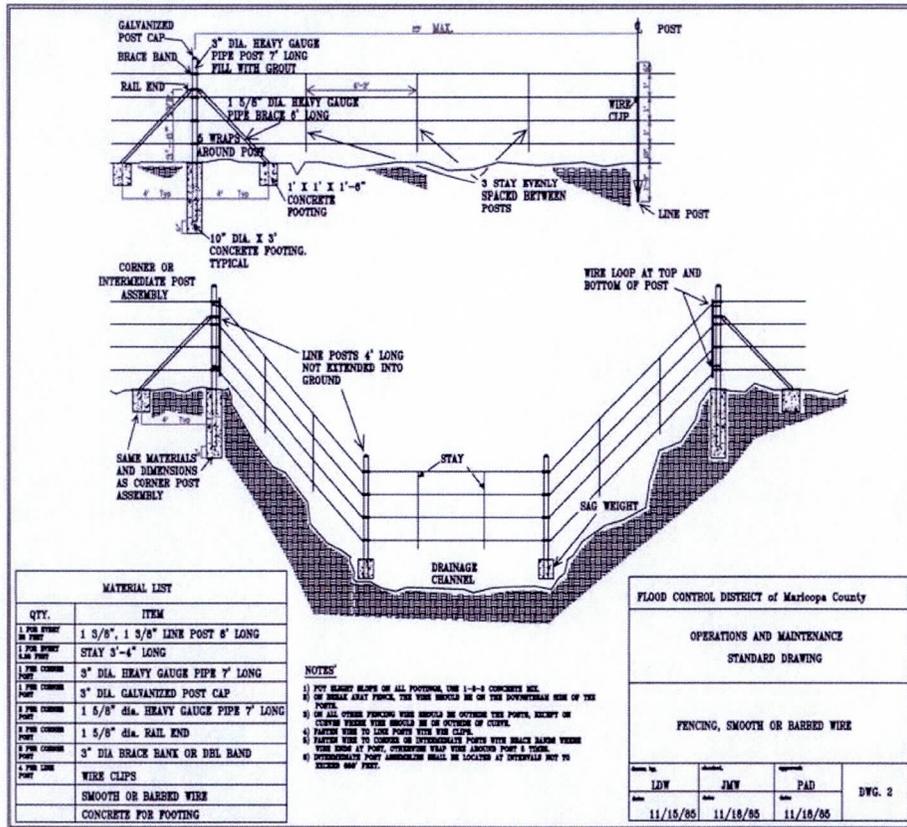
.....Materials List

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



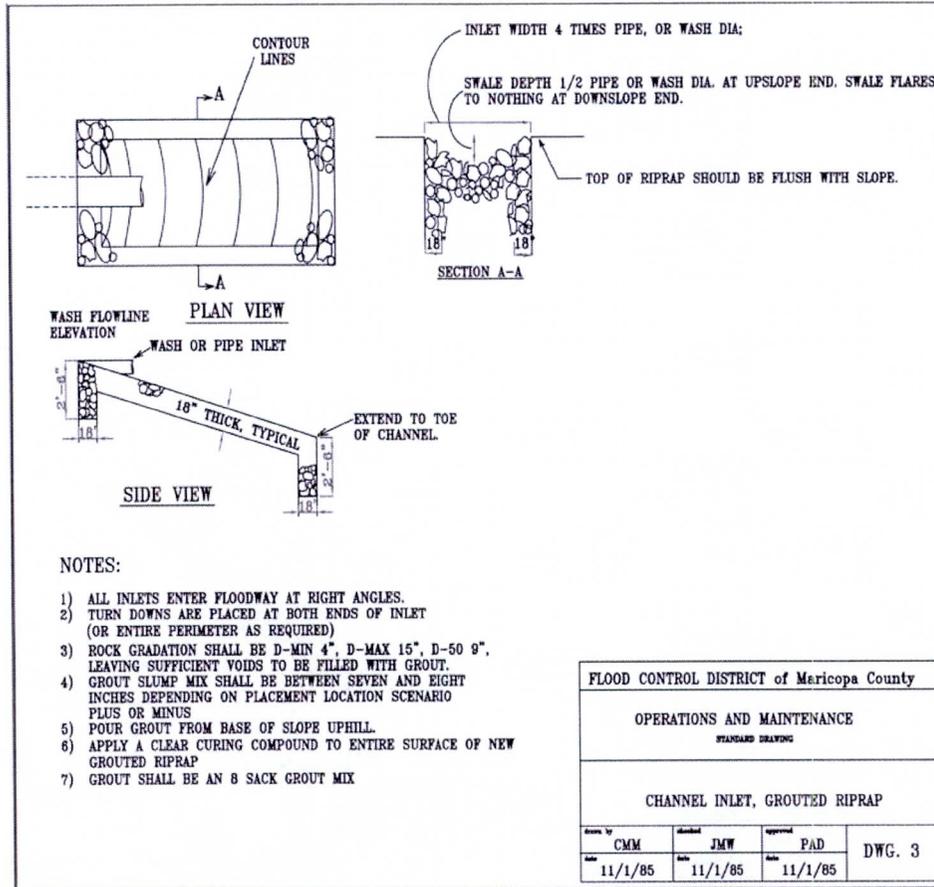
.....Swing Gate

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



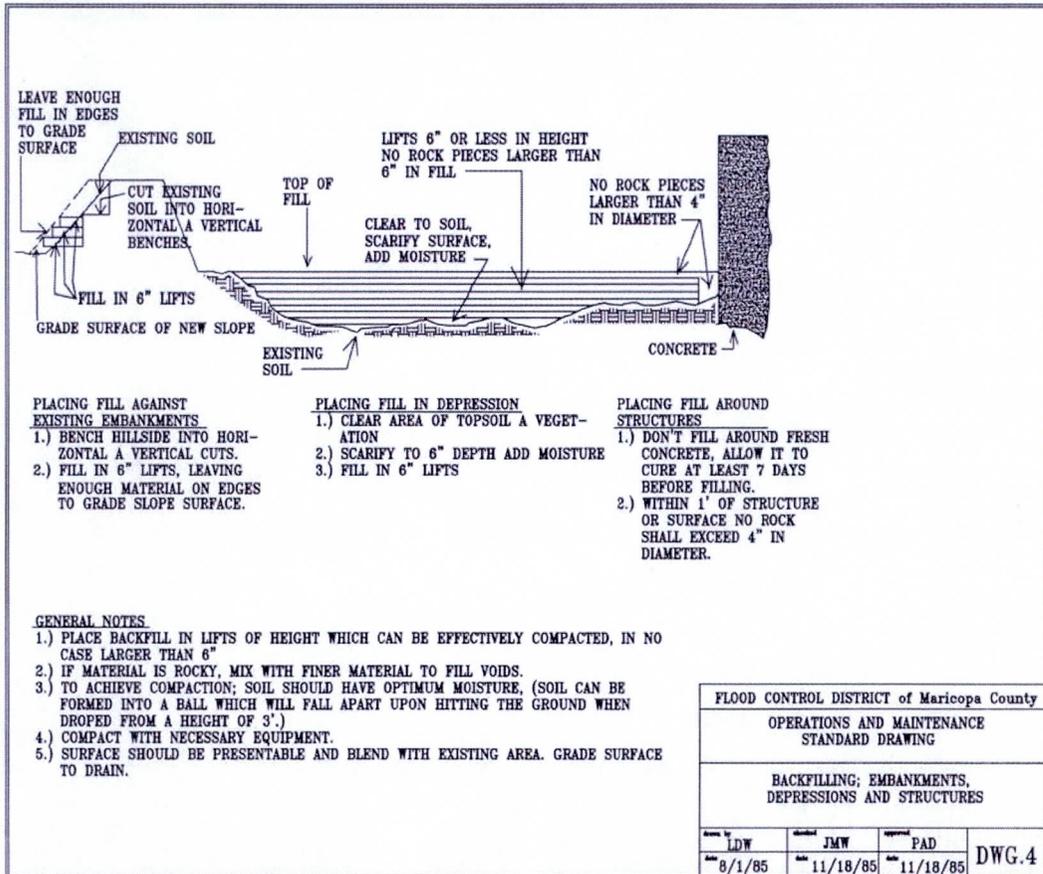
SD#2 Fencing, Smooth or Barbed Wire

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



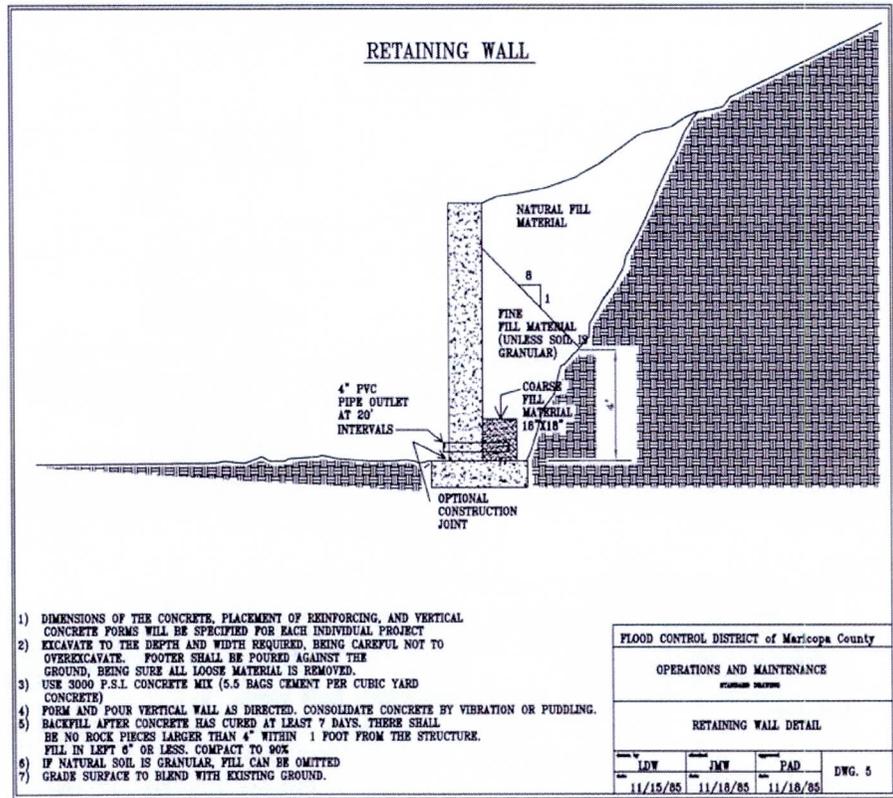
SD#3 Grouted Riprap Side Inlet Chute

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



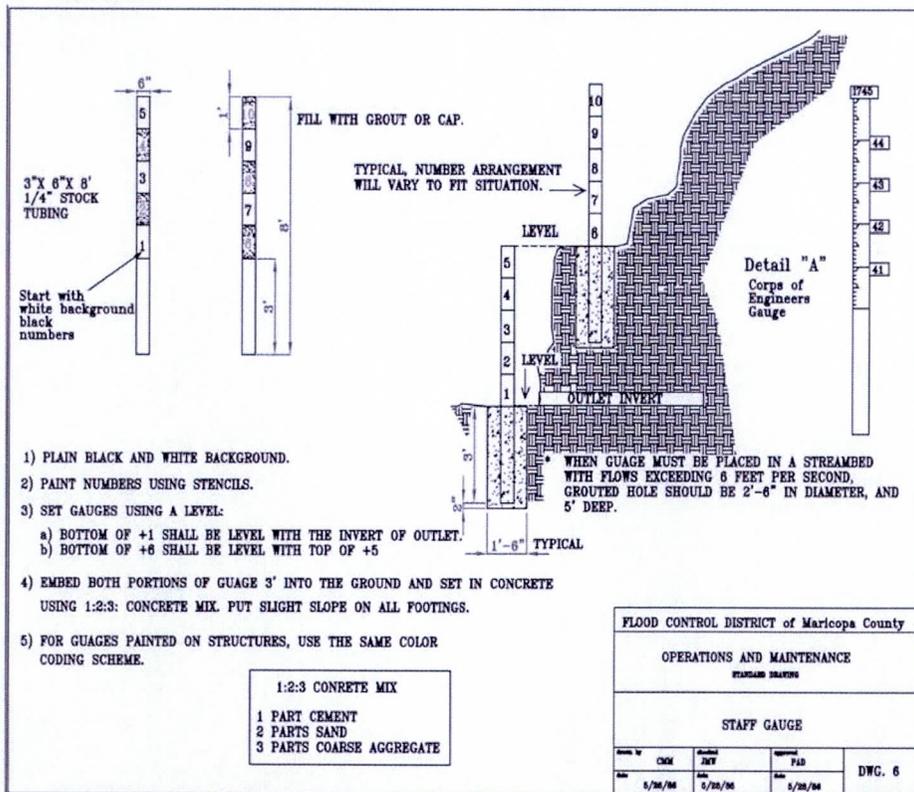
SD#4 Embankment Backfilling

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



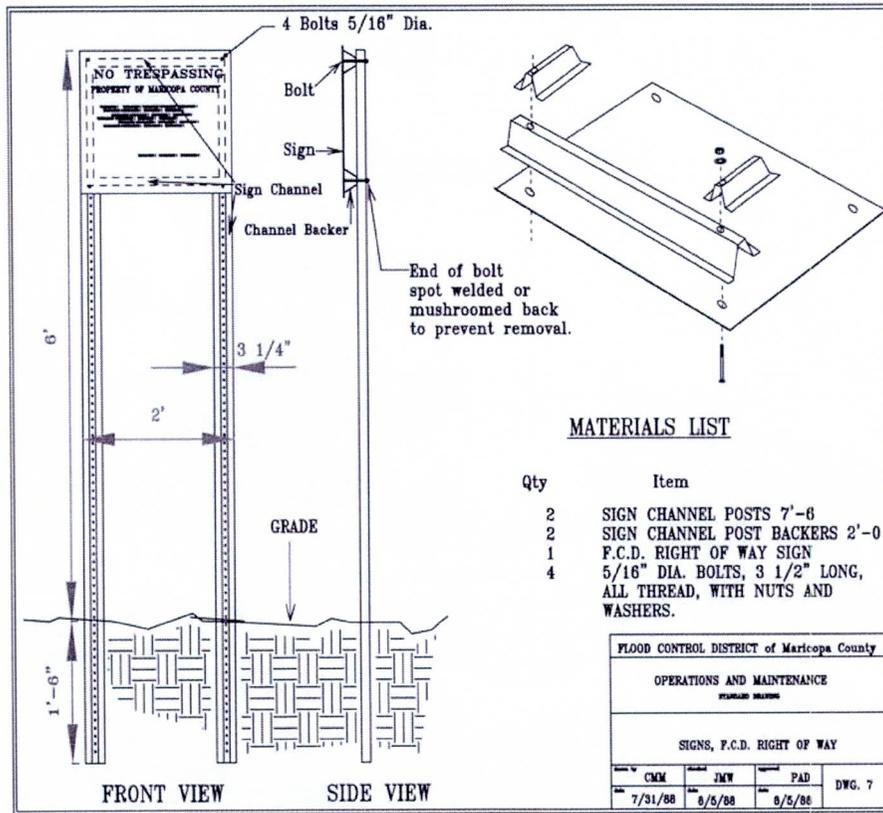
SD#5 Retaining Walls

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



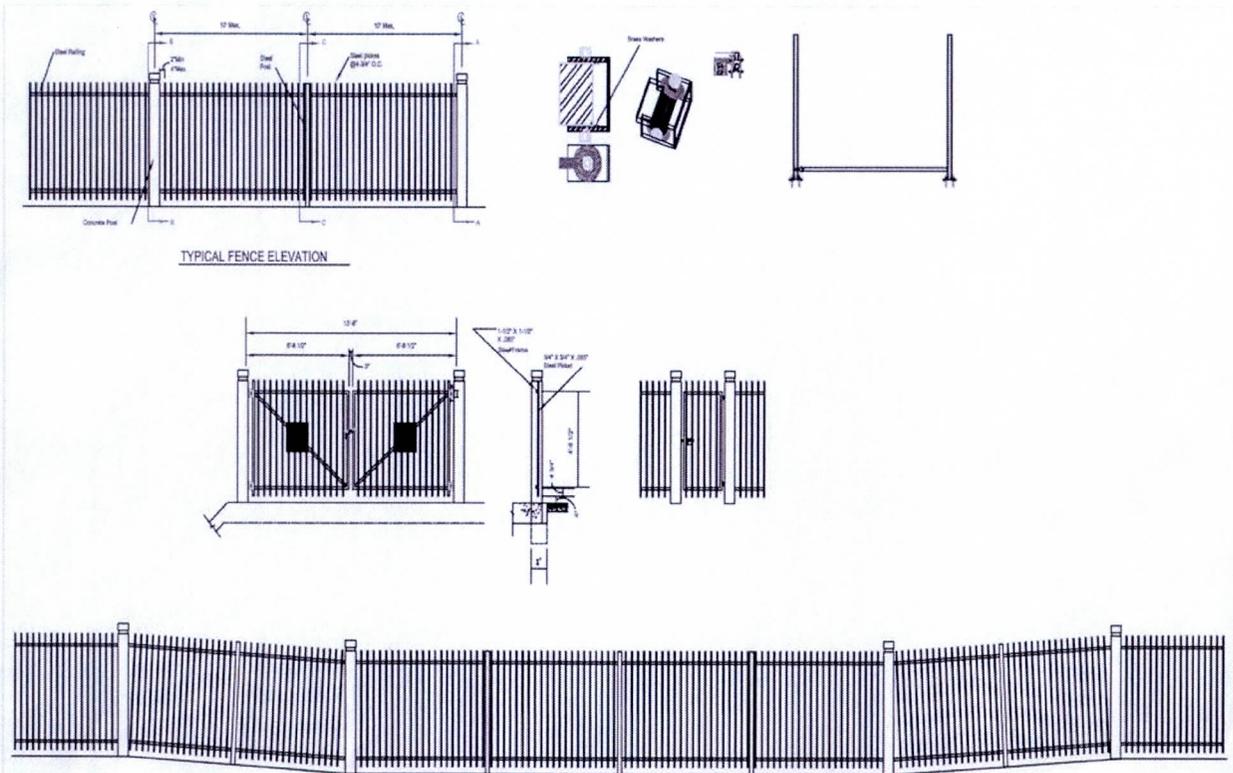
SD#6 Staff Gages

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



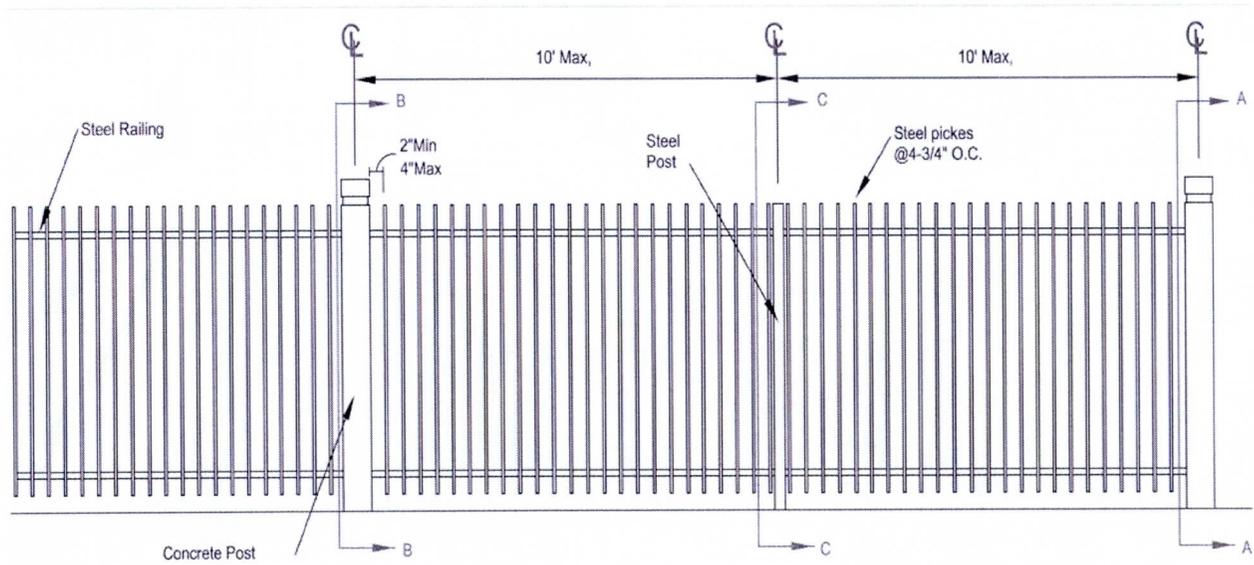
SD#7 FCDMC Signs Right-Of-Way

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



SD#8 Wrought Iron Fence 1 of 8

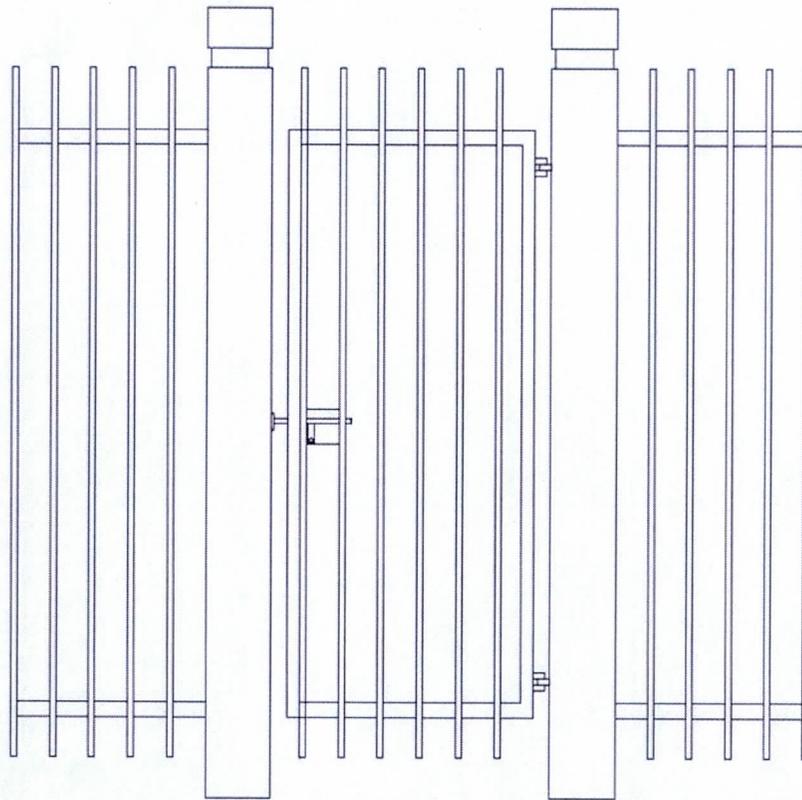
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



TYPICAL FENCE ELEVATION

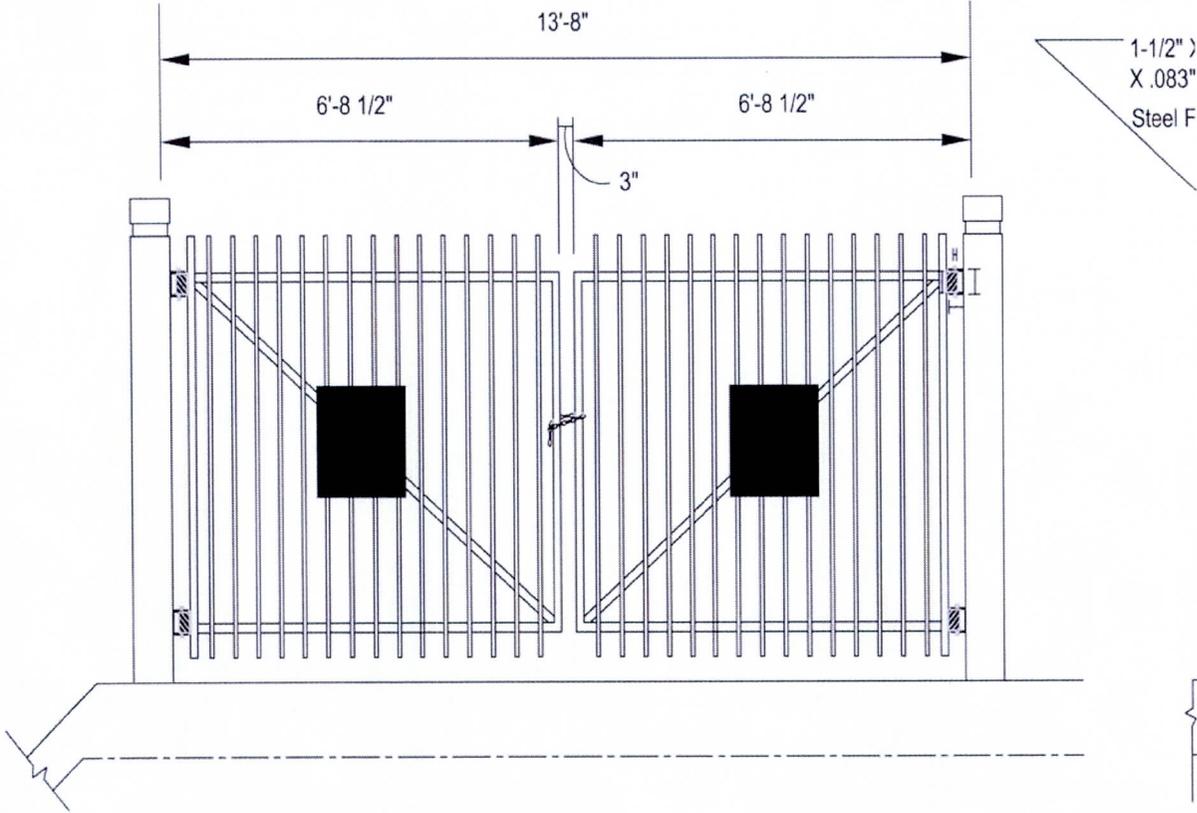
..... Wrought Iron Fence 2 of 8

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



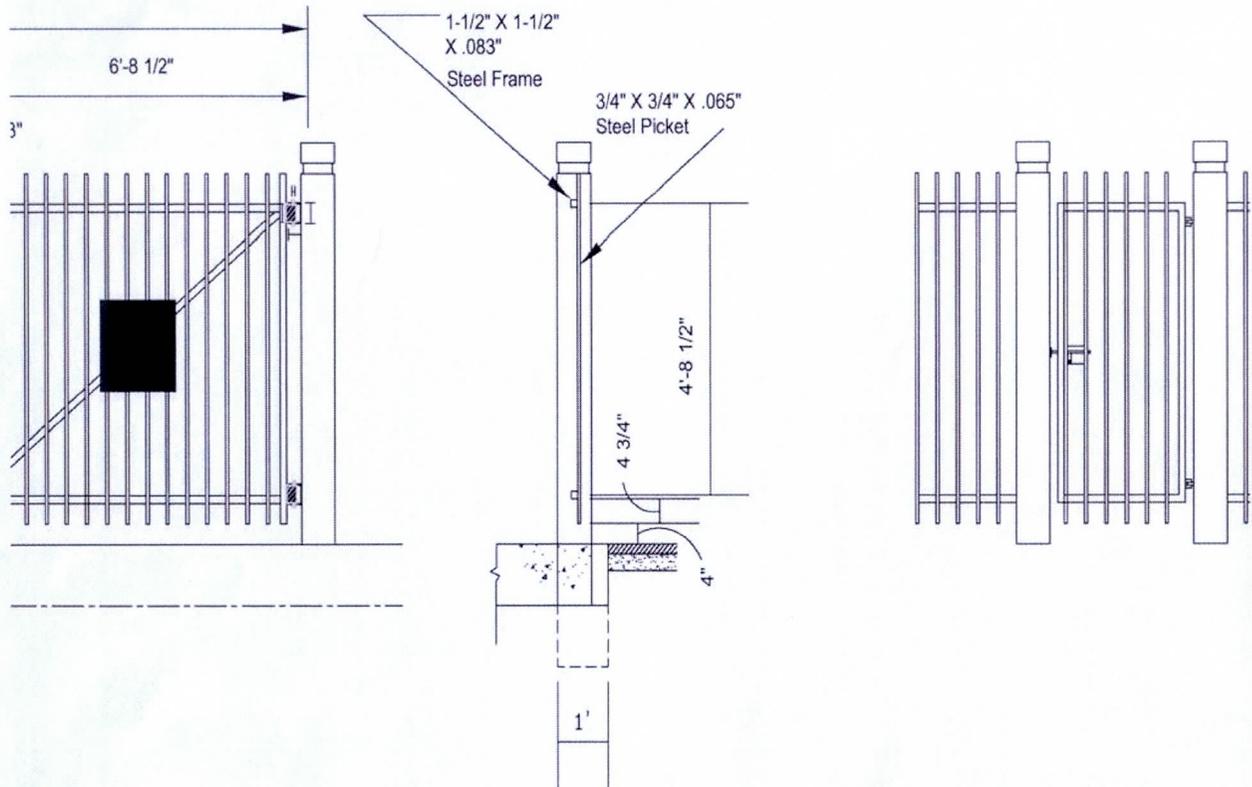
..... Wrought Iron Fence 3 of 8

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



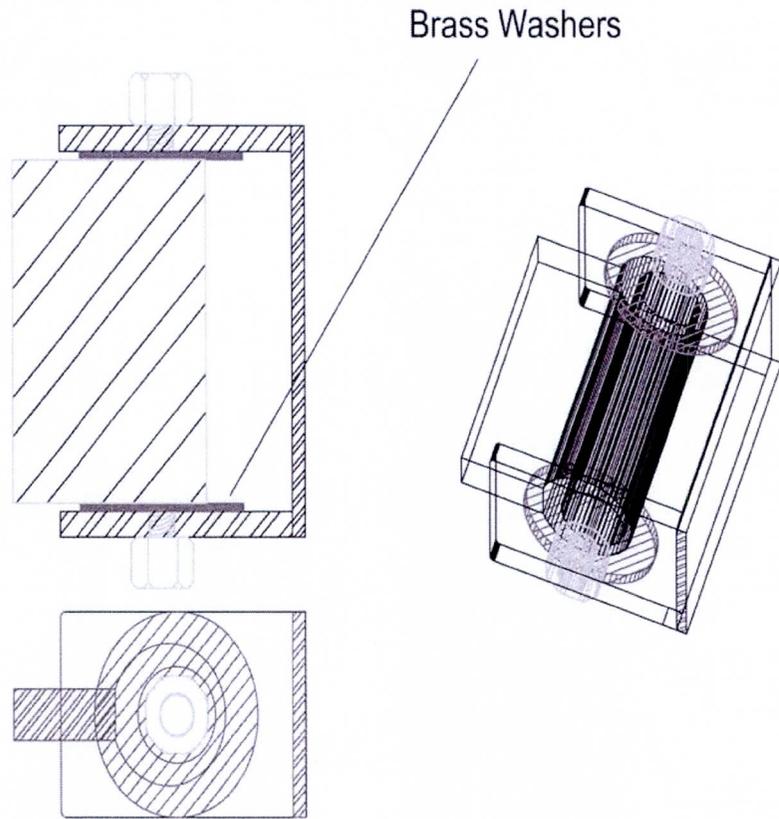
..... Wrought Iron Fence 4 of 8

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



..... Wrought Iron Fence 5 of 8

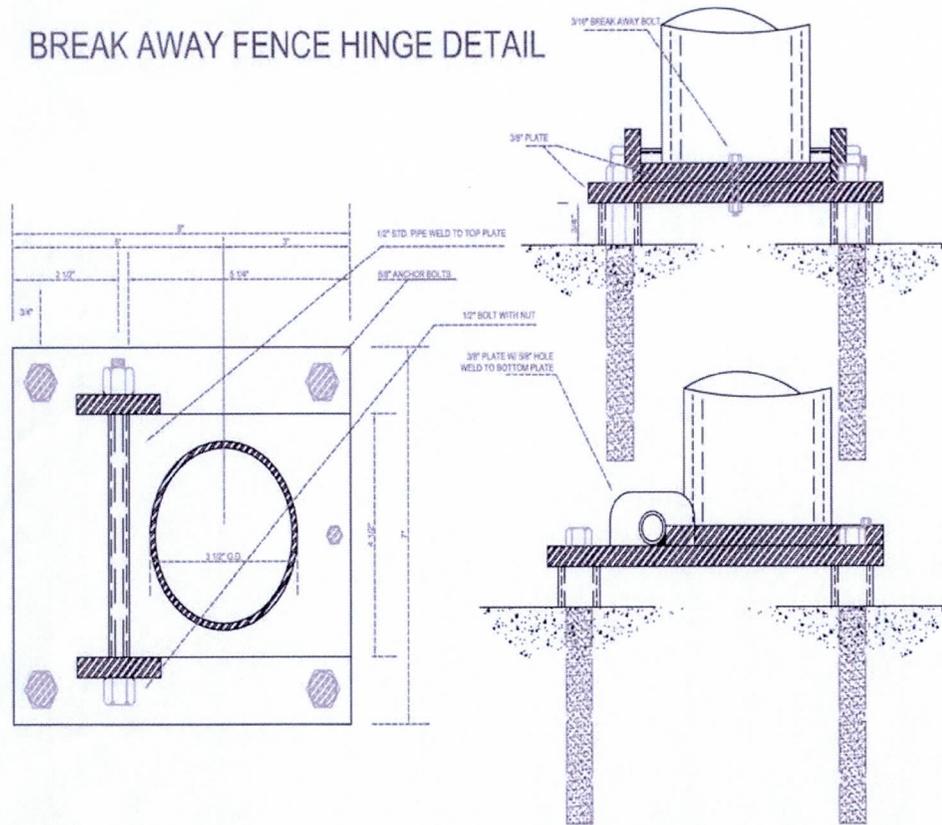
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



..... **Wrought Iron Fence 6 of 8**

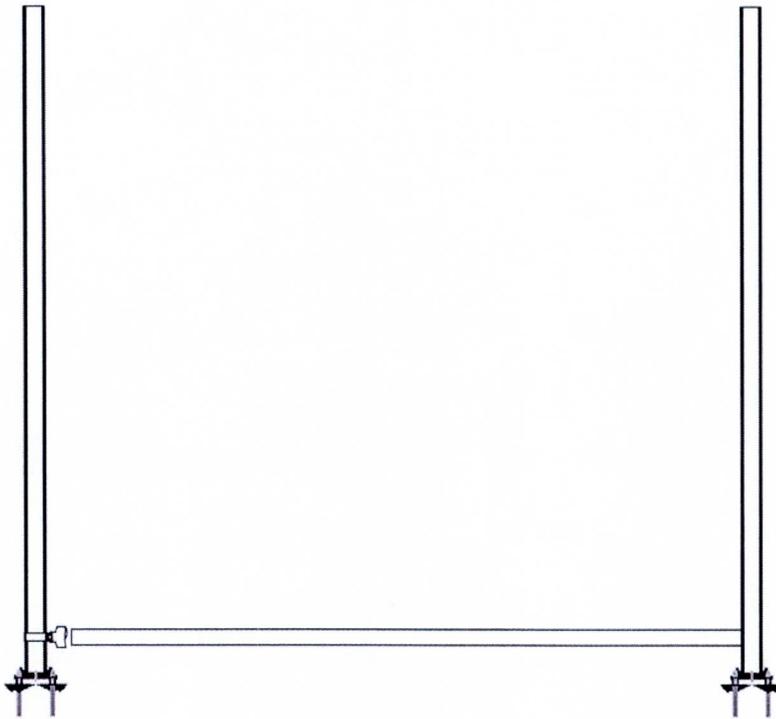
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

BREAK AWAY FENCE HINGE DETAIL



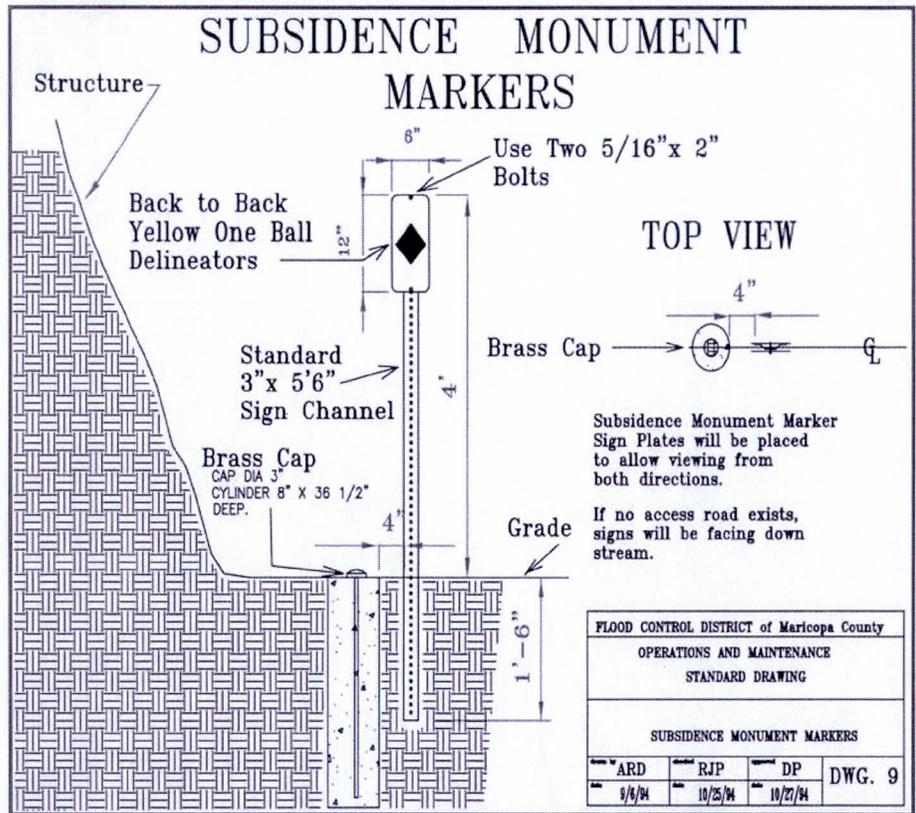
..... Wrought Iron Fence 7 of 8

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



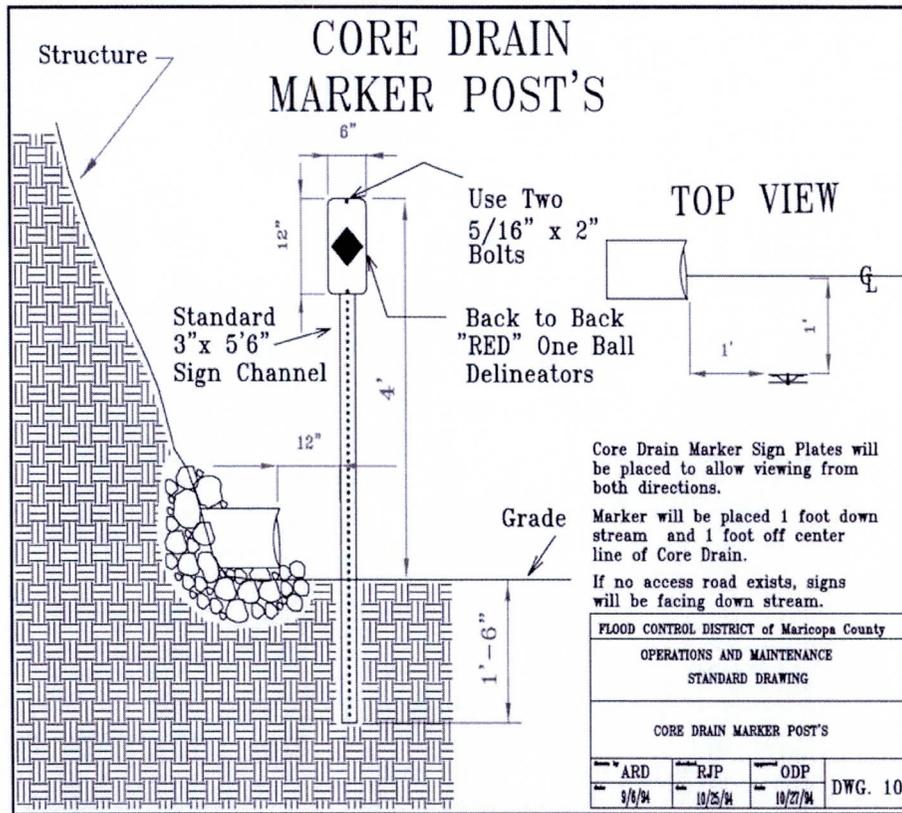
..... Wrought Iron Fence 8 of 8

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



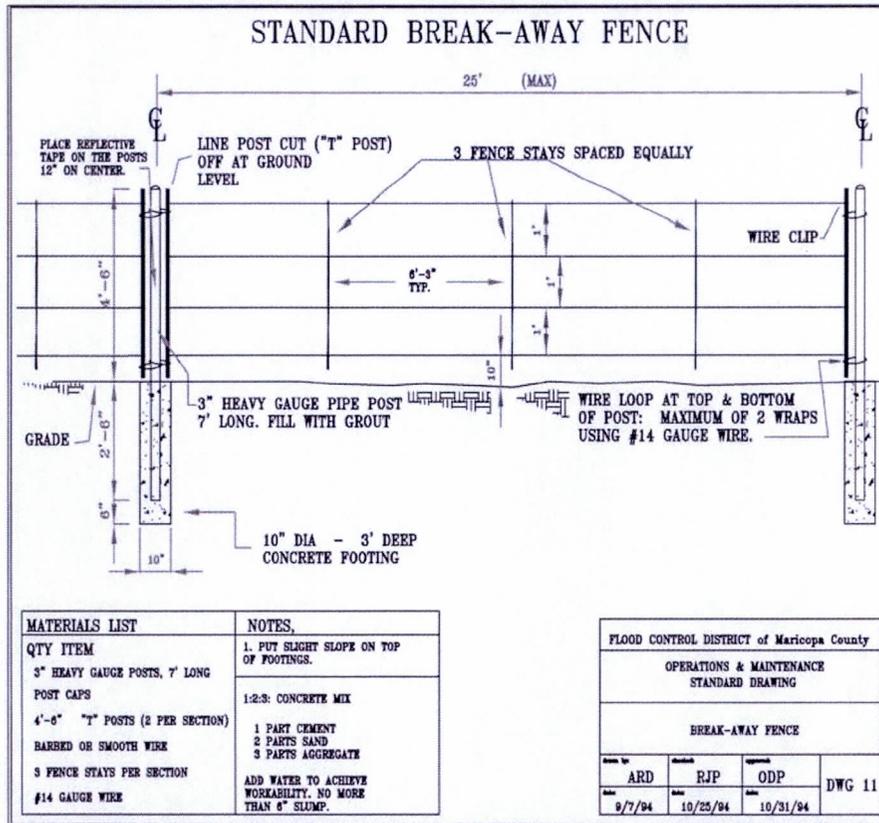
SD#9 Subsidence Markers

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



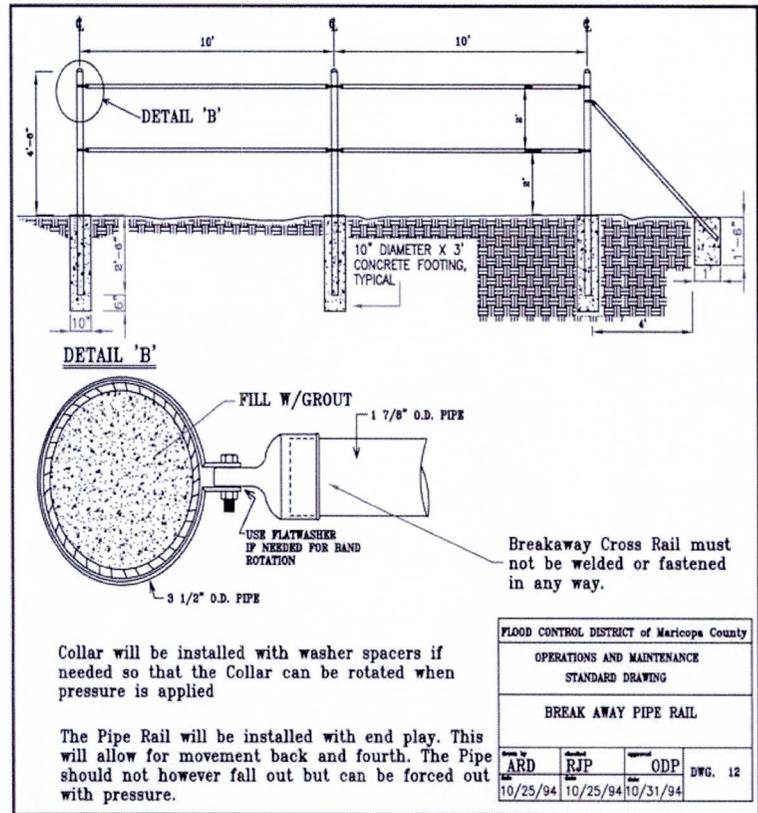
SD#10 Core Drain Markers

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



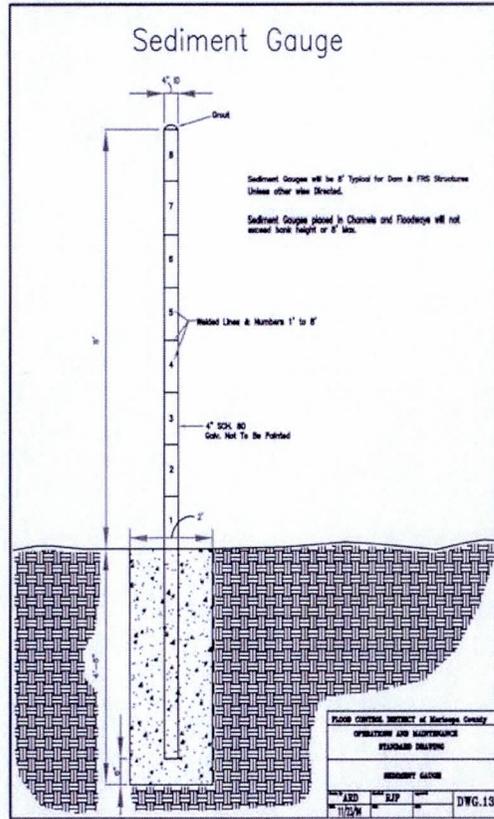
SD#11 Standard Break-Away Fence

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



SD#12 Standard Break-Away Pipe Rail Fence

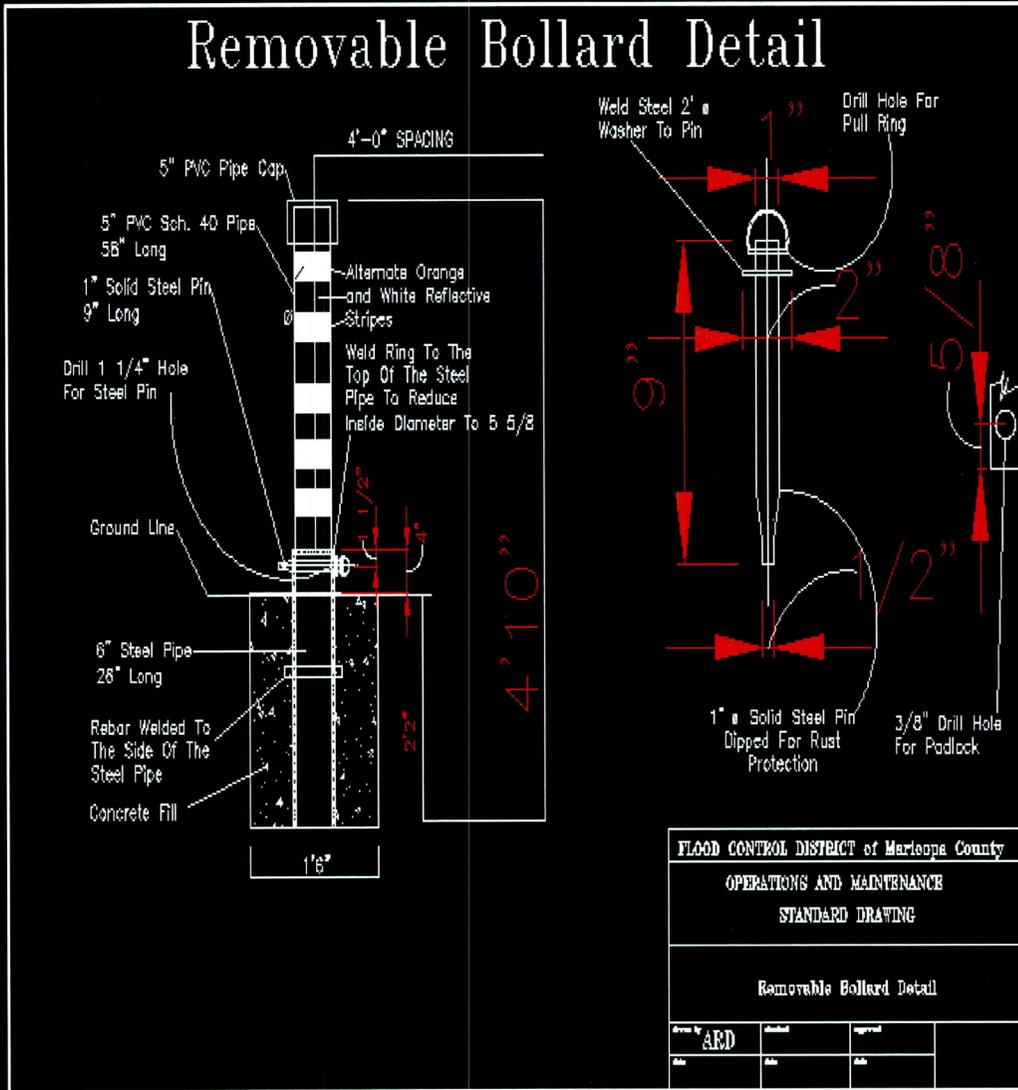
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



SD#13 Sediment Gage

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

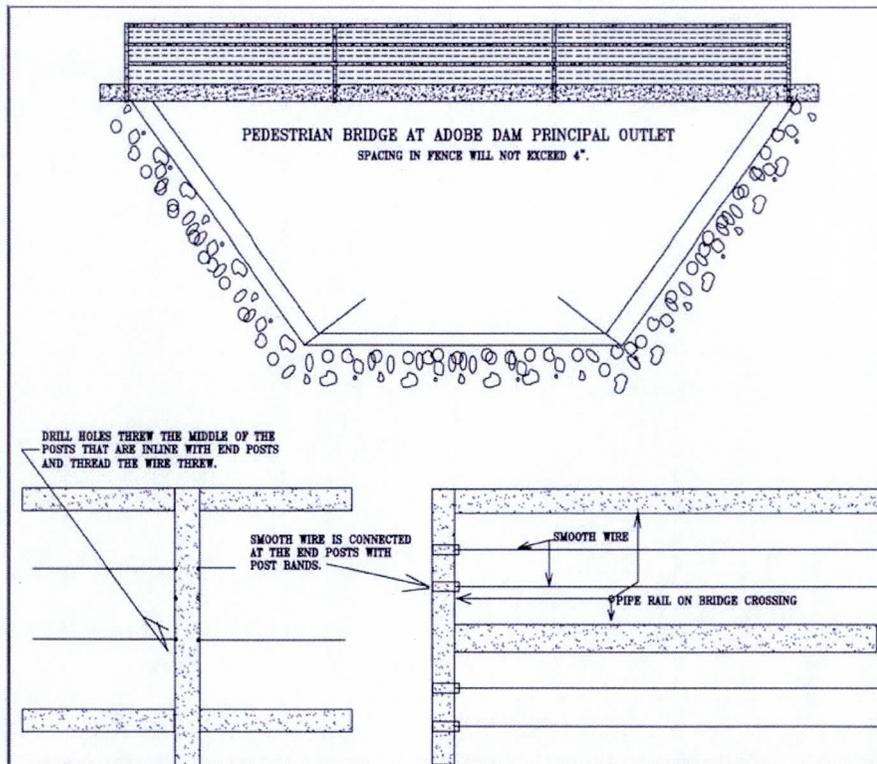
Removable Bollard Detail



| | | |
|---|---------|----------|
| FLOOD CONTROL DISTRICT of Maricopa County | | |
| OPERATIONS AND MAINTENANCE | | |
| STANDARD DRAWING | | |
| Removable Bollard Detail | | |
| Drawn by ARD | Checked | Approved |
| Date | Date | Date |

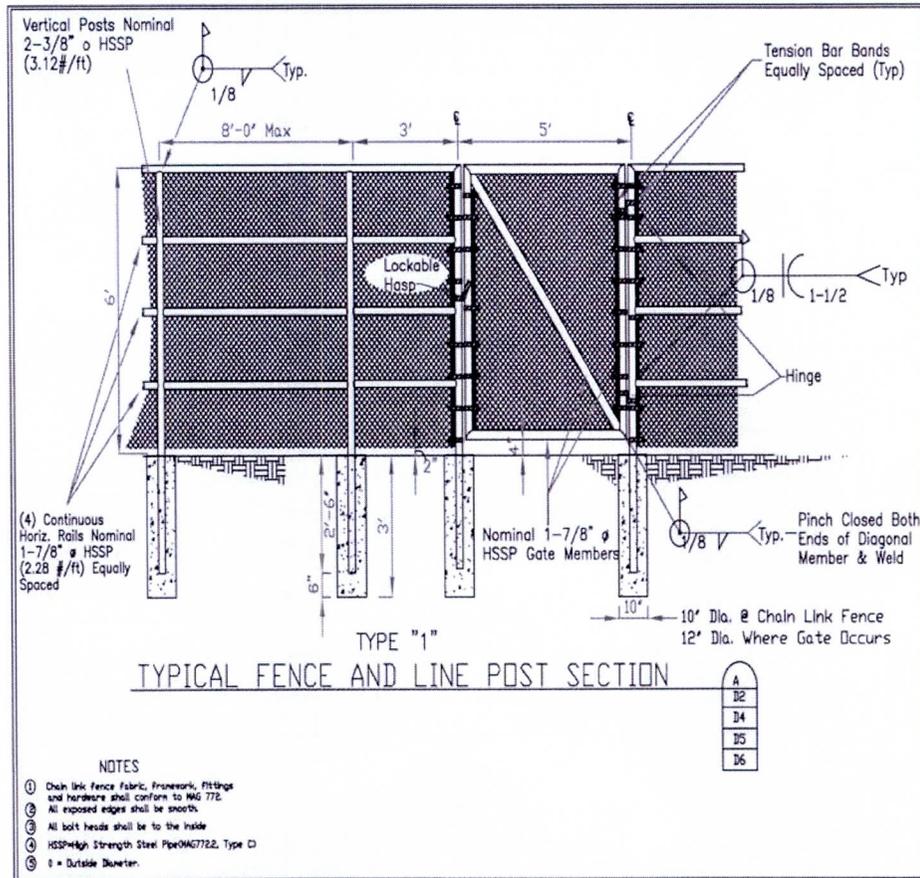
SD#14 Removable Bollard

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



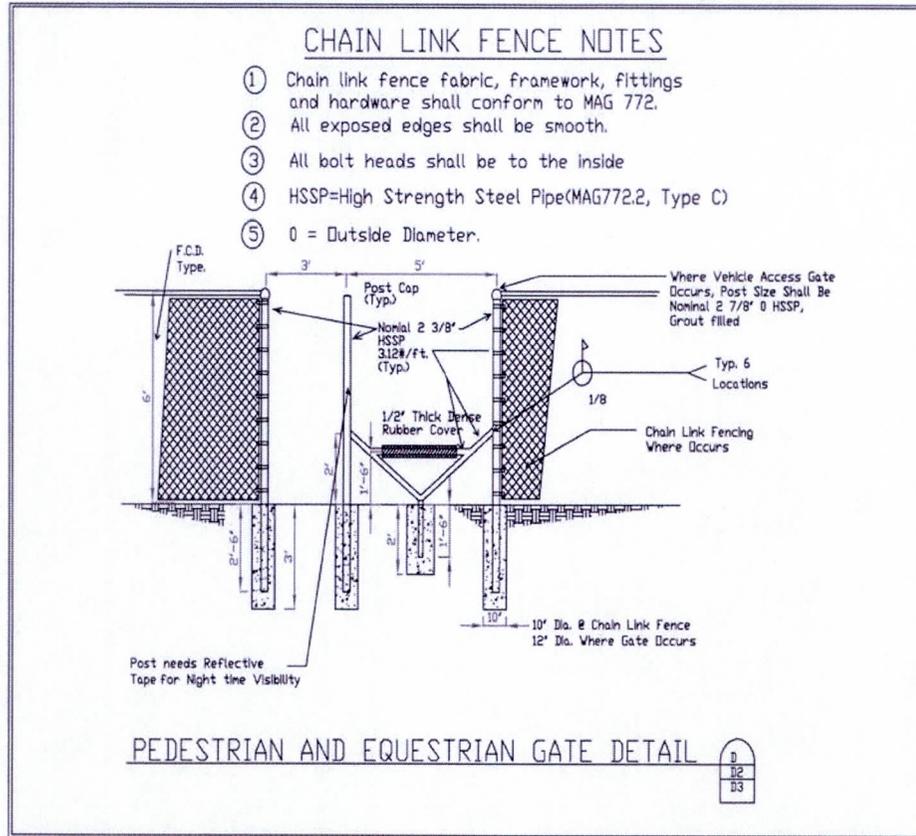
SD#15 Observation Bridge at Adobe Dam

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



SD#16 Line and Fence Posts

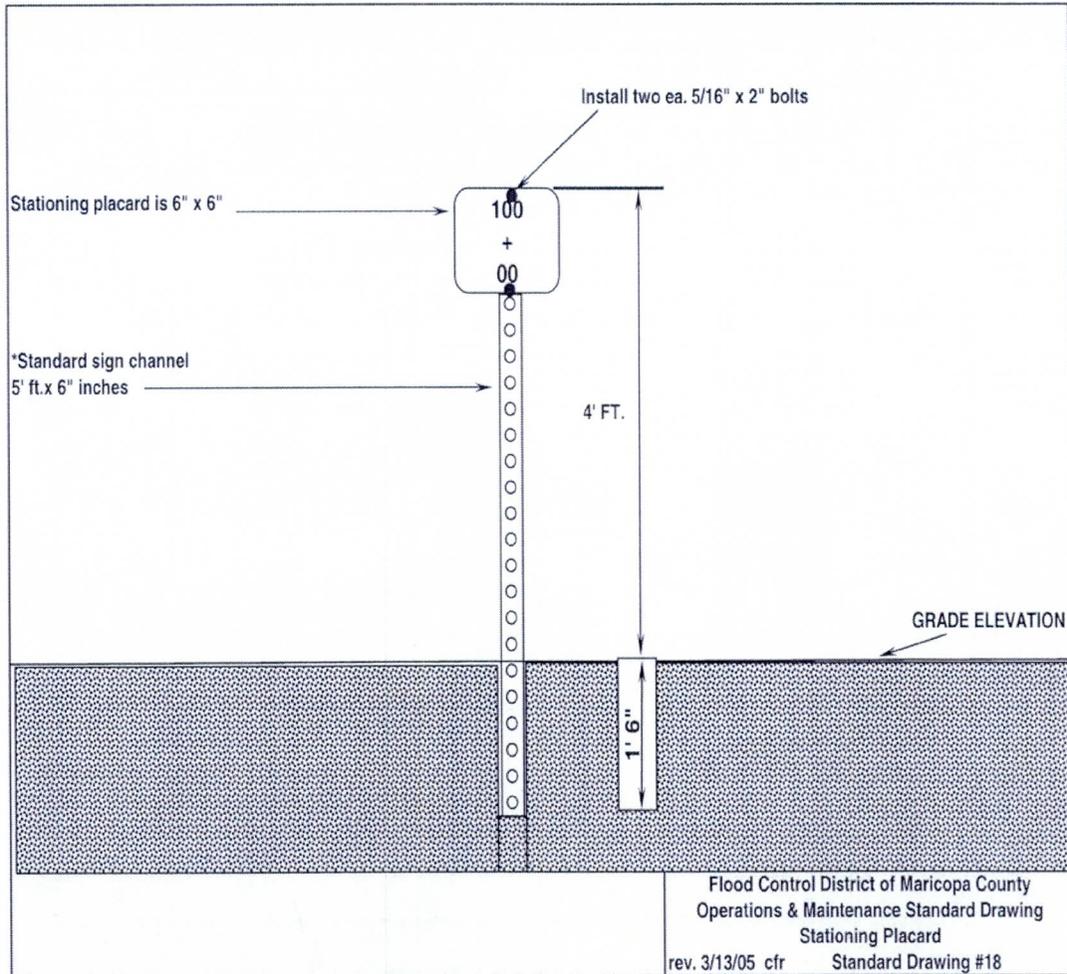
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



SD#17 Equestrian Gate

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

STATIONING PLACARD



SD#18 Stationing Placard

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

2.3. Weldable Anchors

Occasionally anchors may be located on steel ground supports such as tunnel arches, steel tubing or on soldier piles. The eyebolt is attached to a small steel plate, which is then welded to the structure. (Alternately an eyebolt can be screwed directly into a 1/4-20 hole drilled and tapped in the steel member.)

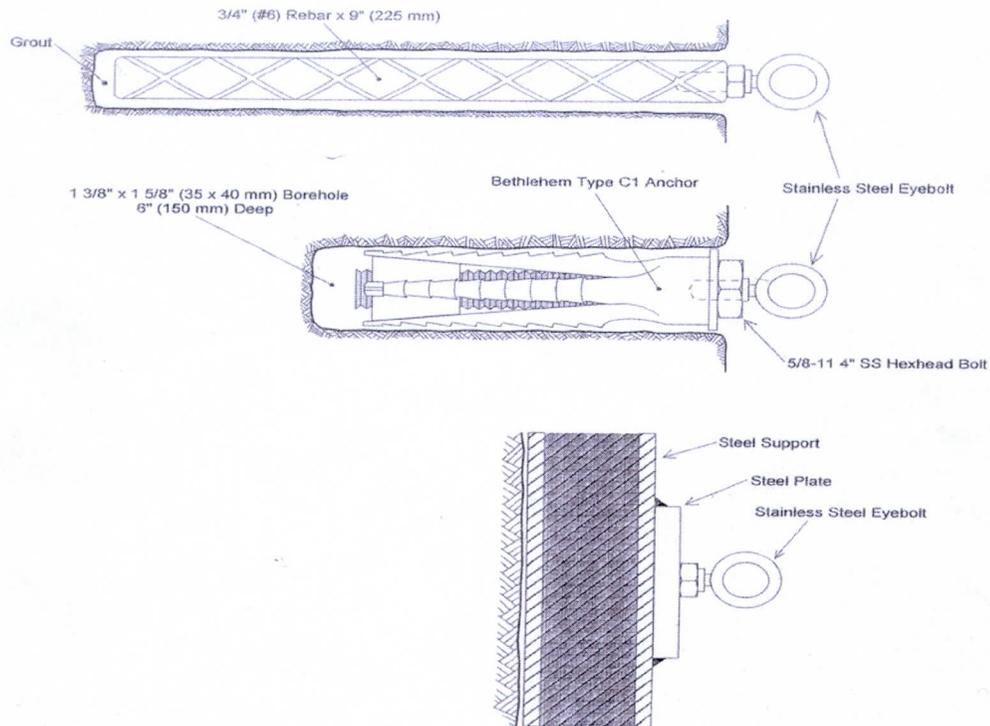


Figure 3 - Three Anchor Types

SD#19 Weldable Anchors

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

FCD Grouted Riprap Placement Notes

1. Riprap bed shall be installed @ 1.67 feet thick. Turndowns shall be installed around the perimeter of the riprap apron at a depth of 2.5 feet.
2. Riprap shall be obtained from any source approved by Flood Control District of Maricopa County (FCD), and shall be reasonable well graded between four and fifteenth inches, with not less than 40% nor more than 70% six inches in size.
3. Riprap shall be placed to produce a surface in which the tops of the individual riprap do not vary more than plus two inches from true grade. Double decking of thin flat riprap will not be permitted.
4. Grout shall fully penetrate to base of Riprap. Contractor shall use a pencil vibrator to ensure full grout penetration.
5. Grout shall be composed of cement, sand, and water mixed in the proportions as directed. The estimated cement content requirement per cubic yard of grout shall be eight sack mix-per Mag Specification 220.5. The water content of the mix shall not exceed eight and a half gallons per sack of cement. Slump of grout mix shall be between seven and eight inches depending on placement location scenario plus or minus.
6. Placement and brooming of the grouted surface shall be such that the outer layer of rocks projects 1/3 to 1/4 their diameter above the grouted surface. After the top course has stiffened, the entire surface shall be re-broomed to eliminate runs in the top course and to fill voids caused by sloughing of the layers of grout.
7. Representative of FCD required to be onsite during grouting operations. Contractor shall contact FCD 48 Hours prior to grouting
8. Contractor shall clean surface of riprap stone projecting above grout to match any existing riprap. Surface shall be cleaned by air-water blasting or other approved method. Cleaning shall remove all grout, cement paste, and discolorations caused by grout, without damaging the grout to remain in place.
9. The grout shall be permitted to set of a minimum of one hour before air-water blasting is commenced. The air-water blasting shall be at right angles to the surface of the stone.
10. Contractor shall apply a clear curing compound to entire surface of new grouted riprap.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

FCD Gated Outlet Positioning

Buckeye 1-2-3-

The irrigation gates should remain wide open at all times. They provide water to the vegetation along the washes downstream from the structure. Buckeye 1-Sta.#710+00 & 817+00/Buckeye 2-Sta.#239+00/Buckeye 3-Sta.#155+00 & 88+00.

Casandro Wash Dam

The gated outlet should remain closed at all times unless otherwise directed by the FCD Operations Center. Sta. #14+23

Guadalupe FRS

The gate will be closed at all times until floodwaters accumulate within the structure and the silt has settled from the water. Then subject to notification of Salt River Project and their concurrence, the gate should be opened and the floodwaters drained from the structure. Sta.#09+33.

Harquahala FRS

Irrigation outlet sta.# 583+75 (New Tank Outlet) is to remain in the open position. Irrigation outlet sta. #746+00 is to remain closed. The gated outlet at the Principal Outlet Sta. #1045+08 should remain in the closed position.

McMicken Dam

The irrigation outlet gates are to remain in the closed position, due to FCD Dam Safety concerns. The drains shall be used only to drain low pockets of water after flow through the outlet structure has ceased. The drains shall be closed at all other times. The Maricopa Water District needs to be notified before water is released into their canal. The water district has the right to open and close these gates at their discretion. They are supposed to notify the Flood Control District of Maricopa County when they change the position of these gates, but are not well known for this practice. Sta.# 387+14 & 398+24.

Powerline FRS

The gated outlet will be used only to drain the impoundment area after flow through the outlet structure has ceased otherwise it should remain in the closed position. Sta. #141+50

Rittenhouse FRS

The irrigation outlets provide water into the cattle tanks downstream from the structure, leave the gates about ½ open. In the event of heavy rainfall and the tanks are full, they should be closed. However, sta.#69+50 is currently in the closed position due to a Dam Safety concern with a possible transverse crack near the operating wheel & 154+60 is still in the ½ open position.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Saddleback FRS

The two gated outlets supply water to vegetation and cattle tanks downstream, and are to remain open at all times. However at sta.#60+50, the vegetative outlet is closed due to a Dam Safety concern with a possible transverse crack near the operating wheel & sta. 256+00 is still in the open position.

Signal Butte FRS.

The irrigation outlet has two design purposes. One is to act as a means of totally evacuating the reservoir and borrow area. The other is to supply additional water to downstream vegetation. This gate is to remain closed except under controlled circumstances. Due to the development of this area, some kind of warning to the public downstream may be required before the gate is to be opened. Sta. #229+00

Spook Hill FRS

The low stage slide gate should remain in the closed position at all times, unless otherwise directed by the FCD Operations Center. Sta. #299+00

Sunset & Sunnycove FRS

These structures each have one manually operated gate. These gates are to remain closed until floodwaters have accumulated within the structures and the silt has had time to settle out. At this time the gates are to be opened and the impoundment areas completely drained. Sunset FRS Sta.#00+00/Sunnycove FRS Sta.#08+00.

White Tanks-FRS #3

The gated outlets are to remain closed, unless otherwise directed by the FCD Operations Center. The Beardsley Water District needs to be notified before water is released into their canal. The water district has the right to open and close the gate at their discretion. They are supposed to notify the Flood Control District of Maricopa County when they change the position of this gate. Located at Sta. #29+00, 46+00 and 63+80.

White Tanks-FRS #4

The gated outlets are to remain closed, unless otherwise directed by the FCD Operations Center. Due to development, some kind of warning may be required to the public downstream if the gate is opened. In any case the gate and outlet should be under responsible supervision at all times, when it is opened. Sta. #17+32 & 58+50

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division**

Type of Structure and Maintenance

Adobe Dam:

Type of structure: Zoned earth-filled dam. 11,220 lf with approx. 81.31 acres of earthen embankment.

Typical

maintenance: Ant treatment, bank improvements, concrete repair, debris removal, erosion repair, fence installation, floodway maintenance, fence repair, floodway storm maintenance, gate installation, grounds maintenance, graffiti removal, grouted riprap repair, mosquito abatement, operational and annual inspections, principal outlet maintenance, asphalt road repair, earth road or ramp maintenance, rodent erosion repair, rodent treatment, structure additions (drop inlets, chutes, etc.), sediment removal, staff gages, sign installation and maintenance, storm surveillance, vegetation removal, and vandalized fencing; gates, plants, signs, trash, vehicle damage.

Agua Fria River:

Type of structure: Compacted earth with soil cement levee's. (65.45 acres of earthen embankment & 32.72 acres of soil cement)

The Agua Fria River Channelization, carries water from the ACDC, Skunk Creek, Adobe Dam, and New River and empties into the Gila river.

Total length of the four reaches of FCD responsibilities: 31,680 lf (6 miles)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, grader work on maintenance roads, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle,.

Alma School Drain:

Type of structure: 3,640 lf of concrete lined channel and 1,250 lf of unlined channel.

Combination storm drain, irrigation waste ditch, and flood control channel.

Typical maintenance- Concrete repair, debris removal, erosion repair, graffiti removal, grader road work, sediment removal, staff gages, sign maintenance, floodway maintenance, fence repair, weed control, vegetation removal, rodent treatment, vandalism-fencing, gates, signs, trash.

Apache Jct. FRS & Fldwy:

Type of structure: Earth-fill dam (8,450 lf) (1,537 lf concrete rectangular channel floodway). 28.3 acres of earthen embankment.

Catches water from the Usery Mtns. and transports it to Signal Butte FRS.

Typical maintenance- Debris removal, erosion repair, fence repair, floodway maintenance, graffiti removal, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

ACDC:

Type of structure: Partly earth lined channel in Glendale and concrete box channel in Phoenix.

Reach-1 = 10,560 lf of earthen channel.

17.3 miles in length, divided into four reaches. (91,344 lf)

Reach-2 =32,736 lf concrete channel.

Reach-3 =21,120 lf concrete channel.

Reach-4 =26,928 lf concrete channel.

Typical maintenance: Bank improvements, granite erosion repair, debris removal, erosion repair, fence repair, graffiti removal, mower operations, plant maintenance, asphalt road maintenance, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, irrigation, plant replacement, vandalism-fencing, gates, irrigation, plants, signs, trash, vehicle, sweeper operations.

Buckeye FRS #1:

Type of structure: Compacted earth filled dam. 7.14 miles in length (37,680 lf) 147.33 acres of earthen embankment

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Buckeye FRS #2:

Type of structure: Compacted earth filled dam. 2.37 miles in length (12,155 lf) 30.4 acres of earthen embankment

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Buckeye FRS #3:

Type of structure: Compacted earth filled dam. 3 miles in length (16,847 lf) 56.59 acres of earthen embankment

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Camelback Ranch Levee's:

Type of structure: Compacted soil cement levee's. 10,977.8 lf or 2.07 miles in length.

Typical maintenance: Debris removal, fence repair, graffiti removal, rodent treatment, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Dreamy Draw Dam:

Type of structure: Zoned compacted earth-fill dam. 455 lf in length. (2.87 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, fence repair, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash.

Dysart Drain:

Type of structure: Concrete lined channel, shot-creted along the top edge. 21,648 lf (4.1 miles) in length.-3.93 miles of dirt road.

Typical maintenance: Currently the only maintenance being performed is the inlet end of the drain off of Olive Ave to Falcon Dunes Golf Course. This is a concrete lined channel. IGA is not in place.
Debris removal, floodway maintenance, fence repair, sediment removal, sign maintenance, weed control, vandalism-fencing gates, trash.

East Fork Cave Creek:

Type of structure: Earth compacted unlined channel. 6,336 lf (1.2 miles) (9.76 acres of earthen embankment)

Typical maintenance: Debris removal, granite erosion repair, erosion repair, floodway maintenance, fence repair, graffiti removal, irrigation maintenance, mower operations, plant maintenance, plant replacement, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, irrigation, plants, signs, trash.

Paradise Valley Community College Basin #4:

Type of structure: 16.5 acre basin area.

Typical maintenance: Debris removal, erosion repair, sediment removal, vegetation removal, weed control.

El Mirage Drain:

Type of structure: Lined concrete channel. 8,448 lf (1.6 miles)

Typical maintenance: Concrete repair, debris removal, floodway maintenance, graffiti removal, sediment removal, staff gages, fence repair, rodent treatment, sign maintenance, vegetation removal, weed control, vandalism-fencing, signs, trash, vehicle.

East Maricopa Floodway-Reaches 1-6:

Type of structure:

Reach 1-23,760 lf (4.55 miles) compacted earth with sections of riprap. (23.15 acres of earthen embankment)

Reach 2-23,971 lf (4.54 miles) compacted earth with sections of riprap. (29.76 acres of earthen embankment)

Reach 3-23,443 lf (4.44 miles) compacted earthen channel. (35.8 acres of earthen embankment)

Reach 4-25,872 lf (4.9 miles) compacted earthen channel. (31.8 acres of earthen embankment)

Rev. 2005 cfk

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Reach 5-16,363 lf (3.1 miles) compacted earthen channel in a golf course greenbelt. (25.05 acres of earthen embankment)

Reach 6-13,200 lf (2.5 miles) compacted earthen channel incorporated with desert landscaping. (11.97 acres of earthen embankment)

Typical maintenance: Bank improvements, granite erosion repair, debris removal, erosion repair, floodway maintenance, graffiti removal, fence repair, irrigation maintenance, mower operations, plant maintenance, plant replacement, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, irrigation, plants, signs, trash, vehicle, yard maintenance.

48th St. Drain:

Type of structure: Concrete lined trapezoidal channel. 9,450 lf (1.8 miles)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, graffiti removal, fence repair, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Guadalupe Dam:

Type of structure: Homogenous earth-fill dam. 10.36 acres of earthen embankment.

East Dam-4,597 lf North Dam #1-450 lf North Dam #2-950 lf

Typical maintenance: Debris removal from outlet tower, principal outlet maintenance, sediment removal from outlet tower, staff gages, check and maintain manhole outlet system.

Guadalupe Road Box Channel:

Type of structure: Concrete trapezoidal channel. 4,752 lf (0.90 miles).

Typical maintenance: Debris removal, floodway maintenance, fence repair, graffiti removal, sediment removal, staff gages, sign maintenance, vandalism-fencing, gates, signs, trash.

Harquahala FRS:

Type of structure: Compacted earth-fill dam. 62,308 lf (11.80 miles) (393.31 acres of earthen embankment)

Typical maintenance: Bank improvements, debris removal, erosion repair, floodway maintenance, fence repair, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Holly Acres:

Type of structure: Compacted earthen levee with riprap, gabions, soil cement protection.

6,600 lf (1.25 miles) (1.37 acres of earthen embankment)

Typical maintenance: Debris removal, fence repair, rodent erosion & hole repair, rodent treatment, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash.

Indian Bend Wash Outlet Channel:

Type of structure: Unlined trapezoidal channel. 10,032 lf (1.9 miles)-2.4 acres of earthen embankment.

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, mower operations, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Indian Bend Wash Inlet:

The inlet takes in flood waters from McCormick Ranch, conveys them across Indian Bend Road and discharges them into the IBW Greenbelt Floodway.

IGA gives City of Scottsdale maintenance responsibilities.

Indian Bend Wash Greenbelt:

Type of structure:

Unlined trapezoidal channel-23,232 lf (4.7 miles), developed under the direction of the City of Scottsdale and the U.S. Army Corps of Engineers for park, recreation and private enterprise. IGA gives City of Scottsdale maintenance responsibilities.

Indian Bend Wash Collector & Side Drains:

Type of structure: Unlined trapezoidal channel & reinforced concrete (covered).

7,392 lf (1.4 miles) open channel.

9,504 lf (1.8 miles) covered channel.

McDonald Rd. side channel-2,112 lf- 2 each reinforced concrete pipes.

Chaparral Rd. side channel-3,168 lf-1 each reinforced concrete pipe.

Camelback Rd. side channel-5,280 lf-1 each reinforced concrete pipe.

Typical maintenance: Debris removal, graffiti removal, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-inlet grates, signs, trash.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Indian Bend Wash Interceptor:

Flood flows entering the Arizona Canal from the north are directed to the interceptor Channel at Pima Road and conveyed to the Inlet Channel. 6,864 lf (1.3 miles)
IGA gives City of Scottsdale maintenance responsibilities.

Indian School Road Drain:

Type of structure: Shot-crete Channel- 9,200 lf (1.7 miles)

Typical maintenance: Debris removal, graffiti removal, fence repair, sediment removal, vandalism-gates, signs, trash, vehicle, weed control.

McMicken Dam & Floodway:

Type of structure: Compacted earth-fill dam. 53,700 lf (10.17 miles) (151.93 acres of earthen embankment)

Type of structure: Compacted earthen floodway. 30,624 lf (5.8 miles) (39.4 acres of earthen embankment)

Typical maintenance: Bank improvements, debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

New River Dam:

Type of structure: Zoned earth-fill dam. Main dam-2,327 lf (44.41 acres of earthen embankment)

Dike #1-7,475 lf Dike #2-256 lf

Typical maintenance:

Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

New River Channelization-Bethany Home Road alignment to Olive Ave.

Type of structure: Compacted earth with soil cement slopes.-13,200 lf (2.5 miles) (23.12 acres of soil cement embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

New River Channelization-Olive Ave to Grand Ave.

Type of structure: Compacted earth with soil cement slopes.-13,200 lf (2.5 miles) (16.27 acres of soil cement embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, irrigation maintenance, mower operations, plant maintenance, plant replacement, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, irrigation, plants, signs, trash, vehicle, mitigation maintenance.

New River Channelization-Thunderbird Ave to Greenway Road.

Type of structures: Compacted earth-fill with soil cement levees.

Length of west levee-2,357 lf Length of east levee-1,007 lf

Typical maintenance: Debris removal, fence repair, graffiti removal, vandalism-fencing, gates, signs, trash.

Old Cross Cut Canal:

Type of structure: Covered channel from Indian School Road to McDowell. (City of Phoenix maintenance)

Type of structure: Concrete lined open channel from McDowell Road to the Salt River. 7,920 lf (1.5 miles)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, sediment removal, sign maintenance, staff gages, vegetation removal, weed control, vandalism-fencing, gates, signs, trash.

Pass Mountain Diversion Channel:

Type of structure: Earthen embankment-earth channel. 6,635 lf (diversion) & 2,800 lf (outlet)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Powerline FRS-

Type of structure: Compacted earth-fill dam.-15,070 lf (2.85 miles) (65.69 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Powerline Floodway:

Type of structure: Concrete lined floodway-38,174 lf (7.23 miles)

Type of structure: Unlined floodway-8,025 lf (1.52 miles)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Rio Salado: (HoHokam Road bridge east)

Type of structure: Soil cement, riprap armored slope protection channel. (Approx. 7 miles in length)

Typical maintenance: Debris removal, disking operations, floodway maintenance, mosquito abatement, sign maintenance, vegetation removal, weed control, vandalism-fencing gates, signs, trash.

Rittenhouse FRS:

Type of structure: Compacted earth-fill dam. 22,000 lf (4.16 miles) (45.45 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Rittenhouse Road Channel:

Type of structure: Unlined channel with gravel mulch slopes.-22,154 lf (4.19 miles) (74.03 acres of earthen embankment)

Typical maintenance: Bank improvements, debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash.

Saddleback FRS & Diversion Channel:

Type of structure: Compacted earth-fill dam.-27,269 lf (5.16 miles) 68.84 acres of earthen embankment (FRS)

Type of structure: Unlined compacted channel.-24,974 lf (4.73 miles) 24.86 acres of earthen embankment (diversion)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Perryville Bank Stabilization:

Type of structure: 2,300 lf (0.43 miles)

Compacted earth-fill levee, provides protection along the north bank of the Gila River near Perryville to prevent further erosion of the river bank and the resultant loss of land and improvements.

Typical maintenance: Debris removal, vegetation removal, weed control, vandalism-signs, trash.

Signal Butte FRS & Floodway:

Type of structure:

Earth-fill dam-7,038 lf (1.33 miles) (20.75 acres of earthen embankment)

Earthen trapezoidal channel-8,440 lf

Concrete rectangular channel-5,966 lf

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates signs, trash, vehicle.

Skunk Creek at I-17:

Type of structure: Earth-fill levees-8,900 lf (1.68 miles) (8.2 acres of earthen embankment)

North levee-7,627 lf

South levee-4,927 lf

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Sossaman Road Drain:

Type of structure:

Concrete lined channel-5,140 lf

Unlined channel-5,808 lf (7.2 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Spookhill FRS & Outlet:

Type of structure:

Compacted earth-fill dam.-21,014 lf (3.98 miles) (60.3 acres of earthen embankment)

Outlet channel-19.49 acres of earthen embankment

Sediment basin-1.62 acres of earthen embankment

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Sunnycove Dam:

Type of structure: Zoned compacted earth-fill dam. 714 lf in length (12.12 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, fence repair, graffiti removal, mower operations, principal outlet maintenance, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Sunset Dam:

Typical maintenance: Debris removal, erosion repair, fence repair, graffiti removal, mower operations, principal outlet maintenance, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

Sunset & Sunnycove Pipeline:

Type of structure:

Collects and conveys runoff from both Sunset and Sunnycove Dams through a 30" pipe and discharges these flows into a natural wash that empties into the Hassayampa River. 9 manholes-7,624 lf in length.

Typical maintenance: Storm drain maintenance, stationing, sediment removal,

Sun City Drains:

Type of structure: Shot-crete channel-22,785 lf.(4.31 miles) Unlined channel-1,700 lf.

These drains carry street runoff from Sun City into the Agua Fria River.

Typical maintenance: Debris removal, erosion repair, floodway maintenance, graffiti removal, sediment removal, sign maintenance, vegetation removal, weed control, vandalism-signs, trash.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Sun City West Drains:

Type of structure: Shot-crete channel-35,376 lf (6.7 miles) Storm drain pipe-848 lf

These drainage channels carry Sun City West runoff into the Agua Fria River.

Typical maintenance: Debris removal, erosion repair, floodway maintenance, graffiti removal, sediment removal, sign maintenance, vegetation removal, weed control, vandalism-signs, trash.

Vineyard FRS:

Type of structure: Compacted earth-fill dam-37,900 lf (7.17 miles) (78.3 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & animal hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

White Tanks #3

Type of structure: Compacted earth-fill dam-7,667 lf (1.45 miles) (26.4 acres of earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

White Tanks #4:

Type of structure: Compacted earth-fill dam-6,839 lf (1.29 miles) (16.08 earthen embankment)

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti removal, mower operations, principal outlet maintenance, grader road work, rodent erosion & hole repair, rodent treatment, sediment removal, staff gages, sign maintenance, vegetation removal, weed control, vandalism-fencing, gates, signs, trash, vehicle.

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division**

East Valley Drains:

| | | |
|------------------------------|-------|-------|
| 1. Apache Paradise Unit One- | 1.29 | |
| | acres | |
| 2. Newman Park- | 1.72 | |
| 3. Valley View- | 3.48 | |
| 4. Cherokee Mobile Estates | 1.41 | |
| 5. Crisway Estates Unit Two | 0.17 | |
| Crisway Estates Unit Three | 0.22 | |
| 6. Superstition View | | |
| 7. Knolls Estates | 1.33 | |
| 8. Knolls Mobile Estates | 0.2 | |
| 9. University Basins | 11.1 | |
| 10. Cherokee Mobile Estates | 2.48 | |
| 11. Desert Vista Estates | | |
| | 22.11 | Acres |

Typical maintenance: Debris removal, erosion repair, floodway maintenance, fence repair, graffiti repair, mower operations, rodent erosion & hole repair, rodent treatment, sediment removal, vandalism-fencing, signs, trash.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Maintenance Definitions

Programmed Major Maintenance:

Definition; Includes those maintenance tasks whose cycle exceeds one year (multiple year expenditures).

Examples; Asphalt roads, parking lots, bike paths, walkways, painting.

Projects; Adobe Dam, ACDC, New River Dam, Skunk Creek @ I-17, Cave Buttes Dam, Dreamy Draw, IBW Collector-side channels, Durango FCD complex.

Maint. Scheduled chip or slurry seal projects, larger scaled painting projects.

Applicable Codes: BM-building maintenance, CR-concrete repair, OM-other maintenance, RA-road asphalt, TT-travel time.

Preventive Maintenance:

Definition; Is the planned, periodic inspection, adjustment, cleaning. Lubrication, parts replacement, and minor repair of equipment and systems for which specialized training is not normally required. This activity consists of many check point activities on items that, if disabled, would interfere with an essential operation of the installation, endanger life or property, or involve high cost or long lead time for replacement. PM is the cornerstone of any good maintenance program. A weak or nonexistent PM program could result in much emergency work and costly repairs.

Examples; Principal inlet & outlet structures, flap gates, levees, outlet towers, inverts-channel & storm drains, access gates, buildings, ladders & safety cages, handrails, retention basins, catch basins, bridges & catwalks, fencing, access roads, trails, etc.

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. PM performed as mentioned in the above definition.

- a. Function & integrity of structure
- b. Security & liability
- c. Aesthetics

Applicable Codes: AI-annual inspections, AR-algae removal, AT-ant treatment, BC-bank improvements, BM-building maintenance, BS-bee support, CR-concrete repair, CT-chemical truck, DG-granite erosion repair, DR-debris removal, DSP-dam safety program, EC-equip. cleanup, EI-equip. inspection, ER-erosion repair, FM-floodway maintenance, FP-filter pad, IM-irrigation maint., MW-mower operations, OI-operational insp., OM-other maintenance, PO-principal outlet, RE-rodent erosion, RH-rodent hole repair, RT-rodent treatment, SAG-staff gage, SD-sediment removal, SM-sign maintenance, TT-travel time, VR-vegetation removal, WC-weed control,

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY Operations and Maintenance Division

Extraordinary Maintenance:

Definition; Is maintenance that is performed on as-needed basis. Includes; repairs, rehab., improvements.

Examples; Slope protection, access and maintenance roads/ramps, landscaping work.

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. Bank improvements: Revegetation, gravel mulch installation, drainage chutes-grouted riprap, concrete, drop inlets, plating, slope protection, and landscaping concerns.

Applicable Codes: AR-algae removal, BL-blue stake, CT-chemical truck, FL-fence installation, FM-floodway maint., FR-fence repair, FS-fldwy. storm maint., GI-gate installation, GR-graffiti removal, GUT-grouted riprap repair, MI-mitigation, OM-other maint., RR-riprap repair, RT-rodent treatment, RV-revegetation, SE-seeding operations, SI-sign installation, SO-sweeper operations.

Critical Maintenance:

Definition; Those activities which if deferred, carries a significant risk of consequential damage and significantly higher costs of risk impairment of health safety or reliability or functionality, thus impacting the program.

Examples; Principal outlet maintenance of dams or floodways, rodent activities, discovery of transverse or longitudinal cracks during inspections, large scale erosion concerns, sink holes or other irregularities.

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. Erosion repair, preventive maintenance, rodent treatment and hole repair, cracks and sink hole repair as per DSP recommendations or monitor as directed.

Applicable Codes: AI-annual inspections, CT-chemical truck, ER-erosion repair, DR-debris removal, FM-floodway maintenance, FS-fldwy. storm maint., KB-Africanized bees, MA-mosquito abatement, MW-mower operations, OI-operational inspections, OM-other maintenance, PO-principal outlet maint., RH-rodent hole repair, RT-rodent treatment, SD-sediment removal, TT-travel time, RV-revegetation, VF-vandalized fencing, VG-vandalized gates, VT-vandalized trash, WC-weed control.

Breakdown Maintenance: (Run to failure)

Definition; Refers to repairing a non-critical component after it has been consciously allowed to "run to failure." These components are those that are considered essential for the delivery of services, impacts safety to personnel, or impacts the overall mission and purpose of a facility.

Examples; Maintenance & access roads.

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. Replating of access, maintenance roads and ramps.

Applicable Codes: OM-other maintenance, RA-road asphalt, RD-dirt road, TT-travel time.

Replacement Maintenance:

Definition; Work undertaken to bring a component or system into compliance with new codes or safety regulations or to replace an item that is unacceptable, inefficient, obsolete, or for which spare parts can no longer be obtained. Such work is considered maintenance work if it is required for the continued operation of the facility.

Examples; Gated outlet designs, trash racks on outlet towers.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Operations and Maintenance Division

Projects; White Tanks #3 & #4, McMicken Dam, Powerline FRS, Vineyard FRS, Rittenhouse FRS, Buckeye #1 & #2,

Maint. Manual gated operations on designs for the White Tank 3-4 need modified (400 plus turns). McMicken Dam has same concern as White Tanks structures.
 Trash rack openings on the Pinal Co. structures are too large and need modified accordingly. This issue also applies to Buckeye #1 & #2.
 An environmental impact concern is also the shaft stems on the gated outlets that leak and contaminate the immediate ground.

Applicable Codes: DSP-dam safety program, OM-other maintenance, PO-principal outlet, TT-travel time.

Reliability Centered Maintenance:

Definition; Is a maintenance philosophy that incorporates the most logical and cost effective-mix of breakdown maintenance, pm, predictive testing and inspection, and proactive maintenance.

Examples; Prioritizing the work load, keeping logs and reliable records, a skilled reliable work force.

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. This would include the quarterly operational and annual inspections performed to address maintenance issues through understanding the type of maintenance needed, priority, work load and efficiency.

Applicable Codes: DSP-dam safety program, JT-on the job training, OM-other maintenance, TR-training, TT-travel time.

Deferred Maintenance:

Definition; Is maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for future consideration.

Examples; Major erosion concerns, bank protection; revegetation, gravel mulch, riprap installation, etc...

Projects; All FCD structures on the annual and operational inspection schedules.
 Currently; Harquahala FRS for gravel mulch installation, Spookhill FRS erosion concerns.

Maint. Because of total maintenance costs to the Division gravel mulch installation is done in sections. Currently there is not a 404 permit in place, which prevents work from being performed in low and high flow areas, inflow and outlet channels, impoundment's, maintenance roads, and many other water conveying structures.

Applicable Codes: BM-building maintenance, CT-chemical truck, DG-granite erosion repair, DR-debris removal, ER-erosion repair, FM-floodway maintenance, MW-mower operations, OM-other maintenance, PM-plant maintenance, RV-revegetation, SA-structure addition, SD-sediment removal, TT-travel time, VR-vegetation removal.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Predictive Maintenance:

Definition; Refers to testing and inspection activities that involve the use of sophisticated means to identify maintenance requirements.

Examples; Ultrasonic testing, infrared photography, nuclear compaction tests, etc....

Projects; All FCD structures on the annual and operational inspection schedules.

Maint. Erosion compaction tests, soils test (lab work), conduit- still photography or video, air quality monitoring devices in confined entry spaces, laser level work.

Applicable Codes: ER-erosion repair, DSP-dam safety program, OM-other maintenance, PQ-principal outlet.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

ADWR-Rules and Regulations Pertaining to Dam Safety Procedures:

General maintenance and ordinary repairs which do not require prior approval of the Director of Arizona Department of Water Resources. Those activities which do not impair or adversely effect the safety of the dam. These activities include:

1. Removal of brush or tall weeds.
2. Cutting of trees and removal of slash from the embankment or spillway. Small stumps may be removed provided no excavation into the embankment occurs.
3. Rodent control or extermination by trapping or other methods. Minor rodent damage may be repaired provided it does not involve excavation into the embankment that exceeds 2' ft. deep and replacement materials are compacted as they are placed.
4. Repair of erosion gullies less than 2' ft. deep on the embankment or in the spillway.
5. Surface grading of the top of the dam embankment or spillway to eliminate potholes and provide proper drainage provided that the freeboard is not reduced.
6. Placement of additional riprap and bedding on the upstream slope, or in the spillway in areas which have sustained minor damage. Restoration of the original riprap protection where the damage has not yet resulted in erosion and weakening of the dam.
7. Painting, caulking, or lubricating metal surfaces.
8. Patching or caulking spalled or cracked concrete to prevent deterioration.
9. Removing debris, rock, or earth from the outlet conduits or spillway channels and basins.
10. Patching to prevent deterioration within the outlet works.
11. Replacement of worn or damaged parts of outlet valves or control to restore them to original or equivalent conditions.
12. Repair replacement of fences intended to keep traffic or livestock off the dam or spillway.

General maintenance and ordinary repair which may impair or adversely effect safety such as excavation into or near the toe of the dam, construction of new appurtenant structures for the dam, and repair of damage which has already significantly weakened the dam must be done in accordance with A.A.C. R12-15-1207. The determination of whether general maintenance and ordinary repair will impair or adversely effect safety shall be made by the Director.

Emergency actions not impairing or adversely effecting the safety of the dam may be taken before guidance can be provided by an engineer, and do not require prior approval of the Director.

Emergency actions shall not excuse an owner(s) responsibility to promptly undertake a permanent solution as required for the dam(s) safety. Emergency actions include:

1. Stockpiling materials such as riprap, earthfill, sand, and plastic sheeting.
2. Lowering the reservoir level by making releases through the outlet or a gated spillway, by pumping, or by siphoning. Where large releases are to be made, the Director shall be notified no later than 12 hours after the release began.
3. Armoring eroded areas by placing sandbags, riprap, plastic sheeting, or other available material.
4. Plugging leakage entrances on the upstream slope.
5. Increasing freeboard by placing sandbags or temporary earth fill on the dam.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

6. Diverting floodwaters to prevent them from entering the reservoir basin.
7. Constructing training berms to control floodwaters.
8. Placing sandbag ring dikes or reverse filter materials around boils at the downstream toe to prevent back pressure.
9. Removing obstructions from outlet or spillway flow areas.

Emergency actions impairing or adversely effecting the safety of the dam require prior approval by the Director. Lowering the water level by excavating the spillway or embankment is prohibited unless failure is imminent.

For all high and significant hazard potential dams, the Emergency Action Plan shall be implemented in conjunction with any appropriate emergency actions at the dam.

The owner or the owner(s) engineer shall notify the director immediately of any emergency condition that exists and any emergency action taken.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

FCDMC STRUCTURE NOTIFICATION ELEVATIONS FOR 2005

| Structure | Gage ID# | ALERT Alarm Level | O&M Notification Level | Emergency Management Notification | Emergency Spillway Height | Top of Structure |
|--------------------|----------|-------------------|------------------------|-----------------------------------|---------------------------|------------------|
| Adobe Dam | 5539 | 6.4 | 10.0 | 26.0 | 40.0 | 65.6 |
| Apache Jct. FRS | 6673 | 5.0 | 6.0 | 11.0 | 16.3 | 27.2 |
| Buckeye FRS #1 | 5203 | 6.0 | 7.0 | 13.0 | 22.3 | 30.5 |
| Buckeye FRS #2 | 5208 | 8.0 | 10.0 | 13.0 | 16.7 | 22.5 |
| Buckeye FRS #3 | 6813 | 8.0 | 10.0 | 13.0 | 17.0 | 25.0 |
| Cave Buttes Dam | 4904 | 10.0 | 20.0 | 65.0 | 97.0 | 119.0 |
| Casandro Dam | 7093 | 5.0 | 7.0 | 10.0 | 21.0 | 40.5 |
| Dreamy Draw Dam | 4803 | 5.0 | 8.0 | 17.0 | 36.7 | 50.5 |
| Guadalupe FRS | 6503 | 4.0 | 5.0 | 10.0 | 24.5 | 32.0 |
| Harquahala FRS | 5128 | 15.0 | 21.0 | 27.0 | 35.6 | 46.7 |
| McMicken Dam | 5448 | 5.0 | 6.0 | 13.0 | 21.1 | 28.1 |
| McMicken Dam South | 5443 | 2.0 | 2.0 | ? | n/a | n/a |
| New River Dam | 5614 | 5.8 | 15.0 | 45.0 | 67.0 | 97.3 |
| Powerline FRS | 6683 | 6.0 | 9.0 | 14.0 | 20.9 | 26.7 |
| Rittenhouse FRS | 6703 | 5.0 | 7.0 | 13.0 | 19.5 | 24.2 |
| Saddleback FRS | 5113 | 4.0 | 5.0 | 8.0 | n/a | 16.1 |
| Signal Butte FRS | 6628 | 7.0 | 10.0 | 20.0 | 27.0 | 35.6 |
| Spookhill FRS | 4563 | 5.0 | 6.0 | 11.0 | 16.0 | 25.0 |
| Sunnycove FRS | 5248 | 10.0 | 14.0 | 24.0 | 42.2 | 50.4 |
| Sunset FRS | 5233 | 3.0 | 4.0 | 10.0 | 19.5 | 28.5 |
| Vineyard FRS | 6688 | 4.0 | 5.0 | 8.0 | 11.8 | 16.5 |
| White Tanks #3 | 5418 | 6.0 | 7.0 | 13.0 | 19.6 | 25.4 |
| White Tanks #4 | 6823 | 2.0 | 4.0 | 6.0 | 8.0 | 13.0 |

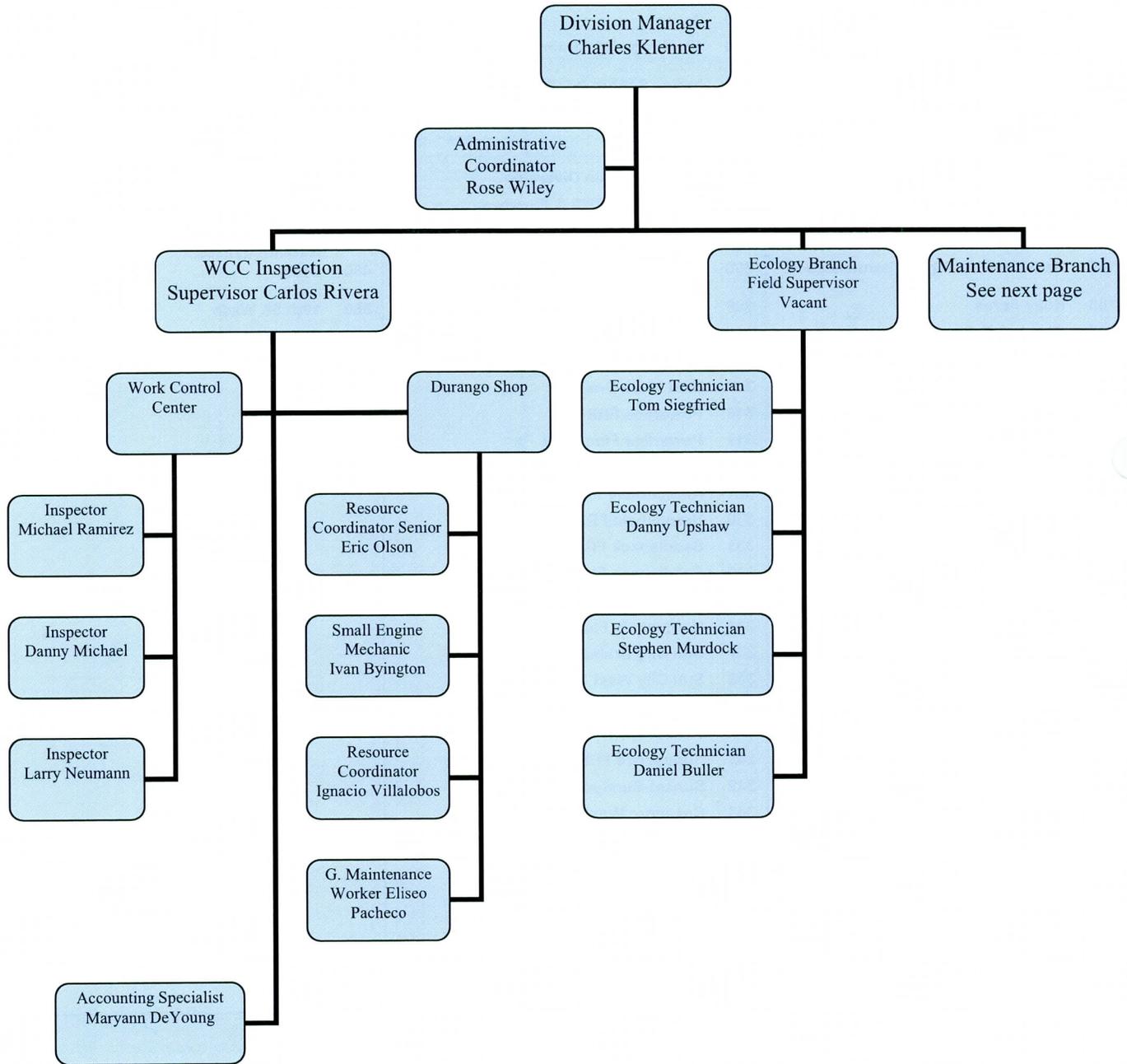
**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division**

FCD STRUCTURE NUMERICAL LISTING FOR 2005

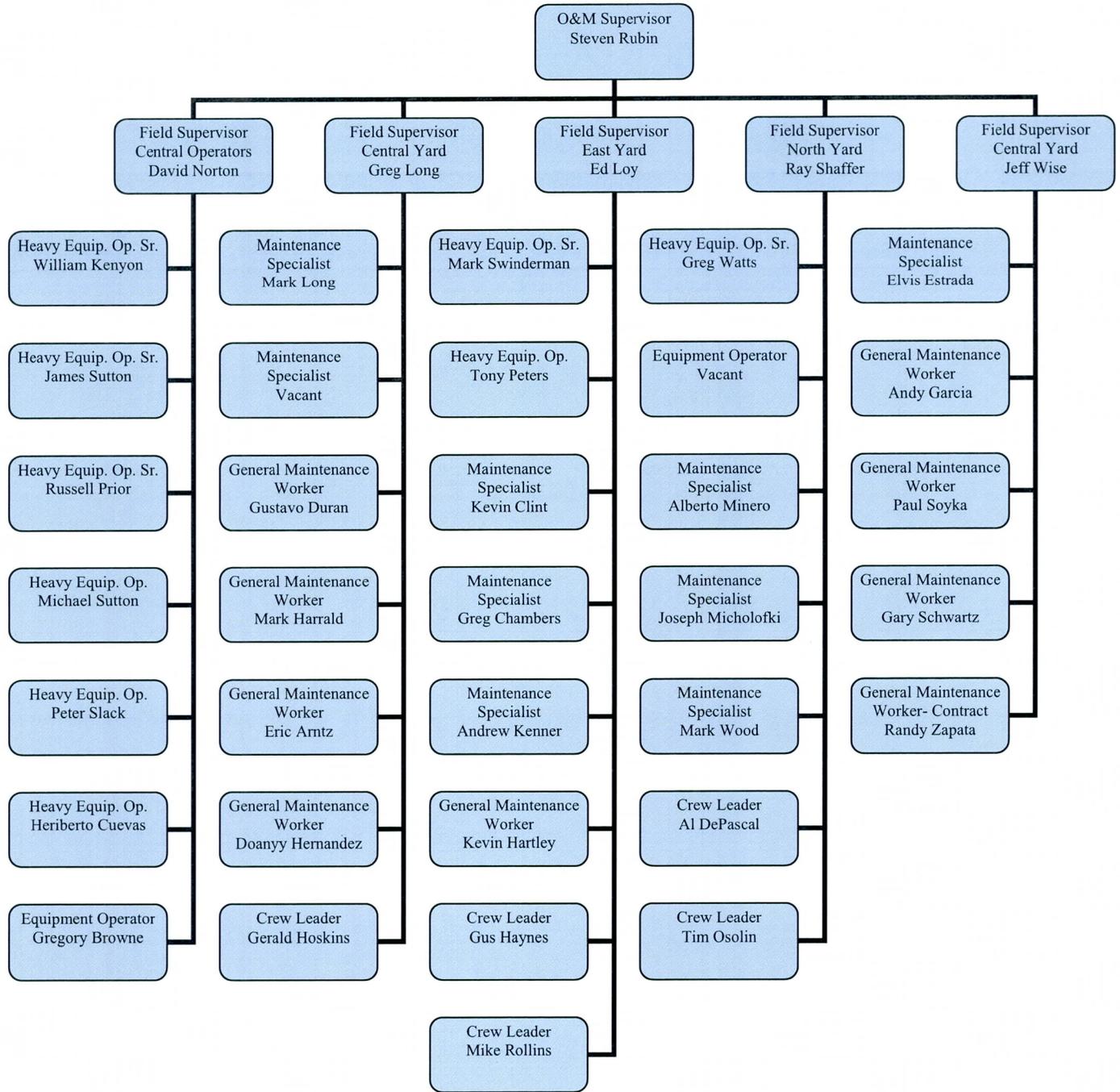
| | | | | | |
|-----|-------------------------------------|-----|-----------------------------------|-----|---|
| 005 | FCD Main Building | 208 | Buckeye 2 | 399 | New River Mitigation Area (CHICKEN RANCH) |
| 006 | FCD Shop | 209 | Buckeye 3 | 400 | New River Channelization |
| 035 | Town of Guadalupe | 210 | EL Mirage Rd. Drain | 400 | Reach #1 Camelback Ranch Levee's Agua Fria River |
| 075 | Bell Rd./Dysart Yd. Detention Basin | 218 | Indian School Rd. Drain | 401 | Flow |
| 100 | Dysart Rd.-Agua Fria Drain | 300 | Spook Hill FRS Signal Butte | 450 | Orangewood Basin |
| 101 | 48th St. Drain | 301 | Floodway | 460 | Reach #7 East Fork Cave Creek |
| 102 | Alma School Drain | 302 | Pass Mountain Diversion | 460 | Reach #4 P.V.C.C. |
| 103 | Old Cross Cut Canal | 303 | Apache Jct. FRS & Floodway | 470 | Reach #1 Colter Channel |
| 104 | Broadway Rd. Bank Stabilization | 304 | Signal Butte FRS | 470 | Reach #2 RID Overchute Rittenhouse Rd. |
| 105 | Salt-Gila Clearing & Channelization | 305 | Bulldog Floodway Knoll | 480 | Drain |
| 106 | Holly Acres | 306 | Drain | 580 | 10th St. Wash |
| 107 | Channel @ Sky Harbor | 307 | West Valley Drains | 590 | Scatter Wash |
| 108 | Sossaman Rd. Drain | 308 | Guadalupe Rd. Box-Channel | 620 | Maryvale ADMP |
| 109 | Agua Fria River | 309 | East Mesa Drains | | |
| 110 | Agua Fria River (ADOT Agreement) | 310 | Powerline FRS | | |
| 111 | IBW Outlet | 311 | Powerline Floodway | | |
| 112 | IBW Inlet | 320 | Vineyard Rd. FRS | | |
| 113 | IBW Greenbelt | 321 | Rittenhouse FRS | | |
| 114 | IBW Interceptor & Side Drains | 330 | Harquahala FRS | | |
| 115 | Price Drain | 331 | Saddleback FRS | | |
| 116 | Champion Storm Drain | 332 | Saddleback Floodway | | |
| 117 | Laveen Basin | 333 | Centennial Levee | | |
| 118 | ACDC | 334 | Harquahala Floodway | | |
| 119 | Cave Creek Wash @ ACDC | 337 | Sun City Drains | | |
| 121 | East Maricopa Floodway | 338 | Sun City West Drains | | |
| 124 | Rio Salado (Hohokam to 19th Ave) | 339 | Thunderbird Rd. Bridge Protection | | |
| 125 | Salt River Channel (Hohokam-East) | 340 | Sunset FRS | | |
| 127 | Perryville Bank Stabilization | 341 | Sunnycove FRS | | |
| 128 | Salt/Gila Pilot Channel | 342 | Sunset-Sunnycove Pipeline | | |
| 200 | White Tanks #3 | 343 | Casandro Wash Dam | | |
| 201 | White Tanks #4 | 344 | Wittman Wash | | |
| 202 | McMicken Dam | 350 | Cave Buttes Dam | | |
| 203 | Dreamy Draw Dam | 360 | Adobe dam | | |
| 204 | McMicken Dam Outlet Channel | 361 | Skunk Creek Channel @ I-17 | | |
| 205 | Guadalupe Dam | 362 | Skunk Creek Channelization | | |
| 206 | Lower Queen Creek | 370 | New River Dam | | |
| 207 | Buckeye 1 | 371 | New River ADMS | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division

Attachment: A: Schematic Organizational Chart



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
Operations and Maintenance Division



Update 02-09-09

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2004 Maintenance Inspection Report Pass Mountain Diversion Channel**

O&M Div. Mgr. _____
Maint. Mgr _____

**Pass Mountain Diversion Channel
Buckhorn-Mesa Watershed**

Inspection Date: _____ 7-20-04 _____

Date of Last Inspection: _____ 9-6-03 _____

Inspectors: _____ Mike Ramirez / Earl Percy _____

Existing Weather Conditions: _____ Sunny & Hot _____

Recent Rainfall: Yes No

| Yes | No | |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The perimeter project fencing and gates. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Existence of physical damage, unsecured, and in need of repairs. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Vandalism |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Horse gates need attention |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Breakaway fencing concerns |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other |
| | | See Comments: #1, 4 & 5 |

| | | |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Condition of the existing levees. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest of the levee stable; need for re-grading or additional plating |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Erosion/rilling present |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Maintenance concerns with associated side inlet chutes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Rodent/animal activity |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Vegetative drains; properly marked, restricted, vandalized, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other |
| | | See Comments: #6 & 7 |

| | | |
|--------------------------|-------------------------------------|---|
| | | The diversion channel bottom low flow from sta. #45+00 downstream to sta. #82+62 |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment or restrictions |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Low flow channel needs re-graded |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comment: # 3 & 6 |

| | | |
|--------------------------|-------------------------------------|--|
| | | Drop structure #1 located at sta. #82+62 downstream to sta. #84+62. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comments: <u>Good Condition</u> |

| | | |
|-------------------------------------|-------------------------------------|---|
| | | Drop structure #2 located at sta. #100+00 downstream to sta. 101+23. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other |
| | | See Comments: # 6 |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2004 Maintenance Inspection Report Pass Mountain Diversion Channel

| Yes | No | |
|--------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Drop structure #3 located at sta. #111+13 downstream to sta. #112+72. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comments: <u>Good Condition</u> |
| <hr/> | | |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Drop structure #4 located at sta. #117+22 downstream to sta. #119+11. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comments: <u>Good Condition</u> |
| <hr/> | | |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Drop structure #5 located at sta. #125+55 downstream to sta. #126+94. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comments: <u>Good Condition</u> |
| <hr/> | | |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Drop structure #6 located at sta. #133+42 downstream to Sta. 134+61. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other |
| | | See Comments: <u>Good Condition</u> |
| <hr/> | | |

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2004 Maintenance Inspection Report Pass Mountain Diversion Channel

Pass Mountain Diversion and Outlet
Buckhorn-Mesa Watershed
Maintenance Inspection Comments
Inspection Date: 7/20/04

- Comment No. 1: At the time of the conducted annual inspection, all the project fencing and access gates were in tact and operational, including the breakaway fence at the far south end of the project.
- Comment No. 2: The project is good condition and will function as designed. This is one of the best-kept maintenance free structures the District maintains.
- Comment No. 3: Only minor sediment was evident in the low flow channel.
- Comment No. 4: The breakaway fence on the far south end of the structure install 3 ball delineators.
- Comment No. 5: Service all access gates and locks throughout the structure.
- Comment No. 6: There is deep-rooted vegetation that is growing on the slopes and floodway invert. Cut and stump treat deep-rooted vegetation accordingly.
- Comment No. 7: On the north bank of the structure there is rilling occurring throughout. Continue to monitor.

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

O&M Div. Mgr. _____

Inspection Date: May 11, 2005

Date of Last Inspection: July 20, 2004

Inspectors: Steven Rubin and Greg Long

Indication of recent rainfall or impoundment: Yes No

Existing Weather Conditions: Clear and warm

Yes No The perimeter project fencing and gates.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Cut of damaged fencing |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Horse gates need attention |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Breakaway fencing concerns |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 8

Condition of the existing levees

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The Levee shows evidence of erosion, rilling, deep rooted vegetation, and or rodent/animal activity. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest of the levee stable, need for re-grading or additional plating |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Embankment slopes stable |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Maintenance concerns with associated side inlet chutes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Vegetative drains properly marked or restricted |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 1, 2, 3, 4, 7

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

Yes No The diversion channel bottom low flow from sta. #45+00 downstream to sta. #82+62

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment or restrictions |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Low flow channel needs re-graded |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 3

Drop structure #1 located at sta. #82+62 downstream to sta. #84+62.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 9

Drop structure #2 located at sta. #100+00 downstream to sta. 101+23.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 5, 9

Drop structure #3 located at sta. #111+13 downstream to sta. #112+72.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 6, 9

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

Yes No Drop structure #4 located at sta. #117+22 downstream to sta. #119+11.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 7, 9

Drop structure #5 located at sta. #125+55 downstream to sta. #126+94.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 9

Drop structure #6 located at sta. #133+42 downstream to Sta. 134+61.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 9

Maintenance Inspection Comments Section:

Date: May 11, 2005

Comment 1: Note: The condition of the levee for all weather access will need to be monitored and repaired in the near future.

Comment 2: At sta.#46+80 on the downstream slope cut and stump treat the deep rooted vegetation.

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel

Comment 3: At sta.# 47+65 at the inlet coming from the north there is accumulated sediment that needs to be removed. At sta# 53+11, 68+30, 76+22, 96+26, and 105+75 there is accumulated sediment that will need to be monitored for removal in the near future.

Comment 4: At sta.# 48+47, 78+00, and 106+66 on the upstream slope repair the foot traffic that will eventually erode the embankment.

Comment 5: At sta.# 100+00 (drop structure #2) at the downstream side of the drop structure there is erosion requiring repair.

Comment 6: At sta.# 111+13 (drop structure #3) there is organic debris that needs to be removed.

Comment 7: At sta.# 117+22 (drop structure #4) replace the missing station placard. At sta.# 45+00 refurbish the station placard. At sta.#80+00 replace the existing placard with a new one on the existing post. At sta.# 138+20 refurbish the staff gauge at the outlet near the breakaway fence.

Comment 8: At sta.# 138+20 repair the breakaway fence at the outlet to Signal Butte FRS. Check all project fencing since the date of this inspection and make repairs as required. Lubricate all locks.

Comment 9: Between all the drop structures perform mowing operations to remove unwanted vegetation in the channel invert.

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

O&M Div. Mgr. _____

Inspection Date: May 9, 2006

Date of Last Inspection: May 11, 2005

Inspectors: Mike C. Ramirez and Larry Neumann

Indication of recent rainfall or impoundment: Yes No

Existing Weather Conditions: Clear and warm

Yes No The perimeter project fencing and gates.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cut of damaged fencing |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Horse gates need attention |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Breakaway fencing concerns |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 4

Condition of the existing levees

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest shows evidence of erosion, rilling, deep rooted vegetation, and or rodent/animal activity. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest of the levee stable, need for re-grading or additional plating |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Embankment slopes stable |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Maintenance concerns with associated side inlet chutes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Vegetative drains properly marked or restricted |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: 3

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
The diversion channel bottom low flow from sta. #45+00 downstream to sta. #82+62

Yes No

- Accumulated sediment or restrictions
- Low flow channel needs re-graded
- Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Drop structure #1 located at sta. #82+62 downstream to sta. #84+62.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Drop structure #2 located at sta. #100+00 downstream to sta. 101+23.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Drop structure #3 located at sta. #111+13 downstream to sta. #112+72.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Drop structure #4 located at sta. #117+22 downstream to sta. #119+11.

Yes

No

Displaced loose riprap concerns

Grouted riprap concerns; cracking, voids, deterioration, etc.

Accumulated sediment

Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Drop structure #5 located at sta. #125+55 downstream to sta. #126+94.

Displaced loose riprap concerns

Grouted riprap concerns; cracking, voids, deterioration, etc.

Accumulated sediment

Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

Drop structure #6 located at sta. #133+42 downstream to Sta. 134+61.

Displaced loose riprap concerns

Grouted riprap concerns; cracking, voids, deterioration, etc.

Accumulated sediment

Other (vandalism, liability concerns, etc.)

See Comments: 1, 2 & 5

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Maintenance Inspection Comments Section:**

Date: 05/09/2006

Comment 1: Stationing illegible and/or missing at stationing 45+00, 50+00, 55+00. Check all signage throughout structure and replace and/or refurbish as needed.

Comment 2: Sediment plugs in the invert at Spillway Trail, NightHawk Wash Trail and Amigos Wash Trail. Also, there is a sediment mound from the last clean up at Amigos Wash Trail. Remove all sediment and disposed of accordingly.

Comment 3: Remove all vegetation, trash and debris from inlet and outlet drains. Also, remove deep rooted vegetation throughout upstream and downstream slope embankments; including the invert. Cut and stump treat according to O&M SOP and dispose of accordingly.

Comment 4: Install directional arrow signage at all drop structures adjacent to maintenance roadways on both north and south sides as needed.

Comment 5: Check all gates throughout project that may have been vandalized post inspection and repair and/or refurbish as needed in reference to O&M SOP. Note; lubricate all 3E59 locks

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

O&M Div. Mgr. _____

Inspection Date: Oct. 17, 2007

Date of Last Inspection: May 9, 2006

Inspectors: Larry Neumann, FCDMC & Daniel Michael, FCDMC

Indication of recent rainfall or impoundment: Yes No

Existing Weather Conditions: Clear and warm

Yes No The perimeter project fencing and gates.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cut of damaged fencing |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Horse gates need attention |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Breakaway fencing concerns |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #4

Condition of the existing levees

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The crest shows evidence of erosion, rilling, deep rooted vegetation, and or rodent/animal activity. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest of the levee stable, need for re-grading or additional plating |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Embankment slopes stable |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Maintenance concerns with associated side inlet chutes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Vegetative drains properly marked or restricted |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #3, & 6

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
The diversion channel bottom low flow from sta. #45+00 downstream to sta. #82+62

Yes No

- Accumulated sediment or restrictions
- Low flow channel needs re-graded
- Other (vandalism, liability concerns, etc.)

See Comments: #1, 2, 5, & 6

Drop structure #1 located at sta. #82+62 downstream to sta. #84+62.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: #1, 2, 5, & 6

Drop structure #2 located at sta. #100+00 downstream to sta. 101+23.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: #1, 2 & 5

Drop structure #3 located at sta. #111+13 downstream to sta. #112+72.

- Displaced loose riprap concerns
- Grouted riprap concerns; cracking, voids, deterioration, etc.
- Accumulated sediment
- Other (vandalism, liability concerns, etc.)

See Comments: #1, 2, 4, & 5

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Drop structure #4 located at sta. #117+22 downstream to sta. #119+11.

- | Yes | No | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5 _____

Drop structure #5 located at sta. #125+55 downstream to sta. #126+94.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5 _____

Drop structure #6 located at sta. #133+42 downstream to Sta. 134+61.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5 _____

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Maintenance Inspection Comments Section:**

Date: 10/17/2007

Comment 1: Stationing faded at 60+00, 65+00, 75+00, 101+23 and 105+40. Check all signage throughout structure and replace and/or refurbish as needed.

Comment 2: Sediment plugs in the invert at stations; 46+00, 67+50, 75+90 and 105+40. Remove all sediment/debris and disposed of accordingly.

Comment 3: Remove all vegetation, trash and debris from inlet and outlet drains. Also, remove deep-rooted vegetation throughout upstream and downstream slope embankments; including the invert. Cut and stump treat according to O&M SOP and dispose of accordingly.

Comment 4: Install directional arrow at station 113+40.

Comment 5: Check all gates throughout project that may have been vandalized post inspection and repair and/or refurbish as needed in reference to O&M SOP. Note; lubricate all 3E59 locks with graphite.

Comment 6: Deep-rooted noted at stations; 52+06, 53+50, 58+00 and 77+00, all down stream mid-slope; also noted at 63+00, and 99+17 on the upstream crest. Cut, stump treat, remove and dispose of accordingly.

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel**

O&M Div. Mgr. _____

Inspection Date: 10/08/2008

Date of Last Inspection: 10/17/2007

Inspectors: Larry Neumann, FCDMC & Daniel Michael, FCDMC

Indication of recent rainfall or impoundment: Yes No

Existing Weather Conditions: Clear and warm

Yes No The perimeter project fencing and gates.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Cut of damaged fencing |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Horse gates need attention |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Breakaway fencing concerns |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #4

Condition of the existing levees

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | The crest shows evidence of erosion, rilling, deep rooted vegetation, and or rodent/animal activity. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | The crest of the levee stable, need for re-grading or additional plating |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Embankment slopes stable |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Maintenance concerns with associated side inlet chutes |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Vegetative drains properly marked or restricted |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #3, & 6

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
The diversion channel bottom low flow from sta. #45+00 downstream to sta. #82+62

Yes

No

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment or restrictions |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Low flow channel needs re-graded |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2, 5, & 6

Drop structure #1 located at sta. #82+62 downstream to sta. #84+62.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2, 5, & 6

Drop structure #2 located at sta. #100+00 downstream to sta. 101+23.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5

Drop structure #3 located at sta. #111+13 downstream to sta. #112+72.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2, 4, & 5

Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Drop structure #4 located at sta. #117+22 downstream to sta. #119+11.

- | Yes | No | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5

Drop structure #5 located at sta. #125+55 downstream to sta. #126+94.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5

Drop structure #6 located at sta. #133+42 downstream to Sta. 134+61.

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Displaced loose riprap concerns |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | Grouted riprap concerns; cracking, voids, deterioration, etc. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Accumulated sediment |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other (vandalism, liability concerns, etc.) |

See Comments: #1, 2 & 5

**Flood Control District Of Maricopa County
Maintenance Inspection Report Pass Mountain Diversion Channel
Maintenance Inspection Comments Section:**

Date: 10/08/2008

Comment 1: Stationing faded at 60+00, 65+00, 75+00, 101+23 and 105+40. Check all signage throughout structure and replace and/or refurbish as needed.

Comment 2: Sediment plugs in the invert at stations; 45+00, 47+71, 53+33, 60+83, 69+00, 75+90, 85+83, 96+80 and 105+40. Remove all sediment/debris and disposed of accordingly.

Comment 3: Remove all vegetation, trash and debris from inlet and outlet drains.

Comment 4: Directional Arrows are down at station 116+27 on both banks and at station 124+82 on the south bank.

Comment 5: Check all gates throughout project that may have been vandalized post inspection and repair and/or refurbish as needed in reference to O&M SOP. Note; lubricate all 3E59 locks with graphite.

Comment 6: Deep-rooted noted at stations; 51+00, 62+95, 64+35, 75+90, 87+31, and 91+06 all upstream crest. Cut, stump treat, remove and dispose of accordingly.



APPENDIX G

**Technical Memorandums
(Field Reconnaissance and Hydrology)**

Memo

To **Mark Mayer** File no **09-115-05010**
Flood Control District of Maricopa County
Planning and Project Management Division
2801 West Durango Street
Phoenix, Arizona 85009-6399

From **Stephen V. Hargus, E.I.T.** cc
Reviewed **Robert Davies, PE, PH, CFM**
By
Tel **480-940-2320**
Email Stephen.hargus@amec.com

Date **September 21, 2009**

Subject **Field Reconnaissance**
Provisionally Accredited Levee Certification
Pass Mountain Diversion
Mesa, Arizona

Submitted herewith are the observations from AMEC Earth & Environmental, Inc. (AMEC) concerning the field reconnaissance of the Pass Mountain Diversion (Diversion) conducted on September 3, 2009.

1.0 Overview

The Diversion is owned and operated by the Flood Control District of Maricopa County (FCDMC) and is located east of the intersection of McKellips Road and Crismon Road in Mesa, Arizona. In support of the levee certification process, a field reconnaissance of the Diversion was necessary to assess the current conditions of the structure relative to design and as-built conditions, and the requirements of 44 CFR 65.10.

2.0 Field Reconnaissance

AMEC's field reconnaissance was a multi-disciplinary team (hydraulic and geotechnical) which walked the length of the embankment. The field reconnaissance conducted by Robert Davies, PE, PH, CFM and Stephen Hargus, E.I.T., both of AMEC. AMEC was accompanied by Mr. Mark Mayer of FCDMC.

Visual observation of the embankment did not reveal any significant signs of erosion or distress. The crest of the Diversion was clear of vegetation. Vegetation found the embankment slopes consisted primarily of creosote and other small desert bushes. No deep rooted species of vegetation were found growing on the embankment. In general, the Diversion was in acceptable condition.

Field Reconnaissance
Provisionally Accredited Levee Certification
Pass Mountain Diversion
Mesa, Arizona

If you have any questions concerning this memorandum, please do not hesitate in contacting us.

Respectfully submitted,

AMEC Earth & Environmental, Inc.

Reviewed by:

Stephen V. Hargus, E.I.T.
Staff Professional

Robert Davies, PE, PH, CFM
Senior Water Resources Engineer

G:\Water Resources\Projects\2009 Projects\09-115-05010 FCDMC Certification of Pass Mtn\Memo-Pas Mountain Diverson.doc

Field Reconnaissance
Provisionally Accredited Levee Certification
Pass Mountain Diversion
Mesa, Arizona

If you have any questions concerning this memorandum, please do not hesitate in contacting me.

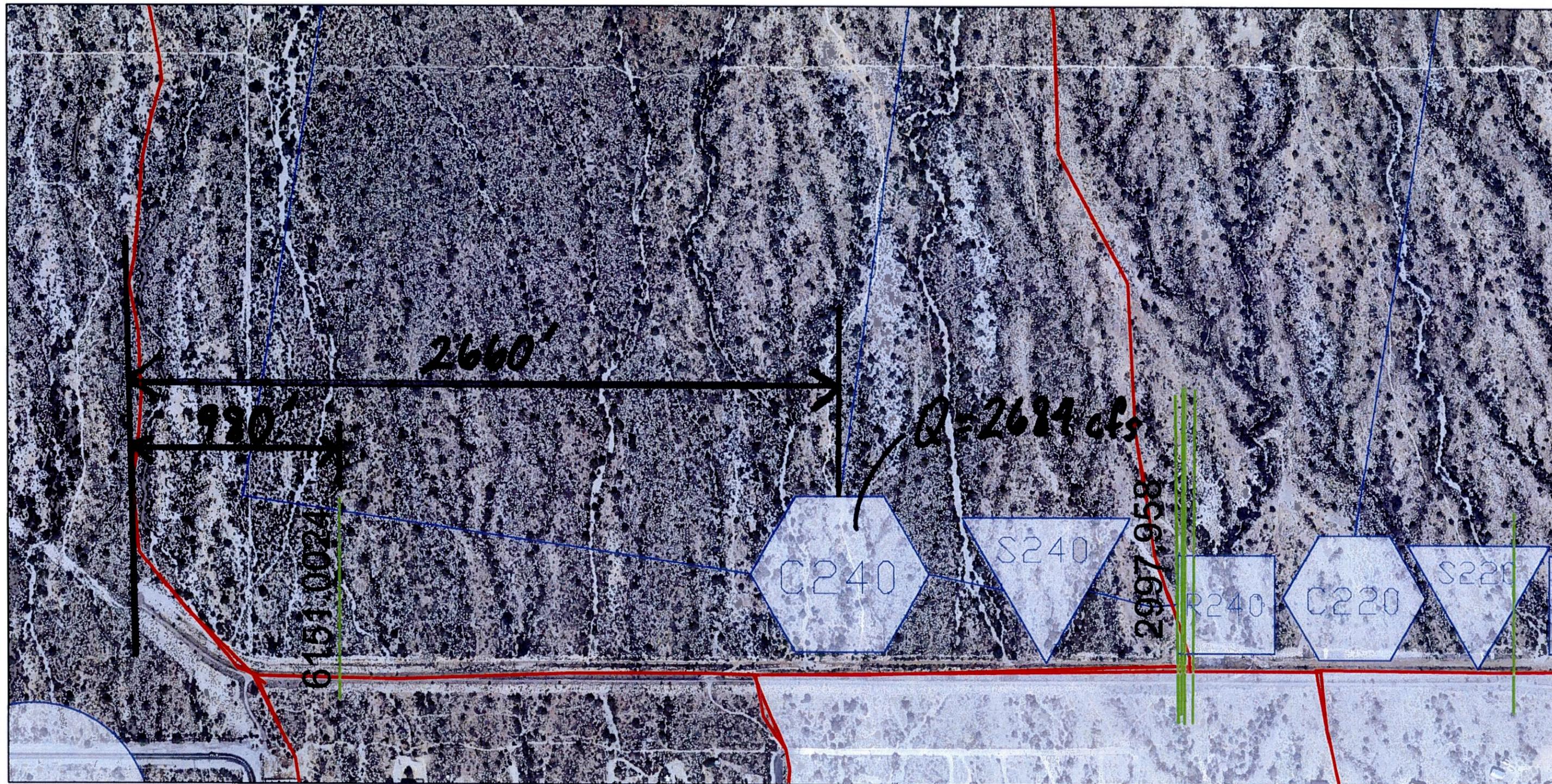
Respectfully submitted,

AMEC Earth & Environmental, Inc.

Reviewed by:

Robert Davies, PE, PH, CFM
Senior Water Resources Engineer

G:\Water Resources\Projects\2009 Projects\09-115-05010 FCDMC Certification of Pass Mtn\Memo-Pas Mountain Diverson.doc



Example :

$$Q @ XS 6151 = \frac{980}{2660} (2684 \text{ cfs}) = 988 \text{ cfs} \Rightarrow \text{used } \underline{\underline{990 \text{ cfs}}}$$

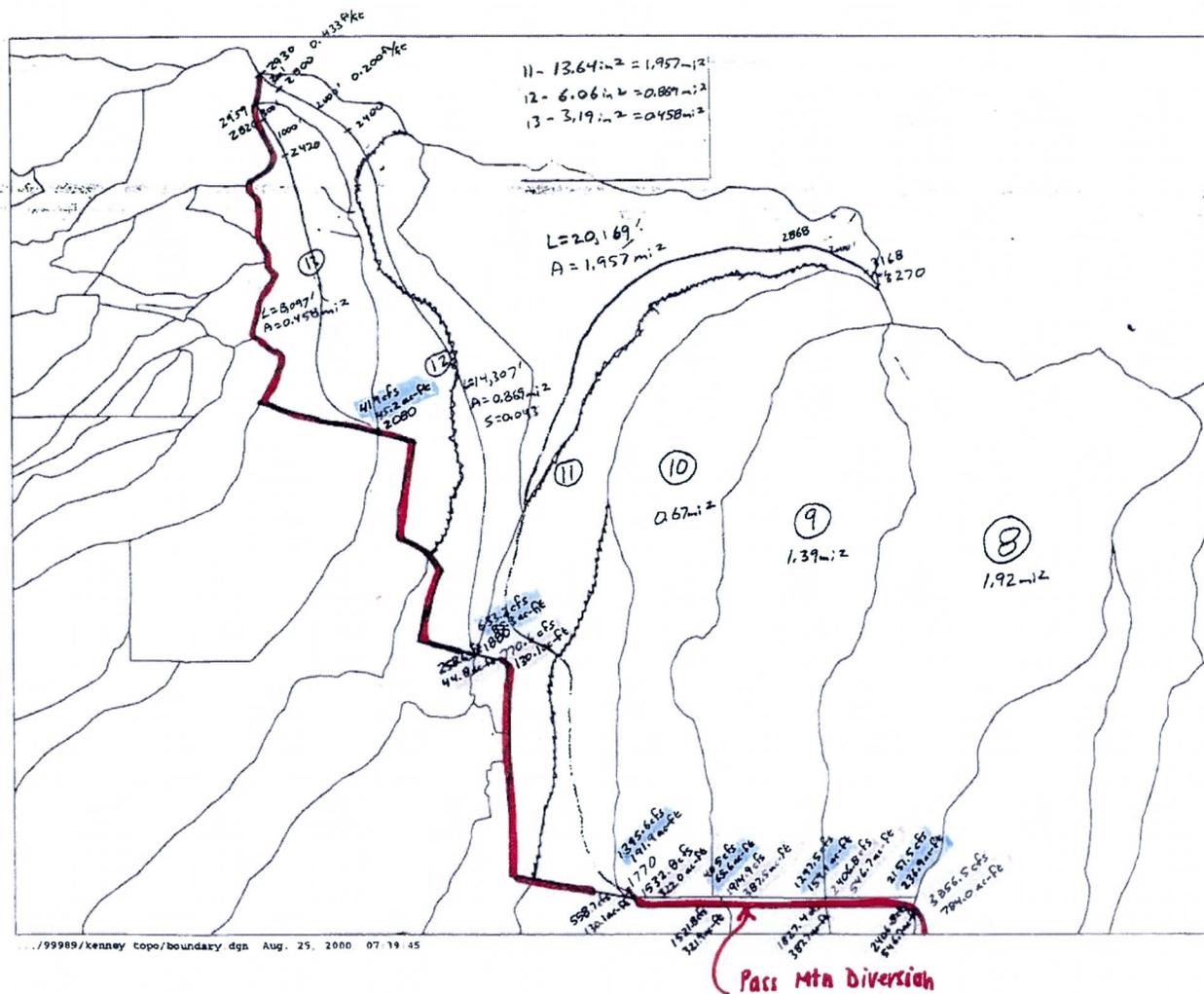
Spook Hill ADMP Update

FCDMC Contract 99-43, WP# 99989

Recommended Alternative Future Land Use HEC-1 Summary Output -- REC-FC24.OUT

| Spook Hill ADMP Update | FCDMC Contract 99-43, WP# 99989 | Recommended Alternative | Future Land Use | HEC-1 | Summary Output | REC-FC24.OUT |
|------------------------|---------------------------------|-------------------------|------------------------|-------------|-----------------------|--------------|
| + HYDROGRAPH AT 150 | 593. 12.17 | 51. 14. 5. .41 | + ROUTED TO RR200 | 1343. 12.83 | 331. 88. 32. 4.12 | |
| + ROUTED TO R150 | 567. 12.23 | 51. 14. 5. .41 | + 2 COMBINED AT CC180 | 7186. 12.27 | 1160. 382. 162. 10.68 | |
| + ROUTED TO R152 | 513. 12.33 | 51. 14. 5. .41 | + ROUTED TO S180 | 124. 24.37 | 124. 123. 89. 10.68 | |
| + HYDROGRAPH AT 160 | 224. 12.40 | 36. 9. 3. .37 | + ROUTED TO R180 | 124. 24.40 | 124. 123. 89. 10.68 | |
| + DIVERSION TO BS160 | 82. 12.13 | 2. 1. 0. .37 | + HYDROGRAPH AT 260 | 427. 12.10 | 42. 11. 4. .26 | |
| + HYDROGRAPH AT D160 | 224. 12.40 | 34. 9. 3. .37 | + 2 COMBINED AT C260 | 428. 12.10 | 140. 130. 102. .26 | |
| + HYDROGRAPH AT RT160 | 82. 12.13 | 2. 1. 0. .37 | + ROUTED TO R260 | 411. 12.20 | 140. 130. 102. .26 | |
| + ROUTED TO S160 | 1. 12.20 | 1. 1. 0. .37 | + HYDROGRAPH AT 280 | 527. 12.10 | 46. 13. 5. .32 | |
| + 3 COMBINED AT C160 | 732. 12.37 | 86. 23. 8. .77 | + 2 COMBINED AT C280 | 893. 12.13 | 181. 141. 107. .58 | |
| + HYDROGRAPH AT 180 | 851. 12.37 | 98. 25. 9. 1.01 | + ROUTED TO R280 | 870. 12.20 | 180. 141. 106. .58 | |
| + 3 COMBINED AT C180 | 7186. 12.27 | 850. 298. 132. 6.56 | + HYDROGRAPH AT 300 | 428. 12.10 | 37. 11. 4. .29 | |
| + HYDROGRAPH AT 210 | 1322. 12.17 | 111. 29. 10. .79 | + 2 COMBINED AT C300 | 1235. 12.17 | 214. 149. 110. .87 | |
| + ROUTED TO R210 | 1246. 12.23 | 111. 29. 10. .79 | + ROUTED TO R300 | 1189. 12.23 | 213. 149. 110. .87 | |
| + HYDROGRAPH AT 240 | 1513. 12.30 | 167. 42. 15. 1.41 | + HYDROGRAPH AT 305A | 394. 12.13 | 41. 11. 4. .32 | |
| + 2 COMBINED AT C240 | 2684. 12.27 | 273. 70. 25. 2.20 | + 2 COMBINED AT C305 | 1534. 12.20 | 250. 159. 113. 1.19 | |
| + ROUTED TO S240 | 799. 12.70 | 226. 59. 21. 2.20 | + ROUTED TO R305 | 1520. 12.23 | 250. 158. 113. 1.19 | |
| + ROUTED TO R240 | 795. 12.77 | 225. 59. 21. 2.20 | + HYDROGRAPH AT 320B1 | 659. 12.13 | 66. 19. 7. .45 | |
| + HYDROGRAPH AT 220 | 676. 12.20 | 68. 18. 6. .47 | + DIVERSION TO B320B1 | 364. 11.93 | 16. 5. 2. .45 | |
| + 2 COMBINED AT C220 | 955. 12.60 | 288. 75. 27. 2.67 | + HYDROGRAPH AT D320B1 | 659. 12.13 | 54. 14. 5. .45 | |
| + ROUTED TO SW220 | 895. 12.80 | 280. 73. 26. 2.67 | + HYDROGRAPH AT T320B1 | 364. 11.93 | 16. 5. 2. .45 | |
| + ROUTED TO R220 | 893. 12.87 | 280. 73. 26. 2.67 | + ROUTED TO S320B1 | 4. 12.00 | 3. 3. 2. .45 | |
| + HYDROGRAPH AT 190 | 1471. 12.17 | 123. 33. 12. .92 | + 3 COMBINED AT C320B1 | 2042. 12.20 | 304. 174. 119. 1.64 | |
| + ROUTED TO R190 | 1415. 12.23 | 123. 33. 12. .92 | + HYDROGRAPH AT 350 | 1315. 12.20 | 112. 29. 11. 1.00 | |
| + ROUTED TO R192 | 1359. 12.30 | 123. 33. 12. .92 | + DIVERSION TO SF350 | 658. 12.20 | 56. 15. 5. 1.00 | |
| + HYDROGRAPH AT 200 | 831. 12.17 | 72. 20. 7. .53 | + HYDROGRAPH AT D350 | 658. 12.20 | 56. 15. 5. 1.00 | |
| + 3 COMBINED AT C200 | 2264. 12.30 | 459. 122. 44. 4.12 | + ROUTED TO R350 | 593. 12.40 | 56. 15. 5. 1.00 | |
| + ROUTED TO SW200 | 2144. 12.37 | 454. 119. 43. 4.12 | + HYDROGRAPH AT 310 | 381. 12.33 | 50. 13. 5. .54 | |
| + ROUTED TO R200 | 2135. 12.37 | 454. 119. 43. 4.12 | + 2 COMBINED AT C310 | 950. 12.37 | 106. 27. 10. 1.04 | |
| + ROUTED TO SS200 | 1364. 12.73 | 333. 88. 32. 4.12 | + ROUTED TO R310 | 865. 12.67 | 106. 27. 10. 1.04 | |

NRCS (SCS) Hydrology Results



8/15/20
 submittal
 1" = 2000'

SBTR-20c.DAT
 Runoff
 Routed Runoff
 Combined Runoff

PART 2 CHARACTERISTICS OF THE EXISTING CORRIDOR**Development**

Since the completion of the original ADMS in 1987, development has been occurring at a rapid pace in the western portion of the study area. There are a significant number of new subdivisions in the study area, more are being constructed right now, and still more are in the design or planning stages. Figure 2 (Jurisdictional Area Map) and Figure 3 (2000 Existing/Planned Subdivisions) depict the city and county jurisdictional boundaries and the existing, in-progress, and future development, respectively.

Structures

Refer to Table 1 below for a summary of structural data.

Table 1 - Summary of Structural Data

| | Apache Junction FRS | Signal Butte FRS | Pass Mtn Diversion | Spook Hill FRS |
|---|---------------------|------------------|--------------------|----------------|
| 100-yr Drainage Area (mi ²) | 5.81 | 10.69 | 4.31 | 16.38 |
| Freeboard Hydrograph Controlled Area (mi ²) | 3.91 | 2.39 | N/A | 13.69 |
| Volume of Sediment Pool (ac-ft) | 95 | 247 | N/A | 271 |
| 100-yr, 24-hr Peak Inflow (cfs) | 5,300 | 6,700 | 5,900 | 6,500 |
| 100-yr Storage Capacity (ac-ft) | 676 | 1060 | N/A | 1391 |
| Emergency Spillway Crest Elev. (ft.) | 1801.92 | 1712.4 | N/A | 1583.86 |
| Emergency Spillway Discharge (cfs) | N/A | 11,126 | N/A | 21,300 |
| Maximum Storage Capacity (ac-ft) | 2,400 | 2,854 | N/A | 4,271 |
| Top of Structure Elevation (ft.) | 1812.92 | 1721.63 | 1780 | 1592.5 |
| Maximum Structure Height (ft) | 21.9 | 38.5 | 31.7 | 25.3 |
| Average Structure Height (ft) | 19 | 28 | 16 | 21 |
| Length of Structure (ft) | 8,400 | 7,600 | 8,400 | 22,000 |
| Year Design Completed | 1986 | 1985 | 1984 | 1977 |
| Year(s) Constructed | 1988 | (1986)? | (1987)? | 1978-1979 |

Flooding History

Several locations within the study area have experienced flood damage in the past and are in locations that could be at risk for future flood damage in the event of a major storm. The project team interviewed local residents and District maintenance personnel in addition to examining documents from the City and the District which documented reports of local flooding. The public representatives on the Citizen's Committee also proved an invaluable source of information related to local flooding as many of them had resided in the area for many years. Home videos taken during relatively minor rainfall events were made available to the project team and provided additional evidence of flooding problems. Figure 4 (Known Flooding Areas) depicts the areas of historic flooding identified in the Data Collection phase of the project.

Modes of Transportation

Figure 5 (Transportation/Land Use Links and Nodes) depicts the existing and planned inter-modal transportation, traffic generators, and gathering spaces within the study area. Existing and planned multi-modal transportation links have been identified and include: existing and planned multi-use pathways, primary trail access points, existing and planned bike lanes/trails, existing transit routes, proposed Red Mountain Freeway and interchanges, and Roads of Regional Significance (a Road of Regional Significance includes six travel lanes with bike lanes and a raised median, e.g. Usery Pass Road). There are no railways within the project area and no transit facilities existing or planned for the immediate future in this portion of Maricopa and Pinal Counties.

Vehicular

There are no freeways currently located within the project limits, however, the Superstition Freeway (US60) is approximately four miles south of the project and the future Red Mountain Freeway (SR202L) alignment will be located parallel to and immediately upstream of the Spook Hill FRS structure. ADOT has agreed to replace the storage volume displaced within the impoundment area due to the construction of the freeway. Numerous major mile streets are located in the southern portion of the project limits including McDowell Road, McKellips Road, and Brown Road/Lost Dutchman Boulevard. Ellsworth Road/Usery Pass Road/Old Bush Highway/Bush Highway is the only north/south roadway that crosses through the entire project area and it is designated as a Road of Regional Significance.

Bikeways & Trailways

Existing major trails are conceptually aligned along the Red Mountain District Park parallel to the Central Arizona Project (CAP) canal, Ellsworth and Brown Roads (Mesa), and Equestrian Park (Apache Junction). Within the Usery Mountain Recreation Area, there is a network of trails varying in length and difficulty from 0.4 miles to 2.9 miles in length. Additionally, the Maricopa County Sun Circle Trail currently exists at the Salt River in the far northeasterly reach just outside of the

study area. The bike facilities include both on-street and remote trails. By definition, Roads of Regional Significance will have bike lanes.

Environmental Inventory

For the purposes of the environmental considerations, the limits of the environmental inventory were extended approximately one mile beyond the Spook Hill ADMP study area boundary, except for the hazardous material investigations. The hazardous material investigations were undertaken for the area encompassing the flood control/mitigation alternatives rather than for the entire study area. The visual conditions inventory considered the seen area or viewshed which would, in some areas, extend beyond the ADMP study area boundary.

This section summarizes the existing natural, physical, social, and cultural environment within the study area. The inventory of the environmental resources of the study area consisted of gathering existing resource data and information from various Local, State, and Federal regulatory agencies having jurisdiction within the project area. These agencies include the Arizona Department of Environmental Quality (ADEQ), Arizona Department of Transportation (ADOT), Arizona Game and Fish Department (AGFD), Arizona State Museum (ASM), State Historic Preservation Office (SHPO), US Fish and Wildlife Service (USFWS), Maricopa County, USDA Forest Service, and the Bureau of Land Management, in addition to the municipalities of Mesa and Apache Junction. The characteristics of the physical and natural environment were also identified based on a reconnaissance survey of the study area and are shown on Figure 6 (Natural, Physical, & Cultural Features). Separate technical reports on the cultural and ecological resources have been prepared and are on file with the District.



APPENDIX H

NOAA 14 Rainfall Data

NOAA-14





POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14



Arizona 33.458 N 111.599 W 1804 feet
 from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
 G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley
 NOAA, National Weather Service, Silver Spring, Maryland, 2006
 Extracted: Thu Dec 10 2009

| Confidence Limits | | Seasonality | | Location Maps | | Other Info. | | GIS data | | Maps | | Docs | | Retu | | | | |
|---|-------|-------------|--------|---------------|--------|-------------|------|----------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Precipitation Frequency Estimates (inches) | | | | | | | | | | | | | | | | | | |
| ARI* (years) | 5 min | 10 min | 15 min | 30 min | 60 min | 120 min | 3 hr | 6 hr | 12 hr | 24 hr | 48 hr | 4 day | 7 day | 10 day | 20 day | 30 day | 45 day | 60 day |
| 1 | 0.20 | 0.31 | 0.39 | 0.52 | 0.64 | 0.72 | 0.77 | 0.94 | 1.11 | 1.36 | 1.46 | 1.94 | 2.17 | 2.38 | 2.96 | 3.49 | 4.14 | 4.69 |
| 2 | 0.27 | 0.41 | 0.50 | 0.68 | 0.84 | 0.94 | 0.99 | 1.19 | 1.40 | 1.72 | 1.86 | 2.48 | 2.79 | 3.04 | 3.81 | 4.49 | 5.34 | 6.05 |
| 5 | 0.36 | 0.55 | 0.68 | 0.91 | 1.13 | 1.24 | 1.29 | 1.51 | 1.76 | 2.19 | 2.40 | 3.28 | 3.71 | 4.03 | 5.03 | 5.92 | 7.03 | 7.94 |
| 10 | 0.43 | 0.66 | 0.81 | 1.09 | 1.35 | 1.48 | 1.53 | 1.77 | 2.04 | 2.58 | 2.84 | 3.94 | 4.46 | 4.83 | 5.97 | 7.02 | 8.31 | 9.34 |
| 25 | 0.53 | 0.80 | 0.99 | 1.34 | 1.66 | 1.79 | 1.87 | 2.13 | 2.43 | 3.10 | 3.44 | 4.87 | 5.55 | 5.98 | 7.26 | 8.53 | 10.03 | 11.19 |
| 50 | 0.60 | 0.91 | 1.13 | 1.52 | 1.89 | 2.04 | 2.14 | 2.41 | 2.73 | 3.52 | 3.91 | 5.64 | 6.45 | 6.91 | 8.26 | 9.71 | 11.37 | 12.59 |
| 100 | 0.67 | 1.03 | 1.27 | 1.71 | 2.12 | 2.30 | 2.42 | 2.69 | 3.03 | 3.96 | 4.41 | 6.46 | 7.42 | 7.91 | 9.30 | 10.94 | 12.74 | 14.02 |
| 200 | 0.75 | 1.14 | 1.42 | 1.91 | 2.36 | 2.55 | 2.71 | 2.99 | 3.33 | 4.41 | 4.93 | 7.34 | 8.46 | 8.98 | 10.37 | 12.20 | 14.16 | 15.46 |
| 500 | 0.85 | 1.30 | 1.61 | 2.16 | 2.68 | 2.90 | 3.11 | 3.39 | 3.75 | 5.03 | 5.64 | 8.59 | 9.96 | 10.51 | 11.85 | 13.93 | 16.09 | 17.40 |
| 1000 | 0.93 | 1.41 | 1.75 | 2.36 | 2.92 | 3.16 | 3.44 | 3.71 | 4.07 | 5.53 | 6.20 | 9.62 | 11.19 | 11.75 | 13.01 | 15.29 | 17.61 | 18.91 |

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to [NOAA Atlas 14 Document](#) for more information. NOTE: Formatting forces estimates near zero to appear as zero.

| * Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches) | | | | | | | | | | | | | | | | | | |
|--|-------|--------|--------|--------|--------|---------|------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| ARI** (years) | 5 min | 10 min | 15 min | 30 min | 60 min | 120 min | 3 hr | 6 hr | 12 hr | 24 hr | 48 hr | 4 day | 7 day | 10 day | 20 day | 30 day | 45 day | 60 day |
| 1 | 0.26 | 0.39 | 0.48 | 0.65 | 0.80 | 0.87 | 0.95 | 1.10 | 1.27 | 1.55 | 1.66 | 2.17 | 2.45 | 2.65 | 3.31 | 3.89 | 4.62 | 5.22 |
| 2 | 0.33 | 0.51 | 0.63 | 0.85 | 1.05 | 1.13 | 1.23 | 1.40 | 1.60 | 1.96 | 2.12 | 2.78 | 3.13 | 3.40 | 4.27 | 5.00 | 5.96 | 6.73 |
| 5 | 0.45 | 0.68 | 0.84 | 1.14 | 1.41 | 1.50 | 1.59 | 1.78 | 2.01 | 2.50 | 2.73 | 3.68 | 4.17 | 4.51 | 5.63 | 6.59 | 7.85 | 8.84 |
| 10 | 0.53 | 0.81 | 1.01 | 1.35 | 1.68 | 1.78 | 1.88 | 2.08 | 2.33 | 2.93 | 3.22 | 4.42 | 5.02 | 5.40 | 6.68 | 7.82 | 9.29 | 10.41 |
| 25 | 0.65 | 0.99 | 1.22 | 1.65 | 2.04 | 2.16 | 2.28 | 2.48 | 2.77 | 3.52 | 3.89 | 5.46 | 6.24 | 6.67 | 8.11 | 9.50 | 11.23 | 12.48 |
| 50 | 0.74 | 1.12 | 1.39 | 1.87 | 2.31 | 2.46 | 2.59 | 2.79 | 3.10 | 3.99 | 4.43 | 6.32 | 7.24 | 7.71 | 9.25 | 10.82 | 12.73 | 14.05 |
| 100 | 0.82 | 1.25 | 1.56 | 2.10 | 2.59 | 2.77 | 2.94 | 3.14 | 3.46 | 4.47 | 5.00 | 7.26 | 8.34 | 8.85 | 10.43 | 12.20 | 14.29 | 15.68 |
| 200 | 0.92 | 1.39 | 1.73 | 2.33 | 2.88 | 3.06 | 3.29 | 3.49 | 3.81 | 4.99 | 5.60 | 8.26 | 9.53 | 10.06 | 11.66 | 13.63 | 15.91 | 17.31 |
| 500 | 1.04 | 1.58 | 1.96 | 2.63 | 3.26 | 3.48 | 3.77 | 3.96 | 4.31 | 5.72 | 6.44 | 9.70 | 11.26 | 11.80 | 13.37 | 15.63 | 18.17 | 19.56 |
| 1000 | 1.13 | 1.73 | 2.14 | 2.88 | 3.56 | 3.82 | 4.17 | 4.34 | 4.70 | 6.32 | 7.12 | 10.91 | 12.72 | 13.25 | 14.74 | 17.25 | 19.97 | 21.34 |

* The upper bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.

** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.

Please refer to [NOAA Atlas 14 Document](#) for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

| * Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches) | | | | | | | | | | | | | | | | | | |
|--|-------|--------|--------|--------|--------|---------|------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| ARI** (years) | 5 min | 10 min | 15 min | 30 min | 60 min | 120 min | 3 hr | 6 hr | 12 hr | 24 hr | 48 hr | 4 day | 7 day | 10 day | 20 day | 30 day | 45 day | 60 day |
| 1 | 0.17 | 0.26 | 0.32 | 0.43 | 0.53 | 0.61 | 0.65 | 0.81 | 0.97 | 1.21 | 1.30 | 1.73 | 1.94 | 2.13 | 2.66 | 3.13 | 3.72 | 4.21 |
| 2 | 0.22 | 0.34 | 0.42 | 0.56 | 0.70 | 0.79 | 0.83 | 1.03 | 1.23 | 1.53 | 1.65 | 2.22 | 2.49 | 2.73 | 3.42 | 4.04 | 4.79 | 5.43 |

H-2

| | | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| 5 | 0.30 | 0.45 | 0.56 | 0.76 | 0.93 | 1.04 | 1.08 | 1.31 | 1.53 | 1.95 | 2.13 | 2.92 | 3.30 | 3.60 | 4.50 | 5.30 | 6.29 | 7.12 |
| 10 | 0.35 | 0.54 | 0.67 | 0.90 | 1.11 | 1.22 | 1.27 | 1.51 | 1.77 | 2.28 | 2.50 | 3.50 | 3.96 | 4.31 | 5.32 | 6.28 | 7.41 | 8.35 |
| 25 | 0.42 | 0.65 | 0.80 | 1.08 | 1.34 | 1.47 | 1.53 | 1.79 | 2.08 | 2.72 | 3.00 | 4.31 | 4.89 | 5.30 | 6.44 | 7.60 | 8.91 | 9.96 |
| 50 | 0.48 | 0.73 | 0.90 | 1.22 | 1.50 | 1.65 | 1.72 | 2.00 | 2.31 | 3.06 | 3.39 | 4.95 | 5.64 | 6.08 | 7.30 | 8.60 | 10.04 | 11.15 |
| 100 | 0.53 | 0.81 | 1.00 | 1.34 | 1.66 | 1.82 | 1.91 | 2.20 | 2.53 | 3.40 | 3.78 | 5.63 | 6.42 | 6.91 | 8.16 | 9.63 | 11.19 | 12.36 |
| 200 | 0.58 | 0.88 | 1.09 | 1.47 | 1.82 | 1.98 | 2.11 | 2.40 | 2.75 | 3.74 | 4.17 | 6.33 | 7.26 | 7.77 | 9.04 | 10.67 | 12.33 | 13.54 |
| 500 | 0.64 | 0.97 | 1.21 | 1.63 | 2.01 | 2.19 | 2.35 | 2.65 | 3.02 | 4.18 | 4.68 | 7.30 | 8.41 | 8.95 | 10.21 | 12.05 | 13.85 | 15.09 |
| 1000 | 0.68 | 1.04 | 1.29 | 1.74 | 2.15 | 2.35 | 2.54 | 2.83 | 3.21 | 4.51 | 5.07 | 8.09 | 9.33 | 9.89 | 11.10 | 13.11 | 15.02 | 16.24 |

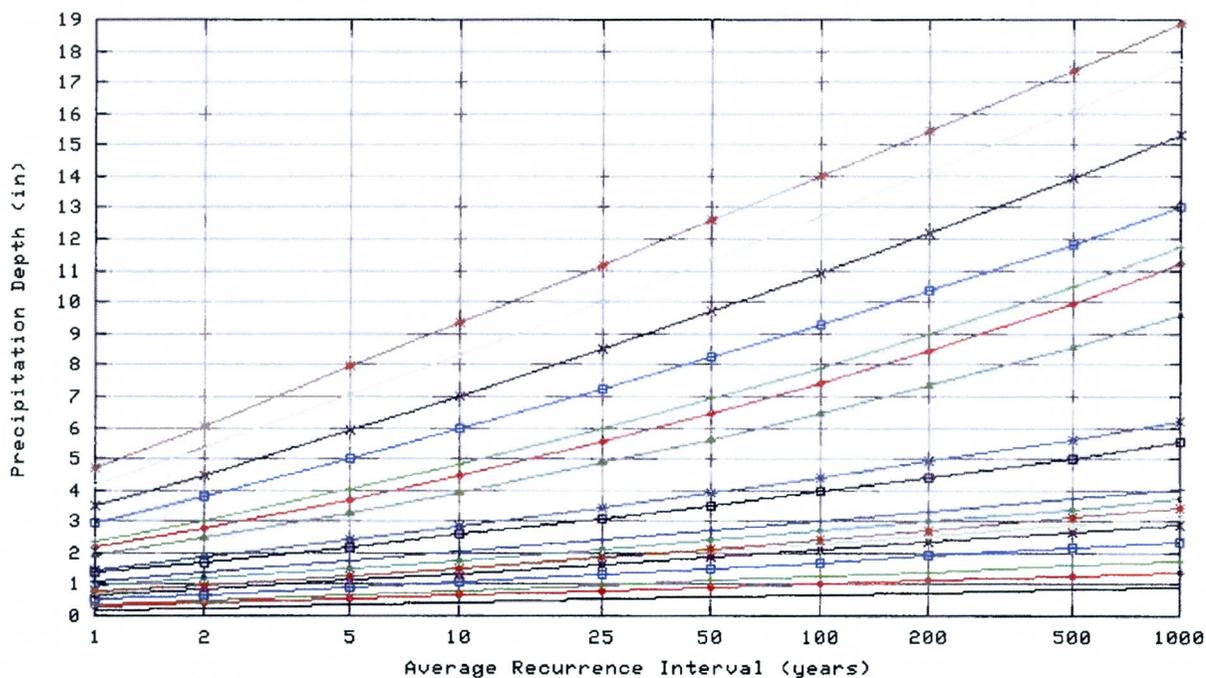
* The lower bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.

** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Text version of tables

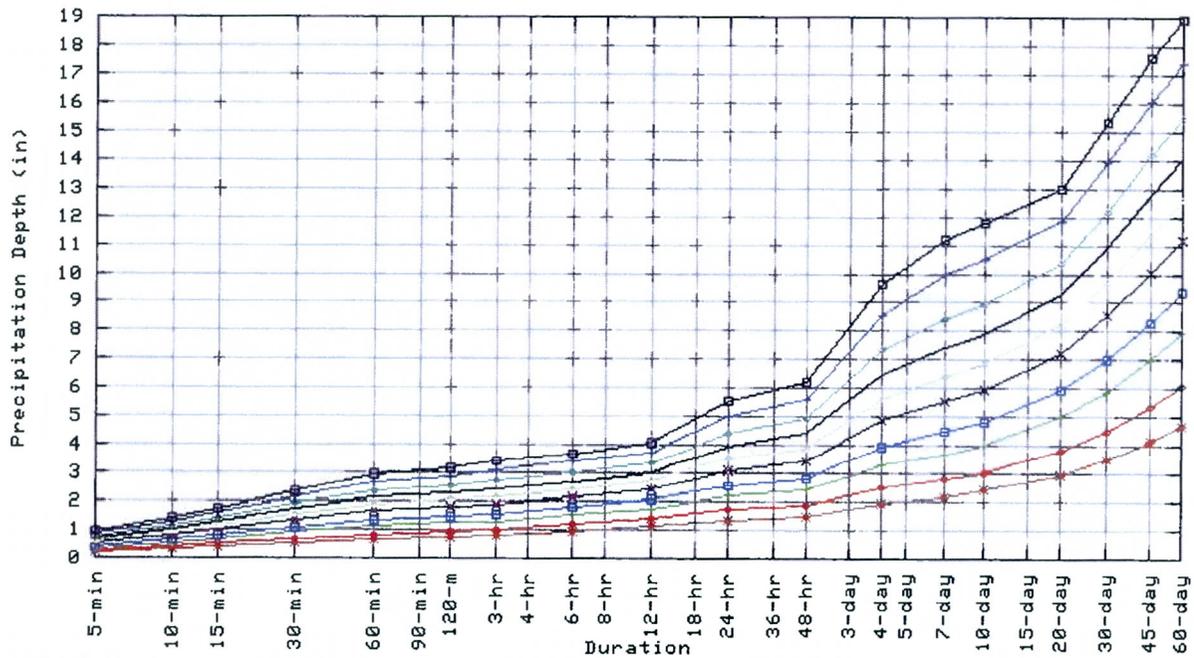
Partial duration based Point Precipitation Frequency Estimates - Version: 4
33.458 N 111.599 W 1804 ft



Thu Dec 10 12:36:24 2009

| Duration | | | |
|----------|----|--------|----|
| 5-min | — | 3-hr | —* |
| 10-min | —♦ | 6-hr | —♦ |
| 15-min | —+ | 12-hr | —+ |
| 30-min | —□ | 24-hr | —□ |
| 60-min | —x | 48-hr | —x |
| | | 30-day | —x |
| | | 45-day | —♦ |
| | | 60-day | —* |
| | | 10-day | —+ |
| | | 20-day | —□ |

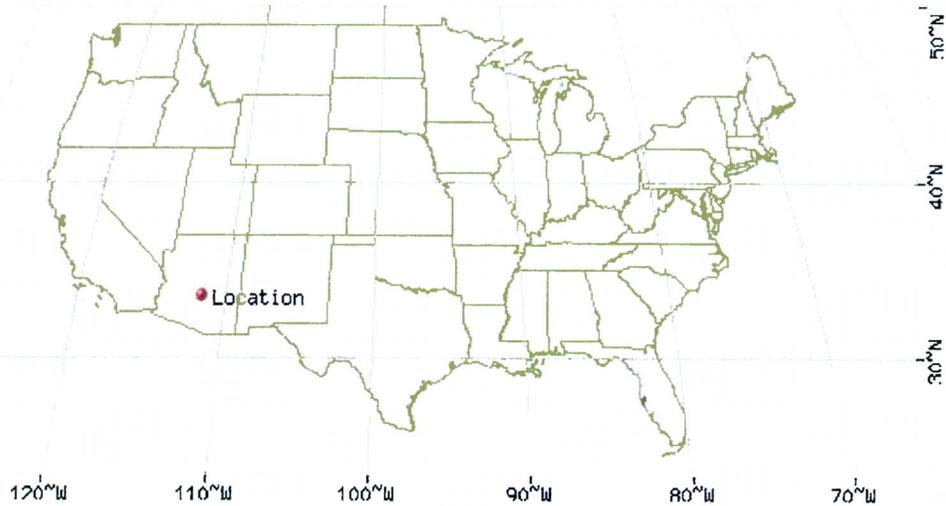
Partial duration based Point Precipitation Frequency Estimates - Version: 4
 33.458 N 111.599 W 1804 ft



Thu Dec 10 12:36:24 2009

| Average Recurrence Interval (years) | |
|-------------------------------------|------|
| 1 | * |
| 2 | • |
| 5 | + |
| 10 | □ |
| 25 | x |
| | 100 |
| | 250 |
| | 500 |
| | 1000 |

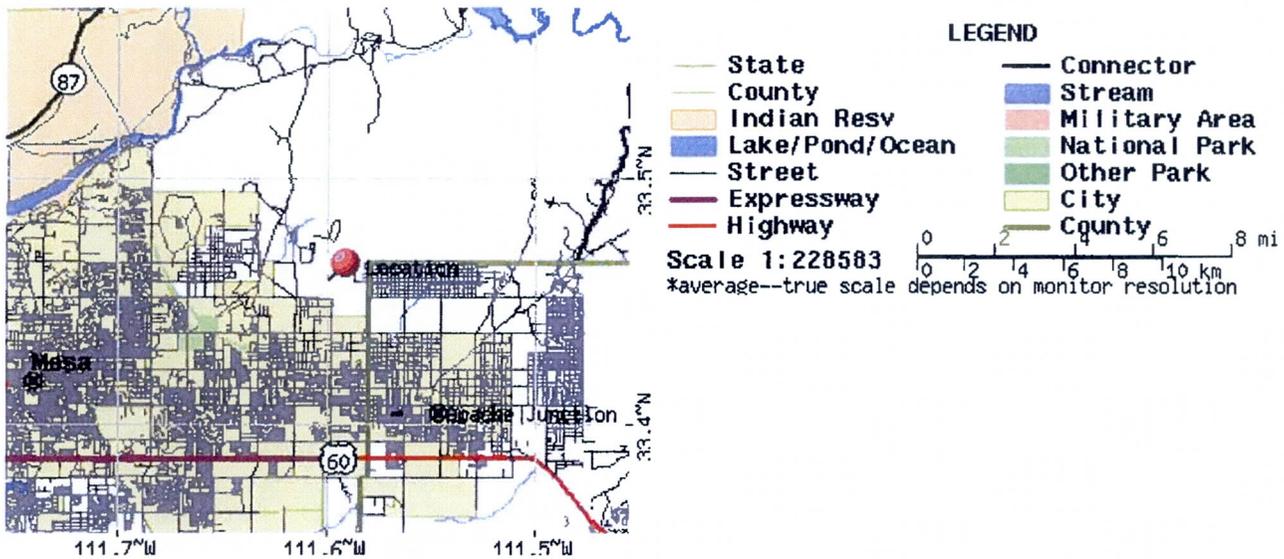
Maps -



These maps were produced using a direct map request from the [U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server](#).

H-4

Please read [disclaimer](#) for more information.



Other Maps/Photographs -

View [USGS digital orthophoto quadrangle \(DOQ\)](#) covering this location from TerraServer; [USGS Aerial Photograph](#) may also be available from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the [USGS](#) for more information.

Watershed/Stream Flow Information -

Find the [Watershed](#) for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely [NCDC](#). The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to [NOAA Atlas 14 Document](#).

Using the [National Climatic Data Center's \(NCDC\)](#) station search engine, locate other climate stations within:

...OR... of this location (33.458/-111.599). Digital ASCII data can be obtained directly from [NCDC](#).

Find [Natural Resources Conservation Service \(NRCS\)](#) SNOTEL (SNOWpack TELEmetry) stations by visiting the [Western Regional Climate Center's state-specific SNOTEL station maps](#).

Hydrometeorological Design Studies Center
 DOC/NOAA/National Weather Service
 1325 East-West Highway
 Silver Spring, MD 20910
 (301) 713-1669
 Questions? HDSCQuestions@noaa.gov

[Disclaimer](#)

H-5

Flood Control District of Maricopa County
Drainage Design Management System
RAINFALL DATA
Project Reference: 01

Page 1

11/23/2009

| ID | Method | Duration | 2 Year | 5 Year | 10 Year | 25 Year | 50 Year | 100 Year |
|---------|--------|----------|--------|--------|---------|---------|---------|----------|
| DEFAULT | NOAA14 | 5 MIN | 0.269 | 0.363 | 0.435 | 0.532 | 0.605 | 0.680 |
| | NOAA14 | 10 MIN | 0.409 | 0.553 | 0.661 | 0.809 | 0.921 | 1.035 |
| | NOAA14 | 15 MIN | 0.508 | 0.686 | 0.820 | 1.003 | 1.142 | 1.283 |
| | NOAA14 | 30 MIN | 0.684 | 0.923 | 1.104 | 1.351 | 1.538 | 1.728 |
| | NOAA14 | 1 HOUR | 0.846 | 1.143 | 1.367 | 1.672 | 1.904 | 2.139 |
| | NOAA14 | 2 HOUR | 0.945 | 1.252 | 1.489 | 1.810 | 2.058 | 2.314 |
| | NOAA14 | 3 HOUR | 1.001 | 1.305 | 1.550 | 1.891 | 2.158 | 2.440 |
| | NOAA14 | 6 HOUR | 1.207 | 1.534 | 1.796 | 2.154 | 2.438 | 2.730 |
| | NOAA14 | 12 HOUR | 1.420 | 1.785 | 2.074 | 2.468 | 2.771 | 3.079 |
| | NOAA14 | 24 HOUR | 1.751 | 2.238 | 2.630 | 3.171 | 3.597 | 4.045 |



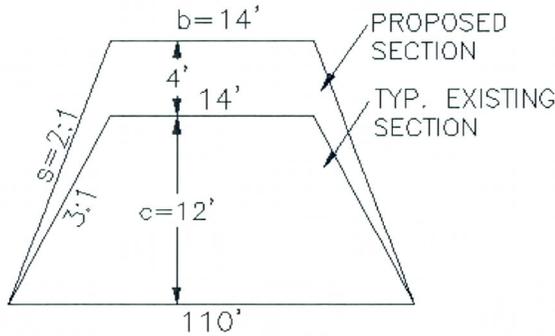
APPENDIX I

Earthwork Calculations

| | | | |
|--------------------------|------------------------|-------------|---------------------|
| Improvement Alternatives | | | |
| Client: | FCDMC | | Sheet 1 of 1 |
| Project: | Pass Mtn Diversion | | Date: 12/12/2009 |
| Data For: | Earthwork Calculations | | Work Order: |
| Prepared By: | d.s. | Checked By: | Project# 0911505010 |

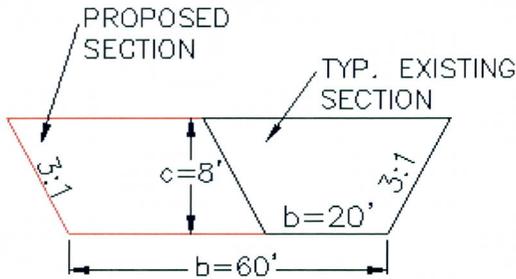


Alternative 1 Calculate how much additional fill to add 4' to height of levee. Existing side slope is 3:1 and proposed side slope is



Area = $c(b+s*c)$
 Area (proposed) = $16(14+2*16) = 736 \text{ ft}^2$
 Area (existing) = $12(14+3*12) = 600 \text{ ft}^2$

Alternative 2 Calculate how much excavation to make channel bottom 60'. Side slope is 3:1



Area = $c(b+s*c)$
 Area (proposed) = $8(60+3*8) = 672 \text{ ft}^2$
 Area (existing) = $8(20+3*8) = 352 \text{ ft}^2$

Use Average End Area Method to calculate volume of fill: $V=A*L/27$

| Alternative | Area Proposed ft ² | Area Existing ft ² | Length ft | Added Volume* yd ³ | Costs* \$ |
|-------------|----------------------------------|----------------------------------|--------------|----------------------------------|--------------|
| 1 | 736 | 600 | 4500 | 22667 | \$453,333 |
| 2 | 672 | 352 | 4000 | 47407 | \$474,074 |

*added volume refers to Backfill for Alt 1 and Excavation for Alt 2
 *costs based on estimated \$20/cy for backfill and \$10/cy for excavation (ADOT Summary of Bids)

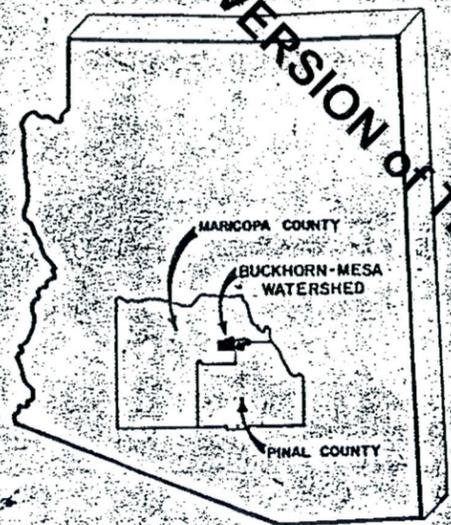
File Path: X:\Projects\042009035\Hydro_Calculations



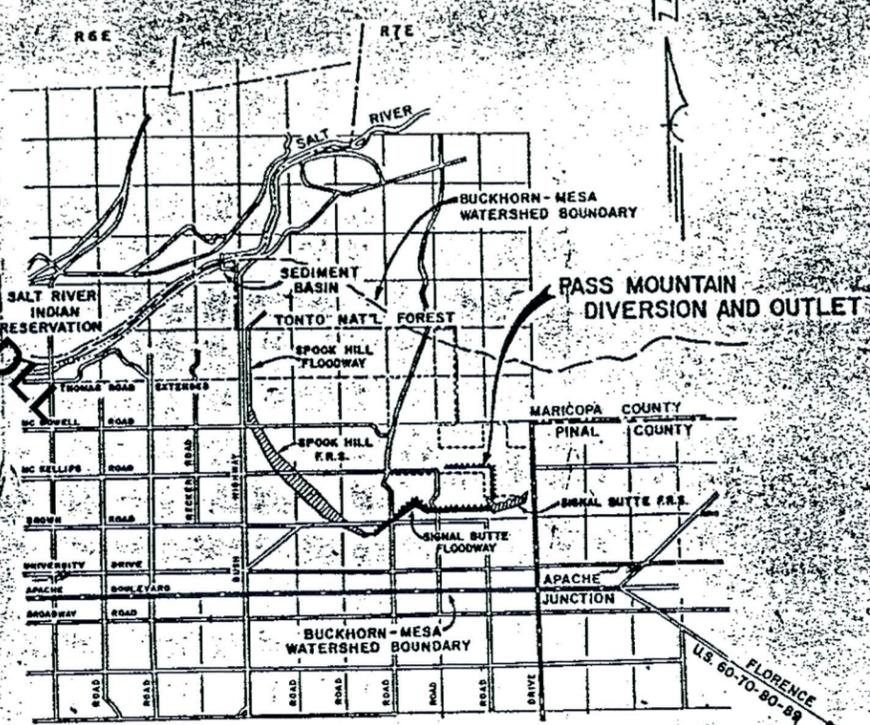
APPENDIX J

As-Built Plans

TRIAL VERSION OF TIEFDL



ARIZONA



PROJECT LOCATION MAP



INDEX

GENERAL NOTES

- Elevations are in feet above mean sea level U.S.G.S. datum.
- All stationing refers to centerline of construction, unless otherwise shown and is measured horizontal distance.
- All soil classification symbols shown are based on the unified soil classification system: ASTM D2487-69 and D2488-69. Field identification was used except where indicated by an asterisk (*). This denotes laboratory classification. Logs and descriptions are abridged. All prospective bidders should review the complete drilling logs, laboratory reports and geology report which are available for inspection at the project office.
- All bearings are True North.
- Blow counts indicated are the result of standard penetration tests made with a split spoon sampler. Results are expressed as blows per foot of depth, unless otherwise noted.
- The locations of utilities shown on plan are approximate. It shall be the responsibility of the contractor to field verify locations of all utilities and to coordinate construction with the respective utility companies.
- All cross sections are viewed in the direction of increasing stations.

- INDEX OF DRAWINGS
- LOCATION MAP & RIGHT OF WAY
- PLAN & PROFILE - STA. 43+65 TO 65+00
- PLAN & PROFILE - STA. 65+00 TO 85+00
- PLAN & PROFILE - STA. 85+00 TO 105+00
- PLAN & PROFILE - STA. 105+00 TO 125+00
- PLAN & PROFILE - STA. 125+00 TO 138+00
- DROP STRUCTURE NO. 1 DETAILS
- DROP STRUCTURE NO. 2 DETAILS
- DROP STRUCTURE NO. 3 DETAILS
- DROP STRUCTURE NO. 4 DETAILS
- DROP STRUCTURE NO. 5 DETAILS
- DROP STRUCTURE NO. 6 DETAILS
- VEGETATIVE OUTLET DETAILS - STA. 105+40, STA. 92+10, STA. 75+90
- VEGETATIVE OUTLET DETAILS - STA. 85+80, STA. 70+33
- MAINTENANCE RAMP & PVC PIPE DETAILS
- IDENTIFICATION SIGN

LEGEND

- - DH - Drill Hole
- △ - TP - Test Pit
- ▲ - Construction Monuments

BUCKHORN-MESA WATERSHED PROTECTION AND FLOOD PREVENTION PROJECT

MARICOPA AND PINAL COUNTIES, ARIZONA

PLANS FOR THE CONSTRUCTION OF PASS MOUNTAIN DIVERSION AND OUTLET

PREPARED FOR THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY BOARD OF SUPERVISORS OF PINAL COUNTY EAST MARICOPA NATURAL RESOURCE CONSERVATION DISTRICT

BY SOIL CONSERVATION SERVICE U.S. DEPARTMENT OF AGRICULTURE

GOVT. REP: John M. Harrington
 CHIEF REP: Albert Rottledge
 CONTRACTOR: Police Construction Inc.
 2032 W. Mountain View
 Phoenix, Arizona 85021
 CONTACT NO: 50-1957-0-00911
 July 27, 1985



CENTRAL FILES



36

DRAWER #



AS BUILT

AS BUILT

PASS MOUNTAIN DIVERSION AND OUTLET AS BUILT 83008-AZ-CH 302

EAST MARICOPA NATURAL RESOURCE CONSERVATION DISTRICT
 APPROVED
 DATE 6-24-84 [Signature]

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 APPROVED
 DATE 6-24-84 [Signature]

| INDEX OF DRAWINGS | | | |
|------------------------------------|---------------|-------------|-------------|
| PASS MOUNTAIN DIVERSION AND OUTLET | | | |
| BUCKHORN-MESA WATERSHED | | | |
| MARICOPA & PINAL COUNTIES, ARIZONA | | | |
| U. S. DEPARTMENT OF AGRICULTURE | | | |
| SOIL CONSERVATION SERVICE | | | |
| Designed | WEP, DEP, PJM | Date | 3-84 |
| Drawn | BJL, JEB | Date | 3-84 |
| Traced | EFS | Date | 3-84 |
| Checked | [Signature] | Date | [Signature] |
| Approved | [Signature] | Date | [Signature] |
| Checked | [Signature] | Date | [Signature] |
| Drawing No. | | 83008-AZ-CH | |

TRIAL VERSION of TIFDILL

CURVE DATA
 $\Delta = 38^{\circ}50'00''$
 $D = 13^{\circ}27'50''$
 $R = 425.55'$
 $T = 150.00'$
 $L = 288.45'$

CURVE DATA
 $\Delta = 30^{\circ}02'57''$
 $D = 284.72'$
 $R = 193.85'$
 $T = 200.00'$
 $L = 314.86'$

$\Delta = 90^{\circ}01'21''$
 $D = 28^{\circ}39'33.2''$
 $R = 199.92'$
 $T = 200.00'$
 $L = 314.11'$

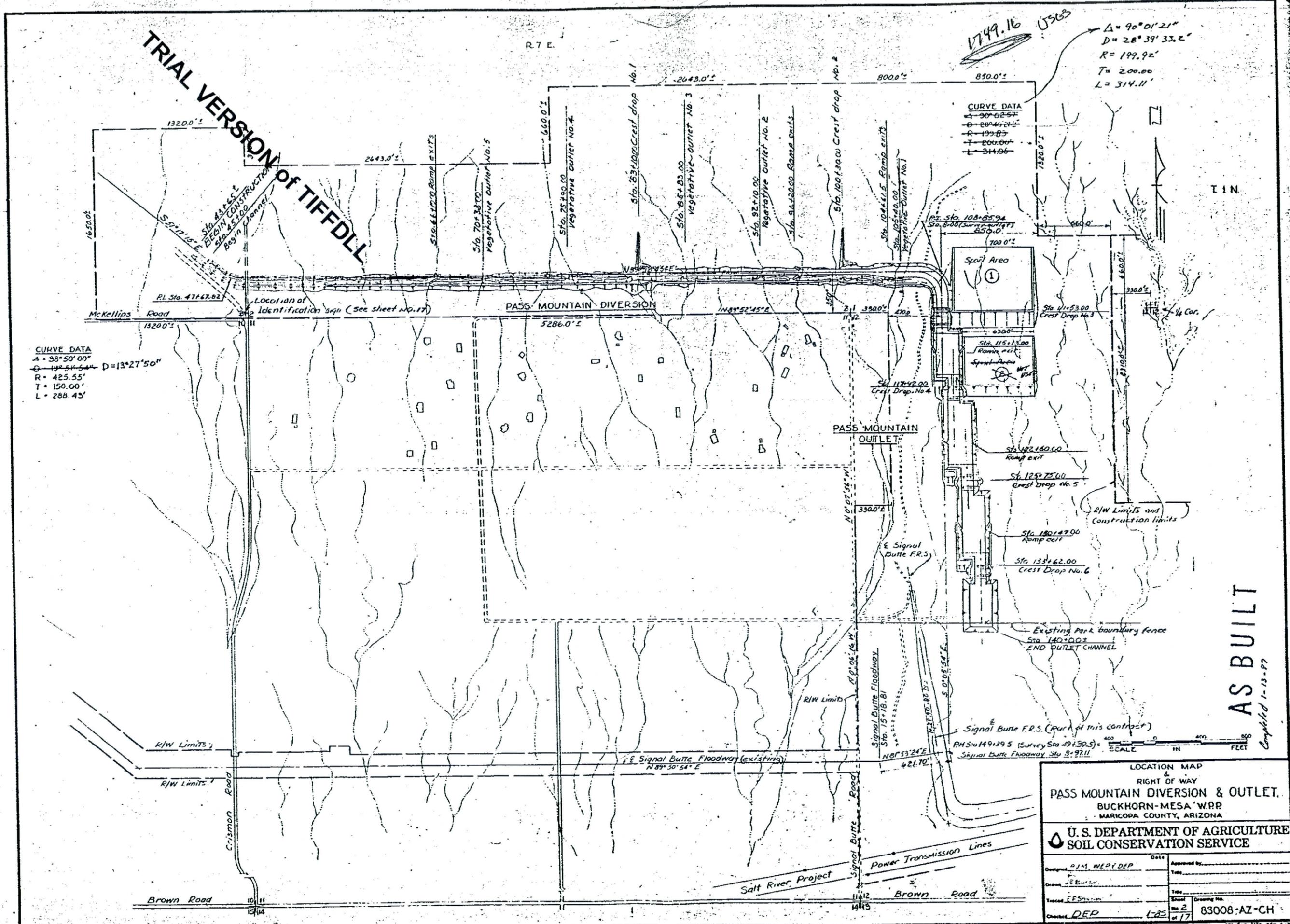
AS BUILT
 Compiled 1-13-97

LOCATION MAP
 RIGHT OF WAY
 PASS MOUNTAIN DIVERSION & OUTLET.
 BUCKHORN-MESA W.P.P.
 MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

| | | |
|-------------------------|-------|-------------------------|
| Designed: J.M. WERT DEP | Date: | Approved by: |
| Drawn: J.E. ELLIOTT | | Title: |
| Traced: F.F. SHAW | | Title: |
| Checked: DEP | 1-25 | Drawing No. 83008-AZ-CH |

Scale: 1" = 100' FEET

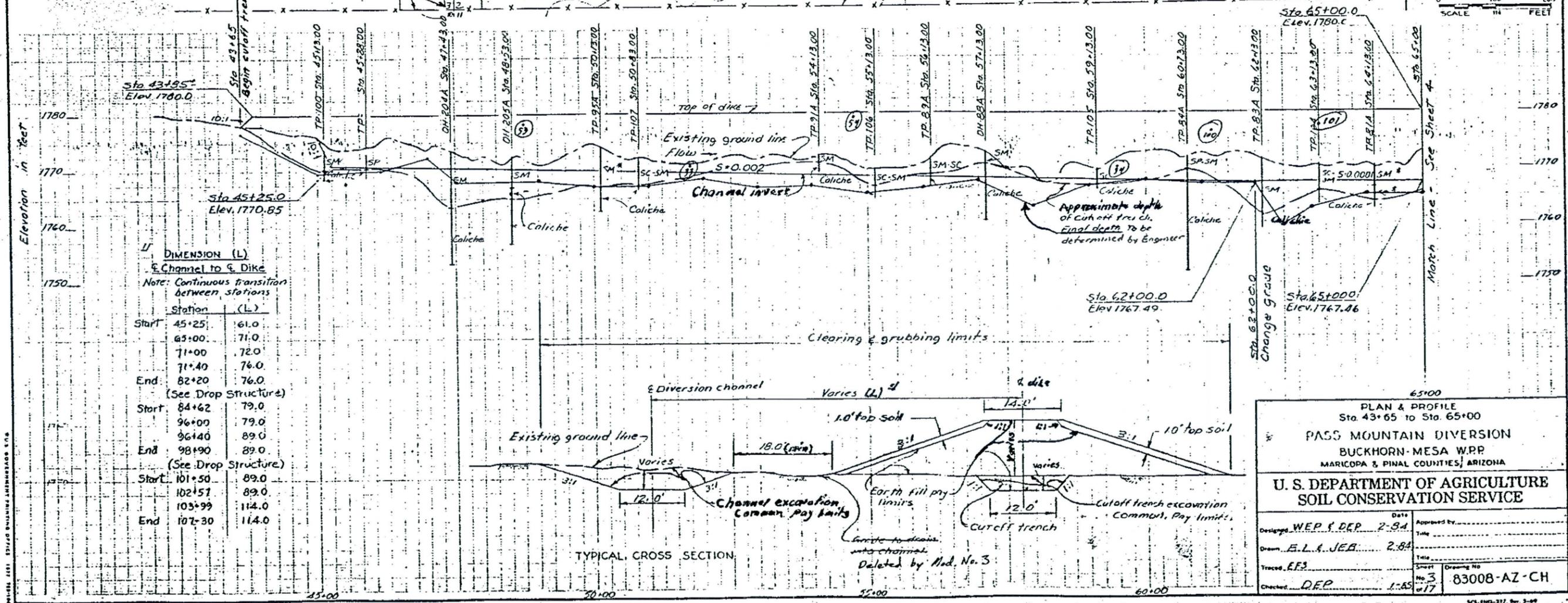


TRIAL VERSION of TIEFDL

CURVE DATA
 $\Delta = 58^{\circ} 50' 00''$
 $D = 13^{\circ} 27' 50''$
 $R = 425.55'$
 $T = 150.00'$
 $L = 288.43'$

Primary Survey Control Line and Upstream construction limit
 Note: Downstream construction limit shall not extend more than 25' from the downstream toe of the dike except where shown.

AS BUILT
 Completed 1-15-77



Channel to Dike
 Note: Continuous transition between stations

| Station | (L) |
|----------------------|-------|
| Start 45+25 | 61.0 |
| 63+00 | 71.0 |
| 71+00 | 72.0 |
| 71+40 | 76.0 |
| End 82+20 | 76.0 |
| (See Drop Structure) | |
| Start 84+62 | 79.0 |
| 96+00 | 79.0 |
| 96+40 | 89.0 |
| End 98+90 | 89.0 |
| (See Drop Structure) | |
| Start 101+50 | 89.0 |
| 102+57 | 89.0 |
| 103+99 | 114.0 |
| End 107+30 | 114.0 |

TYPICAL CROSS SECTION

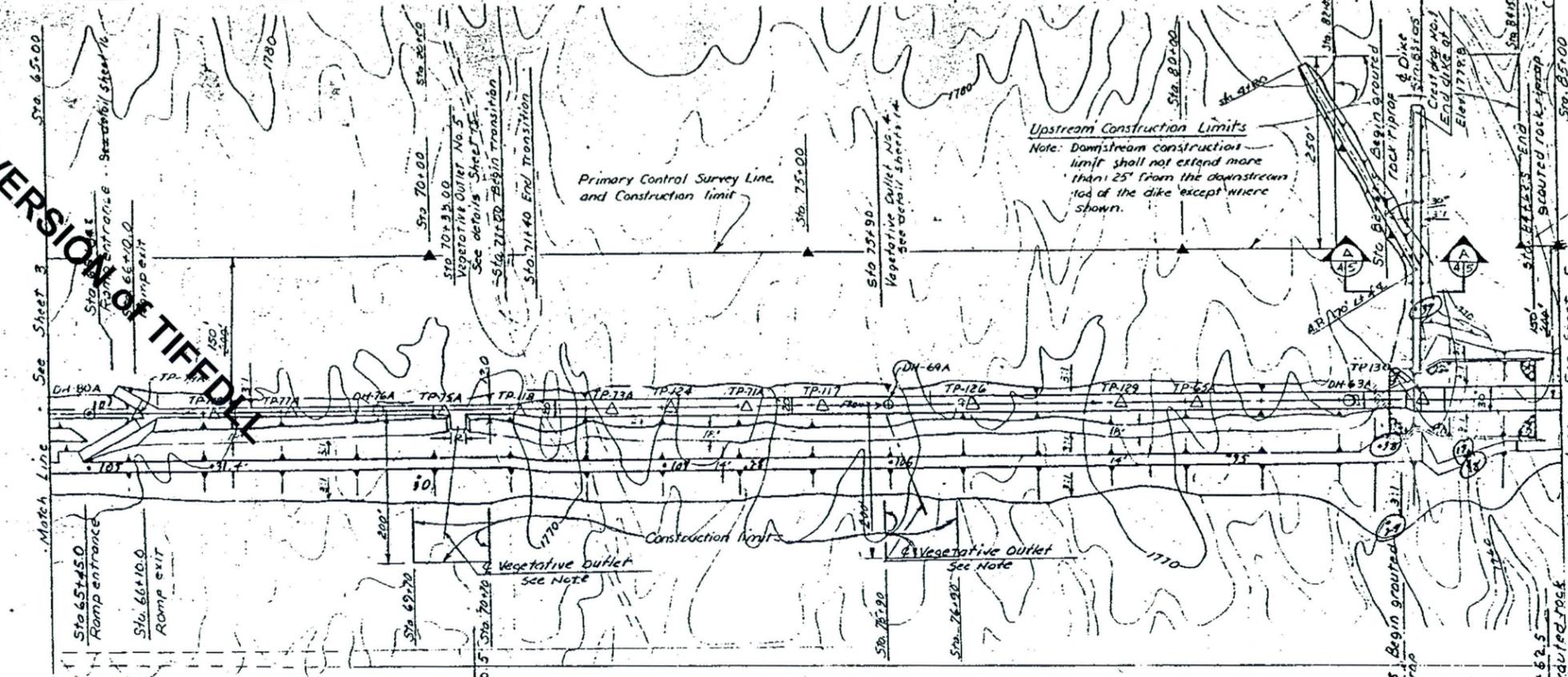
65+00
PLAN & PROFILE
 Sta 43+65 to Sta. 65+00
PASS MOUNTAIN DIVERSION
 BUCKHORN-MESA W.P.P.
 MARICOPA & PINAL COUNTIES, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed **WEP, S. DEP** 2-84 Date
 Drawn **E.L.L. JEB** 2-84 Title
 Traced **EFS** Sheet No. 3 Drawing No.
 Checked **DEP** 1-85 No. 3 83008-AZ-CH

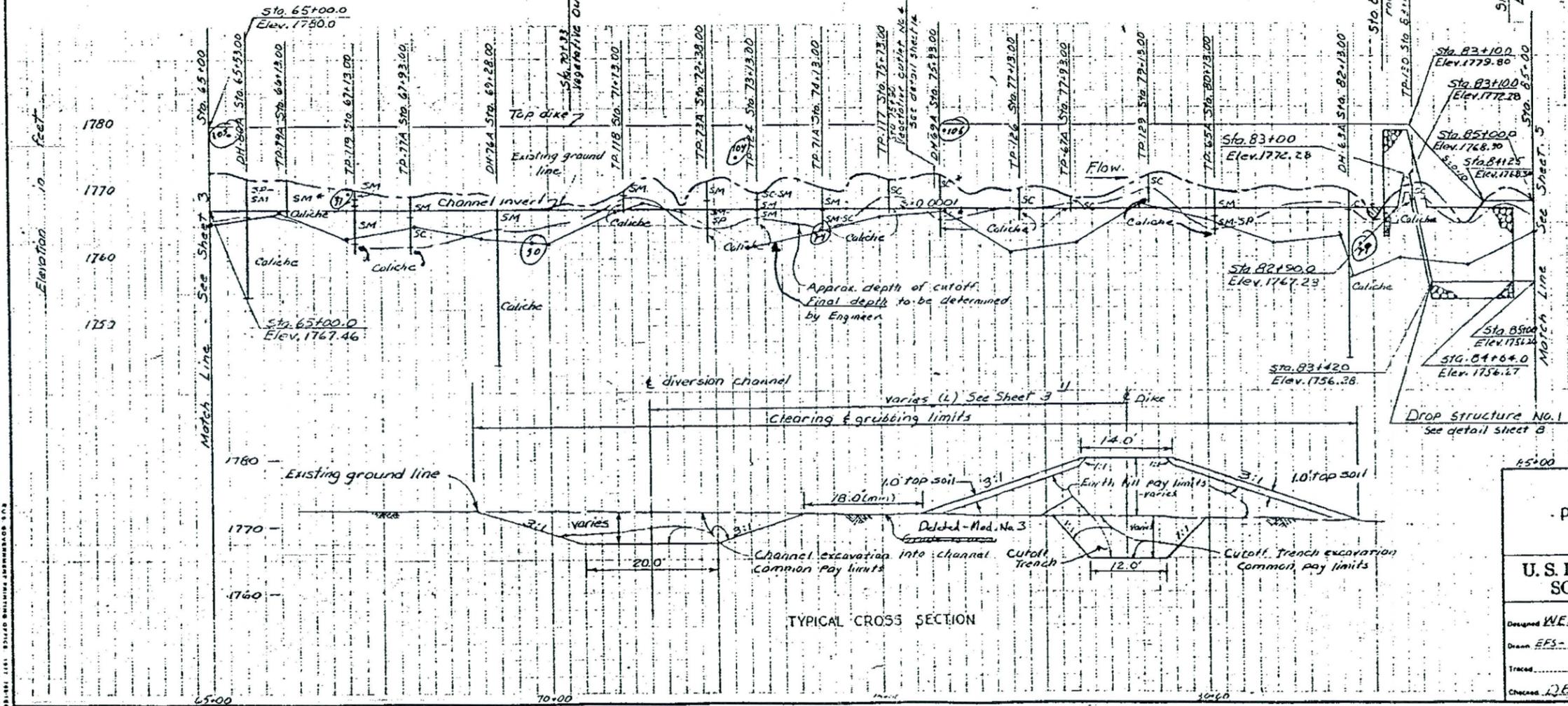
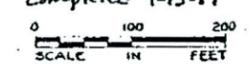
100' SCALE
 1" = 100' FEET

TRIAL VERSION OF TIED DIK



NOTE: Vegetative outlets - Locations are Approximate. Exact locations to be determined by the SCS Engineers.

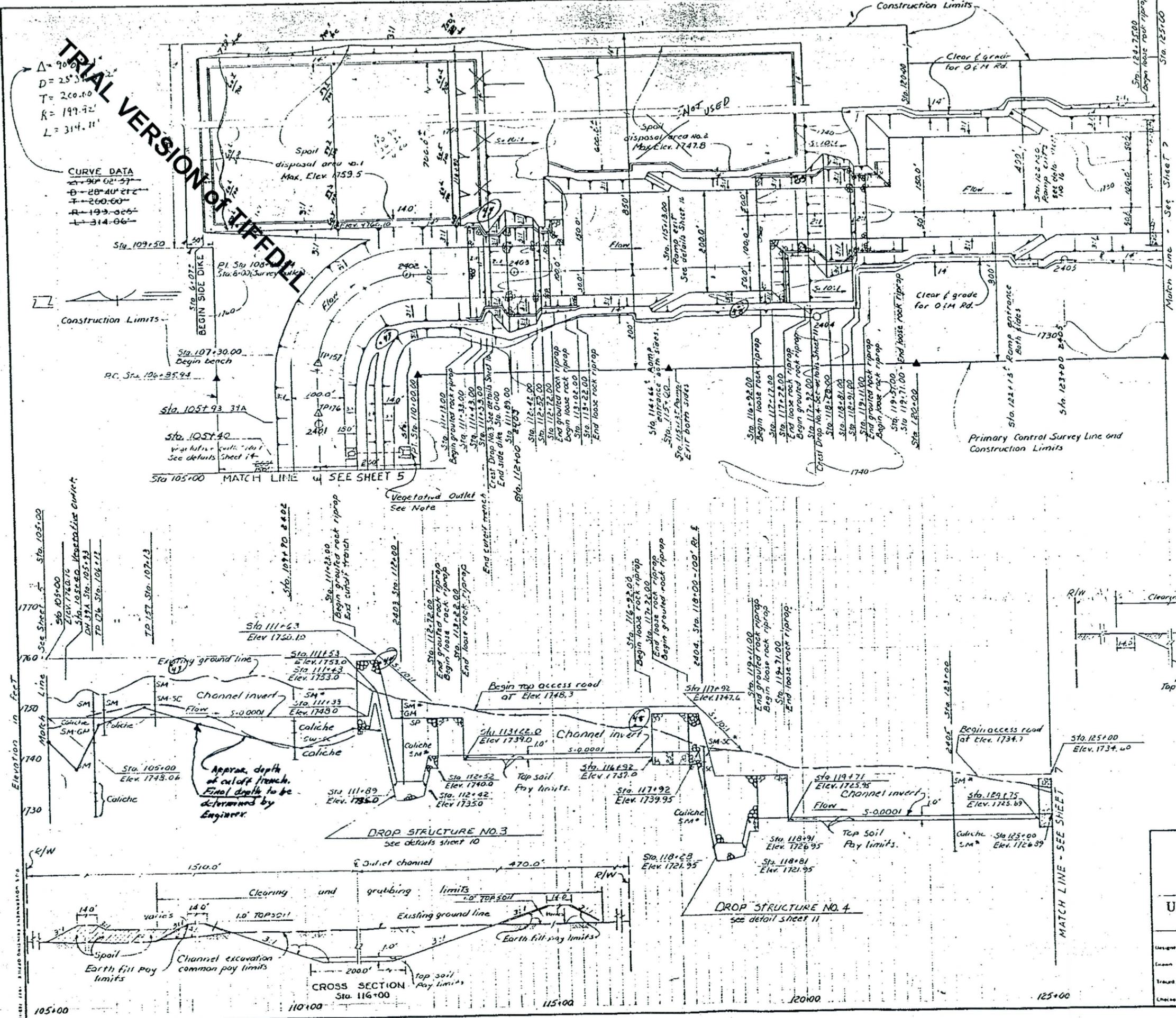
AS BUILT
Completed 1-13-87



| | | | |
|---|---------------------|-------|----------------------------|
| PLAN & PROFILE Sta 65+00 to Sta 85+00 | | | |
| PASS MOUNTAIN DIVERSION BUCKHORN - MESA W.R.P. MARICOPA & PINAL COUNTIES, ARIZONA | | | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | | | |
| Designed | WEP, J. DEP | Date | 2-84 |
| Drawn | EFS - P. Lord - JEB | Date | 2-84 |
| Traced | | Sheet | 4 |
| Checked | JEP | Date | 1-85 |
| | | | Drawing No. 83008-AZ-CH |

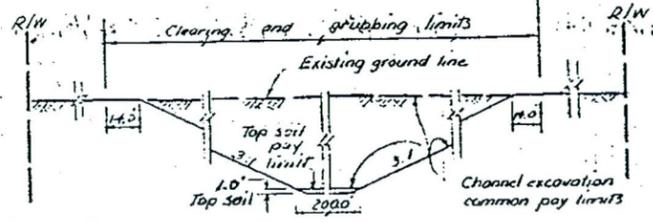
$\Delta = 90^\circ$
 $D = 253.3'$
 $T = 200.00'$
 $R = 199.92'$
 $L = 314.11'$

CURVE DATA
 $\Delta = 90^\circ 02' 57''$
 $D = 253.30'$
 $T = 200.00'$
 $R = 199.92'$
 $L = 314.06'$



Note: Vegetative Outlets -
 Locations are approximate.
 Exact locations to be
 determined by Engineer
 in the field.

AS BUILT
 Completed 1-13-87



CROSS SECTION
 Sta. 120+00

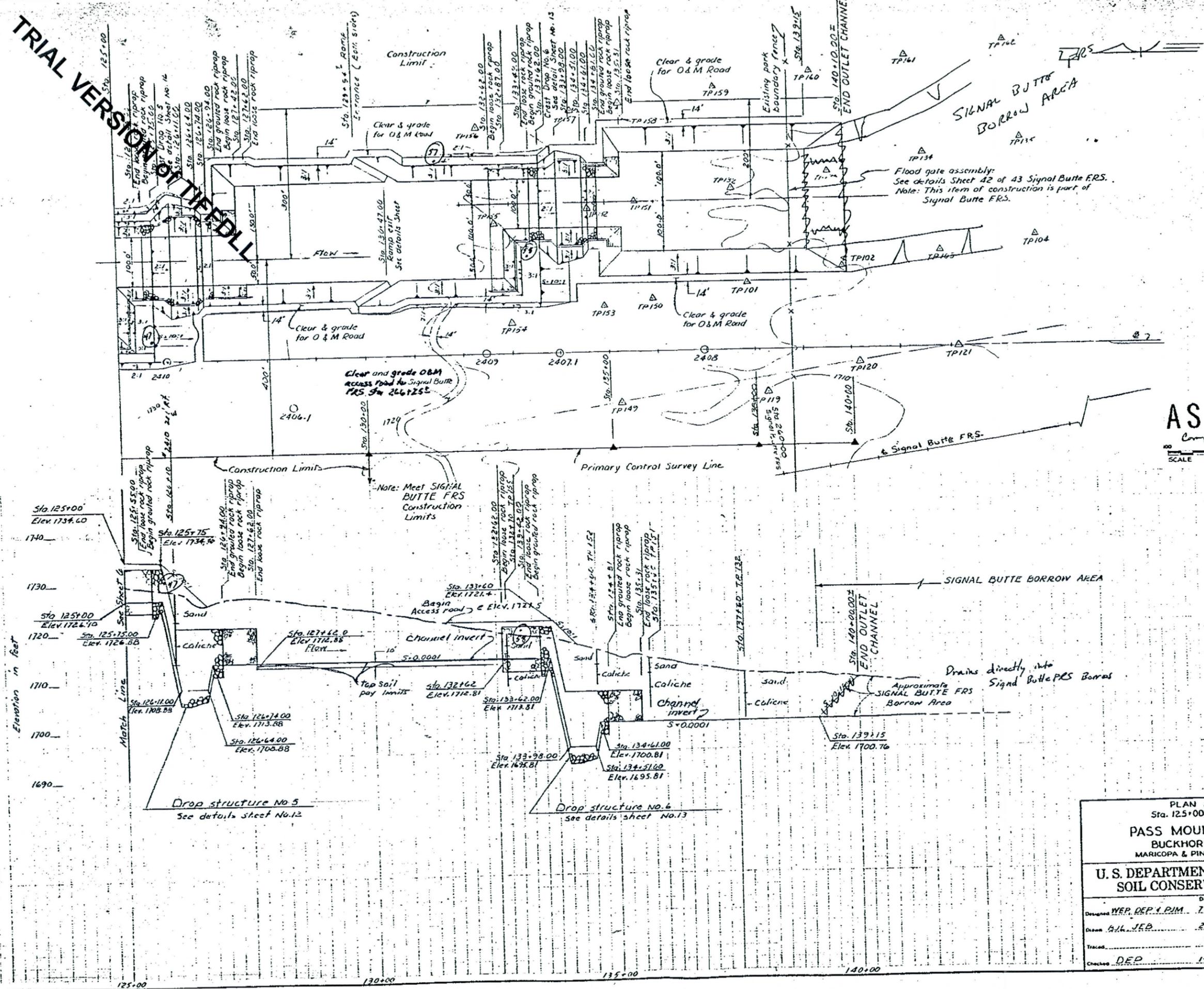
Elevation in Feet

MATCH LINE - SEE SHEET 5

MATCH LINE - SEE SHEET 7

| | | | |
|---|----------------|-------------|-------------|
| PLAN & PROFILE Sta. 105+00 to Sta. 125+00 PASS MOUNTAIN OUTLET BUCKHORN - MESA WPP MARICOPA & PINAL COUNTIES, ARIZONA U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | | | |
| Designed | WEP, DEP & PIM | Date | 7-83 |
| Drawn | B.L., J.E.B. | Approved by | Line |
| Traced | E.F.S. | Date | 2-84 |
| Checked | J.E.P. | Sheet | 6 of 7 |
| | | | 83008-AZ-CH |

TRIAL VERSION OF THE FLL



AS BUILT
Completed 1-13-87

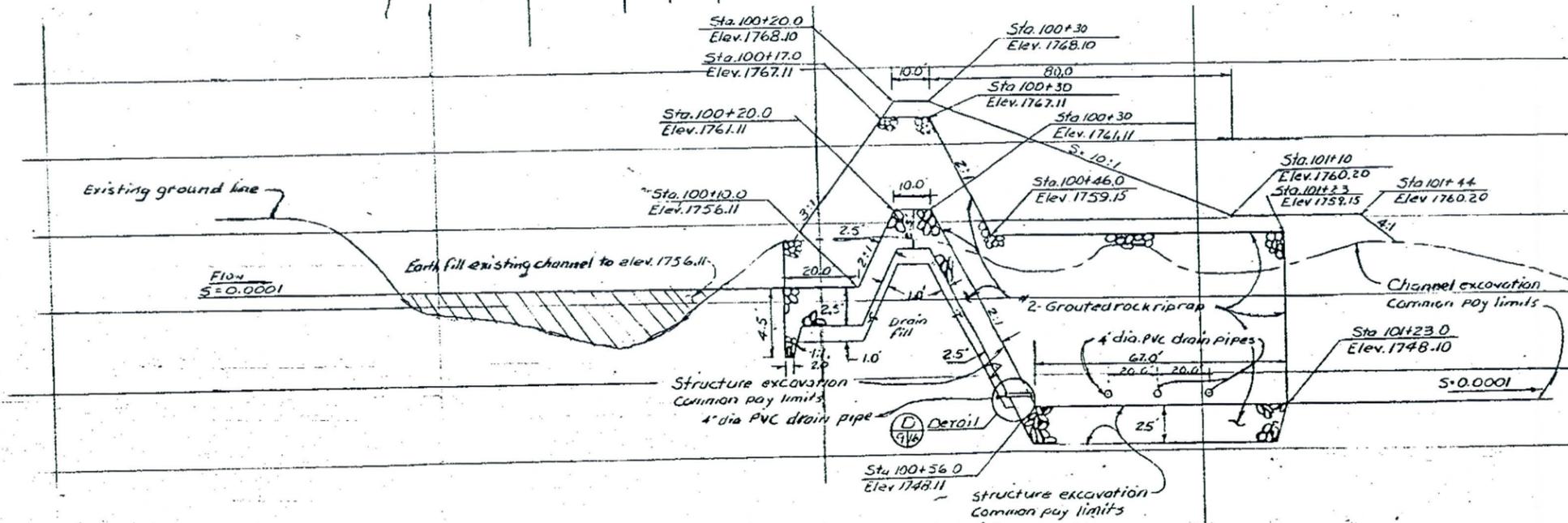
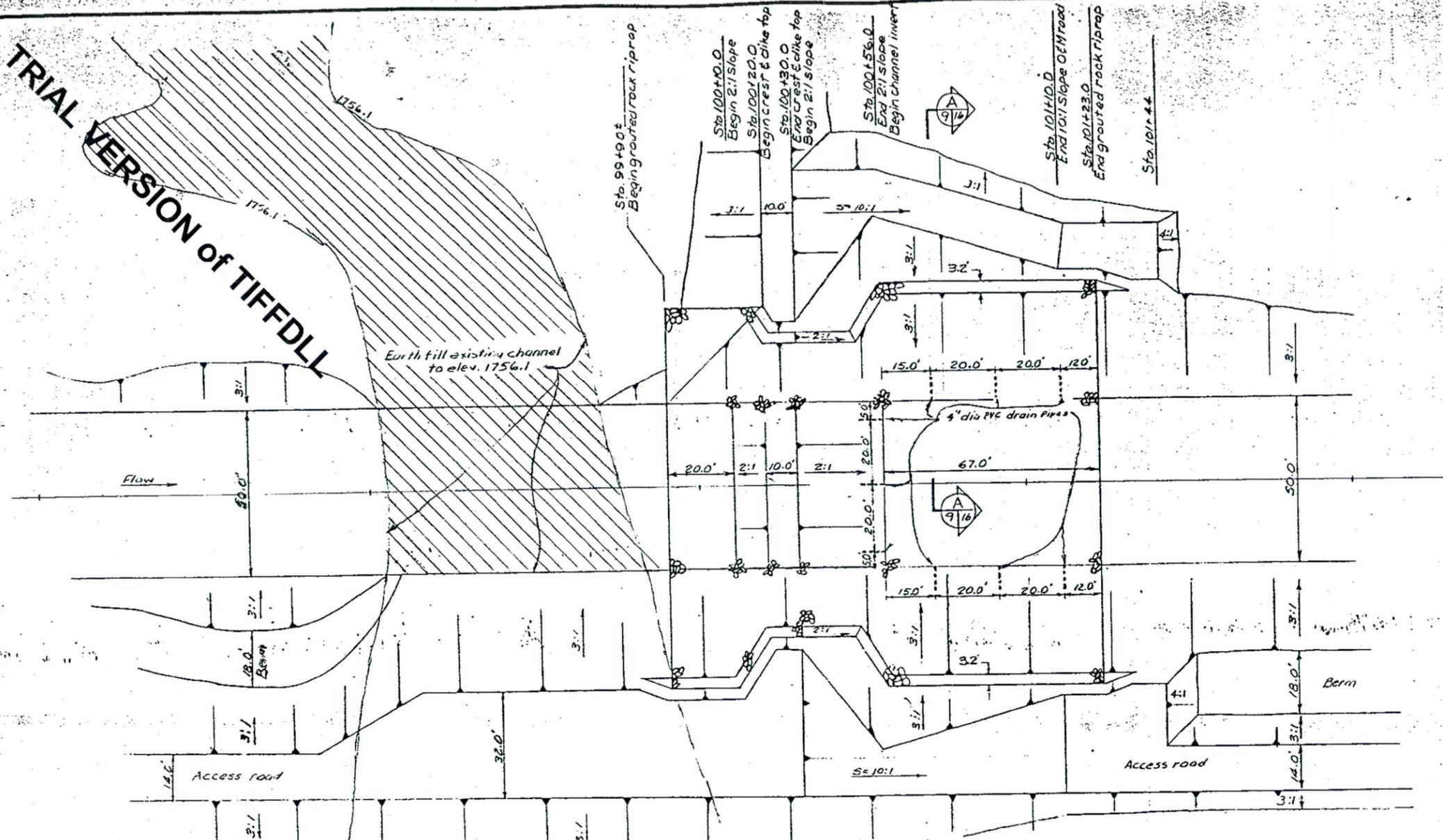
SCALE 0 100 200
IN FEET

Elevation in feet

| | |
|--|-------------------------|
| PLAN & PROFILE Sta. 125+00 to Sta. 138+00 | |
| PASS MOUNTAIN OUTLET BUCKHORN-MESA W.P.P. MARICOPA & PINAL COUNTIES, ARIZONA | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | |
| Designed: WEP, DEP. J. P. M. | Date: 7-83 |
| Drawn: B.L. J.E.P. | Title: 284 |
| Traced: _____ | Title: _____ |
| Checked: DEP | Date: 1-85 |
| Sheet No. 7 | Drawing No. 83008-AZ-CH |

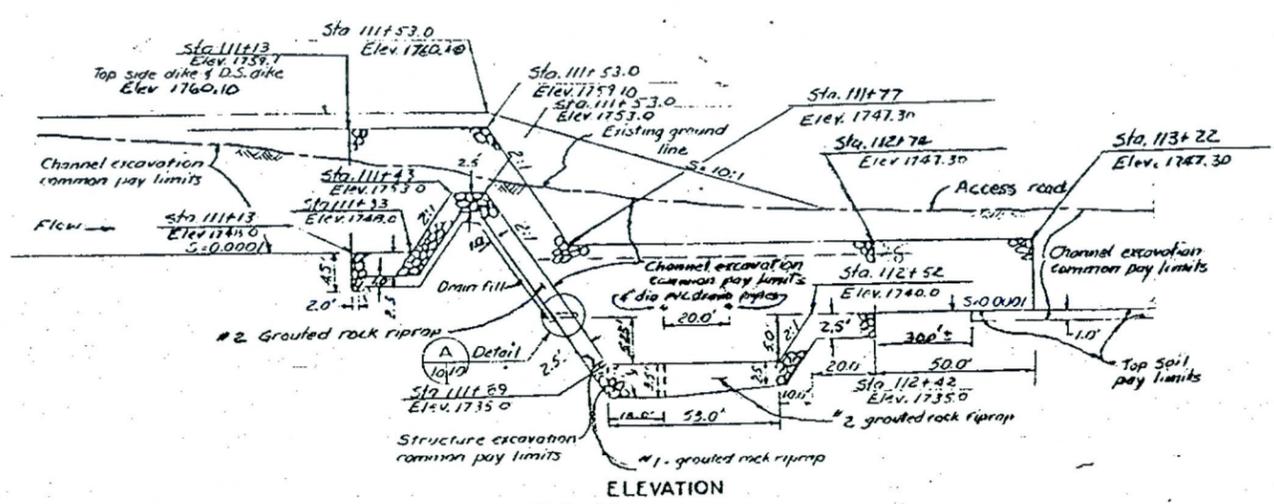
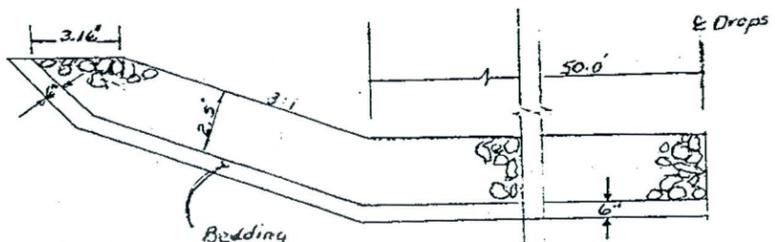
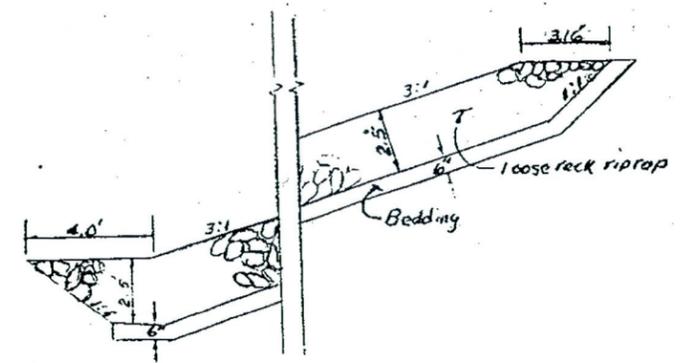
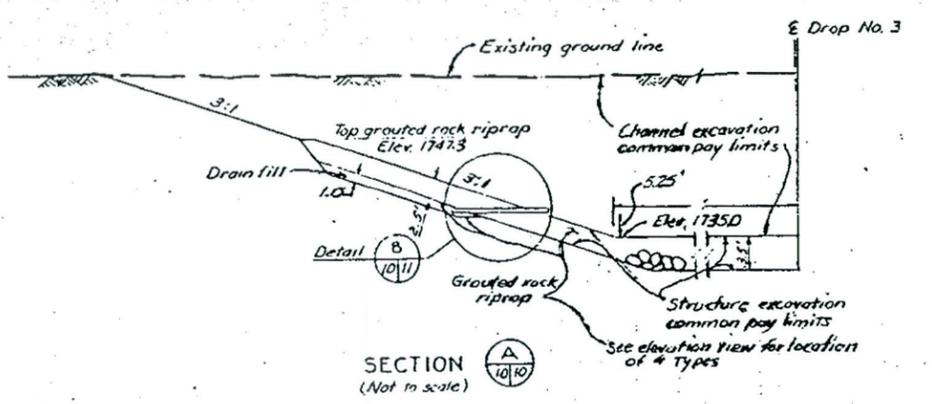
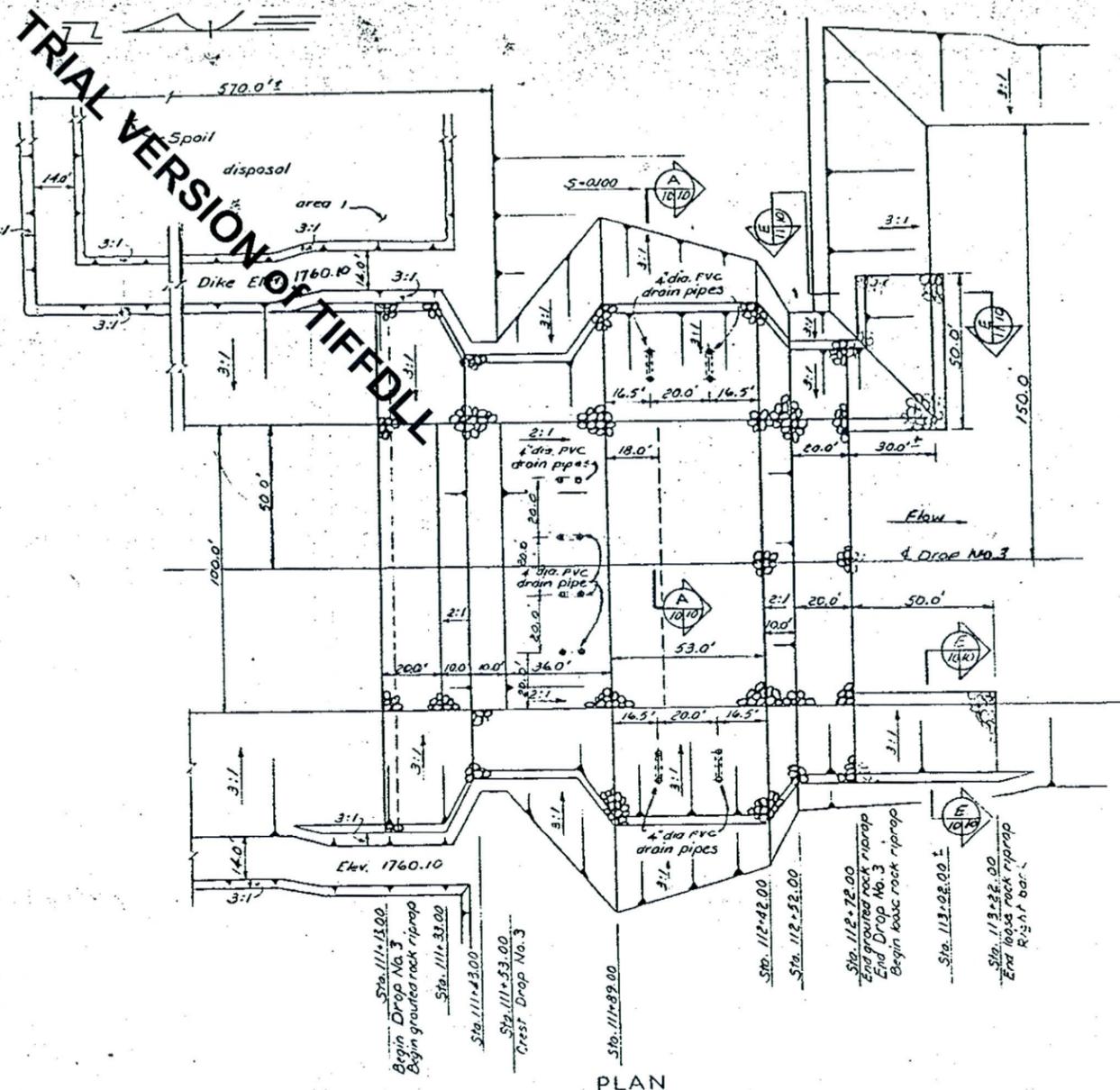
SHEET 555 - 23100 DRAWING INSTRUMENT 578

TRIAL VERSION of TIFD L L



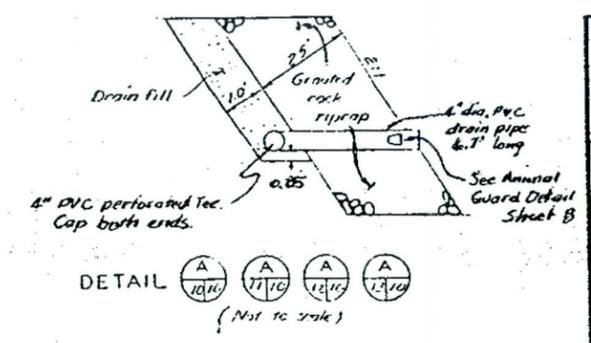
AS BUILT
Completed 1-13-97

| | | | |
|---|--------------|-------------|-------------|
| DROP STRUCTURE NO. 2 DETAILS | | | |
| PASS MOUNTAIN DIVERSION BUCKHORN-MESA W.P.P. MARICOPA & PINAL COUNTIES, ARIZONA | | | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | | | |
| Designed | DEP | Date | 2-84 |
| Drawn | J.E.B.F.B.L. | Title | 2-84 |
| Traced | | Sheet | No 9 of 77 |
| Checked | DEP | Drawing No. | 83008-AZ-CH |



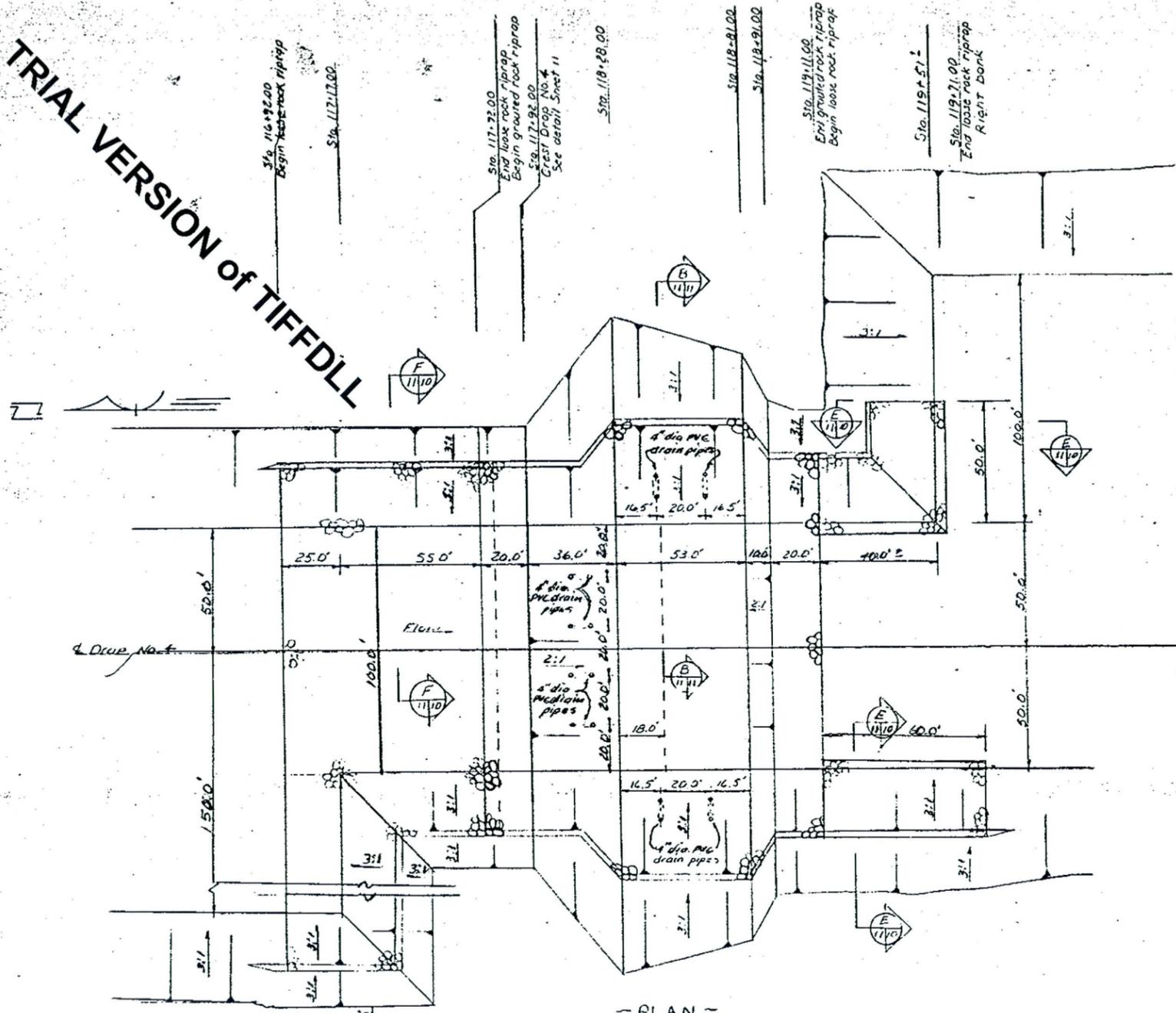
Notes: See stations and dimensions on elevation

AS BUILT
Completed 1-13-83
SCALE IN FEET

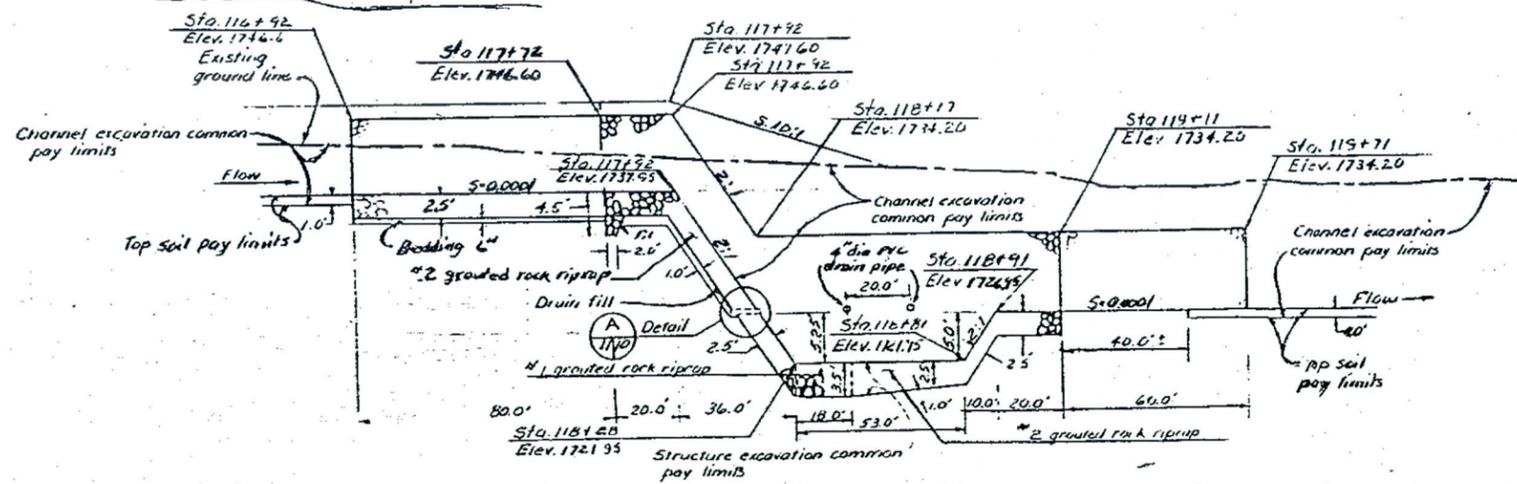


| | |
|--|-------------------------|
| DROP STRUCTURE FIG. 7 DETAILS | |
| PASS MOUNTAIN OUTLET PUCKHORN-MESA WRP COCHISE & TULSA COUNTIES, ARIZONA | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | |
| Designed: WTP, DEP, PIM | Date: |
| Drawn: E.C. | Scale: 3/8" |
| Traced: E.C.S. | Title: |
| Checked: [Signature] | Sheet No. 10 of 11 |
| | Drawing No. B3008-AZ-CH |

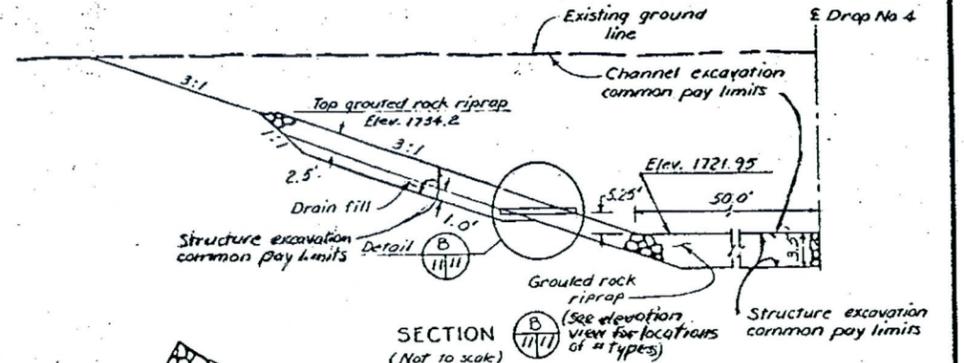
TRIAL VERSION of TIFDILL



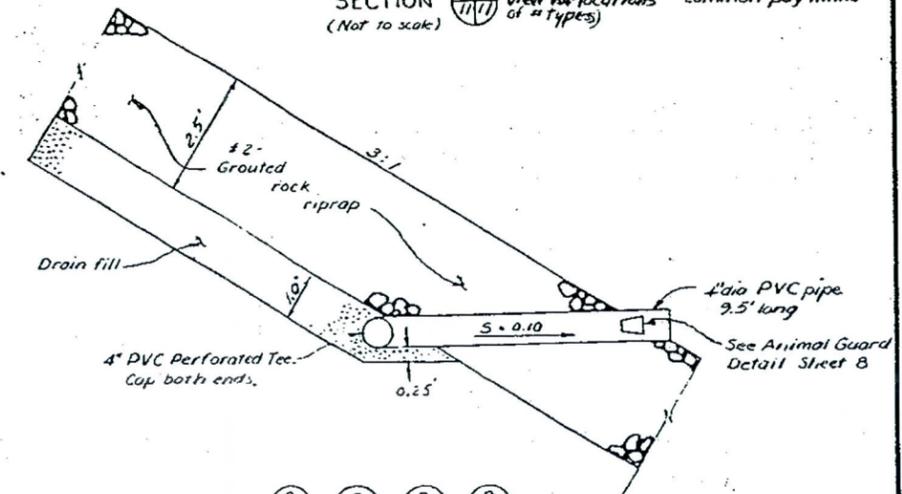
- PLAN -



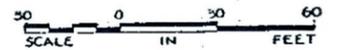
ELEVATION



SECTION B-B (Not to scale)



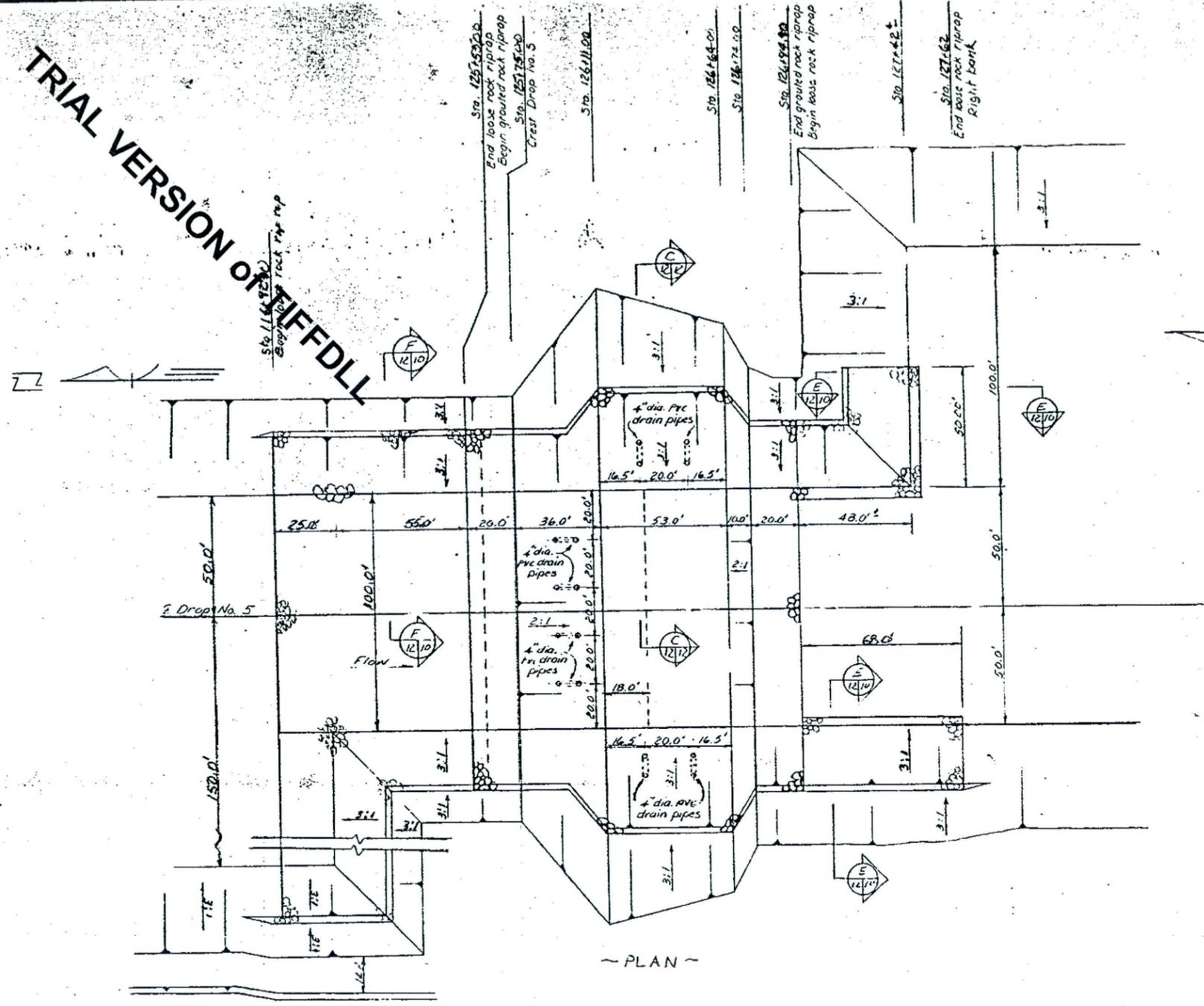
DETAIL B-10, B-11, B-12, B-13 (Not to scale)



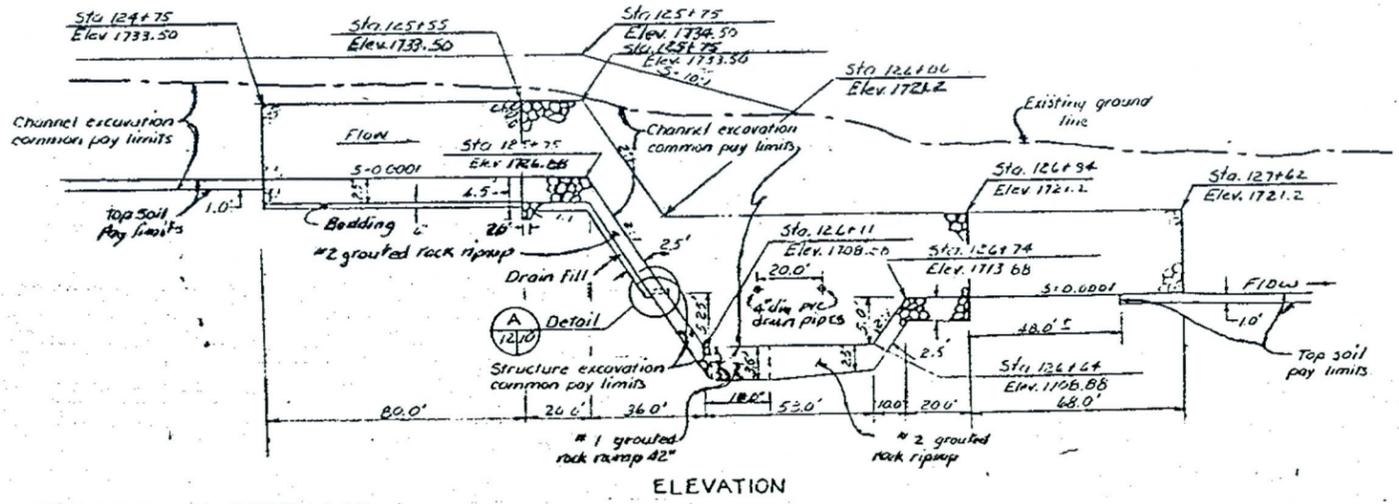
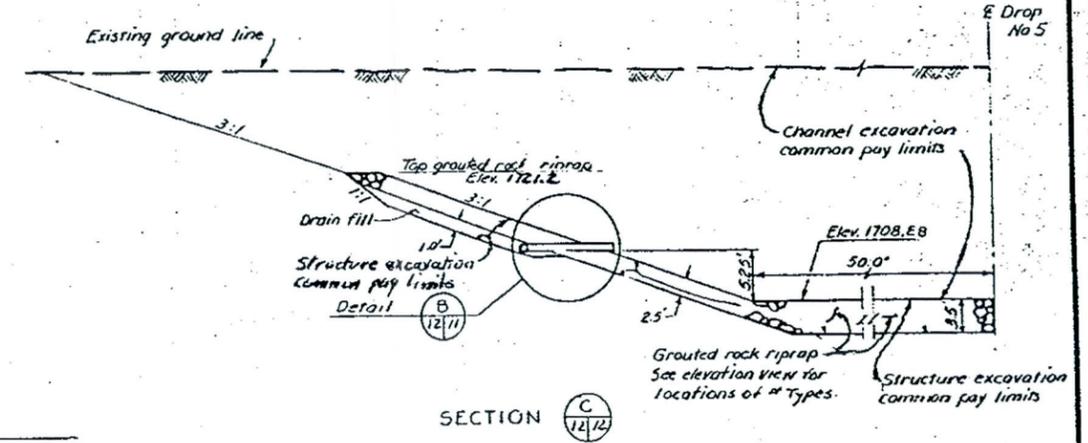
| DROP STRUCTURE NO 4 DETAILS | | | |
|--|-------------|-------------|-------------|
| PASS MOUNTAIN OUTLET BUCKHORN - MESA W.P.P. MARICOPA & PINAL COUNTIES, ARIZONA | | | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | | | |
| Designed | WED DEP PJM | Date | 12-83 |
| Drawn | A.L. | Date | 2-84 |
| Traced | E.E.S. | Date | |
| Checked | DEP | Date | 1-25 |
| | | Sheet | 11 of 17 |
| | | Drawing No. | 83008-AZ-CH |

AS BUILT
Completed 1-13-97

TRIAL VERSION OF TIFDILL



~ PLAN ~



ELEVATION

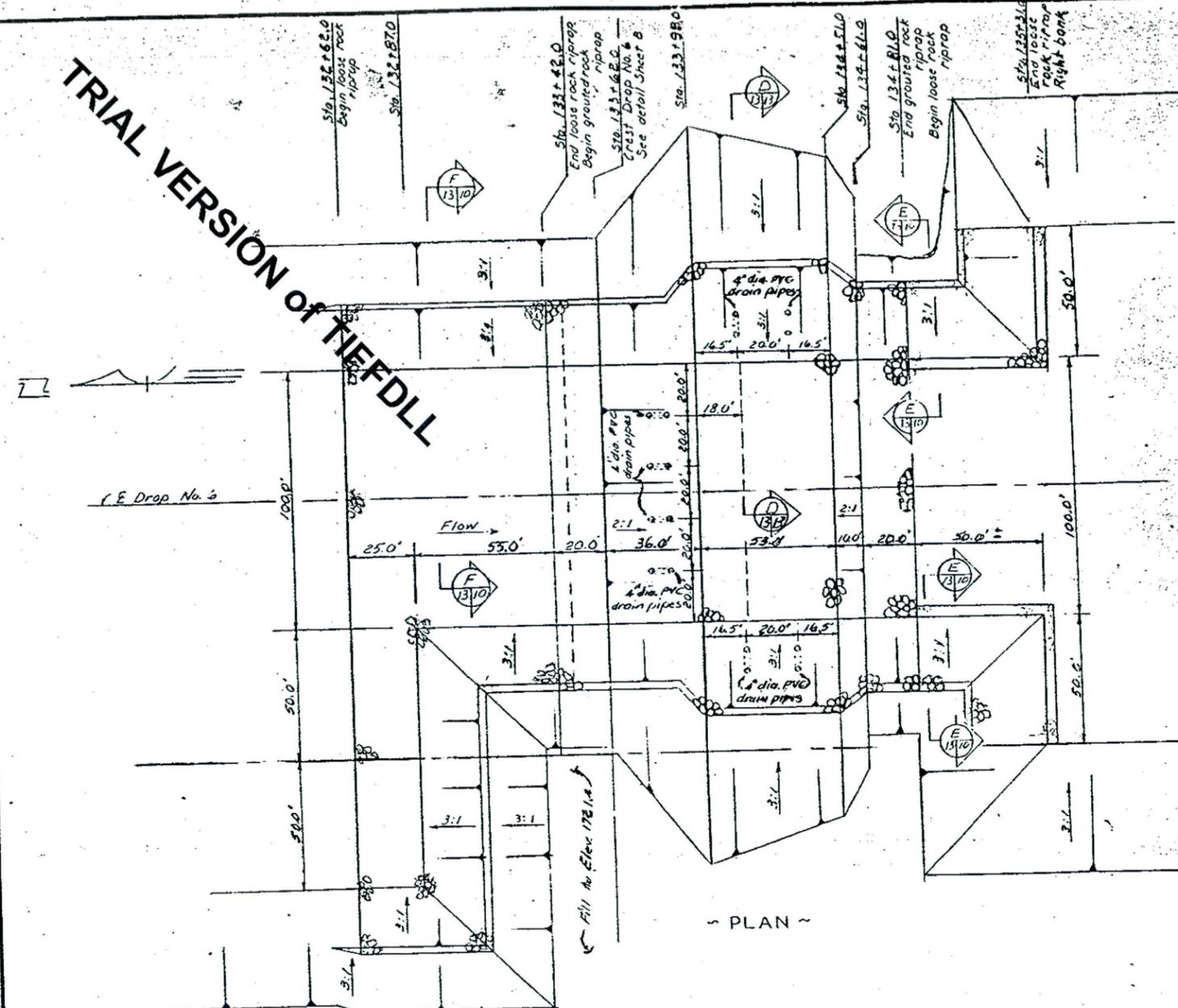
AS BUILT

Completed 1-13-97

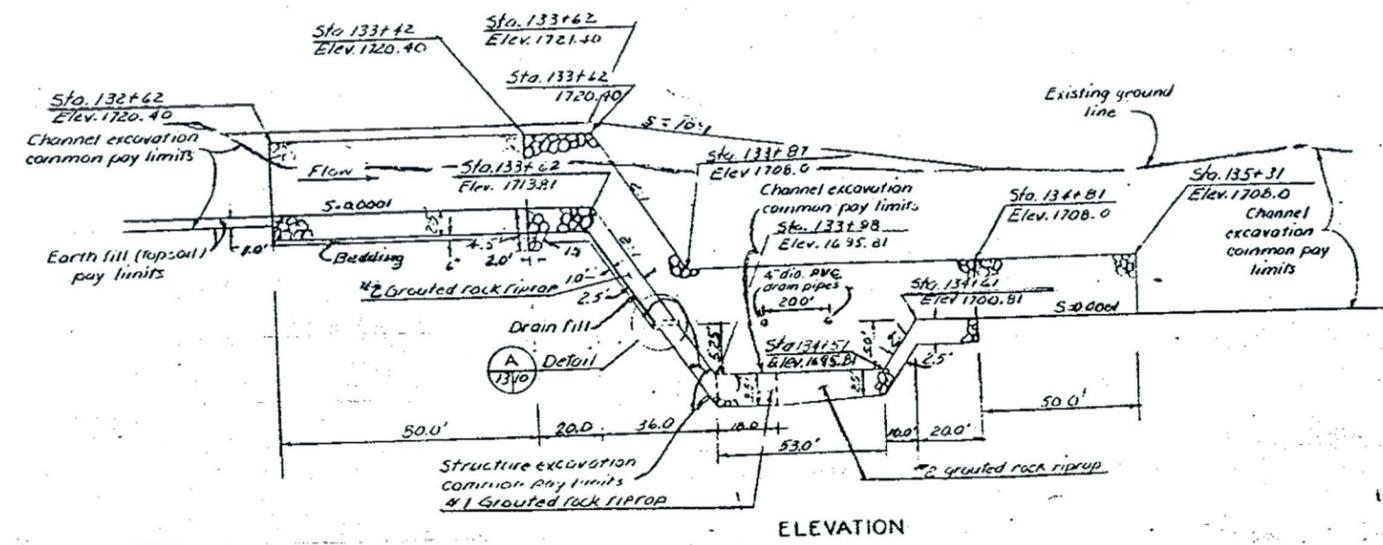
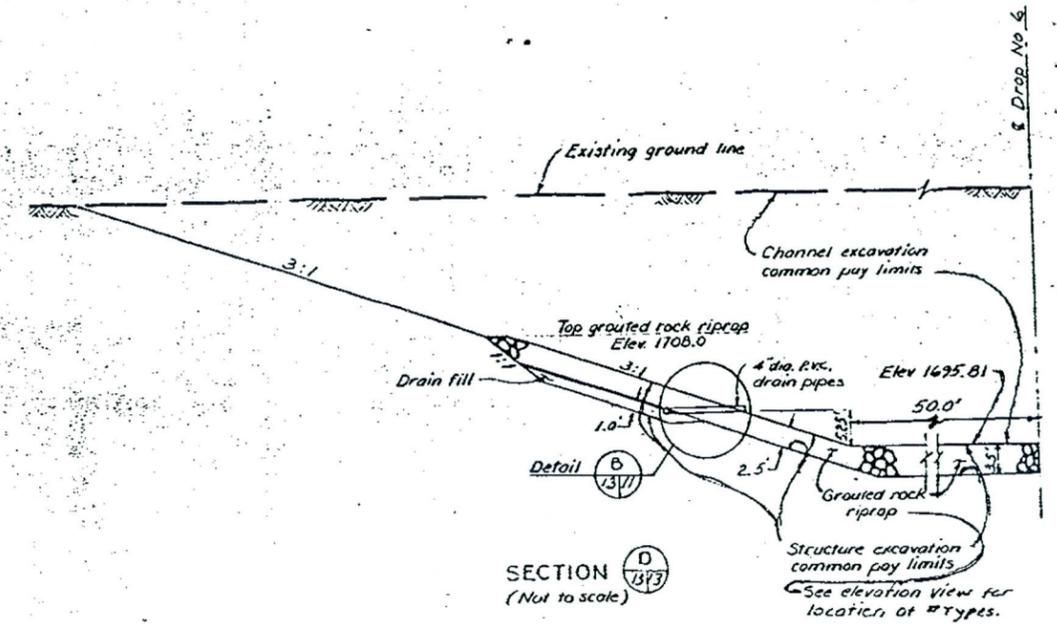
SCALE 30 IN FEET

| | | | |
|--|--------------|-------------------------|--------|
| DROP STRUCTURE NO. 5 DETAILS | | | |
| PASS MOUNTAIN OUTLET BUCKHORN-MESA W.P.P. MARICOPA & PINAL COUNTIES, ARIZONA | | | |
| U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | | | |
| Designed: WLD D.F. PJM | Date: | Approved By: | Title: |
| Drawn: B.L. | 3-88 | | |
| Traced: FFS | | | |
| Checked: JEP | 1-25 | | |
| | Sheet No. 12 | Drawing No. 83008-AZ-CH | |
| | of 17 | | |

TRIAL VERSION of TIEDLL

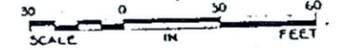


~ PLAN ~



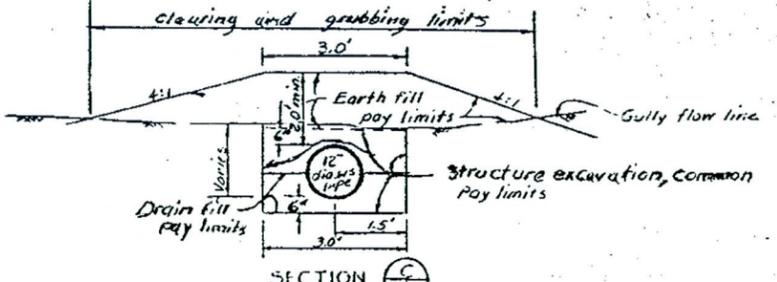
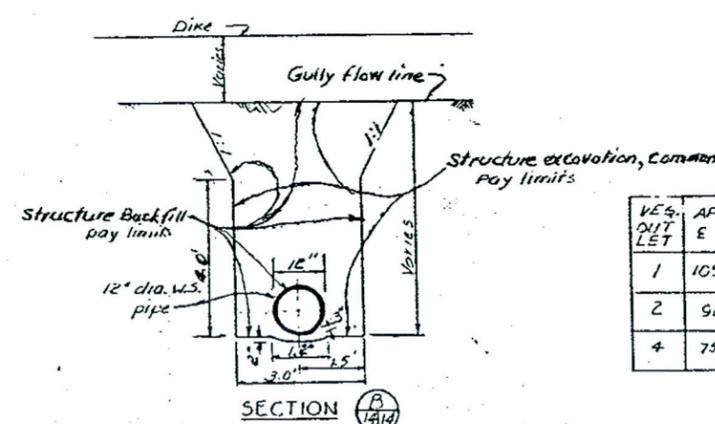
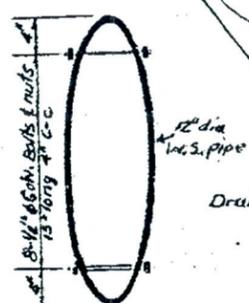
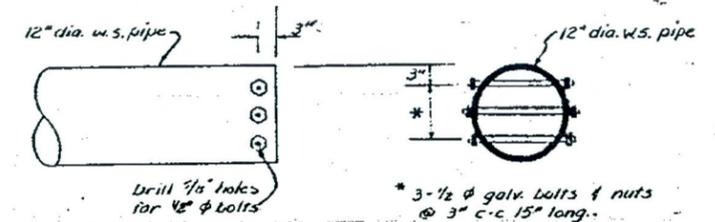
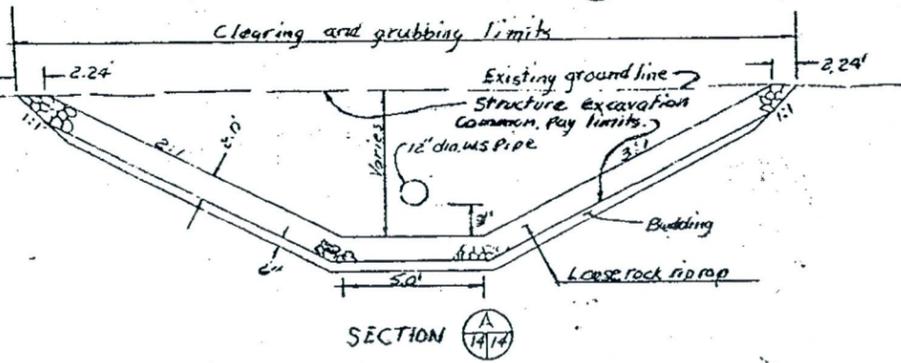
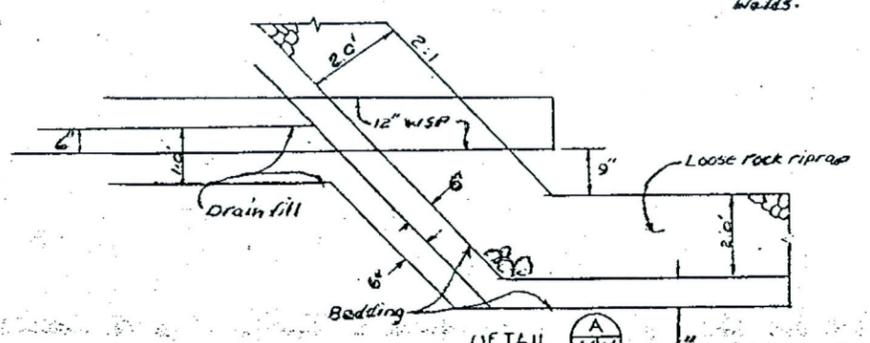
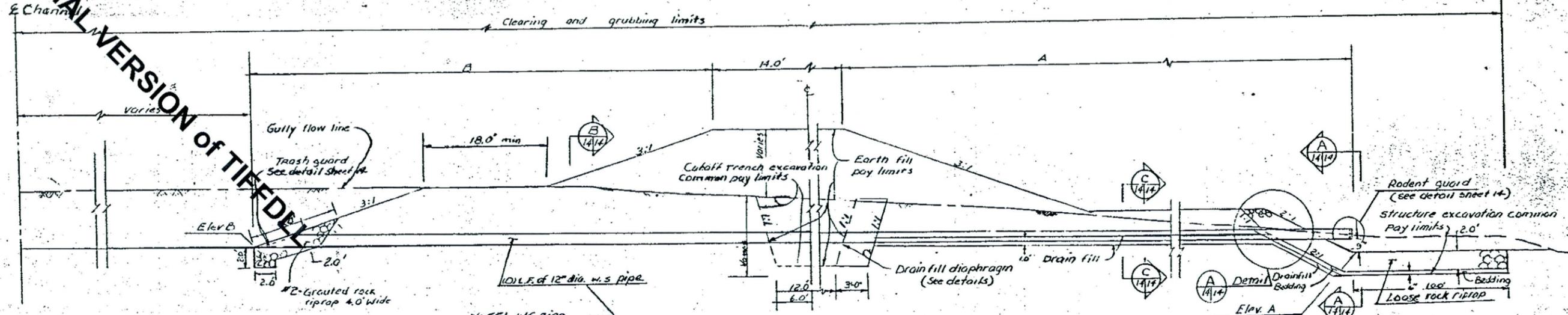
ELEVATION

AS BUILT
completed 1-13-97



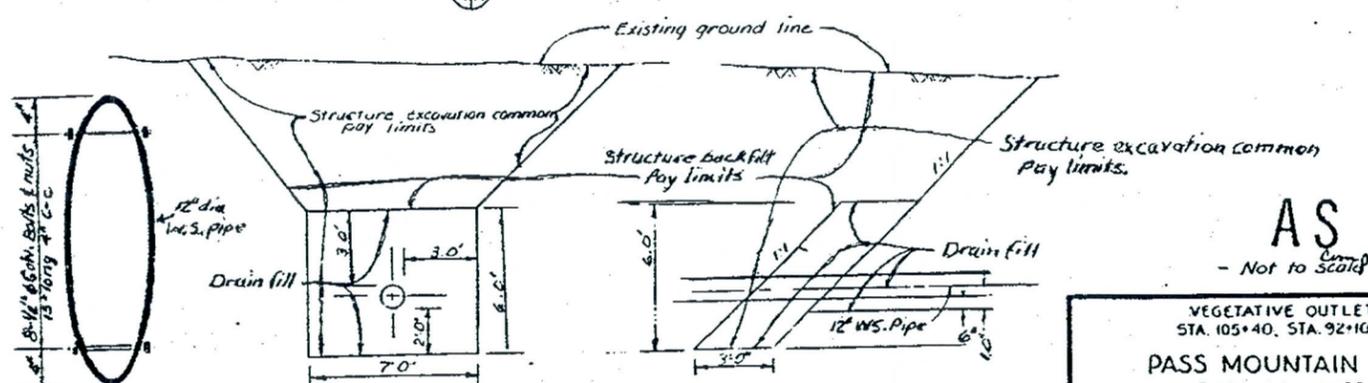
| | |
|--|-------------|
| DROP STRUCTURE NO. 6 DETAILS | |
| PASS MOUNTAIN OUTLET BUCKHORN-MESA W.P.P. MARICOPA & PINAL COUNTIES, ARIZONA | |
| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | |
| Designed: WEP, DEP, DJM | Date: _____ |
| Drawn: B.L. | Title: 2-84 |
| Traced: E.F.S. | Title: 2-84 |
| Checked: DEP | Date: 1-85 |
| Drawing No. 83008-AZ-CH | |

TRIAL VERSION OF TIE DEL



LAYOUT DATA

| VEG. OUT LET | APPROX. E STA. | APPROX. ELEVATIONS | | DIMENSIONS | | | |
|--------------|----------------|--------------------|--------|------------|----|---|-----|
| | | A | B | A | B | C | D |
| 1 | 105+40 | 1747.0 | 1748.1 | 54 | | | 142 |
| 2 | 92+10 | 1754.0 | 1756.2 | 62 | 54 | | 130 |
| 4 | 75+90 | 1766.0 | 1767.4 | 62 | 54 | | 147 |



AS BUILT
- Not to scale -
Completed 1-13-87

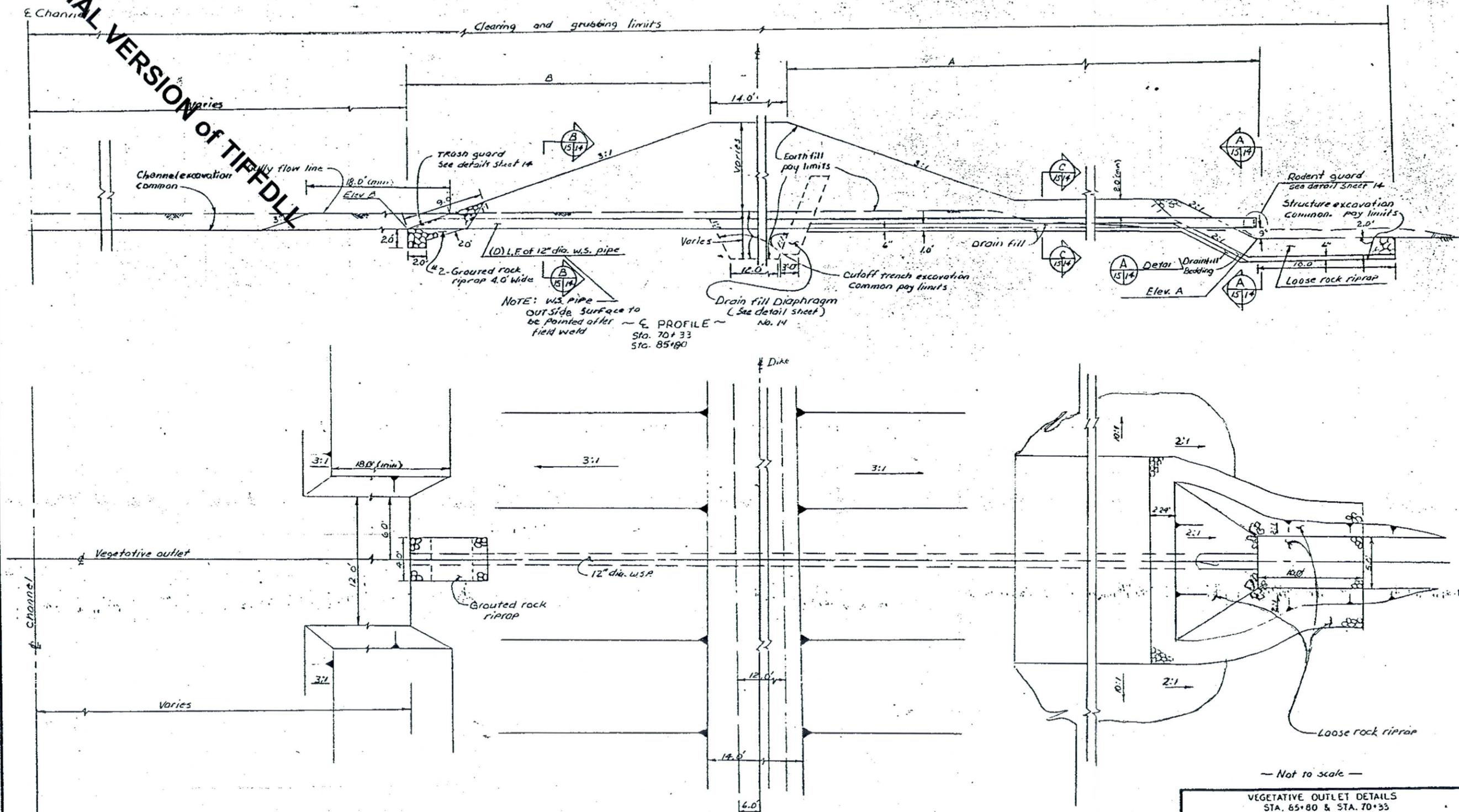
VEGETATIVE OUTLET DETAILS
STA. 105+40, STA. 92+10 & STA. 75+90

PASS MOUNTAIN DIVERSION
BUCKHORN - MESA W.P.P.
MARICOPA & PINAL COUNTIES, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

| | | |
|--------------------|---------|-------------------------|
| Designed: WEP & DP | Date: | Approved by: |
| Drawn: B. Lloyd | 3-84 | Title: |
| Traced: | | Title: |
| Checked: DEP | 1-13-87 | Sheet: No. 14 of 17 |
| | | Drawing No. 63005-AZ-CH |

TRIAL VERSION of TIFDLI



LAYOUT DATA

| VEG. OUT LET | APPROX. STA. | APPROX. ELEVATIONS | | DIMENSIONS | | |
|--------------|--------------|--------------------|--------|------------|----|-----|
| | | A | B | A | B | D |
| 3 | 85+80 | 1752.0 | 1752.3 | 68 | 36 | 118 |
| 5 | 70+33 | 1769.0 | 1767.4 | 64 | 40 | 118 |

~ PLAN ~

— Not to scale —

AS BUILT
Completed 1-13-87

VEGETATIVE OUTLET DETAILS
STA. 65+80 & STA. 70+33

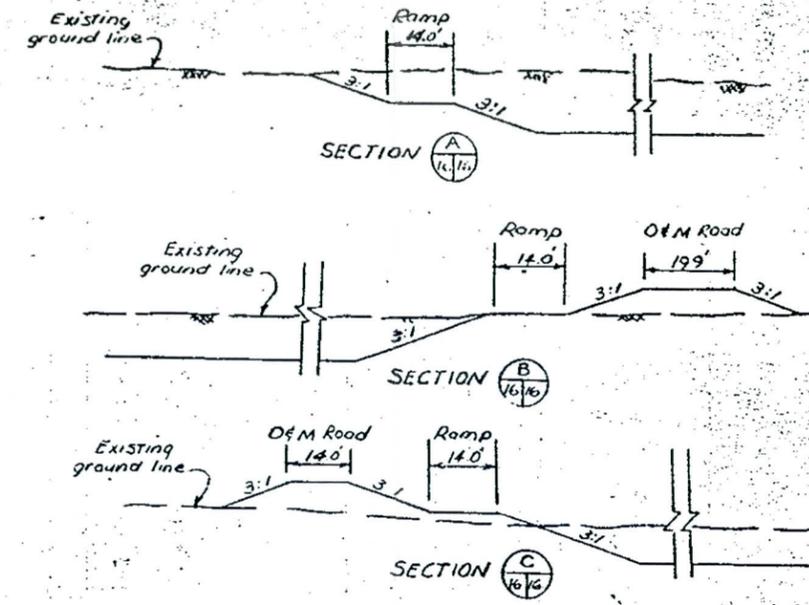
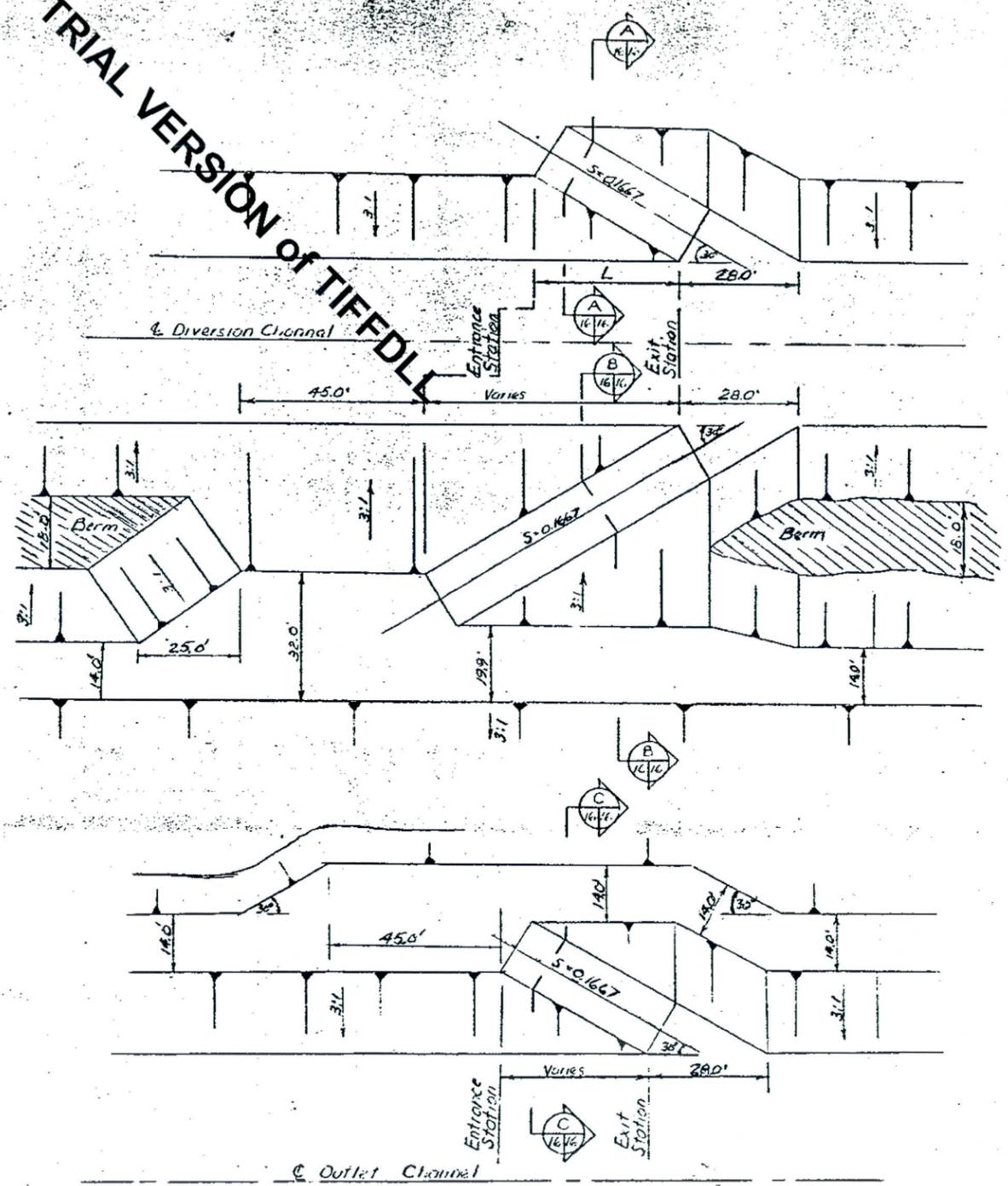
PASS MOUNTAIN DIVERSION
BUCKHORN - MESA W.F.P.
MARICOPA & PINAL COUNTIES, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

| | | |
|---------------------------------|------------------|------------------------------|
| Designed <i>W.P. & D.P.</i> | Date <i>3-84</i> | Approved by _____ |
| Drawn <i>B. Lloyd</i> | Date <i>3-84</i> | Title _____ |
| Traced _____ | Title _____ | Drawing No. _____ |
| Checked <i>DEP</i> | Date <i>1-85</i> | Sheet <i>15</i> of <i>17</i> |

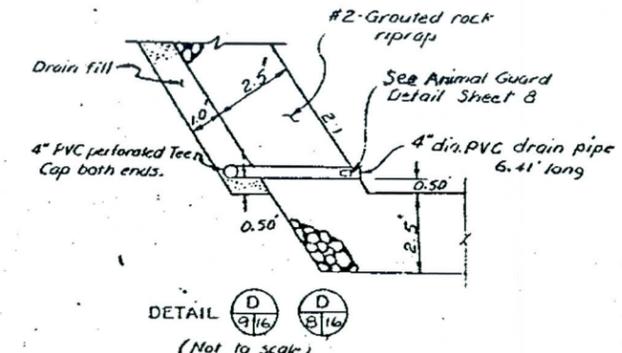
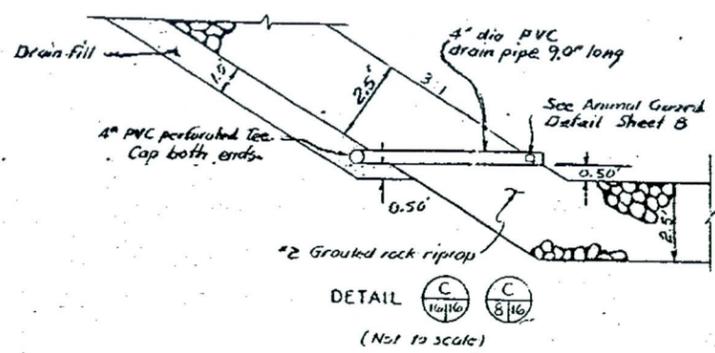
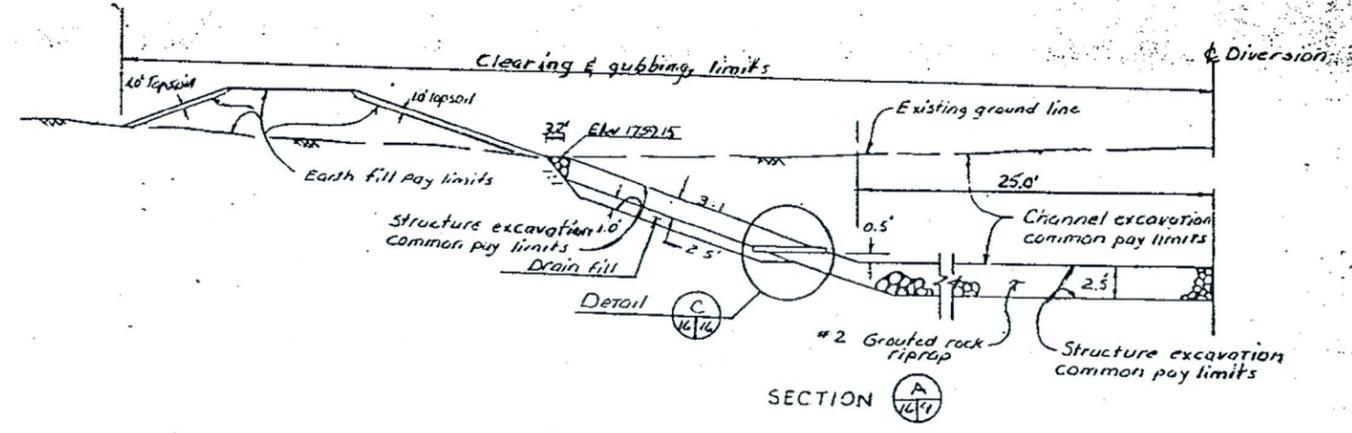
83008-AZ-CH

TRIAL VERSION OF TIFD L L



MAINTENANCE RAMP LOCATIONS & ELEVATIONS

| ENTRANCE STATION | ENTRANCE ELEV. | EXIT STATION | EXIT ELEV. | BANK LT-RT |
|------------------|----------------|--------------|------------|------------|
| 65+5 ± | 1779.96 ± | 66+10 | 1767.75 | Right |
| 65+84 ± | 1772.50 ± | 66+10 | 1767.75 | Left |
| 95+58 ± | 1768.15 ± | 96+20 | 1756.15 | Right |
| 95+84 ± | 1763.00 ± | 96+20 | 1756.15 | Left |
| 114+66 ± | 1749.00 ± | 115+13 | 1739.97 | LT-RT |
| 122+13 ± | 1735.90 ± | 122+60 | 1726.91 | LT-RT |
| 129+54 ± | 1724.00 ± | 130+47 | 1713.84 | LT-RT |
| 103+99 ± | 1760.10 ± | 104+61.5 | 1748.08 | Right |
| 104+20 ± | 1756.00 ± | 104+61.5 | 1748.08 | Left |



AS BUILT
Completed 1-13-97
(Not to scale)

MAINTENANCE RAMP & PVC PIPE DETAILS

PASS MOUNTAIN OUTLET
BUCKHORN-MESA W.P.P.
MARICOPA & PINAL COUNTIES, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed DEP
Drawn B.L.F. AD 3-84
Traced
Checked DEP 1-85

Date
Approved By
Title
Drawn
Traced
Sheet No 16 of 17
Drawing No. 83008-AZ-CH

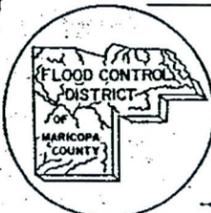
BUCKHORN-MESA WATERSHED

PASS MOUNTAIN DIVERSION AND OUTLET

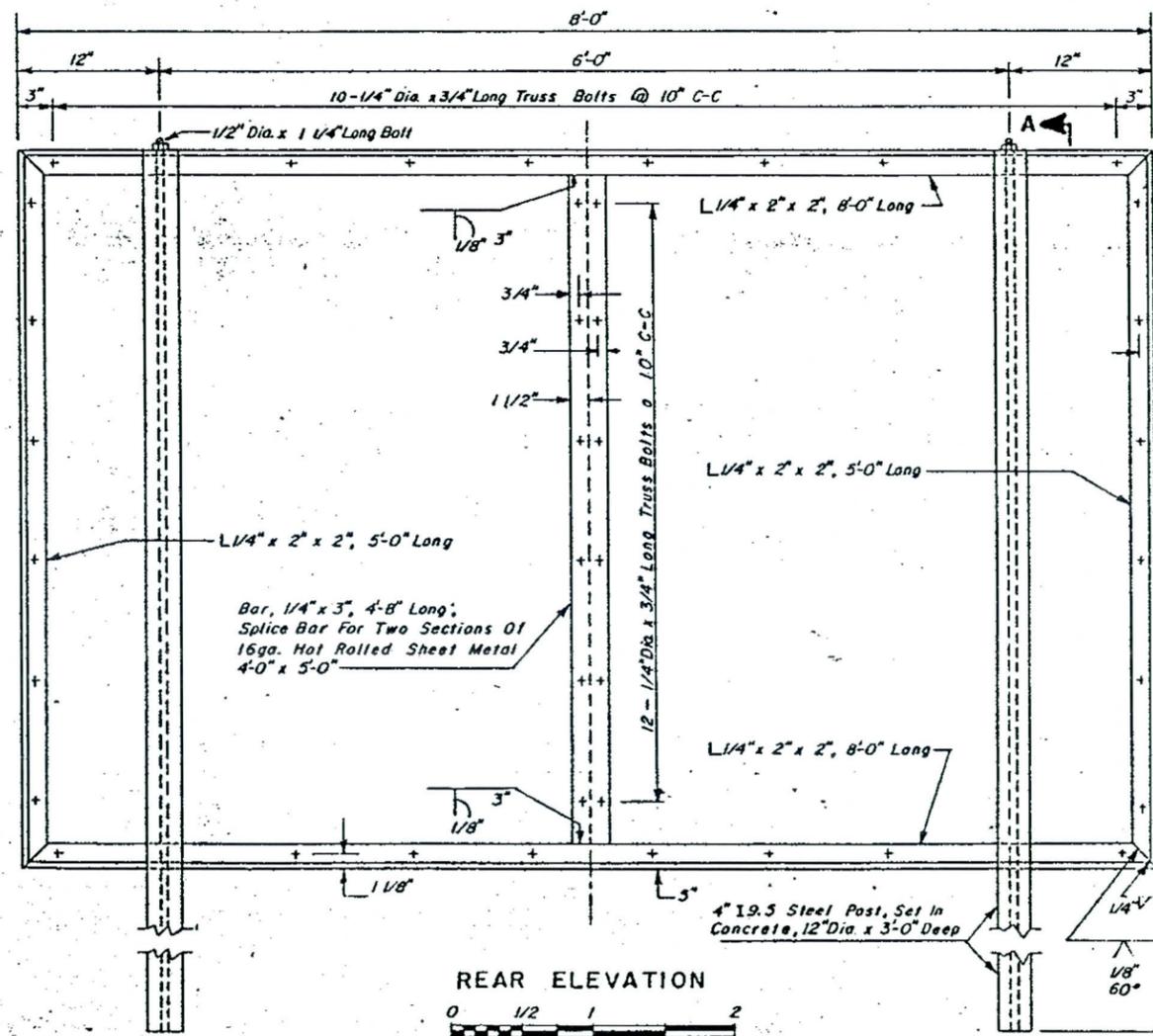
DRAINAGE AREA 3.98 SQUARE MILES
 DIVERSION CHANNEL LENGTH 6,635 FEET
 OUTLET CHANNEL LENGTH 2,800 FEET
 VOLUME OF EXCAVATION 295,000 CUBIC YARDS
 VOLUME OF EARTHFILL 170,000 CUBIC YARDS

BUILT UNDER THE WATERSHED PROTECTION
 AND FLOOD PREVENTION ACT

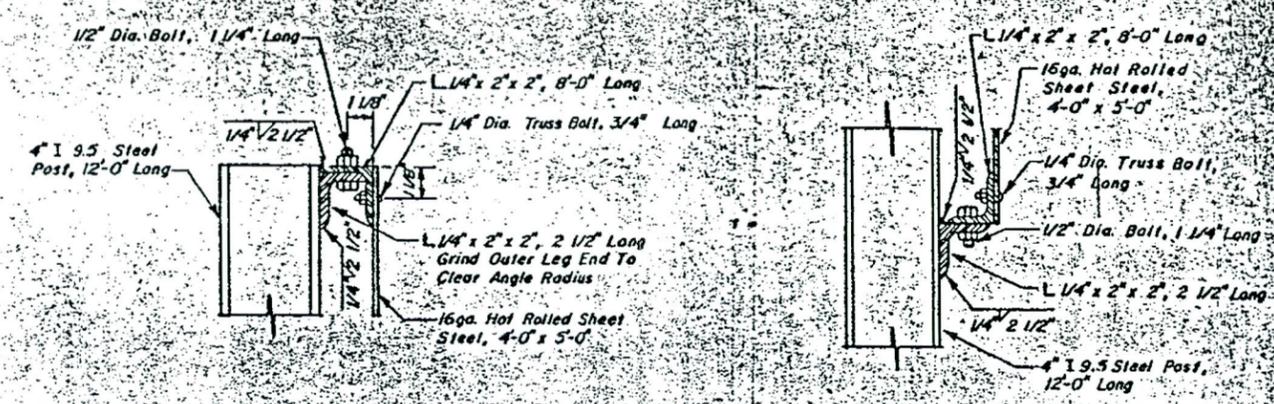
BY
 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 EAST MARICOPA N.R.C.D.
 BOARD OF SUPERVISORS OF PINAL COUNTY
 WITH THE ASSISTANCE OF
 SOIL CONSERVATION SERVICE
 OF THE
 U.S. DEPARTMENT OF AGRICULTURE
 1983



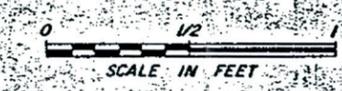
LETTERING LAYOUT



REAR ELEVATION
 SCALE IN FEET



DETAIL "A" DETAIL "B"



- NOTE:
- All bolts shall be installed with lock washers
 - All bolts, nuts, and washers to be galvanized
 - Approved spot or tack welding may be substituted for truss bolts in securing sign sheet steel sections to frame
 - Frame and sign shall be painted in accordance with construction specification 62.
 - All parts shall be painted with base coat before assembly.
 - Background of sign shall be painted with a white enamel.
 - Letters shall be painted with a dark green enamel.
 - Location of sign is shown on Sheet 2.

MATERIALS LIST

| ITEM | SIZE | LENGTH | QUANTITY |
|-----------------|----------------|--------|----------|
| L | 1/2" x 2" x 2" | 8'-0" | 2 |
| L | 1/2" x 2" x 2" | 5'-0" | 2 |
| L | 1/2" x 2" x 2" | 2 1/2" | 4 |
| 4" I Steel Post | 9.5 | 12'-0" | 2 |
| Machine Bolts | 1/2" | 1 1/4" | 4 |
| Truss Bolts | 1/4" | 3/4" | 44 |

16ga. Hot Rolled Sheet Steel, 4'-0" x 5'-0", Two Required



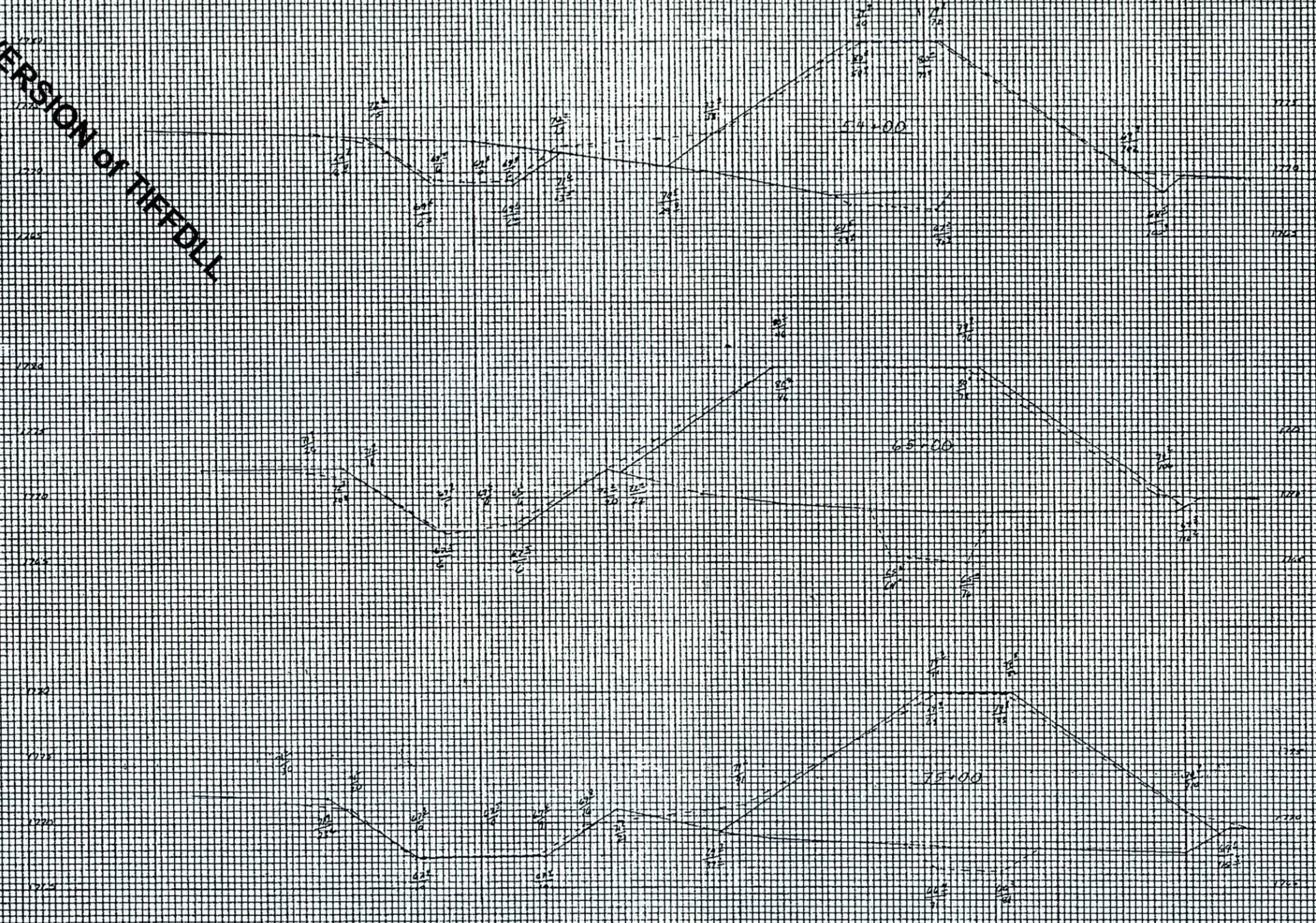
AS BUILT
 Completed 1-13-87

IDENTIFICATION SIGN
 PASS MOUNTAIN DIVERSION AND OUTLET
 BUCKHORN-MESA W.P.P.
 MARICOPA & PINAL COUNTIES, ARIZONA

U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Designed: WEP, DEP, P.J.M. Date: 8-81
 Drawn: F.E.S. Title: _____
 Traced: _____
 Checked: DEP Date: 1-85
 Sheet: 17 of 17 Drawing No: 83008-AZ-CH

TRIAL VERSION OF TIFFDLL



SCALE: HORIZ. 1" = 10' VERT. 1" = 5'
 Solid Lines - Design
 Dashed Lines - As-Built Surveys

| | |
|---------------------------------|-------------|
| Pass Mountain Diversion | |
| Design / As-Built Comparison | |
| Random X-Sections | |
| 54+00, 65+00 & 75+00 | |
| U. S. DEPARTMENT OF AGRICULTURE | |
| SOIL CONSERVATION SERVICE | |
| Date | Approved by |
| Designed | Drawn |
| 3-14-87 | J.M.H. |
| Traced | Checked |
| Sheet No. 1 of 2 | Drawing No. |

APPENDIX K

Survey Report

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CONTRACT NO. 2007C052

ASSIGNMENT NO. 9

FLO-2D MODELING OF THE PASS MOUNTAIN DIVERSION LEVEE

AMEC EARTH & ENVIRONMENTAL, INC.

SURVEY REPORT



TABLE OF CONTENTS

| | |
|-------------------------------|---|
| Summary | 3 |
| MCDOT UPLSS Corner sheets | A |
| Control Point Listing | B |
| Data Collection Point Listing | C |
| Data Collector File Printouts | D |



SUMMARY

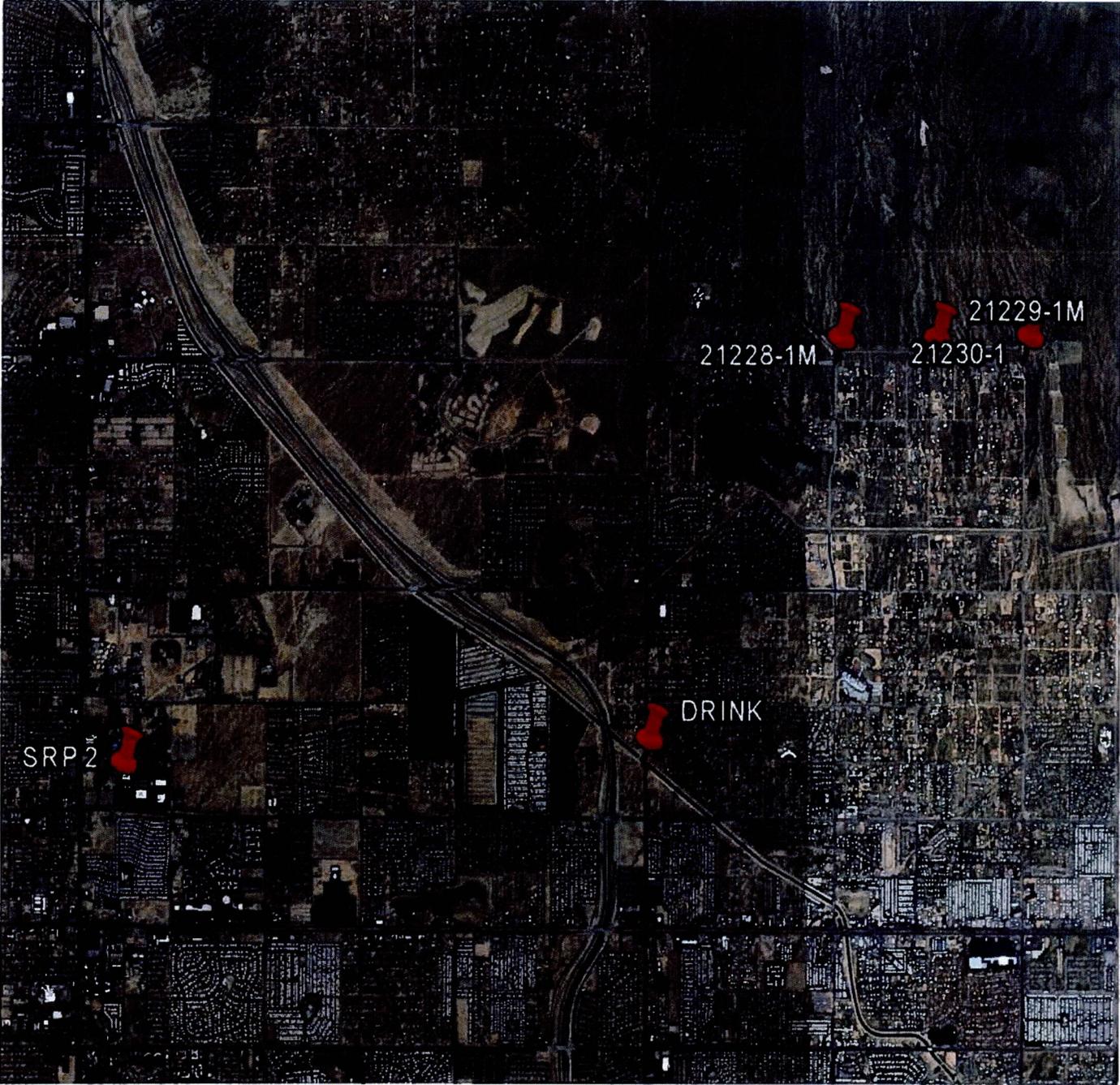
Narrative

The AMEC Earth & Environmental Survey Department was tasked with the performance of a limited topographic survey of a portion of the Pass Mountain Diversion Dam in east Maricopa County. AMEC survey personnel performed field data collection using real-time kinematic (RTK) global positioning system (GPS) surveying methods. NGS control station Designation EVSC, PID AI1922 was utilized for the GPS base station for the project. Current information for this control station obtained from Salt River Project was utilized for survey control. Using Real Time Kinematic surveying methods, checks were made to Maricopa County Department of Transportation GDACS points 21228-1M, 21229-1M, 21230-1 and DRINK for verification of horizontal and vertical control. Cross-sectional and spot grade elevations were collected across the project site using RTK surveying methods. Topographic survey cross sections of the dam were taken at a maximum spacing of 500 feet for a distance of approximately 1.3 miles along the existing diversion dam. Additional shots were taken at a maximum of 100-foot intervals along the crest of the levee. Shots were also collected at any high points or low points along the levee, within the project limits. Additional cross-section data was collected in critical locations as directed in the field by the AMEC engineer. The survey data was utilized to produce an electronic topographic base drawing.

Control Datum: Horizontal control is based on NAD 83 (2007). Coordinate values are expressed in Arizona State Plane Coordinates, Central Zone, in International Feet. Vertical control was based on NAVD 88 relative to Geoid 03.

Field survey data was collected using Trimble equipment and processed with Trimble Geomatics Office software. Orthometric heights were derived by applying GEOID 03 to ellipsoid heights.

**PASS MOUNTAIN DIVERSION LEVEE
SURVEY CONTROL DIAGRAM**



APPENDIX A

UPLSS Corners

The information here on was gathered by the Maricopa County Department of Transportation (MCDOT) and is deemed reliable but is not guaranteed and should always be verified by the user. MCDOT is currently in the process of quality control checks. The elevations contained here are derived by GPS static procedures with a rigorous vertical adjustment. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

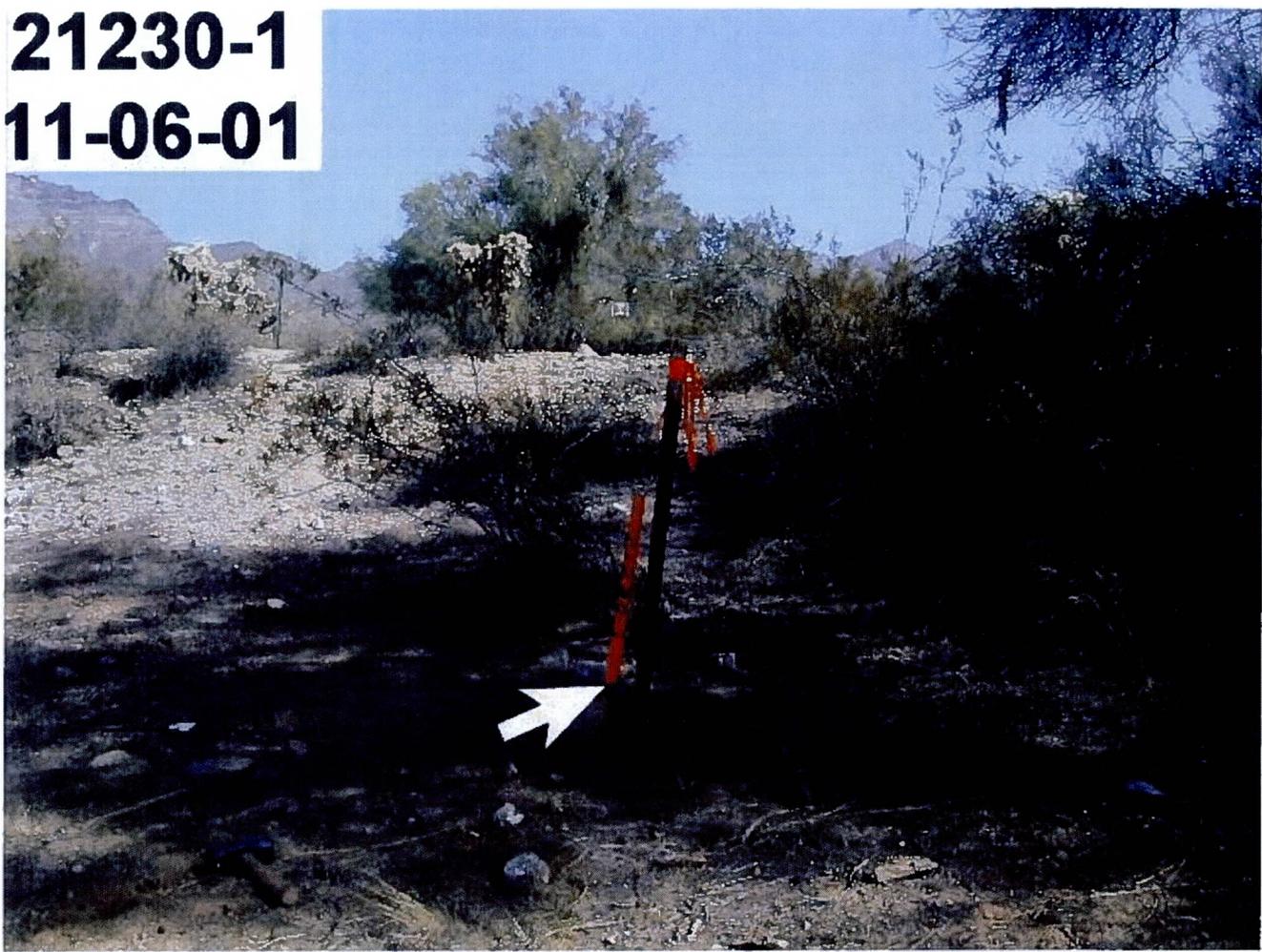
Unofficial Document

| | |
|-------------------------------|---|
| Unique ID: | 595 |
| Point Name: | 21230-1 |
| Alias: | 2123001 |
| Import Date: | 2/15/2004 |
| Modified Date: | |
| Classification: | USPLSS Monument |
| Township: | T01N |
| Range: | R07E |
| Section: | 11 |
| UPLSS Corner Name: | Northeast |
| USPLSS Corner Type: | Standard Corner |
| Determination Status: | Accepted |
| Latitude NAD83(1992): | 33.270484085N (DD.MMSSsssss) |
| Longitude NAD83(1992): | 111.355261993W (DDD.MMSSsssss) |
| Ellipsoid Height (Int. Feet): | 1654.602 |
| SPC AZ C Northing (Int Feet): | 891896.052 |
| SPC AZ C Easting (Int Feet): | 797210.040 |
| NAVD88 Elev. (Int feet): | 1750.766 |
| Combination Grid Factor: | 1.000168188 |
| Convergence: | 0.10320 |
| Last Date Visited: | 10/16/2001 |
| FIRM/Agency: | AMEC |
| MCR Number: | 2007-0733697 |
| MCR Book: | 932 |
| MCR Page: | 28 |
| Project Number: | 40068966 |
| Project Name: | GDACS |
| Monument Status: | Good |
| Description: | FD 2 1/2" GLO BC 0.4' UP STAMPED "T1N R7E S2 S1 S11 S12 1921" |
| Comments: | |

Photos of Survey Point

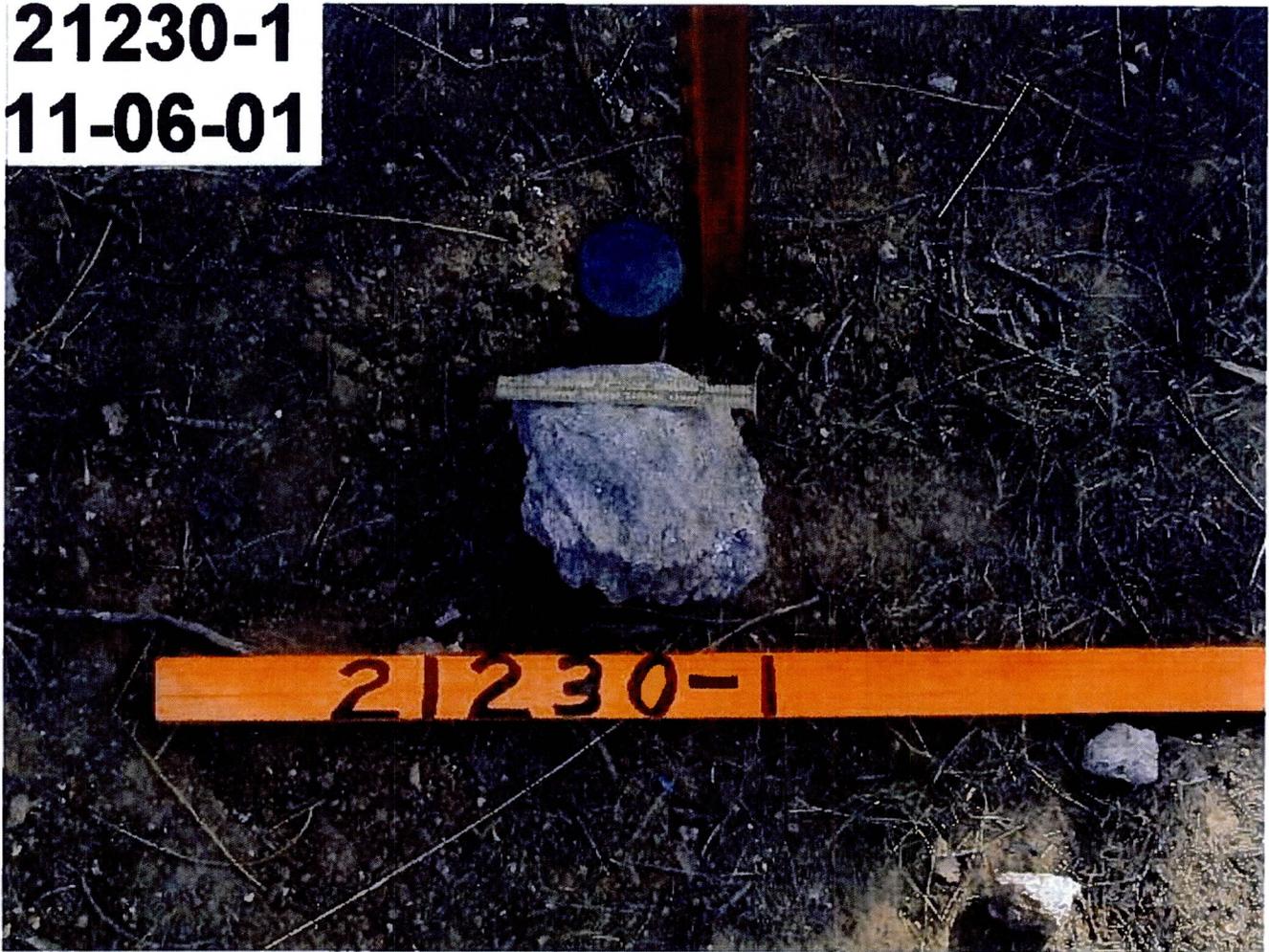
21230.1-VIC-1.jpg

21230-1
11-06-01



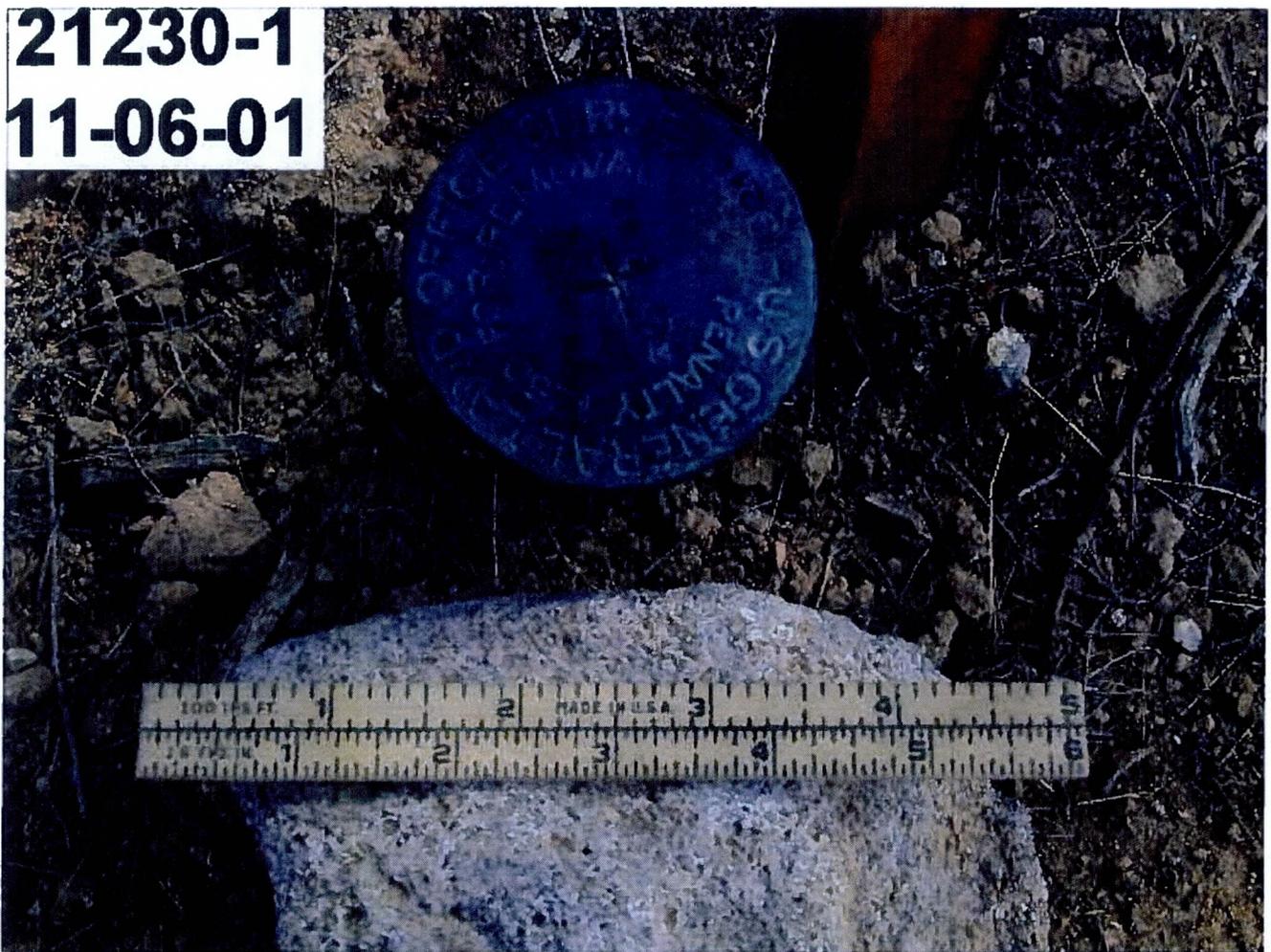
21230.1-MON-2.jpg

21230-1
11-06-01



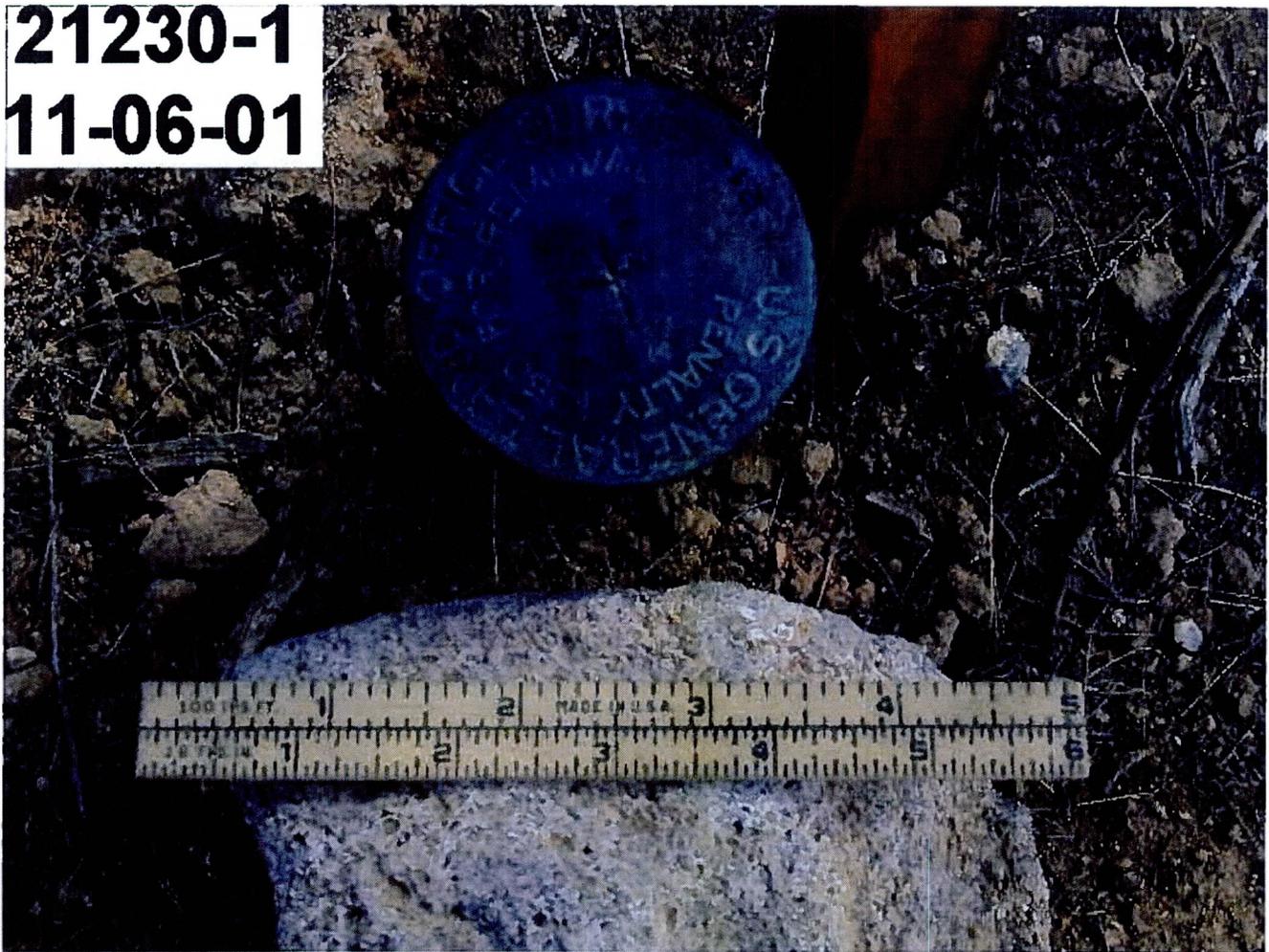
21230.1-MON-1.jpg

21230-1
11-06-01



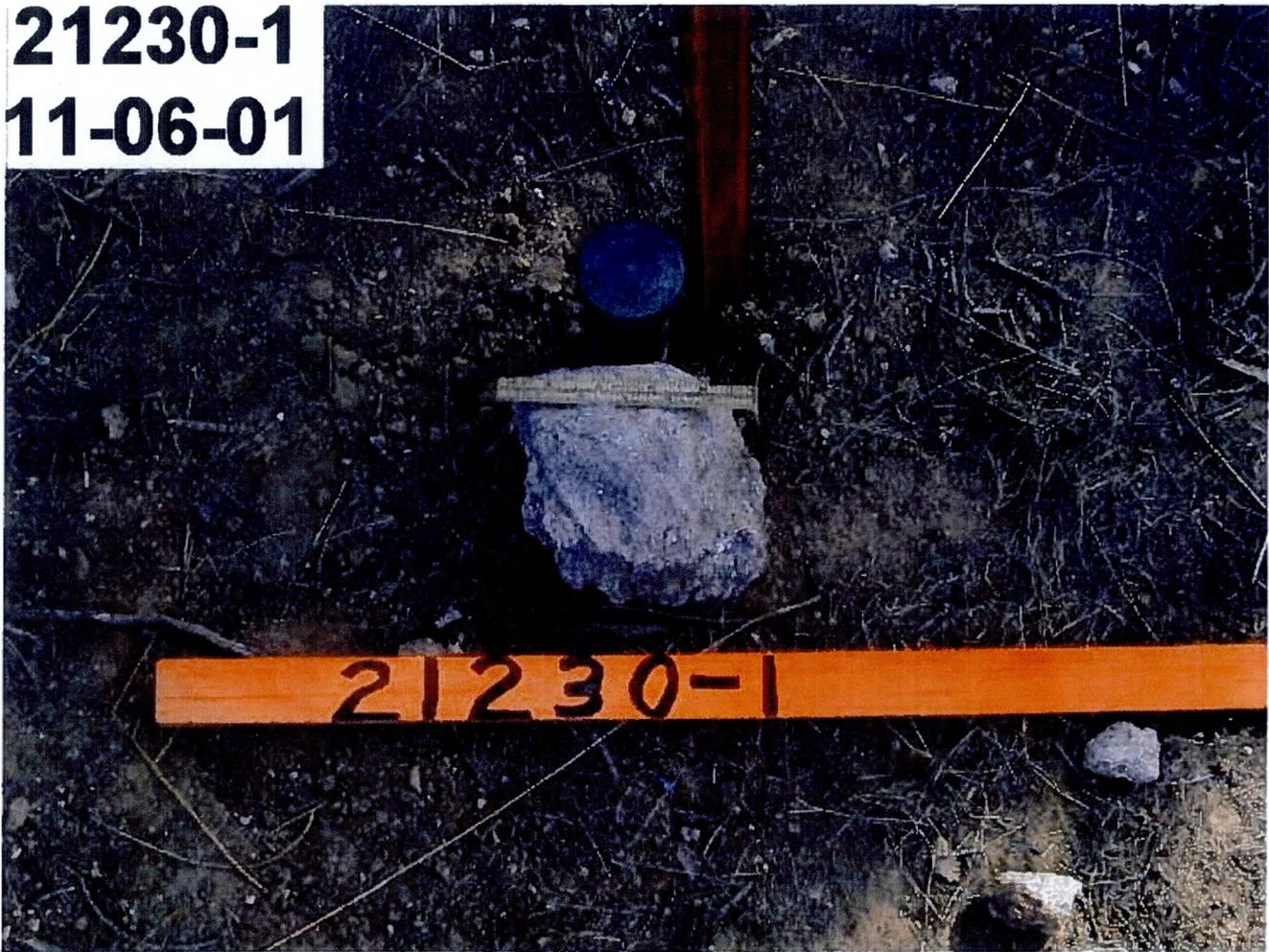
DSCN1933.JPG

21230-1
11-06-01



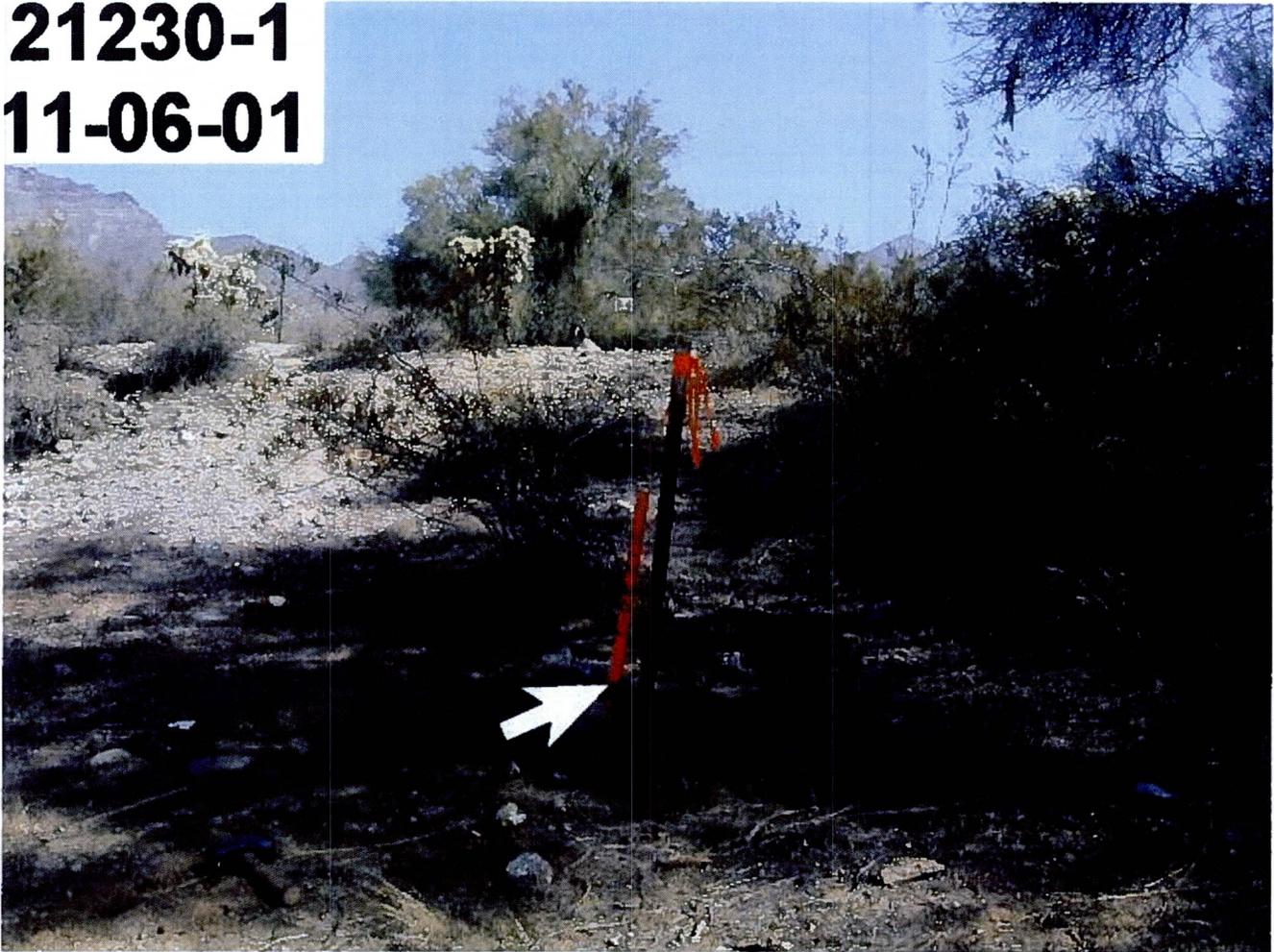
DSCN1934.JPG

21230-1
11-06-01



DSCN1935.JPG

21230-1
11-06-01



Copyright © 1998 - 2011 · The Maricopa County Department of Transportation

Close

UPLSS Corners

The information here on was gathered by the Maricopa County Department of Transportation (MCDOT) and is deemed reliable but is not guaranteed and should always be verified by the user. MCDOT is currently in the process of quality control checks. The elevations contained here are derived by GPS static procedures with a rigorous vertical adjustment. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

Unofficial Document

| | |
|-------------------------------|---|
| Unique ID: | 600 |
| Point Name: | 21229-1M |
| Alias: | 2122921 |
| Import Date: | 2/15/2004 |
| Modified Date: | |
| Classification: | USPLSS Monument |
| Township: | T01N |
| Range: | R07E |
| Section: | 11 |
| UPLSS Corner Name: | North 1/4 |
| USPLSS Corner Type: | Standard Corner |
| Determination Status: | Accepted |
| Latitude NAD83(1992): | 33.270483791N (DD.MMSSsssss) |
| Longitude NAD83(1992): | 111.362380334W (DDD.MMSSsssss) |
| Ellipsoid Height (Int. Feet): | 1672.107 |
| SPC AZ C Northing (Int Feet): | 891887.764 |
| SPC AZ C Easting (Int Feet): | 794568.064 |
| NAVD88 Elev. (Int feet): | 1768.312 |
| Combination Grid Factor: | 1.000169599 |
| Convergence: | 0.10150 |
| Last Date Visited: | 10/3/2002 |
| FIRM/Agency: | AMEC |
| MCR Number: | 2007-0733696 |
| MCR Book: | 932 |
| MCR Page: | 28 |
| Project Number: | 40068965 |
| Project Name: | GDACS |
| Monument Status: | Good |
| Description: | FD 1/2" RB W/O ID FL, AFFIXED W/ 2" MARICOPA COUNTY AL CAP FL STAMPED "T1N R7E 1/4 S2/S11 2002 RLS 15573" NOTE- 15' WEST |
| Comments: | |

Photos of Survey Point

DSCN1606.JPG

21229-1M
11-07-03



DSCN1604.JPG



DSCN1605.JPG



Copyright © 1998 - 2011 · The Maricopa County Department of Transportation

Close

UPLSS Corners

The information here on was gathered by the Maricopa County Department of Transportation (MCDOT) and is deemed reliable but is not guaranteed and should always be verified by the user. MCDOT is currently in the process of quality control checks. The elevations contained here are derived by GPS static procedures with a rigorous vertical adjustment. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

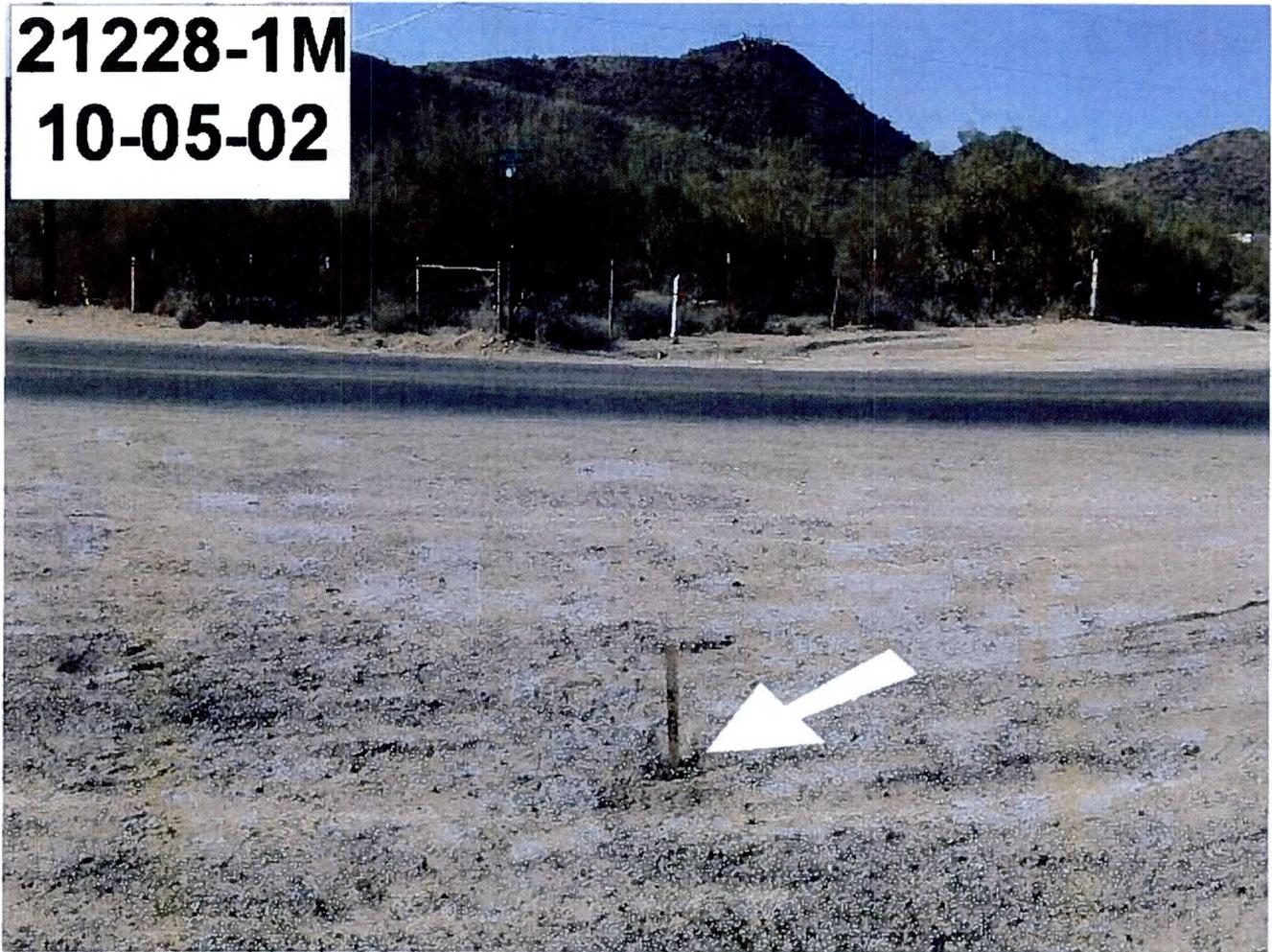
Unofficial Document

| | |
|-------------------------------|---|
| Unique ID: | 480 |
| Point Name: | 21228-1M |
| Alias: | 2122821 |
| Import Date: | 2/15/2004 |
| Modified Date: | |
| Classification: | USPLSS Monument |
| Township: | T01N |
| Range: | R07E |
| Section: | 10 |
| UPLSS Corner Name: | Northeast |
| USPLSS Corner Type: | Standard Corner |
| Determination Status: | Accepted |
| Latitude NAD83(1992): | 33.270482873N (DD.MMSSsssss) |
| Longitude NAD83(1992): | 111.365498959W (DDD.MMSSsssss) |
| Ellipsoid Height (Int. Feet): | 1671.218 |
| SPC AZ C Northing (Int Feet): | 891879.064 |
| SPC AZ C Easting (Int Feet): | 791925.849 |
| NAVD88 Elev. (Int feet): | 1767.465 |
| Combination Grid Factor: | 1.000170119 |
| Convergence: | 0.09580 |
| Last Date Visited: | 11/7/2002 |
| FIRM/Agency: | AMEC |
| MCR Number: | 2007-0733695 |
| MCR Book: | 932 |
| MCR Page: | 28 |
| Project Number: | 40068964 |
| Project Name: | GDACS |
| Monument Status: | Good |
| Description: | FD 1/2" RB W/O ID 0.2' DN, AFFIXED W/ 2" MARICOPA COUNTY AL CAP 0.1' DN STAMPED "T1N R7E S 3/S2/S10/S11 2002 RLS 15573" NOTE- C/L CRISMON RD AND MCKELLIPS RD |
| Comments: | |

Photos of Survey Point

DSCN3182.JPG

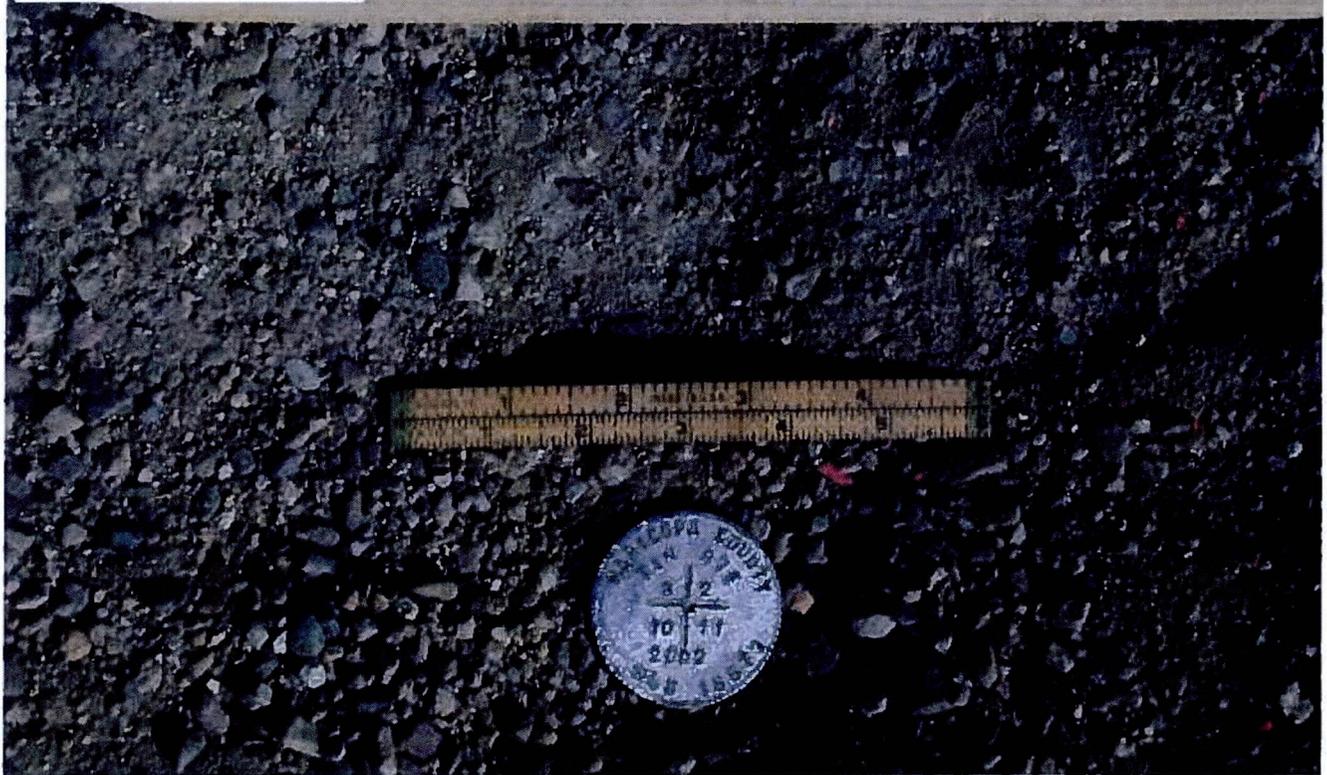
21228-1M
10-05-02



DSCN3181.JPG

21228-1M
10-05-02

21228-1M



DSCN3180.JPG

21228-1M
10-05-02



Copyright © 1998 - 2011 · The Maricopa County Department of Transportation

Close

SURVEY DATASHEET (Version 1.0)

PID: BBBN53
Designation: DRINK (515)
Stamping: DRINK 515 3-2009 LS 33310
Stability: Monuments of questionable or unknown reliability
Setting: Object surrounded by mass of concrete
Description: The monument is
 - 27 feet west of the west edge of pavement of Ellsworth Road.
 - 21 feet north of the west PC of back of Curb off Decatur Road.
 - 16.5 feet southwest of the southeast corner of a 6 foot high chain link fence protecting the Central Arizona Project canal.
Observed: 2009-09-25T13:46:00Z
Source: OPUS - page5 0909.08



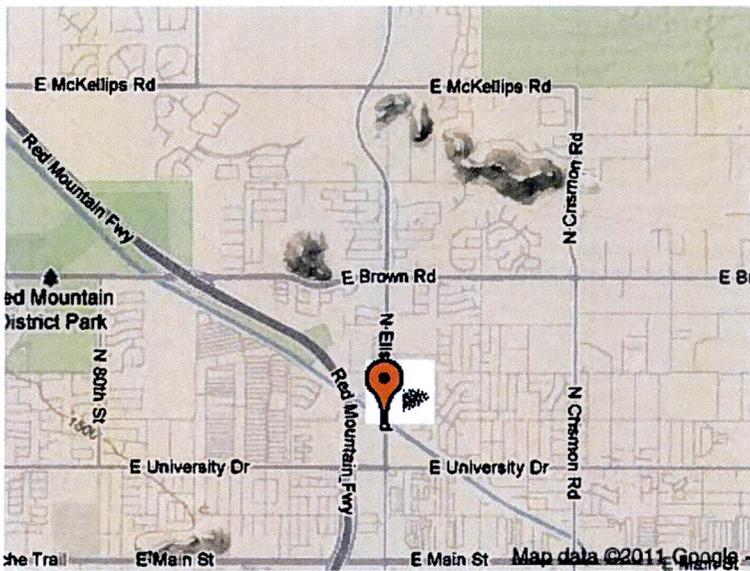
Close-up View

| | | | | | |
|---|----------------------------|---|--------------------|--------------------|----------------|
| REF FRAME: NAD_83 (CORS96) | EPOCH: 2002.0000 | SOURCE: NAVD88 (Computed using GEOID09) | UNITS: m | SET PROFILE | DETAILS |
| LAT: 33° 25' 32.77005" ± 0.005 m LON: -111° 37' 58.31322" ± 0.011 m ELL HT: 451.426 ± 0.012 m X: -1964572.329 ± 0.005 m Y: -4953639.859 ± 0.016 m Z: 3493714.542 ± 0.002 m ORTHO HT: 480.864 ± 0.088 m | | UTM 12 SPC 202(AZ C) NORTHING: 3698668.396m 269004.172m EASTING: 441165.520m 239751.483m CONVERGENCE: -0.34862748° 0.15633492° POINT SCALE: 0.99964268 0.99990858 COMBINED FACTOR: 0.99957183 0.99983772 | | | |

CONTRIBUTED BY

[briandalager](#)
 [Maricopa County Department of Transportation](#)

Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

APPENDIX B

PASS MOUNTAIN DIVERSION DAM CONTROL POINTS

| Pt. No. (Alias) | POINT NAME | SPC AZ C NORTHING (Int. feet) | SPC AZ C EASTING (Int. Feet) | NAVD 88 ELEVATION (Int. Feet) | DESCRIPTION |
|--------------------|---------------|-------------------------------------|------------------------------------|-------------------------------------|---|
| 1 | N/A | 892048.153 | 797809.475 | 1755.643 | FD 2 1/2" USDA BRASS CAP, FLUSH IN CONCRETE, STAMPED 110+00 SCS (AS- BUILT LOCATION) |
| 2123001 | 21230-1 | 891896.052 | 797210.04 | 1750.766 | FD 2 1/2" GLO BC 0.4' UP STAMPED "T1N R7E S2 S1 S11 S12 1921" |
| 2122921 | 21229-1M | 891887.764 | 794568.064 | 1768.312 | FD 1/2" RB W/2" MARICOPA COUNTY AL CAP FL STAMPED "T1N R7E 1/4 S2/S11 2002 RLS 15573" |
| 2122821 | 21228-1M | 891879.065 | 791925.849 | 1767.465 | FD 1/2" ROUND SSTL METAL ROD FL W/ 2" MARICOPA COUNTY AL CAP STAMPED "T1N R7E S11/R8E S12 2002 RLS 36563" |
| DRINK | DRINK (515) | 882559.621 | 786586.229 | 1577.638 | FD 2 1/2" BC IN CONCRETE STAMPED "Maricopa County, 515 DRINK, 3-2009, LS 33310" |
| SRPEAST | | 881756.31 | 772499.519 | 1472.342 | COBS |

APPENDIX C

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2000 | 892441.631 | 791526.956 | 1782.989 | TOP B |
| 2001 | 892425.785 | 791519.201 | 1782.552 | TOP1 B |
| 2002 | 892367.917 | 791615.205 | 1782.474 | TOP |
| 2003 | 892356.815 | 791609.041 | 1782.532 | TOP1 |
| 2004 | 892297.188 | 791704.892 | 1782.145 | TOP |
| 2005 | 892285.682 | 791698.721 | 1782.176 | TOP1 |
| 2006 | 892233.685 | 791798.275 | 1782.034 | TOP |
| 2007 | 892222.274 | 791791.405 | 1782.349 | TOP1 |
| 2008 | 892189.769 | 791900.036 | 1781.993 | TOP |
| 2009 | 892174.088 | 791891.999 | 1781.184 | TOP1 |
| 2010 | 892162.661 | 791897.71 | 1779.79 | TOP1 |
| 2011 | 892150.571 | 791896.901 | 1778.389 | TOP1 |
| 2012 | 892137.355 | 791892.982 | 1776.694 | TOP1 |
| 2013 | 892123.638 | 791891.165 | 1775.368 | TOP1 |
| 2014 | 892109.56 | 791889.857 | 1773.758 | TOP1 |
| 2015 | 892095.319 | 791891.679 | 1772.461 | TOP1 |
| 2016 | 892081.908 | 791893.832 | 1771.474 | TOP1 E |
| 2017 | 892084.395 | 791907.386 | 1771.506 | TOP1 B |
| 2018 | 892096.798 | 791904.819 | 1772.42 | TOP1 |
| 2019 | 892112.818 | 791903.807 | 1774.136 | TOP1 |
| 2020 | 892129.095 | 791905.619 | 1775.93 | TOP1 |
| 2021 | 892143.477 | 791910.799 | 1777.583 | TOP1 |
| 2022 | 892153.795 | 791919.302 | 1778.988 | TOP1 |
| 2023 | 892164.102 | 791930.818 | 1781.172 | TOP1 |
| 2024 | 892167.604 | 791945.821 | 1782.067 | TOP1 |
| 2025 | 892172.215 | 792014.925 | 1781.925 | TOP |
| 2026 | 892161.211 | 792013.503 | 1782.148 | TOP1 |
| 2027 | 892172.002 | 792138.554 | 1781.958 | TOP |
| 2028 | 892159.449 | 792137.957 | 1782.098 | TOP1 |
| 2029 | 892170.312 | 792261.745 | 1782.115 | TOP |
| 2030 | 892159.454 | 792261.236 | 1782.225 | TOP1 |
| 2031 | 892170.82 | 792385.626 | 1782.087 | TOP |
| 2032 | 892158.896 | 792384.469 | 1782.113 | TOP1 |
| 2033 | 892171.76 | 792510.246 | 1781.941 | TOP |
| 2034 | 892159.691 | 792509.005 | 1782.056 | TOP1 |
| 2035 | 892171.717 | 792634.63 | 1782.035 | TOP |
| 2036 | 892160.04 | 792633.898 | 1782.194 | TOP1 |
| 2037 | 892171.137 | 792758.438 | 1782.042 | TOP |
| 2038 | 892157.926 | 792757.713 | 1782.025 | TOP1 |
| 2039 | 892170.698 | 792881.746 | 1781.756 | TOP |
| 2040 | 892158.644 | 792880.836 | 1781.934 | TOP1 |
| 2041 | 892170.606 | 793003.078 | 1782.063 | TOP |
| 2042 | 892158.401 | 793003.78 | 1782.269 | TOP1 |
| 2043 | 892169.869 | 793128.907 | 1782.248 | TOP |
| 2044 | 892157.559 | 793129.011 | 1782.273 | TOP1 |
| 2045 | 892169.793 | 793250.913 | 1781.896 | TOP |
| 2046 | 892157.445 | 793249.302 | 1781.976 | TOP1 |
| 2047 | 892169.456 | 793376.34 | 1781.961 | TOP |
| 2048 | 892158.511 | 793376.17 | 1781.984 | TOP1 |
| 2049 | 892169.434 | 793501.405 | 1781.973 | TOP |
| 2050 | 892158.22 | 793501.053 | 1782.16 | TOP1 |
| 2051 | 892170.344 | 793586.468 | 1782.106 | TOP |
| 2052 | 892180.033 | 793603.423 | 1781.463 | TOP |
| 2053 | 892188.964 | 793622.535 | 1781.757 | TOP |
| 2054 | 892190.813 | 793637.5 | 1781.919 | TOP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2055 | 892192.601 | 793666.627 | 1781.777 | TOP |
| 2056 | 892196.14 | 793681.613 | 1780.246 | TOP |
| 2057 | 892201.457 | 793696.506 | 1778.324 | TOP |
| 2058 | 892207.827 | 793712.524 | 1776.104 | TOP |
| 2059 | 892215.54 | 793727.176 | 1773.774 | TOP |
| 2060 | 892222.731 | 793737.307 | 1771.111 | TOP E |
| 2061 | 892213.616 | 793750.82 | 1771.61 | TOP B |
| 2062 | 892204.205 | 793732.928 | 1773.644 | TOP |
| 2063 | 892196.179 | 793714.446 | 1776.287 | TOP |
| 2064 | 892187.291 | 793693.882 | 1779.586 | TOP |
| 2065 | 892173.451 | 793665.234 | 1782.421 | TOP |
| 2066 | 892158.73 | 793630.301 | 1782.099 | TOP1 |
| 2067 | 892155.822 | 793634.258 | 1781.457 | TOP1 |
| 2068 | 892140.36 | 793635.542 | 1778.083 | TOP1 |
| 2069 | 892123.739 | 793638.995 | 1775.259 | TOP1 |
| 2070 | 892108.048 | 793645.111 | 1773.327 | TOP1 E |
| 2071 | 892109.643 | 793656.284 | 1773.49 | TOP1 B |
| 2072 | 892132.193 | 793654.987 | 1776.306 | TOP1 |
| 2073 | 892150.745 | 793656.902 | 1780.25 | TOP1 |
| 2074 | 892157.181 | 793660.746 | 1781.932 | TOP1 |
| 2075 | 892158.809 | 793665.663 | 1782.295 | TOP1 |
| 2076 | 892170.395 | 793749.101 | 1782.234 | TOP |
| 2077 | 892158.859 | 793748.137 | 1782.102 | TOP1 |
| 2078 | 892169.181 | 793872.542 | 1782.354 | TOP |
| 2079 | 892157.622 | 793871.762 | 1782.204 | TOP1 |
| 2080 | 892169.019 | 793996.329 | 1782.265 | TOP |
| 2081 | 892158.616 | 793996.51 | 1782.408 | TOP1 |
| 2082 | 892169.244 | 794120.545 | 1782.113 | TOP |
| 2083 | 892158.725 | 794121.612 | 1782.162 | TOP1 |
| 2084 | 892168.362 | 794244.386 | 1782.002 | TOP |
| 2085 | 892156.709 | 794243.712 | 1782.145 | TOP1 |
| 2086 | 892167.073 | 794367.006 | 1781.898 | TOP |
| 2087 | 892155.473 | 794368.784 | 1782.02 | TOP1 |
| 2088 | 892166.771 | 794491.485 | 1781.792 | TOP |
| 2089 | 892155.149 | 794490.894 | 1781.921 | TOP1 |
| 2090 | 892167.39 | 794615.637 | 1782.019 | TOP |
| 2091 | 892155.888 | 794615.535 | 1782.216 | TOP1 |
| 2092 | 892167.468 | 794739.678 | 1781.887 | TOP |
| 2093 | 892156.16 | 794740.524 | 1782.16 | TOP1 |
| 2094 | 892166.862 | 794863.843 | 1782.157 | TOP |
| 2095 | 892156.342 | 794864.735 | 1782.21 | TOP1 |
| 2096 | 892167.768 | 794987.961 | 1782.152 | TOP |
| 2097 | 892156.602 | 794988.383 | 1782.085 | TOP1 |
| 2098 | 892168.652 | 795111.922 | 1782.063 | TOP |
| 2099 | 892158.183 | 795111.908 | 1781.982 | TOP1 |
| 2100 | 892168.602 | 795235.4 | 1781.529 | TOP |
| 2101 | 892156.677 | 795235.144 | 1781.582 | TOP1 |
| 2102 | 892169.403 | 795345.069 | 1781.874 | TOP E |
| 2111 | 892166.714 | 795730.458 | 1770.678 | TOP |
| 2112 | 892155.316 | 795731.119 | 1770.654 | TOP1 |
| 2113 | 892166.413 | 795854.361 | 1770.703 | TOP |
| 2114 | 892155.404 | 795855.061 | 1770.584 | TOP1 |
| 2115 | 892167.757 | 795978.884 | 1770.282 | TOP |
| 2116 | 892156.084 | 795978.659 | 1770.313 | TOP1 |
| 2117 | 892168.125 | 796103.34 | 1770.254 | TOP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2118 | 892157.365 | 796102.894 | 1770.323 | TOP1 |
| 2119 | 892168.175 | 796227.243 | 1770.412 | TOP |
| 2120 | 892157.478 | 796227.987 | 1770.313 | TOP1 |
| 2121 | 892168.926 | 796351.849 | 1770.778 | TOP |
| 2122 | 892157.929 | 796352.124 | 1770.745 | TOP1 |
| 2123 | 892169.408 | 796475.651 | 1770.596 | TOP |
| 2124 | 892157.847 | 796476.218 | 1770.538 | TOP1 |
| 2125 | 892170.766 | 796600.324 | 1770.975 | TOP |
| 2126 | 892158.695 | 796601.366 | 1770.787 | TOP1 |
| 2127 | 892159.588 | 796649.384 | 1771.026 | TOP1 |
| 2128 | 892158.184 | 796717.434 | 1770.892 | TOP1 |
| 2129 | 892150.939 | 796767.56 | 1770.629 | TOP1 |
| 2130 | 892149.627 | 796837.826 | 1770.172 | TOP1 |
| 2131 | 892173.195 | 796614.557 | 1770.903 | TOP |
| 2132 | 892183.084 | 796630.683 | 1770.407 | TOP |
| 2133 | 892189.351 | 796649.431 | 1770.619 | TOP |
| 2134 | 892190.661 | 796671.669 | 1770.607 | TOP |
| 2135 | 892194.532 | 796687.822 | 1769.264 | TOP |
| 2136 | 892201.898 | 796705.826 | 1766.413 | TOP |
| 2137 | 892212.794 | 796725.648 | 1762.903 | TOP |
| 2138 | 892222.092 | 796743.949 | 1760.103 | TOP |
| 2139 | 892227.809 | 796751.971 | 1758.921 | TOP E |
| 2140 | 892212.96 | 796760.616 | 1759.831 | TOP B |
| 2141 | 892204.42 | 796742.633 | 1761.793 | TOP |
| 2142 | 892194.569 | 796722.564 | 1765.415 | TOP |
| 2143 | 892184.552 | 796701.436 | 1768.823 | TOP |
| 2144 | 892175.682 | 796683.619 | 1770.971 | TOP |
| 2145 | 892178.325 | 796703.622 | 1770.479 | TOP |
| 2146 | 892177.71 | 796720.171 | 1770.451 | TOP |
| 2147 | 892170.263 | 796743.672 | 1770.536 | TOP |
| 2148 | 892165.194 | 796768.494 | 1770.437 | TOP |
| 2149 | 892160.729 | 796836.655 | 1770.091 | TOP |
| 2150 | 892162.721 | 796967.728 | 1770.145 | TOP |
| 2151 | 892150.641 | 796968.751 | 1770.284 | TOP1 |
| 2152 | 892154.799 | 797088.848 | 1770.956 | TOP1 |
| 2153 | 892167.009 | 797049.207 | 1770.795 | TOP |
| 2154 | 892179.247 | 797089.745 | 1770.62 | TOP |
| 2155 | 892182.111 | 797104.036 | 1770.485 | TOP |
| 2156 | 892183.833 | 797132.952 | 1770.104 | TOP |
| 2157 | 892185.245 | 797136.939 | 1770.131 | TOP |
| 2158 | 892194.815 | 797143.041 | 1769.929 | TOP |
| 2159 | 892196.317 | 797146.654 | 1769.936 | TOP |
| 2160 | 892194.841 | 797150.831 | 1770.092 | TOP |
| 2161 | 892185.783 | 797156.569 | 1770.291 | TOP |
| 2162 | 892175.025 | 797165.759 | 1769.784 | TOP |
| 2163 | 892168.121 | 797172.741 | 1769.458 | TOP |
| 2164 | 892165.682 | 797217.973 | 1764.835 | TOP |
| 2165 | 892165.12 | 797245.275 | 1762.971 | TOP |
| 2166 | 892154.365 | 797141.952 | 1771.084 | TOP1 |
| 2167 | 892153.813 | 797165.334 | 1770.156 | TOP1 |
| 2168 | 892153.282 | 797188.638 | 1767.954 | TOP1 |
| 2169 | 892153.179 | 797217.876 | 1764.762 | TOP1 |
| 2170 | 892162.125 | 797339.471 | 1762.267 | TOP |
| 2171 | 892149.799 | 797339.913 | 1762.234 | TOP1 |
| 2172 | 892139.808 | 797453.4 | 1762.391 | TOP1 |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2173 | 892133.563 | 797498.474 | 1762.574 | TOP1 |
| 2174 | 892130.318 | 797503.068 | 1762.056 | TOP1 |
| 2175 | 892125.504 | 797504.309 | 1761.172 | TOP1 |
| 2176 | 892119.465 | 797503.558 | 1759.999 | TOP1 |
| 2177 | 892103.689 | 797503.412 | 1757.138 | TOP1 |
| 2178 | 892088.921 | 797503.063 | 1755.516 | TOP1 E |
| 2179 | 892088.534 | 797517.954 | 1755.821 | TOP1 B |
| 2180 | 892102.552 | 797519.607 | 1757.312 | TOP1 |
| 2181 | 892117.806 | 797521.972 | 1759.617 | TOP1 |
| 2182 | 892126.818 | 797526.073 | 1761.64 | TOP1 |
| 2183 | 892128.835 | 797529.091 | 1762.511 | TOP1 |
| 2184 | 892129.988 | 797533.771 | 1762.812 | TOP1 |
| 2185 | 892127.874 | 797571.486 | 1762.63 | TOP1 |
| 2186 | 892153.985 | 797454.842 | 1762.577 | TOP |
| 2187 | 892155.299 | 797459.389 | 1762.542 | TOP |
| 2188 | 892159.591 | 797474.92 | 1762.43 | TOP |
| 2189 | 892157.93 | 797496.747 | 1762.621 | TOP |
| 2190 | 892157.099 | 797520.012 | 1762.25 | TOP |
| 2191 | 892157.606 | 797527.578 | 1761.602 | TOP |
| 2192 | 892160.608 | 797535.083 | 1760.462 | TOP |
| 2193 | 892172.059 | 797556.504 | 1757.172 | TOP |
| 2194 | 892183.547 | 797576.737 | 1754.579 | TOP |
| 2195 | 892192.344 | 797590.209 | 1752.308 | TOP E |
| 2196 | 892181.37 | 797596.877 | 1752.895 | TOP B |
| 2197 | 892168.425 | 797576.442 | 1755.499 | TOP |
| 2198 | 892155.063 | 797555.385 | 1759 | TOP |
| 2199 | 892141.695 | 797533.123 | 1762.503 | TOP |
| 2200 | 892139.468 | 797571.908 | 1762.826 | TOP |
| 2201 | 892138.619 | 797699.945 | 1762.534 | TOP |
| 2202 | 892126.879 | 797700.057 | 1762.503 | TOP1 |
| 2203 | 892138.551 | 797787.993 | 1762.503 | TOP |
| 2204 | 892127.017 | 797789.564 | 1762.253 | TOP1 |
| 2205 | 892122.733 | 797821.688 | 1762.359 | TOP1 |
| 2206 | 892135.367 | 797823.139 | 1762.5 | TOP |
| 2207 | 892119.244 | 797871.573 | 1762.521 | TOP |
| 2208 | 892107.338 | 797864.77 | 1762.257 | TOP1 |
| 2209 | 892072.05 | 797899.359 | 1761.924 | TOP1 |
| 2210 | 892080.109 | 797913.563 | 1761.981 | TOP |
| 2211 | 892030.132 | 797922.821 | 1761.976 | TOP |
| 2212 | 892029.455 | 797910.281 | 1762.1 | TOP1 |
| 2213 | 891974.633 | 797910.122 | 1762.52 | TOP1 |
| 2214 | 891974.379 | 797922.423 | 1762.32 | TOP |
| 2215 | 891931.914 | 797918.977 | 1762.817 | TOP |
| 2216 | 891926.823 | 797921.516 | 1762.328 | TOP |
| 2217 | 891915.659 | 797922.889 | 1762.349 | TOP |
| 2218 | 891911.667 | 797924.89 | 1762.528 | TOP |
| 2219 | 891907.411 | 797928.981 | 1762.437 | TOP |
| 2220 | 891904.46 | 797933.319 | 1762.533 | TOP |
| 2221 | 891898.617 | 797934.75 | 1762.529 | TOP |
| 2222 | 891894.371 | 797933.445 | 1762.435 | TOP |
| 2223 | 891890.105 | 797928.897 | 1762.543 | TOP |
| 2224 | 891878.961 | 797911.734 | 1761.436 | TOP |
| 2225 | 891874.739 | 797906.046 | 1760.854 | TOP |
| 2226 | 891870 | 797903.037 | 1760.435 | TOP |
| 2227 | 891865.011 | 797901.458 | 1759.879 | TOP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2228 | 891840.089 | 797901.043 | 1756.715 | TOP |
| 2229 | 891815.099 | 797905.753 | 1754.177 | TOP |
| 2230 | 891805.728 | 797909.152 | 1752.846 | TOP |
| 2231 | 891798.552 | 797915.782 | 1752.391 | TOP |
| 2232 | 891790.443 | 797927.699 | 1752.314 | TOP |
| 2233 | 891763.716 | 797930.969 | 1751.018 | TOP |
| 2234 | 891729.418 | 797932.94 | 1750.232 | TOP E |
| 2235 | 891927.737 | 797903.2 | 1763.034 | TOP1 |
| 2236 | 891902.066 | 797896.332 | 1762.447 | TOP1 |
| 2237 | 891880.068 | 797891.088 | 1760.974 | TOP1 |
| 2238 | 891867.151 | 797886.905 | 1759.637 | TOP1 |
| 2239 | 891839.247 | 797886.975 | 1756.872 | TOP1 |
| 2240 | 891811.147 | 797892.86 | 1753.572 | TOP1 |
| 2241 | 891789.953 | 797896.749 | 1752.095 | TOP1 |
| 2242 | 891726.473 | 797912.521 | 1750.885 | TOP1 E |
| 2243 | 892415.572 | 791510.912 | 1779.797 | TOE |
| 2244 | 892368.456 | 791482.258 | 1777.574 | NG |
| 2245 | 892450.611 | 791533.363 | 1780.699 | TOE |
| 2246 | 892494.909 | 791559.834 | 1781.362 | NG |
| 2247 | 892503.243 | 791564.637 | 1781.771 | NG |
| 2248 | 892513.76 | 791571.128 | 1780.965 | NG |
| 2249 | 892434.226 | 791616.572 | 1778.731 | TOP |
| 2250 | 892443.938 | 791624.297 | 1778.493 | TOP |
| 2251 | 892411.372 | 791660.899 | 1774.262 | TOE |
| 2252 | 892402.746 | 791653.968 | 1774.084 | TOE |
| 2253 | 892394.707 | 791643.864 | 1777.394 | TOP |
| 2254 | 892379.921 | 791629.831 | 1778.079 | TOE |
| 2255 | 892078.763 | 792013.811 | 1770.911 | NG |
| 2256 | 892132.751 | 792013.223 | 1772.619 | TOE |
| 2257 | 892198.096 | 792015.21 | 1774.691 | TOE |
| 2258 | 892216.811 | 792017.042 | 1773.753 | TOP |
| 2259 | 892225.099 | 792017.182 | 1772.46 | TOE |
| 2260 | 892234.147 | 792017.274 | 1772.376 | TOE |
| 2261 | 892238.058 | 792017.291 | 1773.175 | TOP |
| 2262 | 892264.948 | 792016.702 | 1773.827 | NG |
| 2263 | 892286.326 | 792015.082 | 1773.883 | NG |
| 2264 | 892066.531 | 792632.874 | 1769.106 | NG |
| 2265 | 892121.917 | 792634.134 | 1770.272 | TOE |
| 2266 | 892197.591 | 792635.078 | 1774.535 | TOE |
| 2267 | 892223.216 | 792634.755 | 1772.164 | TOP |
| 2268 | 892225.362 | 792634.828 | 1771.421 | TOE |
| 2269 | 892236.002 | 792634.946 | 1771.391 | TOE |
| 2270 | 892238.464 | 792635.041 | 1771.951 | TOP |
| 2271 | 892259.572 | 792635.261 | 1772.611 | NG |
| 2272 | 892286.049 | 792635.194 | 1773.362 | NG |
| 2273 | 892073.778 | 793250.914 | 1771.817 | NG |
| 2274 | 892126.836 | 793251.514 | 1772.77 | TOE |
| 2275 | 892194.036 | 793252.344 | 1774.9 | TOE |
| 2276 | 892214.046 | 793253.088 | 1774.345 | TOP |
| 2277 | 892228.764 | 793252.975 | 1770.212 | TOE |
| 2278 | 892238.239 | 793252.748 | 1770.169 | TOE |
| 2279 | 892254.148 | 793252.294 | 1774.544 | TOP |
| 2280 | 892282.803 | 793251.118 | 1775.216 | NG |
| 2281 | 892310.551 | 793250.575 | 1775.886 | NG |
| 2282 | 892066.801 | 793869.89 | 1768.988 | NG |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2283 | 892119.246 | 793873.913 | 1769.818 | TOE |
| 2284 | 892200.114 | 793872.499 | 1772.851 | TOE |
| 2285 | 892220.594 | 793871.478 | 1771.991 | TOP |
| 2286 | 892229.338 | 793871.271 | 1770.273 | TOE |
| 2287 | 892240.042 | 793871.138 | 1770.225 | TOE |
| 2288 | 892250.518 | 793871.51 | 1771.946 | TOP |
| 2289 | 892278.218 | 793873.568 | 1772.075 | NG |
| 2290 | 892318.954 | 793873.739 | 1772.839 | NG |
| 2291 | 892069.452 | 794493.419 | 1769.379 | NG |
| 2292 | 892119.415 | 794492.824 | 1770.815 | TOE |
| 2293 | 892195.967 | 794493.273 | 1773.138 | TOE |
| 2294 | 892217.361 | 794493.165 | 1771.855 | TOP |
| 2295 | 892226.794 | 794492.129 | 1770.006 | TOE |
| 2296 | 892246.123 | 794492.477 | 1769.516 | TOE |
| 2297 | 892256.339 | 794491.625 | 1772.602 | TOP |
| 2298 | 892284.661 | 794492.297 | 1773.942 | NG |
| 2299 | 892321.725 | 794492.655 | 1774.744 | NG |
| 2300 | 892071.275 | 795110.539 | 1771.578 | NG |
| 2301 | 892126.767 | 795111.913 | 1772.166 | TOE |
| 2302 | 892197.501 | 795112.909 | 1772.806 | TOE |
| 2303 | 892220.885 | 795112.009 | 1772.111 | TOP |
| 2304 | 892230.215 | 795111.996 | 1769.833 | TOE |
| 2305 | 892247.231 | 795113.317 | 1769.63 | TOE |
| 2306 | 892261.507 | 795113.723 | 1772.882 | TOP |
| 2307 | 892287.365 | 795113.351 | 1773.25 | NG |
| 2308 | 892317.337 | 795114.228 | 1774.286 | NG |
| 2309 | 892069.798 | 795728.55 | 1754.107 | NG |
| 2310 | 892085.142 | 795729.87 | 1753.802 | NG |
| 2311 | 892098.822 | 795729.021 | 1757.213 | NG |
| 2312 | 892121.762 | 795728.246 | 1759.83 | TOE |
| 2313 | 892279.348 | 795726.862 | 1764.651 | TOP |
| 2314 | 892304.861 | 795725.392 | 1767.435 | NG |
| 2315 | 892339.269 | 795721.181 | 1768.83 | NG |
| 2316 | 892084.406 | 796348.202 | 1764.776 | NG |
| 2317 | 892135.604 | 796352.148 | 1764.059 | TOE |
| 2318 | 892187.68 | 796350.978 | 1765.256 | TOE |
| 2319 | 892209.071 | 796350.872 | 1764.694 | TOP |
| 2320 | 892230.68 | 796350.689 | 1758.535 | TOE |
| 2321 | 892258.934 | 796351.015 | 1758.564 | TOE |
| 2322 | 892281.663 | 796350.348 | 1765.745 | TOP |
| 2323 | 892309.559 | 796348.916 | 1765.842 | NG |
| 2324 | 892337.865 | 796347.108 | 1765.39 | NG |
| 2325 | 892054.801 | 796971.365 | 1754.662 | NG |
| 2326 | 892106.659 | 796971.034 | 1756.36 | TOE |
| 2327 | 892201.318 | 796965.796 | 1758.711 | TOE |
| 2328 | 892249.82 | 796963.481 | 1758.329 | NG |
| 2329 | 892282.704 | 796961.43 | 1758.399 | TOE |
| 2330 | 892294.871 | 796959.544 | 1760.281 | TOP |
| 2331 | 892328.301 | 796950.651 | 1761.184 | NG |
| 2332 | 892042.27 | 797566.862 | 1751.45 | NG |
| 2333 | 892076.444 | 797568.174 | 1752.122 | NG |
| 2334 | 892096.081 | 797572.904 | 1752.444 | TOE |
| 2335 | 892166.189 | 797571.548 | 1756.033 | TOE |
| 2336 | 892179.814 | 797570.752 | 1755.294 | TOP |
| 2337 | 892196.889 | 797570.418 | 1750.891 | TOE |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 2338 | 892246.488 | 797570.131 | 1750.428 | NG |
| 2339 | 892298.328 | 797568.048 | 1751.278 | TOE |
| 2340 | 892319.645 | 797565.031 | 1757.306 | TOP |
| 2341 | 892351.407 | 797561.626 | 1759.614 | NG |
| 2342 | 892381.269 | 797560.85 | 1760.579 | NG |
| 2343 | 892397.15 | 797622.654 | 1758.696 | BC |
| 2344 | 891726.853 | 797845.281 | 1751.147 | NG |
| 2345 | 891727.001 | 797906.38 | 1749.536 | TOE |
| 2346 | 891730.664 | 797963.436 | 1741.942 | TOE |
| 2347 | 891729.546 | 798030.222 | 1741.99 | NG |
| 2348 | 891729.512 | 798104.234 | 1741.904 | NG |
| 2349 | 891730.774 | 798157.926 | 1742.761 | TOE |
| 2350 | 891733.27 | 798189.171 | 1751.921 | TOP |
| 2351 | 891734.507 | 798202.874 | 1752.142 | TOP |
| 2352 | 891735.314 | 798208.651 | 1751.226 | TOE |
| 2353 | 891733.336 | 798269.064 | 1750.84 | NG |
| 2354 | 892031.782 | 797812.289 | 1754.89 | NG |
| 2355 | 892088.293 | 797858.344 | 1755.961 | TOE |
| 2356 | 892134.198 | 797896.231 | 1756.016 | TOE |
| 2357 | 892143.469 | 797902.565 | 1755.241 | TOP |
| 2358 | 892154.184 | 797911.428 | 1751.214 | TOE |
| 2359 | 892195.564 | 797943.6 | 1750.488 | NG |
| 2360 | 892234.867 | 797978.303 | 1750.747 | TOE |
| 2361 | 892255.342 | 797997.429 | 1759.798 | TOP |
| 2362 | 892298.212 | 798031.64 | 1760.343 | NG |
| 2363 | 892119.151 | 797131.981 | 1759.203 | TOE |
| 2364 | 892118.56 | 797143.413 | 1759.213 | TOE |
| 2365 | 892119.28 | 797156.892 | 1759.231 | TOE |
| 2366 | 892066.743 | 797160.553 | 1756.985 | NG |
| 2367 | 892064.383 | 797147.441 | 1757.142 | NG |
| 2368 | 892063.151 | 797132.884 | 1756.826 | NG |
| 2372 | 892058.913 | 795437.845 | 1768.59 | NG |
| 2373 | 892059.196 | 795419.206 | 1766.665 | NG |
| 2374 | 892058.571 | 795400.685 | 1763.818 | NG |
| 2375 | 892135.804 | 791790.107 | 1772.963 | NG |
| 2376 | 892181.319 | 791820.522 | 1774.804 | TOE |
| 2377 | 892200.549 | 791833.456 | 1782.261 | TOP |
| 2378 | 892211.192 | 791840.436 | 1782.33 | TOP |
| 2379 | 892228.809 | 791852.22 | 1775.985 | TOE |
| 2380 | 892246.606 | 791864.205 | 1775.491 | TOP |
| 2381 | 892254.123 | 791869.302 | 1773.466 | TOE |
| 2382 | 892264.443 | 791876.056 | 1773.117 | TOE |
| 2383 | 892275.709 | 791883.596 | 1776.027 | TOP |
| 2384 | 892306.948 | 791904.3 | 1775.832 | NG |
| 2385 | 892332.361 | 791921.391 | 1775.486 | NG |
| 3000 | 892380.135 | 791600.012 | 1782.883 | TOP |
| 3001 | 892370.204 | 791592.073 | 1782.669 | TOP1 |
| 3002 | 892321.431 | 791673.949 | 1782.166 | TOP |
| 3003 | 892312.154 | 791666.325 | 1782.421 | TOP1 |
| 3004 | 892263.79 | 791748.702 | 1782.115 | TOP |
| 3005 | 892253.884 | 791742.039 | 1782.184 | TOP1 |
| 3006 | 892215.45 | 791831.355 | 1782.188 | TOP |
| 3007 | 892204.512 | 791825.831 | 1782.302 | TOP1 |
| 3008 | 892184.147 | 791921.126 | 1782.123 | TOP |
| 3009 | 892171.351 | 791916.348 | 1781.832 | TOP1 |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 3010 | 892171.902 | 792017.803 | 1782.03 | TOP |
| 3011 | 892161.223 | 792014.517 | 1782.224 | TOP1 |
| 3012 | 892171.622 | 792112.419 | 1781.847 | TOP |
| 3013 | 892159.829 | 792112.337 | 1781.889 | TOP1 |
| 3014 | 892165.041 | 792112.609 | 1781.975 | NG |
| 3015 | 892168.072 | 796654.82 | 1771.024 | NG |
| 3016 | 892155.418 | 796812.812 | 1770.286 | NG |
| 3017 | 892162.497 | 797143.696 | 1771.101 | NG |
| 3018 | 892159.834 | 792207.493 | 1782.154 | TOP1 |
| 3019 | 892170.939 | 792207.654 | 1782.131 | TOP |
| 3020 | 892170.937 | 792302.645 | 1782.197 | TOP |
| 3021 | 892159.463 | 792302.556 | 1782.216 | TOP1 |
| 3022 | 892169.908 | 792397.555 | 1782.222 | TOP |
| 3023 | 892159.607 | 792397.463 | 1782.136 | TOP1 |
| 3024 | 892077.936 | 792324.468 | 1772.286 | NG |
| 3025 | 892128.206 | 792324.645 | 1772.499 | TOE1 |
| 3026 | 892159.461 | 792324.666 | 1782.361 | TOP1 |
| 3027 | 892171.544 | 792324.669 | 1782.336 | TOP |
| 3028 | 892193.032 | 792324.746 | 1775.838 | TOE NJ |
| 3029 | 892215.462 | 792325.078 | 1774.828 | TOP NJ |
| 3030 | 892225.866 | 792325.13 | 1772.147 | TOE NJ |
| 3031 | 892236.596 | 792325.224 | 1772.13 | TOE NJ |
| 3032 | 892248.407 | 792324.21 | 1775.833 | TOP NJ |
| 3033 | 892296.819 | 792324.583 | 1776.384 | NG |
| 3034 | 892340.84 | 792324.278 | 1777.628 | NG |
| 3035 | 892170.73 | 792492.32 | 1782.097 | TOP |
| 3036 | 892159.816 | 792492.683 | 1782.188 | TOP1 |
| 3037 | 892171.336 | 792587.702 | 1781.901 | TOP |
| 3038 | 892160.287 | 792587.615 | 1782.142 | TOP1 |
| 3039 | 892171.138 | 792682.818 | 1782.117 | TOP |
| 3040 | 892159.892 | 792682.149 | 1782.222 | TOP1 |
| 3041 | 892159.004 | 792777.789 | 1782.159 | TOP1 |
| 3042 | 892170.71 | 792777.863 | 1782.107 | TOP |
| 3043 | 892169.922 | 792872.746 | 1782.122 | TOP |
| 3044 | 892158.707 | 792873.123 | 1782.143 | TOP1 |
| 3045 | 892158.421 | 792967.795 | 1782.1 | TOP1 |
| 3046 | 892170.897 | 792967.953 | 1782.077 | TOP |
| 3047 | 892071.409 | 792967.348 | 1769.28 | NG |
| 3048 | 892104.522 | 792967.386 | 1769.813 | NG |
| 3049 | 892116.541 | 792966.915 | 1769.395 | TOE NJ |
| 3050 | 892199.75 | 792967.676 | 1773.384 | TOE NJ |
| 3051 | 892217.881 | 792968.172 | 1771.783 | TOP NJ |
| 3052 | 892229.779 | 792967.667 | 1770.244 | TOE NJ |
| 3053 | 892250.813 | 792966.034 | 1770.485 | NG |
| 3054 | 892346.635 | 792968.072 | 1771.975 | NG |
| 3055 | 892170.19 | 793062.737 | 1782.393 | TOP |
| 3056 | 892158.392 | 793062.638 | 1782.308 | TOP1 |
| 3057 | 892158.574 | 793157.358 | 1782.24 | TOP1 |
| 3058 | 892169.484 | 793157.41 | 1782.164 | TOP |
| 3059 | 892169.098 | 793252.573 | 1782.008 | TOP |
| 3060 | 892157.986 | 793252.339 | 1782.028 | TOP1 |
| 3061 | 892158.297 | 793347.865 | 1781.973 | TOP1 |
| 3062 | 892169.939 | 793347.89 | 1781.908 | TOP |
| 3063 | 892170.028 | 793442.397 | 1782.039 | TOP |
| 3064 | 892157.589 | 793442.675 | 1782.073 | TOP1 |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 3065 | 892158.165 | 793537.477 | 1782.084 | TOP1 |
| 3066 | 892051.992 | 793537.359 | 1770.557 | NG |
| 3067 | 892095.336 | 793537.233 | 1771.079 | NG |
| 3068 | 892117.822 | 793537.415 | 1769.968 | TOE NJ |
| 3069 | 892168.959 | 793537.56 | 1782.163 | TOP |
| 3070 | 892196.643 | 793537.582 | 1773.818 | TOE NJ |
| 3071 | 892218.251 | 793538.088 | 1772.686 | TOP NJ |
| 3072 | 892227.572 | 793538.333 | 1769.722 | TOE NJ |
| 3073 | 892239.235 | 793538.449 | 1769.698 | TOE NJ |
| 3074 | 892251.785 | 793537.868 | 1773.265 | TOP NJ |
| 3075 | 892343.758 | 793537.325 | 1775.491 | NG |
| 3076 | 892291.321 | 793536.829 | 1774.623 | NG |
| 3077 | 892160.402 | 793632.403 | 1782.292 | TOP1 |
| 3078 | 892171.132 | 793632.298 | 1782.311 | NG |
| 3079 | 892190.508 | 793631.989 | 1781.961 | TOP |
| 3080 | 892170.624 | 793727.2 | 1782.251 | TOP |
| 3081 | 892178.269 | 793727.592 | 1781.755 | TOP NJ |
| 3082 | 892158.745 | 793727.746 | 1782.104 | TOP1 |
| 3083 | 892158.416 | 793822.226 | 1782.21 | TOP1 |
| 3084 | 892169.381 | 793822.575 | 1782.268 | TOP |
| 3085 | 892168.495 | 793917.638 | 1782.428 | TOP |
| 3086 | 892157.958 | 793917.467 | 1782.285 | TOP1 |
| 3087 | 892158.582 | 794012.179 | 1782.486 | TOP1 |
| 3088 | 892168.904 | 794012.104 | 1782.207 | TOP |
| 3089 | 892169.766 | 794107.397 | 1782.083 | TOP |
| 3090 | 892158.713 | 794107.396 | 1782.24 | TOP1 |
| 3091 | 892062.603 | 794202.141 | 1767.463 | NG |
| 3092 | 892092.776 | 794202.113 | 1767.988 | NG |
| 3093 | 892112.844 | 794202.196 | 1768.025 | TOE NJ |
| 3094 | 892157.623 | 794202.085 | 1781.881 | TOP1 |
| 3095 | 892169.073 | 794202.41 | 1781.995 | TOP |
| 3096 | 892200.995 | 794202.404 | 1772.369 | TOE NJ |
| 3097 | 892223.981 | 794202.712 | 1771.042 | TOP NJ |
| 3098 | 892233.611 | 794202.293 | 1769.999 | TOE NJ |
| 3099 | 892242.792 | 794202.725 | 1770.057 | TOE NJ |
| 3100 | 892250.021 | 794202.945 | 1770.748 | TOP NJ |
| 3101 | 892301.888 | 794202.362 | 1772.42 | NG |
| 3102 | 892351.291 | 794202.753 | 1774.641 | NG |
| 3103 | 892167.298 | 794297.126 | 1781.971 | TOP |
| 3104 | 892155.973 | 794297.227 | 1782.234 | TOP1 |
| 3105 | 892155.789 | 794392.235 | 1781.941 | TOP1 |
| 3106 | 892167.169 | 794391.997 | 1781.776 | TOP |
| 3107 | 892166.821 | 794487.012 | 1781.783 | TOP |
| 3108 | 892155.383 | 794487.646 | 1781.89 | TOP1 |
| 3109 | 892156.054 | 794582.239 | 1782.191 | TOP1 |
| 3110 | 892167.127 | 794582.033 | 1782.009 | TOP |
| 3111 | 892166.915 | 794677.101 | 1782.048 | TOP |
| 3112 | 892156.079 | 794676.656 | 1782.17 | TOP1 |
| 3113 | 892156.694 | 794772.233 | 1782.137 | TOP1 |
| 3114 | 892167.555 | 794772.076 | 1781.999 | TOP |
| 3115 | 892167.28 | 794802.557 | 1782.111 | TOP |
| 3116 | 892156.607 | 794802.72 | 1782.251 | TOP1 |
| 3117 | 892123.138 | 794801.694 | 1771.585 | TOE NJ |
| 3118 | 892119.113 | 794802.036 | 1771.01 | TOP NJ |
| 3119 | 892110.015 | 794802.325 | 1768.378 | TOE NJ |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 3120 | 892104.705 | 794802.187 | 1768.043 | TOE NJ |
| 3121 | 892095.079 | 794801.91 | 1769.684 | TOP NJ |
| 3122 | 892049.782 | 794802.274 | 1768.56 | NG |
| 3123 | 892197.06 | 794802.033 | 1772.526 | TOE NJ |
| 3124 | 892221.488 | 794802.331 | 1771.616 | TOP NJ |
| 3125 | 892227.503 | 794802.66 | 1770.489 | TOE NJ |
| 3126 | 892244.373 | 794803.214 | 1770.302 | TOE NJ |
| 3127 | 892258.408 | 794802.184 | 1772.171 | TOP NJ |
| 3128 | 892358.577 | 794810.734 | 1774.582 | NG |
| 3129 | 892305.141 | 794801.775 | 1773.244 | NG |
| 3130 | 892166.66 | 794867.338 | 1782.089 | TOP |
| 3131 | 892156.677 | 794867.59 | 1782.165 | TOP1 |
| 3132 | 892157.162 | 794962.006 | 1782.024 | TOP1 |
| 3133 | 892167.344 | 794961.896 | 1781.958 | TOP |
| 3134 | 892167.955 | 795057.11 | 1781.98 | TOP |
| 3135 | 892157.97 | 795057.321 | 1782.008 | TOP1 |
| 3136 | 892157.686 | 795152.403 | 1781.88 | TOP1 |
| 3137 | 892168.217 | 795152.318 | 1781.851 | TOP |
| 3138 | 892168.685 | 795247.053 | 1781.618 | TOP |
| 3139 | 892157.366 | 795247.496 | 1781.763 | TOP1 |
| 3140 | 892157.589 | 795341.977 | 1781.797 | TOP1 |
| 3141 | 892169.192 | 795342.292 | 1781.913 | TOP |
| 3142 | 892154.844 | 795436.406 | 1781.065 | TOP1 |
| 3143 | 892168.356 | 795437.195 | 1781.502 | NG |
| 3144 | 892192.155 | 795437.301 | 1781.358 | TOP |
| 3145 | 892169.118 | 795532.055 | 1772.176 | TOP |
| 3146 | 892155.432 | 795532.278 | 1771.86 | TOP1 |
| 3147 | 892167.053 | 795627.063 | 1770.49 | TOP |
| 3148 | 892154.067 | 795626.538 | 1770.242 | TOP1 |
| 3149 | 892155.452 | 795722.186 | 1770.497 | TOP1 |
| 3150 | 892166.542 | 795722.091 | 1770.524 | TOP |
| 3151 | 892166.418 | 795817.191 | 1770.499 | TOP |
| 3152 | 892155.4 | 795816.808 | 1770.446 | TOP1 |
| 3153 | 892156.073 | 795912.367 | 1770.665 | TOP1 |
| 3154 | 892167.038 | 795912.535 | 1770.711 | TOP |
| 3155 | 892167.894 | 796006.85 | 1770.347 | TOP |
| 3156 | 892156.343 | 796007.186 | 1770.336 | TOP1 |
| 3157 | 892094.499 | 796040.851 | 1766.719 | NG |
| 3158 | 892147.098 | 796040.717 | 1768.248 | TOE NJ |
| 3159 | 892156.855 | 796040.477 | 1770.445 | TOP1 |
| 3160 | 892167.839 | 796040.798 | 1770.493 | TOP |
| 3161 | 892178.239 | 796041.1 | 1767.752 | TOE NJ |
| 3162 | 892202.277 | 796041.147 | 1766.369 | TOP NJ |
| 3163 | 892229.676 | 796041.161 | 1758.728 | TOE NJ |
| 3164 | 892253.929 | 796042.084 | 1758.42 | TOE NJ |
| 3165 | 892296.041 | 796040.316 | 1770.916 | TOP NJ |
| 3166 | 892346.456 | 796041.519 | 1771.858 | NG |
| 3167 | 892395.747 | 796040.591 | 1772.327 | NG |
| 3168 | 892167.921 | 796101.829 | 1770.261 | TOP |
| 3169 | 892157.491 | 796102.204 | 1770.352 | TOP1 |
| 3170 | 892157.904 | 796197.203 | 1770.242 | TOP1 |
| 3171 | 892168.453 | 796197.575 | 1770.198 | TOP |
| 3172 | 892168.941 | 796292.123 | 1770.823 | TOP |
| 3173 | 892157.497 | 796292.208 | 1770.752 | TOP1 |
| 3174 | 892157.7 | 796386.53 | 1770.746 | TOP1 |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------|
| 3175 | 892169.409 | 796386.489 | 1770.624 | TOP |
| 3176 | 892168.881 | 796481.917 | 1770.53 | TOP |
| 3177 | 892158.331 | 796482.502 | 1770.52 | TOP1 |
| 3178 | 892158.475 | 796577.316 | 1770.727 | TOP1 |
| 3179 | 892170.255 | 796577.182 | 1770.725 | TOP |
| 3180 | 892160.23 | 796671.974 | 1770.831 | TOP1 |
| 3181 | 892125.756 | 796672.413 | 1760.367 | TOE NJ |
| 3182 | 892078.081 | 796671.197 | 1760.039 | NG |
| 3183 | 892171.486 | 796671.773 | 1771.24 | NG |
| 3184 | 892190.293 | 796671.606 | 1770.686 | TOP |
| 3185 | 892230.066 | 796672.187 | 1758.611 | TOE NJ |
| 3186 | 892258.588 | 796672.475 | 1758.404 | TOE NJ |
| 3187 | 892275.23 | 796672.272 | 1763.647 | TOP NJ |
| 3188 | 892323.155 | 796672.065 | 1765.277 | NG |
| 3189 | 892374.773 | 796672.088 | 1766.425 | NG |
| 3190 | 892164.624 | 796766.901 | 1770.643 | TOP |
| 3191 | 892151.45 | 796765.966 | 1770.608 | TOP1 |
| 3192 | 892149.662 | 796861.892 | 1770.185 | TOP1 |
| 3193 | 892161.152 | 796861.624 | 1770.096 | TOP |
| 3194 | 892162.239 | 796957.045 | 1770.232 | TOP |
| 3195 | 892150.345 | 796957.711 | 1770.266 | TOP1 |
| 3196 | 892153.517 | 797051.935 | 1770.635 | TOP1 |
| 3197 | 892166.986 | 797051.538 | 1770.816 | TOP |
| 3198 | 892167.398 | 797146.785 | 1770.973 | NG |
| 3199 | 892154.479 | 797146.827 | 1771.037 | TOP1 |
| 3200 | 892153.084 | 797241.693 | 1762.968 | TOP1 |
| 3201 | 892164.676 | 797242.22 | 1763.193 | TOP |
| 3202 | 892161.013 | 797337.163 | 1762.397 | TOP |
| 3203 | 892150.333 | 797337.16 | 1762.224 | TOP1 |
| 3204 | 892143.049 | 797431.96 | 1762.311 | TOP1 |
| 3205 | 892155.415 | 797433.326 | 1762.52 | TOP |
| 3206 | 892141.68 | 797527.485 | 1762.66 | TOP |
| 3207 | 892129.125 | 797526.782 | 1762.647 | TOP1 |
| 3208 | 892126.158 | 797621.527 | 1762.328 | TOP1 |
| 3209 | 892138.41 | 797621.042 | 1762.543 | TOP |
| 3210 | 892138.522 | 797716.656 | 1762.333 | TOP |
| 3211 | 892126.859 | 797717.773 | 1762.475 | TOP1 |
| 3212 | 892137.004 | 797811.761 | 1762.471 | TOP |
| 3213 | 892124.895 | 797810.776 | 1762.283 | TOP1 |
| 3214 | 892081.072 | 797894.67 | 1761.85 | TOP1 |
| 3215 | 892097.545 | 797899.198 | 1762.181 | TOP |
| 3216 | 892003.122 | 797922.753 | 1762.048 | TOP |
| 3217 | 892003.285 | 797911.518 | 1762.105 | TOP1 |
| 3218 | 891908.87 | 797913.209 | 1762.65 | NG |
| 3219 | 891911.002 | 797899.392 | 1762.8 | TOP1 |
| 3220 | 891817.23 | 797889.366 | 1753.944 | TOP1 |
| 3221 | 891819.205 | 797904.558 | 1754.398 | TOP |
| 3222 | 891725.575 | 797912.744 | 1750.845 | TOP1 |
| 3223 | 891728.445 | 797925.748 | 1750.712 | TOP |
| 3224 | 891729.872 | 797932.869 | 1750.172 | TOP NJ |
| 3225 | 891631.072 | 797916.778 | 1750.941 | TOP1 |
| 3226 | 891630.968 | 797935.022 | 1750.319 | TOP |
| 3227 | 892329.931 | 797800.229 | 1757.568 | TOP NJ |
| 3228 | 892315.14 | 797876.497 | 1758.39 | TOP NJ |
| 3229 | 892297.332 | 797933.529 | 1758.156 | TOP NJ |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------------------------|
| 3230 | 892264.279 | 797984.305 | 1759.253 | TOP NJ |
| 3231 | 892239.293 | 798013.384 | 1759.883 | TOP NJ |
| 3232 | 892200.811 | 798042.353 | 1759.435 | TOP NJ |
| 3233 | 892155.866 | 798066.062 | 1758.28 | TOP NJ |
| 3234 | 892134.08 | 798083.078 | 1759.548 | TOP NJ |
| 3235 | 892117.078 | 798094.078 | 1762.048 | TOP NJ |
| 3236 | 892109.987 | 798054.334 | 1750.893 | TOE NJ |
| 3237 | 892146.06 | 798041.751 | 1750.823 | TOE NJ |
| 3238 | 892187.562 | 798017.664 | 1750.67 | TOE NJ |
| 3239 | 892225.705 | 797987.037 | 1750.586 | TOE NJ |
| 3240 | 892256.931 | 797946.435 | 1751.147 | TOE NJ |
| 3241 | 892282.355 | 797902.602 | 1751.116 | TOE NJ |
| 3242 | 892295.719 | 797851.919 | 1750.956 | TOE NJ |
| 3243 | 892296.847 | 797799.635 | 1751.109 | TOE NJ |
| 3244 | 892199.458 | 797781.324 | 1750.91 | TOE NJ |
| 3245 | 892196.598 | 797830.623 | 1750.574 | TOE NJ |
| 3246 | 892182.786 | 797875.981 | 1750.646 | TOE NJ |
| 3247 | 892149.481 | 797919.759 | 1750.799 | TOE NJ |
| 3248 | 892110.055 | 797949.308 | 1750.808 | TOE NJ |
| 3249 | 892057.047 | 797957.143 | 1750.999 | TOE NJ |
| 3250 | 892084.819 | 797934.426 | 1756.578 | TOP NJ |
| 3251 | 892120.531 | 797922.135 | 1755.99 | TOP NJ |
| 3252 | 892119.057 | 797914.294 | 1756.331 | TOE NJ |
| 3253 | 892142.015 | 797883.171 | 1756.097 | TOE NJ |
| 3254 | 892152.848 | 797890.731 | 1755.519 | TOP NJ |
| 3255 | 892173.327 | 797851.642 | 1755.399 | TOP NJ |
| 3256 | 892156.772 | 797847.466 | 1755.937 | TOE NJ |
| 3257 | 892166.382 | 797797.948 | 1755.235 | TOE NJ |
| 3258 | 892182.997 | 797798.012 | 1755.035 | TOP NJ |
| 5000 | 892093.508 | 794148.73 | 1767.875 | PIPE B TOP OF 12" STEEL PIPE |
| 5001 | 892208.208 | 794157.197 | 1769.462 | PIPE INV OF 12" STEEL PIPE |
| 5002 | 892108.982 | 794804.308 | 1769.758 | PIPE NJ TOP OF 12" STEEL PIPE |
| 5003 | 892222.871 | 794715.54 | 1769.333 | PIPE INV OF 12" STEEL PIPE |
| 5004 | 892169.438 | 795345.09 | 1781.807 | TOP B |
| 5005 | 892171.957 | 795354.766 | 1781.63 | TOP |
| 5006 | 892181.56 | 795376.349 | 1781.269 | TOP |
| 5007 | 892188.036 | 795390.037 | 1781.354 | TOP |
| 5008 | 892190.993 | 795412.862 | 1781.415 | TOP |
| 5009 | 892197.34 | 795421.343 | 1781.24 | TOP PC |
| 5010 | 892199.949 | 795426.807 | 1781.204 | TOP |
| 5011 | 892199.464 | 795432.795 | 1781.38 | TOP |
| 5012 | 892193.93 | 795437.105 | 1781.213 | TOP |
| 5013 | 892186.493 | 795440.186 | 1781.191 | TOP |
| 5014 | 892178.935 | 795445.863 | 1780.993 | TOP |
| 5015 | 892173.291 | 795452.557 | 1780.64 | TOP |
| 5016 | 892169.39 | 795462.271 | 1779.48 | TOP PT |
| 5017 | 892168.653 | 795500.865 | 1775.181 | TOP |
| 5018 | 892181.92 | 795525.834 | 1771.339 | TOP |
| 5019 | 892184.702 | 795552.974 | 1770.552 | TOP |
| 5020 | 892183.056 | 795588.841 | 1770.388 | TOP |
| 5021 | 892190.145 | 795616.227 | 1769.331 | TOP |
| 5022 | 892198.492 | 795644.703 | 1767.135 | TOP |
| 5023 | 892208.705 | 795667.025 | 1764.425 | TOP PC |
| 5024 | 892216.984 | 795679.177 | 1761.867 | TOP |
| 5025 | 892226.714 | 795686.614 | 1758.953 | TOP TOE B |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-----------------------------|
| 5026 | 892227.529 | 795643.324 | 1759.038 | TOE |
| 5027 | 892191.026 | 795588.878 | 1769.171 | RIPRAP B GROUTED RIVER ROCK |
| 5028 | 892225.962 | 795589.493 | 1758.907 | RIPRAP TOE |
| 5029 | 892224.608 | 795541.06 | 1758.839 | TOE |
| 5030 | 892224.557 | 795492.903 | 1758.848 | TOE |
| 5031 | 892220.236 | 795467.646 | 1760.252 | TOE |
| 5032 | 892231.047 | 795465.628 | 1759.091 | TOE |
| 5033 | 892246.639 | 795465.001 | 1758.839 | TOE |
| 5034 | 892260.281 | 795466.665 | 1760.235 | TOE |
| 5035 | 892255.89 | 795488.948 | 1758.822 | TOE |
| 5036 | 892255.696 | 795536.428 | 1758.427 | TOE |
| 5037 | 892256.73 | 795587.077 | 1758.822 | RIPRAP TOE |
| 5038 | 892254.182 | 795643.098 | 1758.62 | TOE |
| 5039 | 892252.382 | 795684.169 | 1758.838 | TOE TOP NJ |
| 5040 | 892266.135 | 795671.184 | 1762.239 | TOP |
| 5041 | 892282.837 | 795640.181 | 1767.955 | TOP |
| 5042 | 892292.305 | 795613.666 | 1770.697 | TOP |
| 5043 | 892297.51 | 795588.125 | 1772.041 | TOP PT |
| 5044 | 892289.275 | 795589.292 | 1769.51 | RIPRAP |
| 5045 | 892290.232 | 795537.241 | 1769.479 | RIPRAP |
| 5046 | 892300.986 | 795537.178 | 1772.227 | TOP |
| 5047 | 892302.4 | 795491.633 | 1773.311 | TOP |
| 5048 | 892289.374 | 795491.833 | 1769.21 | RIPRAP |
| 5049 | 892286.393 | 795469.415 | 1768.595 | RIPRAP |
| 5050 | 892275.339 | 795454.036 | 1770.512 | RIPRAP |
| 5051 | 892275.817 | 795435.059 | 1780.563 | RIPRAP |
| 5052 | 892275.572 | 795423.789 | 1780.761 | RIPRAP |
| 5053 | 892286.138 | 795413.816 | 1780.599 | RIPRAP |
| 5054 | 892305.196 | 795463.346 | 1775.918 | TOP PC |
| 5055 | 892303.58 | 795446.88 | 1779.254 | TOP |
| 5056 | 892296.538 | 795434.02 | 1781.705 | TOP PT |
| 5057 | 892279.219 | 795432.563 | 1781.792 | TOP |
| 5058 | 892280.911 | 795424.657 | 1781.717 | TOP |
| 5059 | 892289.49 | 795419.374 | 1781.792 | TOP |
| 5060 | 892324.868 | 795424.657 | 1781.775 | TOP |
| 5061 | 892374.088 | 795425.217 | 1781.69 | TOP PC |
| 5062 | 892413.029 | 795418.537 | 1781.768 | TOP |
| 5063 | 892447.335 | 795402.549 | 1781.906 | TOP PT |
| 5064 | 892534.097 | 795349.661 | 1781.818 | TOP |
| 5065 | 892617.91 | 795298.988 | 1781.613 | TOP |
| 5066 | 892674.685 | 795267.188 | 1782.097 | TOP TOE1 B |
| 5067 | 892664.797 | 795264.439 | 1781.426 | TOE1 |
| 5068 | 892616.319 | 795291.142 | 1780.717 | TOE1 |
| 5069 | 892570.333 | 795300.872 | 1779.69 | TOE1 |
| 5070 | 892525.003 | 795333.831 | 1779.156 | TOE1 |
| 5071 | 892438.568 | 795382.444 | 1777.414 | TOE1 PC |
| 5072 | 892406.659 | 795393.908 | 1776.488 | TOE1 |
| 5073 | 892375.159 | 795396.756 | 1775.576 | TOE1 PT |
| 5074 | 892332.289 | 795392.26 | 1774.418 | TOE1 PT |
| 5075 | 892284.381 | 795386.518 | 1770.549 | TOE1 RIPRAP |
| 5076 | 892249.607 | 795384.752 | 1769.729 | TOE1 RIPRAP |
| 5077 | 892248.537 | 795412.177 | 1769.999 | TOE1 |
| 5078 | 892229.524 | 795413.53 | 1769.955 | TOE1 |
| 5079 | 892230.901 | 795385.613 | 1769.633 | TOE1 RIPRAP TOP1 B |
| 5080 | 892229.214 | 795348.238 | 1769.755 | TOE1 |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|---------------|
| 5081 | 892229.151 | 795323.173 | 1769.418 | TOE1 |
| 5082 | 892247.858 | 795323.797 | 1769.419 | TOE1 NJ |
| 5083 | 892248.101 | 795332.265 | 1769.15 | TOE1 PC |
| 5084 | 892254.132 | 795346.26 | 1769.508 | TOE1 |
| 5085 | 892268.18 | 795357.13 | 1769.615 | TOE1 |
| 5086 | 892281.247 | 795355.003 | 1769.925 | TOE1 PT E |
| 5087 | 892288.112 | 795332.657 | 1772.165 | TOP2 B |
| 5088 | 892275.911 | 795336.629 | 1772.221 | TOP2 B PC |
| 5089 | 892264.625 | 795335.879 | 1772.231 | TOP2 |
| 5090 | 892260.165 | 795328.691 | 1772.184 | TOP2 PT |
| 5091 | 892259.032 | 795322.445 | 1772.564 | TOP2 E |
| 5092 | 892220.098 | 795349.482 | 1771.042 | TOP1 |
| 5093 | 892219.784 | 795322.985 | 1771.614 | TOP1 E |
| 5094 | 892215.329 | 795353.33 | 1771.489 | TOE1 B |
| 5095 | 892204.109 | 795335.322 | 1772.157 | TOE1 |
| 5096 | 892199.647 | 795322.357 | 1772.934 | TOE1 E |
| 5097 | 892193.823 | 795386.915 | 1780.39 | RIPRAP |
| 5098 | 892195.689 | 795412.816 | 1780.865 | RIPRAP |
| 5099 | 892204.073 | 795422.704 | 1780.742 | RIPRAP |
| 5100 | 892204.301 | 795432.616 | 1780.65 | RIPRAP |
| 5101 | 892224.798 | 795423.484 | 1774.628 | CONC |
| 5102 | 892224.713 | 795434.518 | 1774.35 | CONC |
| 5103 | 892255.06 | 795432.626 | 1774.789 | CONC |
| 5104 | 892255.143 | 795423.511 | 1774.918 | CONC |
| 5105 | 892262.977 | 795413.109 | 1773.813 | CONC |
| 5106 | 892271.363 | 795401.901 | 1776.166 | CONC |
| 5107 | 892204.91 | 795457.739 | 1769.163 | RIPRAP |
| 5108 | 892195.831 | 795467.381 | 1768.998 | RIPRAP |
| 5109 | 892190.627 | 795494.169 | 1770.005 | RIPRAP |
| 5110 | 892191.479 | 795542.207 | 1769.479 | RIPRAP CLS E |
| 5111 | 892681.322 | 795281.926 | 1781.873 | TOP NJ TOE1 B |
| 5112 | 892624.18 | 795310.449 | 1781.68 | TOP |
| 5113 | 892630.862 | 795347.184 | 1779.336 | TOE1 |
| 5114 | 892560.159 | 795383.223 | 1776.294 | TOE1 |
| 5115 | 892540.554 | 795359.018 | 1781.674 | TOP |
| 5116 | 892453.456 | 795412.594 | 1781.83 | TOP PC |
| 5117 | 892463.34 | 795442.23 | 1774.406 | TOE1 PC |
| 5118 | 892439.448 | 795467.571 | 1772.59 | TOE1 |
| 5119 | 892416.701 | 795429.381 | 1781.808 | TOP |
| 5120 | 892374.218 | 795435.791 | 1781.819 | TOP PT |
| 5121 | 892325.471 | 795437.28 | 1781.377 | TOP |
| 5122 | 892321.743 | 795465.545 | 1776.456 | TOP |
| 5123 | 892316.825 | 795491.688 | 1773.789 | TOP |
| 5124 | 892371.43 | 795474.738 | 1771.022 | TOE1 |
| 5125 | 892350.926 | 795481.54 | 1771.276 | TOE1 |
| 5126 | 892340.074 | 795496.727 | 1770.957 | TOE1 PT |
| 5127 | 892331.27 | 795539.468 | 1771.407 | TOE1 PT |
| 5128 | 892318.258 | 795569.347 | 1772.458 | TOE1 PT |
| 5129 | 892314.198 | 795539.127 | 1772.348 | TOP |
| 5130 | 892311.177 | 795587.846 | 1772.406 | TOP TOE1 E |
| 5131 | 892308.692 | 795617.199 | 1771.083 | TOP PC |
| 5132 | 892303.099 | 795654.536 | 1768.176 | TOP |
| 5133 | 892280.102 | 795683.271 | 1762.772 | TOP |
| 5134 | 892254.79 | 795702.121 | 1759.071 | TOP PT TOE NJ |
| 5135 | 892254.706 | 795728.317 | 1758.93 | TOE |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-----------------------------------|
| 5136 | 892223.933 | 795728.177 | 1758.454 | TOE NJ |
| 5137 | 892222.779 | 795712.163 | 1758.745 | TOE |
| 5138 | 892205.521 | 795703.869 | 1758.48 | TOE PIPE NJ INV OF 12" STEEL PIPE |
| 5139 | 892224.871 | 795706.205 | 1758.839 | TOP NJ TOE E |
| 5140 | 892207.58 | 795686.13 | 1762.012 | TOP |
| 5141 | 892198.048 | 795673.232 | 1764.511 | TOP |
| 5142 | 892186.41 | 795650.521 | 1767.245 | TOP |
| 5143 | 892168.34 | 795607.975 | 1770.632 | TOP |
| 5144 | 892166.716 | 795667.157 | 1770.585 | TOP |
| 5145 | 892182.507 | 795663.446 | 1766.626 | NG |
| 5146 | 892196.502 | 795680.717 | 1764.125 | TOP NJ |
| 5147 | 892189.106 | 795684.454 | 1764.752 | TOP |
| 5148 | 892190.097 | 795726.296 | 1764.002 | TOP TOE B |
| 5149 | 892207.091 | 795726.368 | 1763.307 | TOP |
| 5150 | 892206.434 | 795733.501 | 1763.499 | TOP E |
| 5151 | 892190.925 | 795732.447 | 1764.037 | TOE E |
| 5152 | 892087.654 | 795730.203 | 1755.499 | PIPE TOP OF 12" STEEL PIPE |
| 5153 | 892156.919 | 795624.718 | 1770.517 | TOP B |
| 5154 | 892147.056 | 795623.718 | 1768.719 | TOE B |
| 5155 | 892145.665 | 795593.603 | 1768.556 | TOE |
| 5156 | 892139.031 | 795560.04 | 1767.43 | TOE |
| 5157 | 892157.274 | 795559.908 | 1770.88 | TOP |
| 5158 | 892157.165 | 795526.806 | 1772.48 | TOP |
| 5159 | 892157.345 | 795500.008 | 1775.189 | TOP |
| 5160 | 892157.597 | 795462.087 | 1779.347 | TOP |
| 5161 | 892158.077 | 795432.373 | 1781.386 | TOP |
| 5162 | 892158.03 | 795345.652 | 1781.796 | TOP |
| 5163 | 892132.304 | 795529.465 | 1766.724 | TOE |
| 5164 | 892124.774 | 795470.126 | 1769.565 | TOE |
| 5165 | 892117.986 | 795448.952 | 1769.36 | TOE |
| 5166 | 892109.619 | 795420.262 | 1766.702 | TOE |
| 5167 | 892109.513 | 795377.887 | 1767.425 | TOE |
| 5168 | 892113.901 | 795356.552 | 1768.608 | TOE |
| 5169 | 892114.003 | 795331.317 | 1768.306 | TOE E |
| 5170 | 892170.028 | 795406.21 | 1781.854 | NG |
| 5171 | 892186.76 | 797112.983 | 1769.129 | RIPRAP B GROUTED RIVER ROCK |
| 5172 | 892186.948 | 797132.809 | 1769.061 | RIPRAP |
| 5173 | 892201.999 | 797143.572 | 1768.844 | RIPRAP |
| 5174 | 892201.716 | 797152.058 | 1768.906 | RIPRAP |
| 5175 | 892200.368 | 797168.874 | 1761.368 | RIPRAP |
| 5176 | 892187.186 | 797179.857 | 1761.161 | RIPRAP |
| 5177 | 892186.955 | 797215.041 | 1761.361 | RIPRAP |
| 5178 | 892187.154 | 797247.036 | 1760.621 | RIPRAP |
| 5179 | 892219.617 | 797247.587 | 1751.094 | RIPRAP TOE B |
| 5180 | 892220.009 | 797194.711 | 1750.36 | TOE |
| 5181 | 892216.945 | 797180.83 | 1751.458 | TOE |
| 5182 | 892229.602 | 797179.222 | 1750.411 | TOE |
| 5183 | 892267.337 | 797178.455 | 1750.315 | TOE |
| 5184 | 892274.278 | 797180.726 | 1751.2 | TOE |
| 5185 | 892272.187 | 797191.244 | 1750.682 | TOE |
| 5186 | 892271.143 | 797246.089 | 1750.393 | TOE E RIPRAP |
| 5187 | 892305.444 | 797247.928 | 1760.995 | RIPRAP |
| 5188 | 892313.17 | 797248.494 | 1762.739 | TOP B |
| 5189 | 892304.588 | 797211.128 | 1760.769 | RIPRAP |
| 5190 | 892305.393 | 797177.77 | 1760.913 | RIPRAP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-----------------------------|
| 5191 | 892289.709 | 797169.112 | 1760.788 | RIPRAP |
| 5192 | 892289.126 | 797151.794 | 1768.964 | RIPRAP |
| 5193 | 892318.197 | 797203.626 | 1765.964 | TOP |
| 5194 | 892323.397 | 797177.82 | 1768.748 | TOP |
| 5195 | 892324.182 | 797163.775 | 1769.896 | TOP |
| 5196 | 892320.214 | 797159.465 | 1770.293 | TOP |
| 5197 | 892293.126 | 797151.242 | 1769.954 | TOP |
| 5198 | 892293.155 | 797145.591 | 1769.81 | TOP |
| 5199 | 892304.926 | 797139.848 | 1770.077 | TOP |
| 5200 | 892290.237 | 797143.361 | 1769.09 | RIPRAP |
| 5201 | 892302.798 | 797134.787 | 1769.024 | RIPRAP |
| 5202 | 892307.285 | 797131.063 | 1767.659 | RIPRAP |
| 5203 | 892327.975 | 797142.896 | 1769.978 | TOP |
| 5204 | 892438.917 | 797142.88 | 1770.058 | TOP |
| 5205 | 892535.981 | 797141.555 | 1770.019 | TOP |
| 5206 | 892649.505 | 797142.374 | 1770.101 | TOP TOE B |
| 5207 | 892651.472 | 797155.584 | 1770.107 | TOP NJ TOE1 B |
| 5208 | 892535.579 | 797153.77 | 1770.002 | TOP |
| 5209 | 892536.552 | 797167.263 | 1767.222 | TOE1 |
| 5210 | 892536.104 | 797124.873 | 1766.67 | TOE |
| 5211 | 892438.429 | 797121.937 | 1764.802 | TOE |
| 5212 | 892439.058 | 797153.673 | 1770.2 | TOP |
| 5213 | 892438.766 | 797171.842 | 1765.625 | TOE1 |
| 5214 | 892348.226 | 797154.425 | 1770.09 | TOP |
| 5215 | 892338.953 | 797162.516 | 1769.553 | TOP |
| 5216 | 892330.206 | 797201.575 | 1765.65 | TOP |
| 5217 | 892380.812 | 797182.374 | 1763.631 | TOE1 |
| 5218 | 892367.788 | 797204.783 | 1763.409 | TOE1 |
| 5219 | 892348.029 | 797203.572 | 1763.323 | TOE1 |
| 5220 | 892327.679 | 797246.513 | 1762.617 | TOE1 E TOP E |
| 5221 | 892346.405 | 797114.586 | 1762.992 | TOE |
| 5222 | 892317.486 | 797091.839 | 1758.635 | TOE |
| 5223 | 892302.776 | 797113.424 | 1759.253 | RIPRAP |
| 5224 | 892297.974 | 797112.079 | 1758.421 | RIPRAP TOE |
| 5225 | 892271.466 | 797114.145 | 1758.063 | RIPRAP TOE |
| 5226 | 892269.659 | 797131.221 | 1758.412 | TOE |
| 5227 | 892221.757 | 797132.427 | 1758.603 | TOE |
| 5228 | 892219.86 | 797111.954 | 1758.338 | TOE E RIPRAP CLS E |
| 5229 | 892204.852 | 797132.347 | 1763.659 | CONC |
| 5230 | 892221.951 | 797143.865 | 1762.967 | CONC |
| 5231 | 892221.5 | 797154.818 | 1762.961 | CONC |
| 5232 | 892271.237 | 797152.068 | 1763.449 | CONC |
| 5233 | 892272.705 | 797142.156 | 1763.595 | CONC |
| 5234 | 892283.855 | 797131.066 | 1762.937 | CONC |
| 5235 | 892171.11 | 797194.226 | 1766.86 | TOP B |
| 5236 | 892176.818 | 797225.784 | 1763.409 | TOP B |
| 5237 | 892181.335 | 797246.629 | 1762.073 | TOP B |
| 5238 | 892180.394 | 797266.279 | 1761.98 | TOP |
| 5239 | 892168.434 | 797272.221 | 1761.947 | TOP E |
| 5240 | 891935.645 | 797925.704 | 1761.326 | RIPRAP B GROUTED RIVER ROCK |
| 5241 | 891914.72 | 797927.642 | 1761.135 | RIPRAP |
| 5242 | 891904.796 | 797939.53 | 1761.233 | RIPRAP |
| 5243 | 891895.453 | 797939.113 | 1761.006 | RIPRAP |
| 5244 | 891871.944 | 797939.574 | 1749.757 | RIPRAP |
| 5245 | 891858.466 | 797921.957 | 1749.685 | RIPRAP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|--|
| 5246 | 891804.787 | 797920.744 | 1749.508 | RIPRAP |
| 5247 | 891795.693 | 797934.978 | 1749.095 | RIPRAP |
| 5248 | 891776.056 | 797937.191 | 1748.846 | RIPRAP START OF HAND PLACED RIVER ROCK |
| 5249 | 891725.1 | 797936.171 | 1749.258 | RIPRAP |
| 5250 | 891725.397 | 797963.084 | 1741.714 | RIPRAP TOE B |
| 5251 | 891776 | 797960.929 | 1741.612 | RIPRAP TOE END OF HAND PLACED RIVER ROCK |
| 5252 | 891774.494 | 798003.933 | 1741.942 | RIPRAP |
| 5253 | 891777.412 | 798058.571 | 1741.938 | RIPRAP START OF HAND PLACED RIVER ROCK |
| 5254 | 891748.571 | 798056.372 | 1741.597 | RIPRAP |
| 5255 | 891746.302 | 798111.527 | 1742.039 | RIPRAP TOE NJ |
| 5256 | 891741.486 | 798155.748 | 1742.863 | TOE |
| 5257 | 891694.774 | 798157.469 | 1742.245 | TOE |
| 5258 | 891689.276 | 798113.698 | 1742.019 | NG |
| 5259 | 891684.594 | 798059.673 | 1741.804 | NG |
| 5260 | 891678.144 | 798006.845 | 1741.962 | NG |
| 5261 | 891672.437 | 797963.619 | 1742.203 | TOE NJ CLS E |
| 5262 | 891774.906 | 798113.52 | 1749.544 | RIPRAP |
| 5263 | 891776.156 | 798083.79 | 1749.005 | RIPRAP END HAND PLACED RIVER ROCK |
| 5264 | 891795.838 | 798083.231 | 1748.883 | RIPRAP |
| 5265 | 891808.055 | 798098.997 | 1748.909 | RIPRAP |
| 5266 | 891859.569 | 798097.641 | 1749.242 | RIPRAP |
| 5267 | 891872.723 | 798080.788 | 1749.211 | RIPRAP |
| 5268 | 891896.32 | 798080.796 | 1760.874 | RIPRAP |
| 5269 | 891904.529 | 798078.937 | 1760.797 | RIPRAP |
| 5270 | 891915.791 | 798093.265 | 1760.95 | RIPRAP |
| 5271 | 891936.271 | 798093.124 | 1760.976 | RIPRAP |
| 5272 | 891982.29 | 798057.901 | 1750.246 | TOE B |
| 5273 | 891936.743 | 798058.317 | 1750.263 | TOE RIPRAP |
| 5274 | 891916.572 | 798059.934 | 1750.314 | TOE |
| 5275 | 891916.029 | 798006.875 | 1749.895 | TOE |
| 5276 | 891935.7 | 798008.666 | 1749.846 | RIPRAP |
| 5277 | 891915.376 | 797963.017 | 1750.322 | TOE |
| 5278 | 891918.97 | 797959.353 | 1750.111 | TOE |
| 5279 | 891936.181 | 797960.694 | 1750.125 | TOE RIPRAP CLS E |
| 5280 | 891984.329 | 797960.278 | 1750.302 | TOE E |
| 5281 | 891989.224 | 798003.032 | 1749.987 | NG |
| 5282 | 891905.686 | 798059.964 | 1754.772 | CONC |
| 5283 | 891896.667 | 798059.088 | 1755.033 | CONC |
| 5284 | 891896.248 | 798013.894 | 1755.128 | CONC |
| 5285 | 891905.982 | 798012.999 | 1754.876 | CONC |
| 5286 | 891906.188 | 797959.601 | 1755.043 | CONC |
| 5287 | 891895.872 | 797960.088 | 1754.868 | CONC |
| 5288 | 891858.865 | 797958.676 | 1738.341 | CONC |
| 5289 | 891807.443 | 797960.039 | 1737.194 | CONC |
| 5290 | 891807.348 | 798006.68 | 1736.897 | CONC |
| 5291 | 891808.276 | 798059.633 | 1737.081 | CONC |
| 5292 | 891858.793 | 798061.111 | 1737.74 | CONC |
| 5293 | 891858.785 | 798008.851 | 1736.931 | CONC |
| 5294 | 891827.691 | 798009.64 | 1736.969 | CONC |
| 5295 | 891795.88 | 797960.967 | 1741.935 | CONC |
| 5296 | 891796.105 | 798004.303 | 1741.687 | CONC |
| 5297 | 891795.991 | 798059.4 | 1742.01 | CONC |
| 5298 | 891696.409 | 798188.876 | 1751.452 | TOP B |
| 5299 | 891763.504 | 798185.345 | 1752.102 | TOP |
| 5300 | 891771.62 | 798177.207 | 1751.798 | TOP |

PASS MOUNTAIN DIVERSION DAM
Data Collection Points

| Pt. No. | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|------------|------------|-----------|-------------------------------|
| 5301 | 891777.607 | 798140.814 | 1750.813 | TOP |
| 5302 | 891781.565 | 798111.424 | 1751.082 | TOP |
| 5303 | 891781.671 | 798090.842 | 1750.692 | TOP |
| 5304 | 891791.971 | 798092.875 | 1751.498 | TOP |
| 5305 | 891804.673 | 798111.345 | 1753.03 | TOP |
| 5306 | 891818.951 | 798118.167 | 1754.815 | TOP |
| 5307 | 891859.936 | 798121.715 | 1758.468 | TOP |
| 5308 | 891879.142 | 798108.451 | 1760.705 | TOP |
| 5309 | 891895.783 | 798086.384 | 1761.799 | TOP |
| 5310 | 891904.486 | 798084.662 | 1761.882 | TOP |
| 5311 | 891914.321 | 798098.696 | 1762.308 | TOP |
| 5312 | 891937.7 | 798097.878 | 1762.697 | TOP |
| 5313 | 891988.814 | 798096.618 | 1762.528 | TOP |
| 5314 | 891990.271 | 798110.752 | 1762.309 | TOP NJ |
| 5315 | 891991.553 | 798118.576 | 1760.574 | TOE B |
| 5316 | 891972.152 | 798124.285 | 1760.481 | TOE |
| 5317 | 891970.691 | 798112.168 | 1762.676 | TOP |
| 5318 | 891961.815 | 798119.246 | 1762.684 | TOP |
| 5319 | 891965.356 | 798167.145 | 1761.624 | TOP |
| 5320 | 891970.756 | 798166.882 | 1760.798 | TOE |
| 5321 | 891956.891 | 798168.071 | 1761.756 | TOP NJ |
| 5322 | 891951.289 | 798168.886 | 1760.792 | TOE NJ |
| 5323 | 891947.252 | 798131.109 | 1761.1 | TOE |
| 5324 | 891953.403 | 798121.611 | 1762.753 | TOP |
| 5325 | 891908.609 | 798133.649 | 1761.932 | TOP |
| 5326 | 891909.951 | 798139.693 | 1760.62 | TOE |
| 5327 | 891852.383 | 798161.852 | 1757.289 | TOP TOE |
| 5328 | 891821.252 | 798178.538 | 1754.131 | TOP |
| 5329 | 891785.655 | 798198.227 | 1752.733 | TOP |
| 5330 | 891748.375 | 798204.449 | 1752.215 | TOP |
| 5331 | 891751.367 | 798209.455 | 1751.58 | TOE NJ |
| 5332 | 891691.264 | 798208.232 | 1750.488 | TOE E |
| 5333 | 891690.906 | 798203.089 | 1751.665 | TOP E |
| 5334 | 891804.019 | 798144.348 | 1753.895 | NG |
| 5335 | 891902.825 | 798111.232 | 1762.308 | NG |
| 5336 | 892052.924 | 797663.336 | 1750.816 | PIPE NJ TOP OF 12" STEEL PIPE |
| 5337 | 892194.459 | 797663.232 | 1750.215 | PIPE INV OF 12" STEEL PIPE |
| 5338 | 892112.543 | 796396.786 | 1757.772 | PIPE NJ TOP OF 12" STEEL PIPE |
| 5339 | 892224.941 | 796332.808 | 1758.538 | PIPE INV OF 12" STEEL PIPE |

APPENDIX D


```

PLANE  KI  Orig Nrth <null>          Orig East <null>
        Trans N  <null>             Trans E  <null>
        Rotation <null>             Scale   <null>

NOTE   TS  Time Date 10/14/2010 Time 07:01:34

SURVEY KI  Elev mask 13             PDOP mask 6.0

SURVEY KI  Elev mask 10             PDOP mask 6.0

SURVEY KI  Elev mask 13             PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT  KI  Antenna ht 0.000          Measuremt True

GPSPOS  SI  Point ID SRPEAST        Lat 33°25'25.17374"N Lng 111°40'44.55636"W
        Class Normal                Hgt 1375.166          Code <no text>
        Obs User Input              H.pr <null>          V.pr <null>

GPSANT  KI  Antenna ht 0.000          Measuremt True

GPSPOS  FD  Point ID SRPEAST        Lat 33°25'25.17374"N Lng 111°40'44.55636"W
        Class Normal                Hgt 1375.166          Code <no text>
        Obs User Input              H.pr <null>          V.pr <null>

EQUIP   SI  Receiver <no text>       Serial no <no text>
        Antenna Zephyr Geodetic - Model 2
        Meas To Antenna Phase Center
        Tape adj 0.000                Serial no <no text>
        H.Offset 0.000                V.Offset 0.000

NOTE    NM  Receiver firmware version=0.000

GPSANT  KI  Antenna ht 0.279          Measuremt True

GPSREF  KI  Reference SRPEAST

INIT    KI  Init event Gained         Week 1605
        Init type On the fly         seconds 396181.0
        Init counter 1                Point ID <no text>
        Survey type Real Time         Plate H.Dist <null>
        Plate V.Dist <null>           Plate azimuth <null>

EQUIP   NM  Receiver 5800            Serial no 4251116756
        Antenna R8/5800/SPS780 Internal
        Meas To Bottom of antenna mount
        Tape adj 0.000                Serial no <no text>
        H.Offset 0.000                V.Offset 0.213

NOTE    NM  Receiver firmware version=2.320

GPSANT  KI  Antenna ht 6.890          Measuremt Uncorrected

GPSVEC  CN  Point ID 2122R21        DX 20038.341          DY -2252.485
        Class Check                  DZ 8573.308          Code BC
        Obs L1 Fixed                  H.pr 0.020          V.pr 0.039

GPSQC1  NM  Min SVs 9                PDOP max 2.0
        Relative DOPs Yes            HDOP max 0.9
        Total GPS pos 185            VDOP max 1.8
        Monitor status Not monitored  RMS 19.4
        Horz SD                       Vert SD
        Start wk 1605 sec 396260.0    End wk 1605 sec 396454.0

GPSQC2  NM  Ttl satellites 9          Err Scale 0.0313075595
        VCV xx 0.0000034855          VCV xy 0.0000019285
        VCV xz -0.0000032136         VCV yy 0.0000052091
        VCV yz -0.0000057722         VCV zz 0.0000115394

POLAR D CN  Azmth 114°08'24.651"     H.Dist 0.099
        V.Dist 0.128

INIT    KI  Init event High RMS       Week 1605
        Init type On the fly         seconds 396499.0
        Init counter 1                Point ID <no text>
        Survey type Real Time         Plate H.Dist <null>
        Plate V.Dist <null>           Plate azimuth <null>

INIT    KI  Init event Good RMS       Week 1605
        Init type On the fly         seconds 396500.0
        Init counter 1                Point ID <no text>
        Survey type Real Time         Plate H.Dist <null>
        Plate V.Dist <null>           Plate azimuth <null>

INIT    KI  Init event Lost           Week 1605
        Init type On the fly         seconds 396503.0
        Init counter 0                Point ID <no text>
        Survey type Real Time         Plate H.Dist <null>
        Plate V.Dist <null>           Plate azimuth <null>

INIT    KI  Init event Gained         Week 1605
        Init type On the fly         seconds 396527.0
        Init counter 2                Point ID <no text>
        Survey type Real Time         Plate H.Dist <null>
        Plate V.Dist <null>           Plate azimuth <null>

NOTE    TS  Time Date 10/14/2010 Time 08:28:51
    
```

| | | | | |
|--------|----|---|---|--|
| GPSVEC | TP | Point ID 2000 Class Normal Obs L1 Fixed | DX 19778.691 DZ 9052.267 H.pr 0.021 | DY -1829.160 Code TOP B V.pr 0.037 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 401322.0 | PDOP max 1.5 HDOP max 0.8 VDOP max 1.3 RMS 24.9 Vert SD End wk 1605 sec 401331.0 | |
| F FILE | FC | File AMEC.ddf ID 17373 | Used Name | Yes AMEC |
| GPSVEC | TP | Point ID 2001 Class Normal Obs L1 Fixed | DX 19768.358 DZ 9038.822 H.pr 0.032 | DY -1834.057 Code TOP B V.pr 0.055 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 401355.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.9 RMS 30.2 Vert SD End wk 1605 sec 401360.0 | |
| GPSVEC | TP | Point ID 2002 Class Normal Obs L1 Fixed | DX 19845.682 DZ 8990.257 H.pr 0.023 | DY -1899.115 Code TOP V.pr 0.040 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 401497.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.8 RMS 12.6 Vert SD End wk 1605 sec 401501.0 | |
| GPSVEC | TP | Point ID 2003 Class Normal Obs L1 Fixed | DX 19837.652 DZ 8981.040 H.pr 0.026 | DY -1902.558 Code TOP1 V.pr 0.044 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 401520.0 | PDOP max 1.5 HDOP max 0.8 VDOP max 1.3 RMS 13.4 Vert SD End wk 1605 sec 401522.0 | |
| GPSVEC | TP | Point ID 2004 Class Normal Obs L1 Fixed | DX 19914.566 DZ 8930.839 H.pr 0.020 | DY -1968.220 Code TOP V.pr 0.034 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 401570.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.8 RMS 13.5 Vert SD End wk 1605 sec 401575.0 | |
| GPSVEC | TP | Point ID 2005 Class Normal Obs L1 Fixed | DX 19906.454 DZ 8921.269 H.pr 0.021 | DY -1971.846 Code TOP1 V.pr 0.036 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 401593.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.8 RMS 15.1 Vert SD End wk 1605 sec 401596.0 | |
| GPSVEC | TP | Point ID 2006 Class Normal Obs L1 Fixed | DX 19988.306 DZ 8877.560 H.pr 0.022 | DY -2035.164 Code TOP V.pr 0.038 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 401643.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.8 RMS 17.3 Vert SD End wk 1605 sec 401648.0 | |
| GPSVEC | TP | Point ID 2007 Class Normal Obs L1 Fixed | DX 19979.477 DZ 8868.228 H.pr 0.028 | DY -2038.703 Code TOP1 V.pr 0.048 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 401671.0 | PDOP max 1.5 HDOP max 0.8 VDOP max 1.3 RMS 13.7 Vert SD End wk 1605 sec 401675.0 | |
| GPSVEC | TP | Point ID 2008 Class Normal Obs L1 Fixed | DX 20073.841 DZ 8840.645 H.pr 0.021 | DY -2095.243 Code TOP V.pr 0.035 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 19.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401721.0 | End wk 1605 sec | 401726.0 |
| GPSVEC | TP | Point ID 2009 | | DX 20063.393 | DY -2099.663 |
| | | Class Normal | | DZ 8827.133 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.023 | V.pr 0.039 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 13.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401745.0 | End wk 1605 sec | 401750.0 |
| GPSVEC | TP | Point ID 2010 | | DX 20066.777 | DY -2106.539 |
| | | Class Normal | | DZ 8816.814 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.036 | V.pr 0.061 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 16.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401757.0 | End wk 1605 sec | 401761.0 |
| GPSVEC | TP | Point ID 2011 | | DX 20063.967 | DY -2111.337 |
| | | Class Normal | | DZ 8805.955 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.033 | V.pr 0.055 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 29.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401769.0 | End wk 1605 sec | 401773.0 |
| GPSVEC | TP | Point ID 2012 | | DX 20058.127 | DY -2115.332 |
| | | Class Normal | | DZ 8794.002 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.023 | V.pr 0.038 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 3 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 19.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401781.0 | End wk 1605 sec | 401783.0 |
| GPSVEC | TP | Point ID 2013 | | DX 20054.023 | DY -2120.647 |
| | | Class Normal | | DZ 8781.828 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.031 | V.pr 0.051 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 13.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401791.0 | End wk 1605 sec | 401794.0 |
| GPSVEC | TP | Point ID 2014 | | DX 20050.404 | DY -2126.116 |
| | | Class Normal | | DZ 8769.196 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.020 | V.pr 0.033 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 3 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 16.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401803.0 | End wk 1605 sec | 401805.0 |
| GPSVEC | TP | Point ID 2015 | | DX 20049.566 | DY -2133.068 |
| | | Class Normal | | DZ 8756.593 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.022 | V.pr 0.037 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 10.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401813.0 | End wk 1605 sec | 401816.0 |
| GPSVEC | TP | Point ID 2016 | | DX 20049.109 | DY -2139.959 |
| | | Class Normal | | DZ 8744.852 | Code TOP1 E |
| | | Obs L1 Fixed | | H.pr 0.021 | V.pr 0.035 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 13.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 401826.0 | End wk 1605 sec | 401831.0 |
| GPSVEC | TP | Point ID 2017 | | DX 20062.207 | DY -2143.725 |
| | | Class Normal | | DZ 8746.912 | Code TOP1 B |
| | | Obs L1 Fixed | | H.pr 0.029 | V.pr 0.048 |

| | | | | | |
|--------|----|----------------|-------------------|----------|-------------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 18.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401843.0 | End wk | 1605 sec 401847.0 |
| GPSVEC | TP | Point ID | 2018 | DX | 20062.093 |
| | | Class | Normal | DZ | 8757.773 |
| | | Obs | L1 Fixed | H.pr | 0.026 |
| | | | | DY | -2137.141 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.043 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 29.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401856.0 | End wk | 1605 sec 401859.0 |
| GPSVEC | TP | Point ID | 2019 | DX | 20063.923 |
| | | Class | Normal | DZ | 8772.089 |
| | | Obs | L1 Fixed | H.pr | 0.030 |
| | | | | DY | -2129.903 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.050 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 11.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401868.0 | End wk | 1605 sec 401871.0 |
| GPSVEC | TP | Point ID | 2020 | DX | 20068.405 |
| | | Class | Normal | DZ | 8786.658 |
| | | Obs | L1 Fixed | H.pr | 0.038 |
| | | | | DY | -2123.640 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.064 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 15.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401879.0 | End wk | 1605 sec 401884.0 |
| GPSVEC | TP | Point ID | 2021 | DX | 20075.670 |
| | | Class | Normal | DZ | 8799.558 |
| | | Obs | L1 Fixed | H.pr | 0.041 |
| | | | | DY | -2119.481 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.068 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 36.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401893.0 | End wk | 1605 sec 401897.0 |
| GPSVEC | TP | Point ID | 2022 | DX | 20085.263 |
| | | Class | Normal | DZ | 8808.922 |
| | | Obs | L1 Fixed | H.pr | 0.028 |
| | | | | DY | -2118.440 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.046 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 24.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401906.0 | End wk | 1605 sec 401909.0 |
| GPSVEC | TP | Point ID | 2023 | DX | 20097.413 |
| | | Class | Normal | DZ | 8818.699 |
| | | Obs | L1 Fixed | H.pr | 0.032 |
| | | | | DY | -2119.123 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.052 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 20.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401919.0 | End wk | 1605 sec 401924.0 |
| GPSVEC | TP | Point ID | 2024 | DX | 20111.801 |
| | | Class | Normal | DZ | 8822.079 |
| | | Obs | L1 Fixed | H.pr | 0.038 |
| | | | | DY | -2123.575 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 20.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 401932.0 | End wk | 1605 sec 401936.0 |
| GPSVEC | TP | Point ID | 2025 | DX | 20177.008 |
| | | Class | Normal | DZ | 8825.682 |
| | | Obs | L1 Fixed | H.pr | 0.021 |
| | | | | DY | -2146.673 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.035 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 3 | VDOP max | 1.2 |
| | | Monitor status | Not monitored | RMS | 11.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 402041.0 | End wk | 1605 sec 402044.0 |
| GPSVEC | TP | Point ID | 2026 | DX | 20173.353 |
| | | Class | Normal | DZ | 8816.626 |
| | | Obs | L1 Fixed | H.pr | 0.024 |
| | | | | DY | -2151.948 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.039 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|-----------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.2 |
| | | Monitor status | Not monitored | RMS | 19.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402059.0 | End wk 1605 sec | 402062.0 |
| GPSVEC | TP | Point ID 2027 | | DX | 20291.835 |
| | | Class Normal | | DZ | 8825.224 |
| | | Obs L1 Fixed | | H.pr | 0.019 |
| | | | | DY | -2192.544 |
| | | | | Code TOP | |
| | | | | V.pr | 0.031 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 12.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402142.0 | End wk 1605 sec | 402145.0 |
| GPSVEC | TP | Point ID 2028 | | DX | 20288.653 |
| | | Class Normal | | DZ | 8814.827 |
| | | Obs L1 Fixed | | H.pr | 0.036 |
| | | | | DY | -2198.853 |
| | | | | Code TOP1 | |
| | | | | V.pr | 0.058 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 24.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402167.0 | End wk 1605 sec | 402171.0 |
| GPSVEC | TP | Point ID 2029 | | DX | 20405.912 |
| | | Class Normal | | DZ | 8823.602 |
| | | Obs L1 Fixed | | H.pr | 0.038 |
| | | | | DY | -2239.106 |
| | | | | Code TOP | |
| | | | | V.pr | 0.060 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.4 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 5 | VDOP max | 1.2 |
| | | Monitor status | Not monitored | RMS | 26.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402226.0 | End wk 1605 sec | 402230.0 |
| GPSVEC | TP | Point ID 2030 | | DX | 20403.171 |
| | | Class Normal | | DZ | 8814.603 |
| | | Obs L1 Fixed | | H.pr | 0.029 |
| | | | | DY | -2244.556 |
| | | | | Code TOP1 | |
| | | | | V.pr | 0.046 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 18.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402244.0 | End wk 1605 sec | 402247.0 |
| GPSVEC | TP | Point ID 2031 | | DX | 20521.141 |
| | | Class Normal | | DZ | 8823.710 |
| | | Obs L1 Fixed | | H.pr | 0.024 |
| | | | | DY | -2284.653 |
| | | | | Code TOP | |
| | | | | V.pr | 0.037 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 15.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402299.0 | End wk 1605 sec | 402302.0 |
| GPSVEC | TP | Point ID 2032 | | DX | 20517.605 |
| | | Class Normal | | DZ | 8813.777 |
| | | Obs L1 Fixed | | H.pr | 0.041 |
| | | | | DY | -2290.344 |
| | | | | Code TOP1 | |
| | | | | V.pr | 0.064 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 39.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402315.0 | End wk 1605 sec | 402319.0 |
| GPSVEC | TP | Point ID 2033 | | DX | 20637.182 |
| | | Class Normal | | DZ | 8824.112 |
| | | Obs L1 Fixed | | H.pr | 0.023 |
| | | | | DY | -2330.161 |
| | | | | Code TOP | |
| | | | | V.pr | 0.036 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 18.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402374.0 | End wk 1605 sec | 402377.0 |
| GPSVEC | TP | Point ID 2034 | | DX | 20633.510 |
| | | Class Normal | | DZ | 8814.108 |
| | | Obs L1 Fixed | | H.pr | 0.030 |
| | | | | DY | -2335.964 |
| | | | | Code TOP1 | |
| | | | | V.pr | 0.046 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 14.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 402389.0 | End wk 1605 sec | 402393.0 |
| GPSVEC | TP | Point ID 2035 | | DX | 20752.728 |
| | | Class Normal | | DZ | 8823.826 |
| | | Obs L1 Fixed | | H.pr | 0.020 |
| | | | | DY | -2376.270 |
| | | | | Code TOP | |
| | | | | V.pr | 0.031 |

```

GPSQC1 NM Min SVs 7 PDOP max 2.0
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 1.7
Monitor status Not monitored RMS 13.1
Horz SD Vert SD
Start wk 1605 sec 402491.0 End wk 1605 sec 402495.0

GPSVEC TP Point ID 2036 DX 20749.595 DY -2382.095
Class Normal DZ 8814.172 Code TOP1
Obs L1 Fixed H.pr 0.021 V.pr 0.032

GPSQC1 NM Min SVs 7 PDOP max 2.0
Relative DOPs Yes HDOP max 1.1
Total GPS pos 4 VDOP max 1.7
Monitor status Not monitored RMS 16.7
Horz SD Vert SD
Start wk 1605 sec 402511.0 End wk 1605 sec 402514.0

GPSVEC TP Point ID 2037 DX 20867.655 DY -2422.372
Class Normal DZ 8823.045 Code TOP
Obs L1 Fixed H.pr 0.025 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 2.0
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 1.6
Monitor status Not monitored RMS 18.4
Horz SD Vert SD
Start wk 1605 sec 402664.0 End wk 1605 sec 402668.0

GPSVEC TP Point ID 2038 DX 20864.268 DY -2428.847
Class Normal DZ 8812.013 Code TOP1
Obs L1 Fixed H.pr 0.025 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 1.4
Relative DOPs Yes HDOP max 0.8
Total GPS pos 5 VDOP max 1.1
Monitor status Not monitored RMS 11.2
Horz SD Vert SD
Start wk 1605 sec 402704.0 End wk 1605 sec 402708.0

GPSVEC TP Point ID 2039 DX 20982.236 DY -2467.989
Class Normal DZ 8822.221 Code TOP
Obs L1 Fixed H.pr 0.038 V.pr 0.059

GPSQC1 NM Min SVs 6 PDOP max 1.5
Relative DOPs Yes HDOP max 0.8
Total GPS pos 5 VDOP max 1.2
Monitor status Not monitored RMS 29.0
Horz SD Vert SD
Start wk 1605 sec 402814.0 End wk 1605 sec 402818.0

GPSVEC TP Point ID 2040 DX 20978.855 DY -2473.957
Class Normal DZ 8812.263 Code TOP1
Obs L1 Fixed H.pr 0.029 V.pr 0.047

GPSQC1 NM Min SVs 6 PDOP max 2.4
Relative DOPs Yes HDOP max 1.3
Total GPS pos 4 VDOP max 2.0
Monitor status Not monitored RMS 17.0
Horz SD Vert SD
Start wk 1605 sec 402871.0 End wk 1605 sec 402874.0

GPSVEC TP Point ID 2041 DX 21094.871 DY -2513.158
Class Normal DZ 8822.018 Code TOP
Obs L1 Fixed H.pr 0.024 V.pr 0.039

GPSQC1 NM Min SVs 6 PDOP max 2.4
Relative DOPs Yes HDOP max 1.3
Total GPS pos 5 VDOP max 2.0
Monitor status Not monitored RMS 10.3
Horz SD Vert SD
Start wk 1605 sec 403017.0 End wk 1605 sec 403021.0

GPSVEC TP Point ID 2042 DX 21092.949 DY -2519.820
Class Normal DZ 8811.945 Code TOP1
Obs L1 Fixed H.pr 0.029 V.pr 0.047

GPSQC1 NM Min SVs 6 PDOP max 1.7
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 16.1
Horz SD Vert SD
Start wk 1605 sec 403054.0 End wk 1605 sec 403057.0

GPSVEC TP Point ID 2043 DX 21211.590 DY -2560.225
Class Normal DZ 8821.197 Code TOP
Obs L1 Fixed H.pr 0.019 V.pr 0.030

GPSQC1 NM Min SVs 6 PDOP max 2.4
Relative DOPs Yes HDOP max 1.3
Total GPS pos 6 VDOP max 2.0
Monitor status Not monitored RMS 9.0
Horz SD Vert SD
Start wk 1605 sec 403115.0 End wk 1605 sec 403120.0

```

NOTE TS Time Date 10/14/2010 Time 08:58:59


```

GPSVEC TP Point ID 2053      DX  21574.379      DY  -2732.673
Class Normal      DZ  8835.653      Code TOP
Obs L1 Fixed      H.pr 0.037        V.pr 0.057

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 14.8
Horz SD          Vert SD
Start wk 1605 sec 403482.0 End wk 1605 sec 403485.0

GPSVEC TP Point ID 2054      DX  21688.616      DY  -2737.388
Class Normal      DZ  8837.248      Code TOP
Obs L1 Fixed      H.pr 0.023        V.pr 0.035

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 9.1
Horz SD          Vert SD
Start wk 1605 sec 403495.0 End wk 1605 sec 403498.0

GPSVEC TP Point ID 2055      DX  21716.094      DY  -2747.138
Class Normal      DZ  8838.591      Code TOP
Obs L1 Fixed      H.pr 0.043        V.pr 0.066

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 13.4
Horz SD          Vert SD
Start wk 1605 sec 403510.0 End wk 1605 sec 403513.0

GPSVEC TP Point ID 2056      DX  21731.218      DY  -2749.682
Class Normal      DZ  8840.663      Code TOP
Obs L1 Fixed      H.pr 0.021        V.pr 0.033

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 12.2
Horz SD          Vert SD
Start wk 1605 sec 403522.0 End wk 1605 sec 403525.0

GPSVEC TP Point ID 2057      DX  21746.743      DY  -2750.981
Class Normal      DZ  8844.003      Code TOP
Obs L1 Fixed      H.pr 0.027        V.pr 0.042

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 8.1
Horz SD          Vert SD
Start wk 1605 sec 403533.0 End wk 1605 sec 403536.0

GPSVEC TP Point ID 2058      DX  21763.622      DY  -2751.926
Class Normal      DZ  8848.056      Code TOP
Obs L1 Fixed      H.pr 0.042        V.pr 0.064

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 4          VDOP max 2.0
Monitor status Not monitored RMS 9.3
Horz SD          Vert SD
Start wk 1605 sec 403545.0 End wk 1605 sec 403548.0

GPSVEC TP Point ID 2059      DX  21779.540      DY  -2751.593
Class Normal      DZ  8853.172      Code TOP
Obs L1 Fixed      H.pr 0.032        V.pr 0.049

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 8          VDOP max 2.0
Monitor status Not monitored RMS 5.2
Horz SD          Vert SD
Start wk 1605 sec 403557.0 End wk 1605 sec 403564.0

GPSVEC TP Point ID 2060      DX  21791.252      DY  -2749.596
Class Normal      DZ  8857.681      Code TOP E
Obs L1 Fixed      H.pr 0.020        V.pr 0.031

GPSQC1 NM Min SVs          6          PDOP max 1.7
Relative DOPs Yes          HDOP max 0.9
Total GPS pos 5          VDOP max 1.4
Monitor status Not monitored RMS 8.1
Horz SD          Vert SD
Start wk 1605 sec 403575.0 End wk 1605 sec 403579.0

GPSVEC TP Point ID 2061      DX  21801.781      DY  -2759.644
Class Normal      DZ  8850.316      Code TOP B
Obs L1 Fixed      H.pr 0.023        V.pr 0.035

GPSQC1 NM Min SVs          6          PDOP max 2.4
Relative DOPs Yes          HDOP max 1.3
Total GPS pos 5          VDOP max 2.0
Monitor status Not monitored RMS 7.9
Horz SD          Vert SD
Start wk 1605 sec 403591.0 End wk 1605 sec 403595.0

```

| | | | | |
|--------|----|--|---|---|
| GPSVEC | TP | Point ID 2062 Class Normal Obs L1 Fixed | DX 21782.592 DZ 8843.627 H.pr 0.024 | DY -2759.418 Code TOP V.pr 0.036 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403611.0 | PDOP max 1.7 HDOP max 0.9 VDOP max 1.4 RMS 7.6 Vert SD End wk 1605 sec 403614.0 | |
| GPSVEC | TP | Point ID 2063 Class Normal Obs L1 Fixed | DX 21762.953 DZ 8838.432 H.pr 0.026 | DY -2758.737 Code TOP V.pr 0.040 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 403625.0 | PDOP max 1.7 HDOP max 0.9 VDOP max 1.4 RMS 15.3 Vert SD End wk 1605 sec 403627.0 | |
| GPSVEC | TP | Point ID 2064 Class Normal Obs L1 Fixed | DX 21741.002 DZ 8832.885 H.pr 0.029 | DY -2758.236 Code TOP V.pr 0.044 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403639.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 12.5 Vert SD End wk 1605 sec 403642.0 | |
| GPSVEC | TP | Point ID 2065 Class Normal Obs L1 Fixed | DX 21710.661 DZ 8822.968 H.pr 0.021 | DY -2756.917 Code TOP V.pr 0.032 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403660.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 12.1 Vert SD End wk 1605 sec 403663.0 | |
| GPSVEC | TP | Point ID 2066 Class Normal Obs L1 Fixed | DX 21675.268 DZ 8810.592 H.pr 0.028 | DY -2751.275 Code TOP1 V.pr 0.043 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403681.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 22.5 Vert SD End wk 1605 sec 403685.0 | |
| GPSVEC | TP | Point ID 2067 Class Normal Obs L1 Fixed | DX 21678.544 DZ 8807.801 H.pr 0.028 | DY -2753.729 Code TOP1 V.pr 0.043 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 403690.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 29.9 Vert SD End wk 1605 sec 403695.0 | |
| GPSVEC | TP | Point ID 2068 Class Normal Obs L1 Fixed | DX 21677.591 DZ 8793.036 H.pr 0.027 | DY -2759.494 Code TOP1 V.pr 0.041 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403703.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 22.2 Vert SD End wk 1605 sec 403708.0 | |
| GPSVEC | TP | Point ID 2069 Class Normal Obs L1 Fixed | DX 21678.247 DZ 8777.600 H.pr 0.038 | DY -2767.083 Code TOP1 V.pr 0.057 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 403717.0 | PDOP max 2.4 HDOP max 1.3 VDOP max 2.0 RMS 26.5 Vert SD End wk 1605 sec 403722.0 | |
| GPSVEC | TP | Point ID 2070 Class Normal Obs L1 Fixed | DX 21681.295 DZ 8763.427 H.pr 0.035 | DY -2775.872 Code TOP1 E V.pr 0.054 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403734.0 | PDOP max 2.4 HDOP max 1.4 VDOP max 2.0 RMS 27.3 Vert SD End wk 1605 sec 403738.0 | |

| | | | | |
|--------|----|---|---|---|
| GPSVEC | TP | Point ID 2071 Class Normal Obs L1 Fixed | DX 21691.955 DZ 8764.820 H.pr 0.042 | DY -2779.316 Code TOP1 B V.pr 0.064 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403748.0 | PDOP max 2.4 HDOP max 1.4 VDOP max 2.0 RMS 27.6 Vert SD End wk 1605 sec 403752.0 | |
| GPSVEC | TP | Point ID 2072 Class Normal Obs L1 Fixed | DX 21694.525 DZ 8785.193 H.pr 0.030 | DY -2769.487 Code TOP1 V.pr 0.046 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403769.0 | PDOP max 2.4 HDOP max 1.4 VDOP max 2.0 RMS 29.4 Vert SD End wk 1605 sec 403773.0 | |
| GPSVEC | TP | Point ID 2073 Class Normal Obs L1 Fixed | DX 21698.911 DZ 8802.844 H.pr 0.024 | DY -2763.765 Code TOP1 V.pr 0.058 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1605 sec 403784.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.4 RMS 4.2 Vert SD End wk 1605 sec 403791.0 | |
| GPSVEC | TP | Point ID 2074 Class Normal Obs L1 Fixed | DX 21703.292 DZ 8809.133 H.pr 0.025 | DY -2763.199 Code TOP1 V.pr 0.061 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 403798.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.4 RMS 13.7 Vert SD End wk 1605 sec 403808.0 | |
| GPSVEC | TP | Point ID 2075 Class Normal Obs L1 Fixed | DX 21708.085 DZ 8810.679 H.pr 0.025 | DY -2764.467 Code TOP1 V.pr 0.061 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 9 Monitor status Not monitored Horz SD Start wk 1605 sec 403814.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.4 RMS 3.9 Vert SD End wk 1605 sec 403822.0 | |
| GPSVEC | TP | Point ID 2076 Class Normal Obs L1 Fixed | DX 21788.024 DZ 8820.109 H.pr 0.022 | DY -2789.357 Code TOP V.pr 0.054 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403872.0 | PDOP max 3.3 HDOP max 1.3 VDOP max 3.1 RMS 5.2 Vert SD End wk 1605 sec 403876.0 | |
| GPSVEC | TP | Point ID 2077 Class Normal Obs L1 Fixed | DX 21784.794 DZ 8810.412 H.pr 0.026 | DY -2794.798 Code TOP1 V.pr 0.064 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 403889.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.4 RMS 5.9 Vert SD End wk 1605 sec 403894.0 | |
| GPSVEC | TP | Point ID 2078 Class Normal Obs L1 Fixed | DX 21902.446 DZ 8818.858 H.pr 0.028 | DY -2835.730 Code TOP V.pr 0.068 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403984.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.4 RMS 6.2 Vert SD End wk 1605 sec 403987.0 | |
| GPSVEC | TP | Point ID 2079 Class Normal Obs L1 Fixed | DX 21899.389 DZ 8809.132 H.pr 0.025 | DY -2841.238 Code TOP1 V.pr 0.061 |
| GPSQC1 | NM | Min SVs 5 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 403999.0 | PDOP max 4.7 HDOP max 1.8 VDOP max 4.3 RMS 13.8 Vert SD End wk 1605 sec 404009.0 | |

```

GPSVEC TP Point ID 2080      DX  22017.471      DY  -2881.531
      Class Normal      DZ  8818.369      Code TOP
      Obs L1 Fixed      H.pr 0.026      V.pr 0.064

GPSQC1 NM Min SVs      5      PDOP max 4.7
      Relative DOPs Yes      HDOP max 1.8
      Total GPS pos 7      VDOP max 4.3
      Monitor status Not monitored      RMS 5.4
      Horz SD      Vert SD
      Start wk 1605 sec 404060.0      End wk 1605 sec 404066.0

GPSVEC TP Point ID 2081      DX  22015.455      DY  -2887.030
      Class Normal      DZ  8809.766      Code TOP1
      Obs L1 Fixed      H.pr 0.023      V.pr 0.057

GPSQC1 NM Min SVs      5      PDOP max 3.3
      Relative DOPs Yes      HDOP max 1.2
      Total GPS pos 4      VDOP max 3.1
      Monitor status Not monitored      RMS 12.4
      Horz SD      Vert SD
      Start wk 1605 sec 404080.0      End wk 1605 sec 404083.0

GPSVEC TP Point ID 2082      DX  22132.995      DY  -2927.243
      Class Normal      DZ  8818.166      Code TOP
      Obs L1 Fixed      H.pr 0.025      V.pr 0.060

GPSQC1 NM Min SVs      5      PDOP max 3.3
      Relative DOPs Yes      HDOP max 1.2
      Total GPS pos 5      VDOP max 3.0
      Monitor status Not monitored      RMS 3.8
      Horz SD      Vert SD
      Start wk 1605 sec 404122.0      End wk 1605 sec 404126.0

GPSVEC TP Point ID 2083      DX  22131.806      DY  -2933.056
      Class Normal      DZ  8809.412      Code TOP1
      Obs L1 Fixed      H.pr 0.016      V.pr 0.038

GPSQC1 NM Min SVs      5      PDOP max 3.3
      Relative DOPs Yes      HDOP max 1.2
      Total GPS pos 4      VDOP max 3.0
      Monitor status Not monitored      RMS 10.4
      Horz SD      Vert SD
      Start wk 1605 sec 404139.0      End wk 1605 sec 404142.0

GPSVEC TP Point ID 2084      DX  22247.929      DY  -2973.414
      Class Normal      DZ  8817.063      Code TOP
      Obs L1 Fixed      H.pr 0.023      V.pr 0.057

GPSQC1 NM Min SVs      5      PDOP max 4.6
      Relative DOPs Yes      HDOP max 1.8
      Total GPS pos 4      VDOP max 4.3
      Monitor status Not monitored      RMS 12.8
      Horz SD      Vert SD
      Start wk 1605 sec 404189.0      End wk 1605 sec 404192.0

GPSVEC TP Point ID 2085      DX  22244.860      DY  -2979.236
      Class Normal      DZ  8807.420      Code TOP1
      Obs L1 Fixed      H.pr 0.028      V.pr 0.067

GPSQC1 NM Min SVs      5      PDOP max 3.3
      Relative DOPs Yes      HDOP max 1.2
      Total GPS pos 6      VDOP max 3.0
      Monitor status Not monitored      RMS 13.0
      Horz SD      Vert SD
      Start wk 1605 sec 404204.0      End wk 1605 sec 404209.0

NOTE NM Modified 9:17:02 AM 10/14/2010

NOTE NM Old values TOP

GPSVEC TP Point ID 2086      DX  22361.642      DY  -3019.346
      Class Normal      DZ  8815.627      Code TOP
      Obs L1 Fixed      H.pr 0.026      V.pr 0.062

GPSQC1 NM Min SVs      5      PDOP max 4.6
      Relative DOPs Yes      HDOP max 1.8
      Total GPS pos 8      VDOP max 4.3
      Monitor status Not monitored      RMS 15.6
      Horz SD      Vert SD
      Start wk 1605 sec 404264.0      End wk 1605 sec 404271.0

GPSVEC TP Point ID 2087      DX  22360.870      DY  -3026.032
      Class Normal      DZ  8806.009      Code TOP1
      Obs L1 Fixed      H.pr 0.036      V.pr 0.086

GPSQC1 NM Min SVs      5      PDOP max 4.6
      Relative DOPs Yes      HDOP max 1.8
      Total GPS pos 8      VDOP max 4.3
      Monitor status Not monitored      RMS 4.9
      Horz SD      Vert SD
      Start wk 1605 sec 404284.0      End wk 1605 sec 404291.0

GPSVEC TP Point ID 2088      DX  22477.288      DY  -3065.459
      Class Normal      DZ  8815.909      Code TOP
      Obs L1 Fixed      H.pr 0.025      V.pr 0.061
    
```

```

GPSQC1 NM Min SVs 5 PDOP max 3.2
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 7 VDOP max 3.0
          Monitor status Not monitored RMS 12.0
          Horz SD Vert SD
          Start wk 1605 sec 404370.0 End wk 1605 sec 404376.0

GPSVEC TP Point ID 2089 DX 22474.307 DY -3071.285
          Class Normal DZ 8805.382 Code TOP1
          Obs L1 Fixed H.pr 0.019 V.pr 0.045

GPSQC1 NM Min SVs 5 PDOP max 4.6
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 4 VDOP max 4.2
          Monitor status Not monitored RMS 15.8
          Horz SD Vert SD
          Start wk 1605 sec 404386.0 End wk 1605 sec 404389.0

GPSVEC TP Point ID 2090 DX 22592.717 DY -3111.237
          Class Normal DZ 8815.342 Code TOP
          Obs L1 Fixed H.pr 0.026 V.pr 0.062

GPSQC1 NM Min SVs 5 PDOP max 4.5
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 6 VDOP max 4.2
          Monitor status Not monitored RMS 4.1
          Horz SD Vert SD
          Start wk 1605 sec 404440.0 End wk 1605 sec 404445.0

GPSVEC TP Point ID 2091 DX 22590.195 DY -3117.236
          Class Normal DZ 8805.853 Code TOP1
          Obs L1 Fixed H.pr 0.015 V.pr 0.036

GPSQC1 NM Min SVs 5 PDOP max 4.5
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 4 VDOP max 4.2
          Monitor status Not monitored RMS 8.1
          Horz SD Vert SD
          Start wk 1605 sec 404453.0 End wk 1605 sec 404456.0

GPSVEC TP Point ID 2092 DX 22708.043 DY -3156.972
          Class Normal DZ 8815.026 Code TOP
          Obs L1 Fixed H.pr 0.027 V.pr 0.064

GPSQC1 NM Min SVs 5 PDOP max 2.3
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 3 VDOP max 2.1
          Monitor status Not monitored RMS 4.4
          Horz SD Vert SD
          Start wk 1605 sec 404497.0 End wk 1605 sec 404503.0

GPSVEC TP Point ID 2093 DX 22706.417 DY -3163.281
          Class Normal DZ 8805.738 Code TOP1
          Obs L1 Fixed H.pr 0.028 V.pr 0.065

GPSQC1 NM Min SVs 5 PDOP max 4.5
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 6 VDOP max 4.1
          Monitor status Not monitored RMS 7.0
          Horz SD Vert SD
          Start wk 1605 sec 404512.0 End wk 1605 sec 404517.0

GPSVEC TP Point ID 2094 DX 22823.218 DY -3203.414
          Class Normal DZ 8814.361 Code TOP
          Obs L1 Fixed H.pr 0.022 V.pr 0.051

GPSQC1 NM Min SVs 5 PDOP max 3.2
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 2.9
          Monitor status Not monitored RMS 4.6
          Horz SD Vert SD
          Start wk 1605 sec 404562.0 End wk 1605 sec 404566.0

GPSVEC TP Point ID 2095 DX 22821.866 DY -3209.167
          Class Normal DZ 8805.608 Code TOP1
          Obs L1 Fixed H.pr 0.043 V.pr 0.055

GPSQC1 NM Min SVs 6 PDOP max 4.5
          Relative DOPs Yes HDOP max 2.8
          Total GPS pos 5 VDOP max 3.5
          Monitor status Not monitored RMS 11.0
          Horz SD Vert SD
          Start wk 1605 sec 404574.0 End wk 1605 sec 404579.0

GPSVEC TP Point ID 2096 DX 22938.747 DY -3248.852
          Class Normal DZ 8814.805 Code TOP
          Obs L1 Fixed H.pr 0.045 V.pr 0.058

GPSQC1 NM Min SVs 6 PDOP max 2.7
          Relative DOPs Yes HDOP max 1.6
          Total GPS pos 7 VDOP max 2.1
          Monitor status Not monitored RMS 31.6
          Horz SD Vert SD
          Start wk 1605 sec 404735.0 End wk 1605 sec 404741.0

GPSVEC TP Point ID 2097 DX 22936.861 DY -3254.668
          Class Normal DZ 8805.449 Code TOP1
          Obs L1 Fixed H.pr 0.024 V.pr 0.030
    
```

GPSQC1 NM Min SVs 6 PDOP max 2.7
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 6 VDOP max 2.1
 Monitor status Not monitored RMS 23.0
 Horz SD Vert SD
 Start wk 1605 sec 404750.0 End wk 1605 sec 404755.0

GPSVEC TP Point ID 2098 DX 23054.152 DY -3294.177
 Class Normal DZ 8815.184 Code TOP
 Obs L1 Fixed H.pr 0.043 V.pr 0.054

GPSQC1 NM Min SVs 6 PDOP max 2.7
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 6 VDOP max 2.1
 Monitor status Not monitored RMS 8.0
 Horz SD Vert SD
 Start wk 1605 sec 404861.0 End wk 1605 sec 404866.0

GPSVEC TP Point ID 2099 DX 23052.008 DY -3299.464
 Class Normal DZ 8806.403 Code TOP1
 Obs L1 Fixed H.pr 0.045 V.pr 0.057

GPSQC1 NM Min SVs 6 PDOP max 2.7
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 4 VDOP max 2.1
 Monitor status Not monitored RMS 9.4
 Horz SD Vert SD
 Start wk 1605 sec 404875.0 End wk 1605 sec 404878.0

NOTE TS Time Date 10/14/2010 Time 09:33:37

SURVEY EVENTKISurvey event Survey ended

SURVEY KI Elev mask 13 PDOP mask 6.0

SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY KI Elev mask 13 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000 Measuremt True

GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374*N Lng 111°40'44.55636*W
 Class Normal Hgt 1375.166 Code <no text>
 Obs User Input H.pr <null> V.pr <null>

EQUIP SI Receiver <no text> Serial no <no text>
 Antenna Zephyr Geodetic - Model 2
 Meas To Antenna Phase Center
 Tape adj 0.000 Serial no <no text>
 H.Offset 0.000 V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279 Measuremt True

GPSREF KI Reference SRPEAST

INIT KI Init event Gained Week 1605
 Init type On the fly seconds 405507.0
 Init counter 3 Point ID <no text>
 Survey type Real Time Plate H.Dist <null>
 Plate V.Dist <null> Plate azimuth <null>

EQUIP NM Receiver 5800 Serial no 4251116756
 Antenna R8/5800/SPS780 Internal
 Meas To Bottom of antenna mount
 Tape adj 0.000 Serial no <no text>
 H.Offset 0.000 V.Offset 0.213

NOTE NM Receiver firmware version=2.320

GPSANT KI Antenna ht 6.890 Measuremt Uncorrected

GPSVEC TP Point ID 2100 DX 23169.051 DY -3339.455
 Class Normal DZ 8814.540 Code TOP
 Obs L1 Fixed H.pr 0.030 V.pr 0.037

GPSQC1 NM Min SVs 6 PDOP max 2.6
 Relative DOPs Yes HDOP max 1.7
 Total GPS pos 10 VDOP max 2.1
 Monitor status Not monitored RMS 23.0
 Horz SD Vert SD
 Start wk 1605 sec 405525.0 End wk 1605 sec 405534.0

GPSVEC TP Point ID 2101 DX 23166.342 DY -3345.501
 Class Normal DZ 8804.619 Code TOP1
 Obs L1 Fixed H.pr 0.031 V.pr 0.038

GPSQC1 NM Min SVs 6 PDOP max 1.9
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 8 VDOP max 1.5
 Monitor status Not monitored RMS 11.4
 Horz SD Vert SD
 Start wk 1605 sec 405546.0 End wk 1605 sec 405553.0

```

GPSVEC TP Point ID 2102      DX 23271.024      DY -3379.873
        Class Normal      DZ 8815.124      Code TOP E
        Obs L1 Fixed      H.pr 0.023      V.pr 0.029

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 10      VDOP max 2.1
        Monitor status Not monitored      RMS 12.8
        Horz SD      Vert SD
        Start wk 1605 sec 405627.0      End wk 1605 sec 405636.0

GPSVEC TP Point ID 2103      DX 23281.627      DY -3391.175
        Class Normal      DZ 8804.901      Code TOP1
        Obs L1 Fixed      H.pr 0.025      V.pr 0.031

GPSQC1 NM Min SVs          6      PDOP max 1.9
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 6      VDOP max 1.5
        Monitor status Not monitored      RMS 17.1
        Horz SD      Vert SD
        Start wk 1605 sec 405658.0      End wk 1605 sec 405663.0

GPSVEC TP Point ID 2104      DX 23346.986      DY -3417.673
        Class Normal      DZ 8803.374      Code TOP1
        Obs L1 Fixed      H.pr 0.043      V.pr 0.054

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 11      VDOP max 2.1
        Monitor status Not monitored      RMS 7.3
        Horz SD      Vert SD
        Start wk 1605 sec 405701.0      End wk 1605 sec 405711.0
f.
GPSVEC TP Point ID 2105      DX 23367.889      DY -3425.259
        Class Normal      DZ 8802.407      Code TOP1
        Obs L1 Fixed      H.pr 0.043      V.pr 0.054

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 15.0
        Horz SD      Vert SD
        Start wk 1605 sec 405721.0      End wk 1605 sec 405725.0

GPSVEC TP Point ID 2106      DX 23393.362      DY -3433.080
        Class Normal      DZ 8800.460      Code TOP1
        Obs L1 Fixed      H.pr 0.029      V.pr 0.036

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 15.6
        Horz SD      Vert SD
        Start wk 1605 sec 405737.0      End wk 1605 sec 405741.0

GPSVEC TP Point ID 2107      DX 23415.027      DY -3439.361
        Class Normal      DZ 8799.227      Code TOP1
        Obs L1 Fixed      H.pr 0.024      V.pr 0.030

GPSQC1 NM Min SVs          6      PDOP max 1.9
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 3      VDOP max 1.4
        Monitor status Not monitored      RMS 15.2
        Horz SD      Vert SD
        Start wk 1605 sec 405754.0      End wk 1605 sec 405756.0

GPSVEC TP Point ID 2108      DX 23417.743      DY -3432.602
        Class Del normal      DZ 8810.545      Code TOP B
        Obs L1 Fixed      H.pr 0.049      V.pr 0.060

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 4      VDOP max 2.0
        Monitor status Not monitored      RMS 15.1
        Horz SD      Vert SD
        Start wk 1605 sec 405768.0      End wk 1605 sec 405771.0

NOTE NM Deleted 9:43:34 AM 10/14/2010

GPSVEC TP Point ID 2109      DX 23510.694      DY -3473.157
        Class Normal      DZ 8796.994      Code TOP1
        Obs L1 Fixed      H.pr 0.029      V.pr 0.036

GPSQC1 NM Min SVs          6      PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 6      VDOP max 2.0
        Monitor status Not monitored      RMS 15.7
        Horz SD      Vert SD
        Start wk 1605 sec 405857.0      End wk 1605 sec 405862.0

GPSVEC TP Point ID 2110      DX 23518.513      DY -3468.704
        Class Normal      DZ 8807.887      Code TOP B
        Obs L1 Fixed      H.pr 0.034      V.pr 0.042
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 12.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 405895.0 | End wk 1605 sec | 405899.0 |
| GPSVEC | TP | Point ID 2111 | | DX 23632.048 | DY -3515.089 |
| | | Class Normal | | DZ 8805.743 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.049 | V.pr 0.059 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 7 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 19.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406160.0 | End wk 1605 sec | 406166.0 |
| GPSVEC | TP | Point ID 2112 | | DX 23630.324 | DY -3521.145 |
| | | Class Normal | | DZ 8796.217 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.033 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 7.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406174.0 | End wk 1605 sec | 406177.0 |
| GPSVEC | TP | Point ID 2113 | | DX 23747.121 | DY -3561.085 |
| | | Class Normal | | DZ 8805.194 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.039 | V.pr 0.048 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406234.0 | End wk 1605 sec | 406238.0 |
| GPSVEC | TP | Point ID 2114 | | DX 23745.542 | DY -3566.881 |
| | | Class Normal | | DZ 8795.940 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.035 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 12.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406246.0 | End wk 1605 sec | 406249.0 |
| GPSVEC | TP | Point ID 2115 | | DX 23863.245 | DY -3606.120 |
| | | Class Normal | | DZ 8805.771 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.040 | V.pr 0.048 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406319.0 | End wk 1605 sec | 406323.0 |
| GPSVEC | TP | Point ID 2116 | | DX 23860.624 | DY -3612.031 |
| | | Class Normal | | DZ 8796.047 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.024 | V.pr 0.029 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 8.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406333.0 | End wk 1605 sec | 406337.0 |
| GPSVEC | TP | Point ID 2117 | | DX 23978.986 | DY -3651.934 |
| | | Class Normal | | DZ 8805.748 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.045 | V.pr 0.055 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 3 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 13.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406454.0 | End wk 1605 sec | 406457.0 |
| GPSVEC | TP | Point ID 2118 | | DX 23976.336 | DY -3657.327 |
| | | Class Normal | | DZ 8796.809 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.037 | V.pr 0.044 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 16.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406467.0 | End wk 1605 sec | 406471.0 |
| GPSVEC | TP | Point ID 2119 | | DX 24094.091 | DY -3697.851 |
| | | Class Normal | | DZ 8805.565 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.034 |

```

GPSQC1 NM   Min SVs      6                PDOP max  1.5
           Relative DOPs Yes             HDOP max  0.9
           Total GPS pos  3              VDOP max  1.1
           Monitor status Not monitored   RMS       12.7
           Horz SD
           Start wk 1605 sec 406519.0     End wk 1605 sec 406521.0

GPSVEC TP   Point ID 2120          DX  24092.611      DY  -3703.520
           Class Normal          DZ  8796.582      Code TOP1
           Obs L1 Fixed          H.pr 0.035      V.pr 0.042

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  4              VDOP max  2.0
           Monitor status Not monitored   RMS       16.9
           Horz SD
           Start wk 1605 sec 406531.0     End wk 1605 sec 406534.0

GPSVEC TP   Point ID 2121          DX  24209.929      DY  -3743.830
           Class Normal          DZ  8806.078      Code TOP
           Obs L1 Fixed          H.pr 0.036      V.pr 0.044

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  5              VDOP max  2.0
           Monitor status Not monitored   RMS       12.1
           Horz SD
           Start wk 1605 sec 406589.0     End wk 1605 sec 406593.0

GPSVEC TP   Point ID 2122          DX  24207.932      DY  -3749.531
           Class Normal          DZ  8796.883      Code TOP1
           Obs L1 Fixed          H.pr 0.024      V.pr 0.029

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  5              VDOP max  2.0
           Monitor status Not monitored   RMS       7.4
           Horz SD
           Start wk 1605 sec 406601.0     End wk 1605 sec 406605.0

NOTE NM     Modified 9:56:59 AM 10/14/2010

NOTE NM     Old values TOP

GPSVEC TP   Point ID 2123          DX  24325.134      DY  -3789.223
           Class Normal          DZ  8806.067      Code TOP
           Obs L1 Fixed          H.pr 0.044      V.pr 0.052

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  3              VDOP max  1.9
           Monitor status Not monitored   RMS       14.9
           Horz SD
           Start wk 1605 sec 406706.0     End wk 1605 sec 406709.0

GPSVEC TP   Point ID 2124          DX  24323.299      DY  -3795.301
           Class Normal          DZ  8796.386      Code TOP1
           Obs L1 Fixed          H.pr 0.035      V.pr 0.042

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  6              VDOP max  1.9
           Monitor status Not monitored   RMS       20.1
           Horz SD
           Start wk 1605 sec 406718.0     End wk 1605 sec 406723.0

NOTE TS     Time Date 10/14/2010 Time 10:05:51

GPSVEC TP   Point ID 2125          DX  24441.156      DY  -3834.925
           Class Normal          DZ  8807.094      Code TOP
           Obs L1 Fixed          H.pr 0.024      V.pr 0.029

GPSQC1 NM   Min SVs      6                PDOP max  1.7
           Relative DOPs Yes             HDOP max  1.1
           Total GPS pos  3              VDOP max  1.3
           Monitor status Not monitored   RMS       10.7
           Horz SD
           Start wk 1605 sec 407149.0     End wk 1605 sec 407152.0

GPSVEC TP   Point ID 2126          DX  24439.698      DY  -3841.339
           Class Normal          DZ  8796.914      Code TOP1
           Obs L1 Fixed          H.pr 0.027      V.pr 0.032

GPSQC1 NM   Min SVs      6                PDOP max  2.5
           Relative DOPs Yes             HDOP max  1.6
           Total GPS pos  6              VDOP max  1.9
           Monitor status Not monitored   RMS       15.4
           Horz SD
           Start wk 1605 sec 407162.0     End wk 1605 sec 407167.0

GPSVEC TP   Point ID 2127          DX  24484.431      DY  -3858.823
           Class Normal          DZ  8797.670      Code TOP1
           Obs L1 Fixed          H.pr 0.026      V.pr 0.032
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|-----------|
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 6 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 16.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407185.0 | End wk 1605 sec | 407190.0 |
| GPSVEC | TP | Point ID 2128 | DX 24547.423 | DY | -3884.602 |
| | | Class Normal | DZ 8796.251 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr | 0.036 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 10.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407223.0 | End wk 1605 sec | 407227.0 |
| GPSVEC | TP | Point ID 2129 | DX 24592.595 | DY | -3906.639 |
| | | Class Normal | DZ 8789.933 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.034 | V.pr | 0.041 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 14.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407244.0 | End wk 1605 sec | 407249.0 |
| GPSVEC | TP | Point ID 2130 | DX 24657.764 | DY | -3932.939 |
| | | Class Normal | DZ 8788.408 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.029 | V.pr | 0.035 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 19.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407280.0 | End wk 1605 sec | 407283.0 |
| GPSVEC | TP | Point ID 2131 | DX 24454.905 | DY | -3838.890 |
| | | Class Normal | DZ 8809.045 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 9.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407379.0 | End wk 1605 sec | 407383.0 |
| GPSVEC | TP | Point ID 2132 | DX 24472.078 | DY | -3839.410 |
| | | Class Normal | DZ 8816.983 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.031 | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 9.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407393.0 | End wk 1605 sec | 407396.0 |
| GPSVEC | TP | Point ID 2133 | DX 24490.725 | DY | -3843.302 |
| | | Class Normal | DZ 8822.282 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 9.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407407.0 | End wk 1605 sec | 407410.0 |
| GPSVEC | TP | Point ID 2134 | DX 24511.665 | DY | -3850.845 |
| | | Class Normal | DZ 8823.312 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.033 | V.pr | 0.037 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 21.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407420.0 | End wk 1605 sec | 407423.0 |
| GPSVEC | TP | Point ID 2135 | DX 24527.885 | DY | -3853.797 |
| | | Class Normal | DZ 8825.761 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.031 | V.pr | 0.035 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 11.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407433.0 | End wk 1605 sec | 407436.0 |
| GPSVEC | TP | Point ID 2136 | DX 24547.008 | DY | -3854.475 |
| | | Class Normal | DZ 8830.291 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.048 | V.pr | 0.053 |

| | | | | | |
|--------|----|----------------|-------------------|----------|-------------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 11.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407446.0 | End wk | 1605 sec 407449.0 |
| GPSVEC | TP | Point ID | 2137 | DX | 24568.749 |
| | | Class | Normal | DZ | 8837.398 |
| | | Obs | L1 Fixed | H.pr | 0.036 |
| | | | | DY | -3853.509 |
| | | | | Code | TOP |
| | | | | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 7.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407460.0 | End wk | 1605 sec 407463.0 |
| GPSVEC | TP | Point ID | 2138 | DX | 24588.530 |
| | | Class | Normal | DZ | 8843.568 |
| | | Obs | L1 Fixed | H.pr | 0.049 |
| | | | | DY | -3853.348 |
| | | | | Code | TOP |
| | | | | V.pr | 0.054 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 7 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 9.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407475.0 | End wk | 1605 sec 407481.0 |
| GPSVEC | TP | Point ID | 2139 | DX | 24597.525 |
| | | Class | Normal | DZ | 8847.666 |
| | | Obs | L1 Fixed | H.pr | 0.036 |
| | | | | DY | -3852.473 |
| | | | | Code | TOP E |
| | | | | V.pr | 0.041 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 15.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407491.0 | End wk | 1605 sec 407495.0 |
| GPSVEC | TP | Point ID | 2140 | DX | 24602.223 |
| | | Class | Normal | DZ | 8835.755 |
| | | Obs | L1 Fixed | H.pr | 0.043 |
| | | | | DY | -3863.971 |
| | | | | Code | TOP B |
| | | | | V.pr | 0.048 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 3 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 10.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407509.0 | End wk | 1605 sec 407511.0 |
| GPSVEC | TP | Point ID | 2141 | DX | 24583.150 |
| | | Class | Normal | DZ | 8829.755 |
| | | Obs | L1 Fixed | H.pr | 0.031 |
| | | | | DY | -3863.211 |
| | | | | Code | TOP |
| | | | | V.pr | 0.035 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 14.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407522.0 | End wk | 1605 sec 407526.0 |
| GPSVEC | TP | Point ID | 2142 | DX | 24561.360 |
| | | Class | Normal | DZ | 8823.583 |
| | | Obs | L1 Fixed | H.pr | 0.030 |
| | | | | DY | -3863.639 |
| | | | | Code | TOP |
| | | | | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 10.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407538.0 | End wk | 1605 sec 407541.0 |
| GPSVEC | TP | Point ID | 2143 | DX | 24538.618 |
| | | Class | Normal | DZ | 8817.155 |
| | | Obs | L1 Fixed | H.pr | 0.029 |
| | | | | DY | -3863.594 |
| | | | | Code | TOP |
| | | | | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 6 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407552.0 | End wk | 1605 sec 407557.0 |
| GPSVEC | TP | Point ID | 2144 | DX | 24519.575 |
| | | Class | Normal | DZ | 8810.983 |
| | | Obs | L1 Fixed | H.pr | 0.032 |
| | | | | DY | -3863.209 |
| | | | | Code | TOP |
| | | | | V.pr | 0.036 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 15.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407570.0 | End wk | 1605 sec 407573.0 |
| GPSVEC | TP | Point ID | 2145 | DX | 24538.859 |
| | | Class | Normal | DZ | 8812.966 |
| | | Obs | L1 Fixed | H.pr | 0.037 |
| | | | | DY | -3868.872 |
| | | | | Code | TOP |
| | | | | V.pr | 0.042 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 9.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407597.0 | End wk 1605 sec | 407600.0 |
| GPSVEC | TP | Point ID 2146 | | DX 24554.131 | DY -1875.284 |
| | | Class Normal | | DZ 8812.295 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.049 | V.pr 0.055 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 5 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 20.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407615.0 | End wk 1605 sec | 407619.0 |
| GPSVEC | TP | Point ID 2147 | | DX 24574.401 | DY -3887.849 |
| | | Class Normal | | DZ 8806.069 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 11.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407631.0 | End wk 1605 sec | 407635.0 |
| GPSVEC | TP | Point ID 2148 | | DX 24596.456 | DY -3899.544 |
| | | Class Normal | | DZ 8801.721 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.044 | V.pr 0.050 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 19.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407648.0 | End wk 1605 sec | 407652.0 |
| GPSVEC | TP | Point ID 2149 | | DX 24658.986 | DY -3926.764 |
| | | Class Normal | | DZ 8797.631 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.029 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 8.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407687.0 | End wk 1605 sec | 407690.0 |
| GPSVEC | TP | Point ID 2150 | | DX 24781.186 | DY -3974.254 |
| | | Class Normal | | DZ 8798.989 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 18.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407919.0 | End wk 1605 sec | 407923.0 |
| GPSVEC | TP | Point ID 2151 | | DX 24779.608 | DY -3980.920 |
| | | Class Normal | | DZ 8788.983 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.036 | V.pr 0.043 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 15.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 407933.0 | End wk 1605 sec | 407936.0 |
| GPSVEC | TP | Point ID 2152 | | DX 24891.865 | DY -4023.721 |
| | | Class Normal | | DZ 8792.518 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.027 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408064.0 | End wk 1605 sec | 408067.0 |
| GPSVEC | TP | Point ID 2153 | | DX 24857.588 | DY -4002.693 |
| | | Class Normal | | DZ 8802.719 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.047 | V.pr 0.057 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 11.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408121.0 | End wk 1605 sec | 408127.0 |
| GPSVEC | TP | Point ID 2154 | | DX 24897.833 | DY -4011.288 |
| | | Class Normal | | DZ 8812.732 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.030 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 13.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408153.0 | End wk 1605 sec | 408157.0 |
| GPSVEC | TP | Point ID 2155 | | DX 24911.745 | DY -4015.002 |
| | | Class Normal | | DZ 8815.011 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.045 | V.pr 0.054 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 7 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408168.0 | End wk 1605 sec | 408174.0 |
| GPSVEC | TP | Point ID 2156 | | DX 24939.089 | DY -4024.518 |
| | | Class Normal | | DZ 8816.164 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.041 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 11.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408191.0 | End wk 1605 sec | 408195.0 |
| GPSVEC | TP | Point ID 2157 | | DX 24943.077 | DY -4025.291 |
| | | Class Normal | | DZ 8817.347 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.046 | V.pr 0.058 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.0 |
| | | Relative DOPs | Yes | HDOP max | 0.6 |
| | | Total GPS pos | 3 | VDOP max | 0.8 |
| | | Monitor status | Not monitored | RMS | 27.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408207.0 | End wk 1605 sec | 408209.0 |
| GPSVEC | TP | Point ID 2158 | | DX 24950.778 | DY -4022.496 |
| | | Class Normal | | DZ 8825.207 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.036 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 32.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408219.0 | End wk 1605 sec | 408222.0 |
| GPSVEC | TP | Point ID 2159 | | DX 24954.443 | DY -4023.069 |
| | | Class Normal | | DZ 8826.455 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.044 | V.pr 0.056 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.3 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 5 | VDOP max | 1.0 |
| | | Monitor status | Not monitored | RMS | 13.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408233.0 | End wk 1605 sec | 408237.0 |
| GPSVEC | TP | Point ID 2160 | | DX 24957.973 | DY -4025.490 |
| | | Class Normal | | DZ 8825.298 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.037 | V.pr 0.047 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.3 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.0 |
| | | Monitor status | Not monitored | RMS | 30.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408247.0 | End wk 1605 sec | 408250.0 |
| GPSVEC | TP | Point ID 2161 | | DX 24961.380 | DY -4032.399 |
| | | Class Normal | | DZ 8817.835 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 24.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408262.0 | End wk 1605 sec | 408266.0 |
| GPSVEC | TP | Point ID 2162 | | DX 24967.862 | DY -4040.906 |
| | | Class Normal | | DZ 8808.554 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.044 | V.pr 0.056 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 15.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 408278.0 | End wk 1605 sec | 408281.0 |
| GPSVEC | TP | Point ID 2163 | | DX 24973.029 | DY -4046.767 |
| | | Class Normal | | DZ 8802.595 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.041 | V.pr 0.052 |

```

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 4          VDOP max 1.5
          Monitor status Not monitored RMS    20.6
          Horz SD                      Vert SD
          Start wk 1605 sec 408293.0  End wk 1605  sec 408296.0

GPSVEC TP Point ID 2164      DX  25015.983      DY  -4061.153
          Class Normal        DZ  8797.897          Code TOP
          Obs L1 Fixed        H.pr 0.028          V.pr 0.036

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 4          VDOP max 1.5
          Monitor status Not monitored RMS    17.0
          Horz SD                      Vert SD
          Start wk 1605 sec 408325.0  End wk 1605  sec 408328.0

GPSVEC TP Point ID 2165      DX  25041.811      DY  -4070.089
          Class Normal        DZ  8796.330          Code TOP
          Obs L1 Fixed        H.pr 0.027          V.pr 0.035

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    23.5
          Horz SD                      Vert SD
          Start wk 1605 sec 408344.0  End wk 1605  sec 408348.0

GPSVEC TP Point ID 2166      DX  24941.086      DY  -4043.679
          Class Normal        DZ  8792.091          Code TOP1
          Obs L1 Fixed        H.pr 0.030          V.pr 0.039

GPSQC1 NM Min SVs      8          PDOP max 2.3
          Relative DOPs Yes        HDOP max 1.4
          Total GPS pos 4          VDOP max 1.8
          Monitor status Not monitored RMS    18.7
          Horz SD                      Vert SD
          Start wk 1605 sec 408407.0  End wk 1605  sec 408411.0

NOTE NM Modified 10:26:59 AM 10/14/2010

NOTE NM Old values TOP

GPSVEC TP Point ID 2167      DX  24962.987      DY  -4051.887
          Class Normal        DZ  8791.059          Code TOP1
          Obs L1 Fixed        H.pr 0.025          V.pr 0.033

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    19.9
          Horz SD                      Vert SD
          Start wk 1605 sec 408436.0  End wk 1605  sec 408440.0

GPSVEC TP Point ID 2168      DX  24985.210      DY  -4059.068
          Class Normal        DZ  8789.343          Code TOP1
          Obs L1 Fixed        H.pr 0.036          V.pr 0.048

GPSQC1 NM Min SVs      8          PDOP max 1.3
          Relative DOPs Yes        HDOP max 0.8
          Total GPS pos 4          VDOP max 1.1
          Monitor status Not monitored RMS    27.2
          Horz SD                      Vert SD
          Start wk 1605 sec 408452.0  End wk 1605  sec 408455.0

GPSVEC TP Point ID 2169      DX  25013.341      DY  -4067.455
          Class Normal        DZ  8787.423          Code TOP1
          Obs L1 Fixed        H.pr 0.033          V.pr 0.044

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    26.2
          Horz SD                      Vert SD
          Start wk 1605 sec 408472.0  End wk 1605  sec 408476.0

NOTE TS Time Date 10/14/2010 Time 10:43:50

GPSVEC TP Point ID 2170      DX  25128.948      DY  -4105.905
          Class Normal        DZ  8793.202          Code TOP
          Obs L1 Fixed        H.pr 0.017          V.pr 0.031

GPSQC1 NM Min SVs      7          PDOP max 2.6
          Relative DOPs Yes        HDOP max 1.3
          Total GPS pos 4          VDOP max 2.3
          Monitor status Not monitored RMS    7.1
          Horz SD                      Vert SD
          Start wk 1605 sec 409428.0  End wk 1605  sec 409431.0

GPSVEC TP Point ID 2171      DX  25126.833      DY  -4112.347
          Class Normal        DZ  8782.898          Code TOP1
          Obs L1 Fixed        H.pr 0.019          V.pr 0.034
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|-----------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 8.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409440.0 | End wk 1605 sec | 409443.0 |
| GPSVEC | TP | Point ID 2172 | DX 25230.194 | DY | -4159.543 |
| | | Class Normal | DZ 8774.357 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.021 | V.pr | 0.039 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 13.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409508.0 | End wk 1605 sec | 409511.0 |
| GPSVEC | TP | Point ID 2173 | DX 25270.740 | DY | -4179.544 |
| | | Class Normal | DZ 8769.130 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.043 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.7 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 16.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409531.0 | End wk 1605 sec | 409534.0 |
| GPSVEC | TP | Point ID 2174 | DX 25274.501 | DY | -4182.502 |
| | | Class Normal | DZ 8766.125 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.027 | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 18.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409541.0 | End wk 1605 sec | 409544.0 |
| GPSVEC | TP | Point ID 2175 | DX 25274.935 | DY | -4184.736 |
| | | Class Normal | DZ 8761.618 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.034 | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 11.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409551.0 | End wk 1605 sec | 409554.0 |
| GPSVEC | TP | Point ID 2176 | DX 25273.354 | DY | -4186.638 |
| | | Class Normal | DZ 8755.933 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr | 0.047 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 18.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409560.0 | End wk 1605 sec | 409563.0 |
| GPSVEC | TP | Point ID 2177 | DX 25270.851 | DY | -4192.433 |
| | | Class Normal | DZ 8741.192 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.024 | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 17.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409572.0 | End wk 1605 sec | 409575.0 |
| GPSVEC | TP | Point ID 2178 | DX 25267.984 | DY | -4198.600 |
| | | Class Normal | DZ 8727.975 | Code | TOP1 E |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.7 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 15.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409585.0 | End wk 1605 sec | 409589.0 |
| GPSVEC | TP | Point ID 2179 | DX 25281.650 | DY | -4204.540 |
| | | Class Normal | DZ 8727.782 | Code | TOP1 B |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.053 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 22.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409600.0 | End wk 1605 sec | 409603.0 |
| GPSVEC | TP | Point ID 2180 | DX 25285.613 | DY | -4199.138 |
| | | Class Normal | DZ 8740.297 | Code | TCP1 |
| | | Obs L1 Fixed | H.pr 0.033 | V.pr | 0.062 |

| | | | | | |
|--------|----|----------------|-------------------|----------|-------------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 7.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409612.0 | End wk | 1605 sec 409616.0 |
| GPSVEC | TP | Point ID | 2181 | DX | 25290.243 |
| | | Class | Normal | DZ | 8754.291 |
| | | Obs | L1 Fixed | H.pr | 0.033 |
| | | | | DY | -4193.999 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.062 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 6 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 23.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409625.0 | End wk | 1605 sec 409631.0 |
| GPSVEC | TP | Point ID | 2182 | DX | 25295.287 |
| | | Class | Normal | DZ | 8762.916 |
| | | Obs | L1 Fixed | H.pr | 0.029 |
| | | | | DY | -4192.475 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.056 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 7 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 26.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409638.0 | End wk | 1605 sec 409644.0 |
| GPSVEC | TP | Point ID | 2183 | DX | 25298.239 |
| | | Class | Normal | DZ | 8765.072 |
| | | Obs | L1 Fixed | H.pr | 0.027 |
| | | | | DY | -4193.235 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 19.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409650.0 | End wk | 1605 sec 409653.0 |
| GPSVEC | TP | Point ID | 2184 | DX | 25302.733 |
| | | Class | Normal | DZ | 8766.188 |
| | | Obs | L1 Fixed | H.pr | 0.020 |
| | | | | DY | -4194.609 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.037 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 12.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409659.0 | End wk | 1605 sec 409663.0 |
| GPSVEC | TP | Point ID | 2185 | DX | 25337.404 |
| | | Class | Normal | DZ | 8764.227 |
| | | Obs | L1 Fixed | H.pr | 0.018 |
| | | | | DY | -4209.495 |
| | | | | Code | TOP1 |
| | | | | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 16.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409682.0 | End wk | 1605 sec 409685.0 |
| GPSVEC | TP | Point ID | 2186 | DX | 25234.394 |
| | | Class | Normal | DZ | 8786.286 |
| | | Obs | L1 Fixed | H.pr | 0.027 |
| | | | | DY | -4152.968 |
| | | | | Code | TOP |
| | | | | V.pr | 0.052 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 3 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 7.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409726.0 | End wk | 1605 sec 409729.0 |
| GPSVEC | TP | Point ID | 2187 | DX | 25238.901 |
| | | Class | Normal | DZ | 8787.352 |
| | | Obs | L1 Fixed | H.pr | 0.024 |
| | | | | DY | -4153.950 |
| | | | | Code | TOP |
| | | | | V.pr | 0.046 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 19.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409735.0 | End wk | 1605 sec 409738.0 |
| GPSVEC | TP | Point ID | 2188 | DX | 25254.252 |
| | | Class | Normal | DZ | 8790.831 |
| | | Obs | L1 Fixed | H.pr | 0.027 |
| | | | | DY | -4157.411 |
| | | | | Code | TOP |
| | | | | V.pr | 0.052 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 12.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 409747.0 | End wk | 1605 sec 409750.0 |
| GPSVEC | TP | Point ID | 2189 | DX | 25274.136 |
| | | Class | Normal | DZ | 8799.495 |
| | | Obs | L1 Fixed | H.pr | 0.028 |
| | | | | DY | -4166.479 |
| | | | | Code | TOP |
| | | | | V.pr | 0.055 |

| | | | | | |
|--------|----|----------------|---------------|--------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 14.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409760.0 | End wk 1605 | sec 409763.0 |
| GPSVEC | TP | Point ID 2190 | | DX 25295.699 | DY -4175.219 |
| | | Class Normal | | DZ 8788.537 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.035 | V.pr 0.069 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.9 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 7 | VDOP max | 2.6 |
| | | Monitor status | Not monitored | RMS | 8.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409775.0 | End wk 1605 | sec 409781.0 |
| GPSVEC | TP | Point ID 2191 | | DX 25303.034 | DY -4177.254 |
| | | Class Normal | | DZ 8788.584 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.029 | V.pr 0.056 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 9.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409788.0 | End wk 1605 | sec 409792.0 |
| GPSVEC | TP | Point ID 2192 | | DX 25310.976 | DY -4177.609 |
| | | Class Normal | | DZ 8790.442 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.030 | V.pr 0.058 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 13.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409800.0 | End wk 1605 | sec 409804.0 |
| GPSVEC | TP | Point ID 2193 | | DX 25334.250 | DY -4177.120 |
| | | Class Normal | | DZ 8798.129 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.031 | V.pr 0.061 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 12.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409817.0 | End wk 1605 | sec 409820.0 |
| GPSVEC | TP | Point ID 2194 | | DX 25356.214 | DY -4176.713 |
| | | Class Normal | | DZ 8806.234 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.017 | V.pr 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 8.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409832.0 | End wk 1605 | sec 409835.0 |
| GPSVEC | TP | Point ID 2195 | | DX 25371.242 | DY -4175.434 |
| | | Class Normal | | DZ 8812.289 | Code TOP E |
| | | Obs L1 Fixed | | H.pr 0.024 | V.pr 0.049 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 3 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 15.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409847.0 | End wk 1605 | sec 409850.0 |
| GPSVEC | TP | Point ID 2196 | | DX 25375.000 | DY -4183.967 |
| | | Class Normal | | DZ 8803.438 | Code TOP B |
| | | Obs L1 Fixed | | H.pr 0.018 | V.pr 0.036 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.9 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 2.6 |
| | | Monitor status | Not monitored | RMS | 8.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409862.0 | End wk 1605 | sec 409866.0 |
| GPSVEC | TP | Point ID 2197 | | DX 25352.545 | DY -4185.053 |
| | | Class Normal | | DZ 8794.123 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.020 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.0 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.6 |
| | | Monitor status | Not monitored | RMS | 12.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 409883.0 | End wk 1605 | sec 409886.0 |
| GPSVEC | TP | Point ID 2198 | | DX 25329.151 | DY -4186.818 |
| | | Class Normal | | DZ 8784.956 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.051 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|-----------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409898.0 | End wk 1605 sec | 409901.0 |
| GPSVEC | TP | Point ID 2199 | DX 25304.635 | DY | -4188.142 |
| | | Class Normal | DZ 8775.788 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.022 | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 6.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409915.0 | End wk 1605 sec | 409918.0 |
| GPSVEC | TP | Point ID 2200 | DX 25340.122 | DY | -4203.872 |
| | | Class Normal | DZ 8774.010 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.022 | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.0 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 2.7 |
| | | Monitor status | Not monitored | RMS | 9.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409934.0 | End wk 1605 sec | 409938.0 |
| GPSVEC | TP | Point ID 2201 | DX 25459.024 | DY | -4251.421 |
| | | Class Normal | DZ 8772.812 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.029 | V.pr | 0.053 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 3.2 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 5 | VDOP max | 2.8 |
| | | Monitor status | Not monitored | RMS | 18.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410125.0 | End wk 1605 sec | 410129.0 |
| GPSVEC | TP | Point ID 2202 | DX 25456.721 | DY | -4257.443 |
| | | Class Normal | DZ 8762.997 | Code TOP1 | |
| | | Obs L1 Fixed | H.pr 0.020 | V.pr | 0.037 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 17.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410139.0 | End wk 1605 sec | 410143.0 |
| GPSVEC | TP | Point ID 2203 | DX 25540.844 | DY | -4283.987 |
| | | Class Normal | DZ 8772.512 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.042 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 16.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410214.0 | End wk 1605 sec | 410217.0 |
| GPSVEC | TP | Point ID 2204 | DX 25540.007 | DY | -4290.273 |
| | | Class Normal | DZ 8762.745 | Code TOP1 | |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.048 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 15.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410226.0 | End wk 1605 sec | 410230.0 |
| GPSVEC | TP | Point ID 2205 | DX 25568.947 | DY | -4304.424 |
| | | Class Normal | DZ 8759.147 | Code TOP1 | |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.053 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 11.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410246.0 | End wk 1605 sec | 410249.0 |
| GPSVEC | TP | Point ID 2206 | DX 25572.852 | DY | -4298.608 |
| | | Class Normal | DZ 8769.763 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 17.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410258.0 | End wk 1605 sec | 410261.0 |
| GPSVEC | TP | Point ID 2207 | DX 25614.538 | DY | -4324.779 |
| | | Class Normal | DZ 8756.196 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr | 0.034 |

| | | | | | |
|--------|----|----------------|---------------|--------------|--------------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 13.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410280.0 | End wk 1605 | sec 410284.0 |
| GPSVEC | TP | Point ID 2208 | | DX 25605.846 | DY -4328.149 |
| | | Class Normal | | DZ 8746.132 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.023 | V.pr 0.043 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 9.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410294.0 | End wk 1605 | sec 410298.0 |
| GPSVEC | TP | Point ID 2209 | | DX 25630.831 | DY -4358.728 |
| | | Class Normal | | DZ 8716.413 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.066 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 24.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410316.0 | End wk 1605 | sec 410319.0 |
| GPSVEC | TP | Point ID 2210 | | DX 25645.672 | DY -4359.902 |
| | | Class Normal | | DZ 8723.132 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.065 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 14.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410329.0 | End wk 1605 | sec 410333.0 |
| GPSVEC | TP | Point ID 2211 | | DX 25643.992 | DY -4388.885 |
| | | Class Normal | | DZ 8681.401 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.023 | V.pr 0.045 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 25.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410351.0 | End wk 1605 | sec 410355.0 |
| GPSVEC | TP | Point ID 2212 | | DX 25632.160 | DY -4384.690 |
| | | Class Normal | | DZ 8680.937 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.035 | V.pr 0.068 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 26.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410364.0 | End wk 1605 | sec 410368.0 |
| GPSVEC | TP | Point ID 2213 | | DX 25620.601 | DY -4412.998 |
| | | Class Normal | | DZ 8635.419 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.021 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410387.0 | End wk 1605 | sec 410390.0 |
| GPSVEC | TP | Point ID 2214 | | DX 25632.042 | DY -4417.521 |
| | | Class Normal | | DZ 8635.066 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.021 | V.pr 0.042 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 7.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410398.0 | End wk 1605 | sec 410402.0 |
| GPSVEC | TP | Point ID 2215 | | DX 25619.947 | DY -4438.352 |
| | | Class Normal | | DZ 8599.912 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.066 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 11.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 | sec 410420.0 | End wk 1605 | sec 410424.0 |
| GPSVEC | TP | Point ID 2216 | | DX 25621.409 | DY -4441.516 |
| | | Class Normal | | DZ 8595.387 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.048 |

| | | | | | |
|--------|----|-------------------|---------------|--------------|--------------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 15.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410429.0 | End wk 1605 | sec 410433.0 |
| GPSVEC | TP | Point ID 2217 | | DX 25620.381 | DY -4447.750 |
| | | Class Normal | | DZ 8586.079 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.026 | V.pr 0.050 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 16.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410439.0 | End wk 1605 | sec 410443.0 |
| GPSVEC | TP | Point ID 2218 | | DX 25621.364 | DY -4450.671 |
| | | Class Normal | | DZ 8582.841 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.066 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 18.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410447.0 | End wk 1605 | sec 410451.0 |
| GPSVEC | TP | Point ID 2219 | | DX 25624.318 | DY -4454.290 |
| | | Class Normal | | DZ 8579.229 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.033 | V.pr 0.064 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 7 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 24.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410455.0 | End wk 1605 | sec 410463.0 |
| GPSVEC | TP | Point ID 2220 | | DX 25627.713 | DY -4457.478 |
| | | Class Normal | | DZ 8576.809 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.029 | V.pr 0.058 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 7 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 13.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410468.0 | End wk 1605 | sec 410474.0 |
| GPSVEC | TP | Point ID 2221 | | DX 25627.841 | DY -4460.992 |
| | | Class Normal | | DZ 8571.927 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.024 | V.pr 0.048 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 15.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410479.0 | End wk 1605 | sec 410483.0 |
| GPSVEC | TP | Point ID 2222 | | DX 25625.783 | DY -4462.608 |
| | | Class Normal | | DZ 8568.335 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.018 | V.pr 0.036 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410488.0 | End wk 1605 | sec 410492.0 |
| GPSVEC | TP | Point ID 2223 | | DX 25620.646 | DY -4463.193 |
| | | Class Normal | | DZ 8564.847 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.055 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 17.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410498.0 | End wk 1605 | sec 410502.0 |
| GPSVEC | TP | Point ID 2224 | | DX 25602.742 | DY -4461.688 |
| | | Class Normal | | DZ 8554.981 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.024 | V.pr 0.047 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 3 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 12.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410513.0 | End wk 1605 | sec 410515.0 |
| GPSVEC | TP | Point ID 2225 | | DX 25596.766 | DY -4461.293 |
| | | Class Normal | | DZ 8551.151 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.032 | V.pr 0.065 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|-----------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 16.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410521.0 | End wk 1605 sec | 410524.0 |
| GPSVEC | TP | Point ID 2226 | DX 25593.123 | DY | -4462.279 |
| | | Class Normal | DZ 8546.973 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.029 | V.pr 0.059 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 3 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 14.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410531.0 | End wk 1605 sec | 410533.0 |
| GPSVEC | TP | Point ID 2227 | DX 25590.799 | DY | -4463.816 |
| | | Class Normal | DZ 8542.507 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr 0.053 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 13 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 15.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410539.0 | End wk 1605 sec | 410551.0 |
| GPSVEC | TP | Point ID 2228 | DX 25586.256 | DY | -4473.955 |
| | | Class Normal | DZ 8519.967 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.029 | V.pr 0.060 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 6 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 22.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410564.0 | End wk 1605 sec | 410569.0 |
| GPSVEC | TP | Point ID 2229 | DX 25586.270 | DY | -4486.509 |
| | | Class Normal | DZ 8497.702 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr 0.057 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 16.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410581.0 | End wk 1605 sec | 410584.0 |
| GPSVEC | TP | Point ID 2230 | DX 25587.909 | DY | -4491.527 |
| | | Class Normal | DZ 8489.139 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr 0.037 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 9.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410595.0 | End wk 1605 sec | 410598.0 |
| GPSVEC | TP | Point ID 2231 | DX 25592.733 | DY | -4497.296 |
| | | Class Normal | DZ 8482.883 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr 0.051 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 10.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410604.0 | End wk 1605 sec | 410608.0 |
| GPSVEC | TP | Point ID 2232 | DX 25602.163 | DY | -4505.789 |
| | | Class Normal | DZ 8476.043 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.040 | V.pr 0.082 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 8 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 11.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410617.0 | End wk 1605 sec | 410624.0 |
| GPSVEC | TP | Point ID 2233 | DX 25600.100 | DY | -4519.663 |
| | | Class Normal | DZ 8453.016 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.020 | V.pr 0.042 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.7 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 11.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410635.0 | End wk 1605 sec | 410639.0 |
| GPSVEC | TP | Point ID 2234 | DX 25595.114 | DY | -4537.325 |
| | | Class Normal | DZ 8423.956 | Code TOP E | |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr 0.062 | |

```

GPSQC1 NM Min SVs      8          PDOP max  2.7
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.4
          Monitor status Not monitored RMS       18.2
          Horz SD                               Vert SD
          Start wk 1605 sec 410654.0      End wk 1605 sec 410658.0

GPSVEC TP Point ID 2235      DX  25604.359      DY  -4434.824
          Class Normal      DZ  8596.587          Code TOP1
          Obs L1 Fixed      H.pr 0.025          V.pr 0.052

GPSQC1 NM Min SVs      8          PDOP max  2.7
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.4
          Monitor status Not monitored RMS       15.3
          Horz SD                               Vert SD
          Start wk 1605 sec 410737.0      End wk 1605 sec 410741.0

GPSVEC TP Point ID 2236      DX  25592.874      DY  -4444.960
          Class Normal      DZ  8574.858          Code TOP1
          Obs L1 Fixed      H.pr 0.025          V.pr 0.053

GPSQC1 NM Min SVs      8          PDOP max  1.9
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  4          VDOP max  1.7
          Monitor status Not monitored RMS       13.9
          Horz SD                               Vert SD
          Start wk 1605 sec 410753.0      End wk 1605 sec 410756.0

GPSVEC TP Point ID 2237      DX  25583.925      DY  -4453.130
          Class Normal      DZ  8555.702          Code TOP1
          Obs L1 Fixed      H.pr 0.030          V.pr 0.062

GPSQC1 NM Min SVs      8          PDOP max  2.7
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.5
          Monitor status Not monitored RMS       20.6
          Horz SD                               Vert SD
          Start wk 1605 sec 410767.0      End wk 1605 sec 410771.0

GPSVEC TP Point ID 2238      DX  25577.791      DY  -4457.153
          Class Normal      DZ  8544.197          Code TOP1
          Obs L1 Fixed      H.pr 0.029          V.pr 0.061

GPSQC1 NM Min SVs      8          PDOP max  2.7
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.5
          Monitor status Not monitored RMS       21.4
          Horz SD                               Vert SD
          Start wk 1605 sec 410780.0      End wk 1605 sec 410784.0

GPSVEC TP Point ID 2239      DX  25572.962      DY  -4469.306
          Class Normal      DZ  8519.387          Code TOP1
          Obs L1 Fixed      H.pr 0.023          V.pr 0.049

GPSQC1 NM Min SVs      8          PDOP max  2.7
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.5
          Monitor status Not monitored RMS       20.2
          Horz SD                               Vert SD
          Start wk 1605 sec 410796.0      End wk 1605 sec 410800.0

GPSVEC TP Point ID 2240      DX  25573.661      DY  -4483.294
          Class Normal      DZ  8494.104          Code TOP1
          Obs L1 Fixed      H.pr 0.028          V.pr 0.060

GPSQC1 NM Min SVs      8          PDOP max  2.8
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  5          VDOP max  2.5
          Monitor status Not monitored RMS       22.2
          Horz SD                               Vert SD
          Start wk 1605 sec 410811.0      End wk 1605 sec 410815.0

GPSVEC TP Point ID 2241      DX  25573.367      DY  -4494.427
          Class Normal      DZ  8475.592          Code TOP1
          Obs L1 Fixed      H.pr 0.030          V.pr 0.064

GPSQC1 NM Min SVs      8          PDOP max  2.8
          Relative DOPs Yes        HDOP max  1.2
          Total GPS pos  4          VDOP max  2.5
          Monitor status Not monitored RMS       24.5
          Horz SD                               Vert SD
          Start wk 1605 sec 410824.0      End wk 1605 sec 410827.0

GPSVEC TP Point ID 2242      DX  25575.332      DY  -4531.789
          Class Normal      DZ  8421.911          Code TOP1 E
          Obs L1 Fixed      H.pr 0.029          V.pr 0.062

GPSQC1 NM Min SVs      8          PDOP max  2.0
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  4          VDOP max  1.8
          Monitor status Not monitored RMS       24.0
          Horz SD                               Vert SD
          Start wk 1605 sec 410849.0      End wk 1605 sec 410852.0

```

NOTE TS Time Date 10/14/2010 Time 11:26:17

SURVEY EVENTKISurvey event Survey ended

```

SURVEY KI Elev mask 13 PDOP mask 6.0
SURVEY KI Elev mask 10 PDOP mask 6.0
SURVEY KI Elev mask 13 PDOP mask 6.0
SURVEY EVENTKISurvey event Rover survey started
GPSANT KI Antenna ht 0.000 Measurement True
GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374°N Lng 111°40'44.55636°W
Class Normal Hgt 1375.166 Code <no text>
Obs User Input H.pr <null> V.pr <null>
EQUIP SI Receiver <no text> Serial no <no text>
Antenna Zephyr Geodetic - Model 2
Meas To Antenna Phase Center
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.000
NOTE NM Receiver firmware version=0.000
GPSANT KI Antenna ht 0.279 Measurement True
GPSREF KI Reference SRPEAST
INIT KI Init event Gained Week 1605
Init type On the fly seconds 412189.0
Init counter 4 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>
EQUIP NM Receiver 5800 Serial no 425116756
Antenna R8/5800/SPS780 Internal
Meas To Bottom of antenna mount
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.213
NOTE NM Receiver firmware version=2.320
GPSANT KI Antenna ht 6.890 Measurement Uncorrected
GPSVEC TP Point ID 2243 DX 19756.959 DY -1830.877
Class Del normal DZ 9032.029 Code TOE
Obs L1 Fixed H.pr 0.025 V.pr 0.055
GPSQC1 NM Min SVs 9 PDOP max 2.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 10 VDOP max 2.7
Monitor status Not monitored RMS 25.4
Horz SD Vert SD
Start wk 1605 sec 412481.0 End wk 1605 sec 412490.0
NOTE NM Deleted 11:36:15 AM 10/14/2010
GPSVEC TP Point ID 2244 DX 19723.760 DY -1845.852
Class Normal DZ 8988.326 Code NG
Obs L1 Fixed H.pr 0.042 V.pr 0.094
GPSQC1 NM Min SVs 9 PDOP max 2.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 7 VDOP max 2.7
Monitor status Not monitored RMS 36.4
Horz SD Vert SD
Start wk 1605 sec 412540.0 End wk 1605 sec 412546.0
GPSVEC TP Point ID 2243 DX 19759.401 DY -1834.078
Class Normal DZ 9028.800 Code TOE
Obs L1 Fixed H.pr 0.026 V.pr 0.058
GPSQC1 NM Min SVs 9 PDOP max 2.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 9 VDOP max 2.6
Monitor status Not monitored RMS 26.0
Horz SD Vert SD
Start wk 1605 sec 412588.0 End wk 1605 sec 412596.0
GPSVEC TP Point ID 2245 DX 19787.197 DY -1825.161
Class Normal DZ 9058.483 Code TOE
Obs L1 Fixed H.pr 0.031 V.pr 0.068
GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 7 VDOP max 1.9
Monitor status Not monitored RMS 49.0
Horz SD Vert SD
Start wk 1605 sec 412613.0 End wk 1605 sec 412619.0
GPSVEC TP Point ID 2246 DX 19820.708 DY -1812.811
Class Normal DZ 9095.750 Code NG
Obs L1 Fixed H.pr 0.042 V.pr 0.092
GPSQC1 NM Min SVs 9 PDOP max 1.7
Relative DOPs Yes HDOP max 0.7
Total GPS pos 11 VDOP max 1.5
Monitor status Not monitored RMS 40.9
Horz SD Vert SD
Start wk 1605 sec 412639.0 End wk 1605 sec 412649.0

```

| | | | | |
|--------|----|---|---|--|
| GPSVEC | TP | Point ID 2247 Class Normal Obs L1 Fixed | DX 19826.760 DZ 9102.920 H.pr 0.054 | DY -1810.641 Code NG V.pr 0.120 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1605 sec 412657.0 | PDOP max 2.0 HDOP max 0.8 VDOP max 1.8 RMS 48.9 Vert SD End wk 1605 sec 412663.0 | |
| GPSVEC | TP | Point ID 2248 Class Normal Obs L1 Fixed | DX 19835.205 DZ 9111.235 H.pr 0.039 | DY -1807.038 Code NG V.pr 0.086 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 412674.0 | PDOP max 2.9 HDOP max 1.2 VDOP max 2.6 RMS 26.7 Vert SD End wk 1605 sec 412677.0 | |
| GPSVEC | TP | Point ID 2249 Class Normal Obs L1 Fixed | DX 19861.750 DZ 9043.525 H.pr 0.023 | DY -1862.801 Code TOP V.pr 0.051 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 9 Monitor status Not monitored Horz SD Start wk 1605 sec 412717.0 | PDOP max 3.2 HDOP max 1.3 VDOP max 2.9 RMS 13.8 Vert SD End wk 1605 sec 412725.0 | |
| GPSVEC | TP | Point ID 2250 Class Normal Obs L1 Fixed | DX 19871.000 DZ 9051.480 H.pr 0.034 | DY -1860.506 Code TOP V.pr 0.075 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 412732.0 | PDOP max 3.2 HDOP max 1.3 VDOP max 2.9 RMS 24.5 Vert SD End wk 1605 sec 412741.0 | |
| GPSVEC | TP | Point ID 2251 Class Normal Obs L1 Fixed | DX 19899.610 DZ 9021.884 H.pr 0.029 | DY -1897.423 Code TOE V.pr 0.064 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 412760.0 | PDOP max 1.6 HDOP max 0.7 VDOP max 1.5 RMS 28.8 Vert SD End wk 1605 sec 412765.0 | |
| GPSVEC | TP | Point ID 2252 Class Normal Obs L1 Fixed | DX 19891.449 DZ 9014.604 H.pr 0.028 | DY -1889.134 Code TOE V.pr 0.061 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 412773.0 | PDOP max 2.0 HDOP max 0.8 VDOP max 1.8 RMS 25.6 Vert SD End wk 1605 sec 412777.0 | |
| GPSVEC | TP | Point ID 2253 Class Normal Obs L1 Fixed | DX 19879.388 DZ 9009.745 H.pr 0.027 | DY -1892.074 Code TOP V.pr 0.058 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 412790.0 | PDOP max 2.1 HDOP max 0.9 VDOP max 1.9 RMS 21.4 Vert SD End wk 1605 sec 412795.0 | |
| GPSVEC | TP | Point ID 2254 Class Normal Obs L1 Fixed | DX 19863.094 DZ 8997.817 H.pr 0.028 | DY -1894.977 Code TOE V.pr 0.060 |
| GPSQC1 | NM | Min SVs 9 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 412804.0 | PDOP max 2.1 HDOP max 0.9 VDOP max 1.9 RMS 15.6 Vert SD End wk 1605 sec 412813.0 | |
| GPSVEC | TP | Point ID 2255 Class Normal Obs L1 Fixed | DX 20160.124 DZ 8741.629 H.pr 0.032 | DY -2185.518 Code NG V.pr 0.063 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 413494.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 29.2 Vert SD End wk 1605 sec 413496.0 | |

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 2256 Class Normal Obs L1 Fixed | DX 20170.164 DZ 8797.623 H.pr 0.035 | DY -2159.011 Code TOE V.pr 0.067 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 413538.0 | PDOP max 2.4 HDOP max 1.1 VDOP max 2.1 RMS 28.8 Vert SD End wk 1605 sec 413543.0 | |
| GPSVEC | TP | Point ID 2257 Class Normal Obs L1 Fixed | DX 20184.823 DZ 8843.591 H.pr 0.033 | DY -2127.930 Code TOE V.pr 0.064 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 413580.0 | PDOP max 2.4 HDOP max 1.1 VDOP max 2.1 RMS 20.9 Vert SD End wk 1605 sec 413584.0 | |
| GPSVEC | TP | Point ID 2258 Class Normal Obs L1 Fixed | DX 20190.664 DZ 8858.387 H.pr 0.026 | DY -2118.306 Code TOP V.pr 0.050 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1605 sec 413597.0 | PDOP max 2.4 HDOP max 1.1 VDOP max 2.1 RMS 16.4 Vert SD End wk 1605 sec 413603.0 | |
| GPSVEC | TP | Point ID 2259 Class Normal Obs L1 Fixed | DX 20192.898 DZ 8864.590 H.pr 0.048 | DY -2113.116 Code TOE V.pr 0.090 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 9 Monitor status Not monitored Horz SD Start wk 1605 sec 413612.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 46.0 Vert SD End wk 1605 sec 413620.0 | |
| GPSVEC | TP | Point ID 2260 Class Normal Obs L1 Fixed | DX 20194.872 DZ 8872.094 H.pr 0.049 | DY -2108.457 Code TOE V.pr 0.093 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 413628.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 51.8 Vert SD End wk 1605 sec 413631.0 | |
| GPSVEC | TP | Point ID 2261 Class Normal Obs L1 Fixed | DX 20195.446 DZ 8875.798 H.pr 0.032 | DY -2107.083 Code TOP V.pr 0.061 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1605 sec 413641.0 | PDOP max 2.4 HDOP max 1.1 VDOP max 2.1 RMS 33.0 Vert SD End wk 1605 sec 413647.0 | |
| GPSVEC | TP | Point ID 2262 Class Normal Obs L1 Fixed | DX 20200.233 DZ 8898.598 H.pr 0.055 | DY -2093.617 Code NG V.pr 0.103 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 413668.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 79.4 Vert SD End wk 1605 sec 413672.0 | |
| GPSVEC | TP | Point ID 2263 Class Normal Obs L1 Fixed | DX 20203.110 DZ 8916.473 H.pr 0.031 | DY -2082.125 Code NG V.pr 0.064 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 413701.0 | PDOP max 2.7 HDOP max 1.2 VDOP max 2.4 RMS 25.2 Vert SD End wk 1605 sec 413705.0 | |
| NOTE | TS | Time Date 10/14/2010 Time 12:09:32 | | |
| GPSVEC | TP | Point ID 2264 Class Normal Obs L1 Fixed | DX 20733.421 DZ 8728.927 H.pr 0.020 | DY -2419.393 Code NG V.pr 0.059 |

```

GPSQC1 NM Min SVs      6          PDOP max 3.7
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 4          VDOP max 3.5
          Monitor status Not monitored RMS    7.3
          Horz SD                Vert SD
          Start wk 1605 sec 414569.0 End wk 1605 sec 414573.0

GPSVEC TP Point ID 2265      DX 20745.633      DY -2392.435
          Class Normal        DZ 8775.786      Code TOE
          Obs L1 Fixed        H.pr 0.019      V.pr 0.054

GPSQC1 NM Min SVs      6          PDOP max 3.7
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 6          VDOP max 3.5
          Monitor status Not monitored RMS    10.0
          Horz SD                Vert SD
          Start wk 1605 sec 414602.0 End wk 1605 sec 414607.0

GPSVEC TP Point ID 2266      DX 20760.774      DY -2357.383
          Class Normal        DZ 8841.282      Code TOE
          Obs L1 Fixed        H.pr 0.022      V.pr 0.064

GPSQC1 NM Min SVs      6          PDOP max 3.7
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 5          VDOP max 3.5
          Monitor status Not monitored RMS    4.9
          Horz SD                Vert SD
          Start wk 1605 sec 414642.0 End wk 1605 sec 414646.0

GPSVEC TP Point ID 2267      DX 20766.477      DY -2342.318
          Class Normal        DZ 8861.360      Code TOP
          Obs L1 Fixed        H.pr 0.017      V.pr 0.050

GPSQC1 NM Min SVs      6          PDOP max 3.7
          Relative DOPs Yes        HDOP max 1.2
          Total GPS pos 5          VDOP max 3.5
          Monitor status Not monitored RMS    5.1
          Horz SD                Vert SD
          Start wk 1605 sec 414659.0 End wk 1605 sec 414663.0

GPSVEC TP Point ID 2268      DX 20767.215      DY -2340.670
          Class Normal        DZ 8862.741      Code TOE
          Obs L1 Fixed        H.pr 0.013      V.pr 0.038

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 2.5
          Monitor status Not monitored RMS    6.0
          Horz SD                Vert SD
          Start wk 1605 sec 414670.0 End wk 1605 sec 414673.0

GPSVEC TP Point ID 2269      DX 20769.523      DY -2335.249
          Class Normal        DZ 8871.603      Code TOE
          Obs L1 Fixed        H.pr 0.016      V.pr 0.045

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 2.5
          Monitor status Not monitored RMS    10.0
          Horz SD                Vert SD
          Start wk 1605 sec 414681.0 End wk 1605 sec 414684.0

GPSVEC TP Point ID 2270      DX 20769.946      DY -2334.459
          Class Normal        DZ 8873.966      Code TOP
          Obs L1 Fixed        H.pr 0.023      V.pr 0.065

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 2.5
          Monitor status Not monitored RMS    7.7
          Horz SD                Vert SD
          Start wk 1605 sec 414691.0 End wk 1605 sec 414694.0

GPSVEC TP Point ID 2271      DX 20774.291      DY -2324.255
          Class Normal        DZ 8891.945      Code NG
          Obs L1 Fixed        H.pr 0.014      V.pr 0.041

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 2.5
          Monitor status Not monitored RMS    5.4
          Horz SD                Vert SD
          Start wk 1605 sec 414707.0 End wk 1605 sec 414710.0

GPSVEC TP Point ID 2272      DX 20779.448      DY -2311.270
          Class Normal        DZ 8914.453      Code NG
          Obs L1 Fixed        H.pr 0.014      V.pr 0.041

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 2.5
          Monitor status Not monitored RMS    5.9
          Horz SD                Vert SD
          Start wk 1605 sec 414723.0 End wk 1605 sec 414727.0
    
```

SURVEY EVENTKISurvey event Communications error

```

INIT   KI  Init event      Lost           Week          1505
        Init type        On the fly    seconds       414736.0
        Init counter     0            Point ID      <no text>
        Survey type      Real Time    Plate H.Dist  <null>
        Plate V.Dist     <null>      Plate azimuth <null>

SURVEY EVENTKISurvey event Survey ended

SURVEY  KI  Elev mask 13           PDOP mask 6.0

SURVEY  KI  Elev mask 10           PDOP mask 6.0

SURVEY  KI  Elev mask 13           PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT  KI  Antenna ht 0.000        Measuremt True

GPSPOS  FD  Point ID SRPEAST      Lat 33°25'25.17374°N Lng 111°40'44.55636°W
        Class Normal          Hgt 1375.166         Code <no text>
        Obs User Input        H.pr <null>         V.pr <null>

EQUIP   SI  Receiver <no text>      Serial no <no text>
        Antenna Zephyr Geodetic - Model 2
        Meas To Antenna Phase Center
        Tape adj 0.000          Serial no <no text>
        H.Offset 0.000         V.Offset 0.000

NOTE    NM  Receiver_firmware version=0.000

GPSANT  KI  Antenna ht 0.279        Measuremt True

GPSREF  KI  Reference SRPFAST

INIT   KI  Init event      Gained        Week          1605
        Init type        On the fly    seconds       415074.0
        Init counter     1            Point ID      <no text>
        Survey type      Real Time    Plate H.Dist  <null>
        Plate V.Dist     <null>      Plate azimuth <null>

EQUIP   NM  Receiver 5800            Serial no 4251116756
        Antenna R8/5800/SP5780 Internal
        Meas To Bottom of antenna mount
        Tape adj 0.000          Serial no <no text>
        H.Offset 0.000         V.Offset 0.213

NOTE    NM  Receiver firmware version=2.320

GPSANT  KI  Antenna ht 6.890        Measuremt Uncorrected

GPSVEC  TP  Point ID 2273          DX 21308.394        DY -2646.415
        Class Normal          DZ 8734.962         Code NG
        Obs L1 Fixed          H.pr 0.034         V.pr 0.059

GPSQC1  NM  Min SVs 7                PDOP max 1.6
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3        VDOP max 1.4
        Monitor status Not monitored RMS 24.4
        Horz SD                Vert SD
        Start wk 1605 sec 415336.0 End wk 1605 sec 415338.0

GPSVEC  TP  Point ID 2274          DX 21319.579        DY -2620.238
        Class Normal          DZ 8779.763         Code TOE
        Obs L1 Fixed          H.pr 0.035         V.pr 0.060

GPSQC1  NM  Min SVs 7                PDOP max 2.3
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 4        VDOP max 2.0
        Monitor status Not monitored RMS 28.1
        Horz SD                Vert SD
        Start wk 1605 sec 415358.0 End wk 1605 sec 415361.0

GPSVEC  TP  Point ID 2275          DX 21333.526        DY -2587.824
        Class Normal          DZ 8837.013         Code TOE
        Obs L1 Fixed          H.pr 0.035         V.pr 0.061

GPSQC1  NM  Min SVs 7                PDOP max 3.6
        Relative DOPs Yes      HDOP max 1.8
        Total GPS pos 5        VDOP max 3.1
        Monitor status Not monitored RMS 11.6
        Horz SD                Vert SD
        Start wk 1605 sec 415397.0 End wk 1605 sec 415402.0

GPSVEC  TP  Point ID 2276          DX 21338.507        DY -2577.434
        Class Normal          DZ 8853.403         Code TOP
        Obs L1 Fixed          H.pr 0.031         V.pr 0.054

GPSQC1  NM  Min SVs 7                PDOP max 2.3
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 6        VDOP max 2.0
        Monitor status Not monitored RMS 17.8
        Horz SD                Vert SD
        Start wk 1605 sec 415413.0 End wk 1605 sec 415418.0

GPSVEC  TP  Point ID 2277          DX 21342.700        DY -2566.658
        Class Normal          DZ 8863.407         Code TOE
        Obs L1 Fixed          H.pr 0.027         V.pr 0.046
    
```

```

GPSQC1 NM Min SVs 7 PDOP max 2.3
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.0
Monitor status Not monitored RMS 12.0
Horz SD Vert SD
Start wk 1605 sec 415434.0 End wk 1605 sec 415438.0

GPSVEC TP Point ID 2278 DX 21344.453 DY -2561.695
Class Normal DZ 8871.291 Code TOE
Obs L1 Fixed H.pr 0.033 V.pr 0.052

GPSQC1 NM Min SVs 7 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 6 VDOP max 1.4
Monitor status Not monitored RMS 35.1
Horz SD Vert SD
Start wk 1605 sec 415445.0 End wk 1605 sec 415456.0

GPSVEC TP Point ID 2279 DX 21345.960 DY -2556.783
Class Normal DZ 8886.979 Code TOP
Obs L1 Fixed H.pr 0.038 V.pr 0.066

GPSQC1 NM Min SVs 7 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 24.3
Horz SD Vert SD
Start wk 1605 sec 415471.0 End wk 1605 sec 415474.0

GPSVEC TP Point ID 2280 DX 21350.559 DY -2542.212
Class Normal DZ 8911.265 Code NG
Obs L1 Fixed H.pr 0.036 V.pr 0.062

GPSQC1 NM Min SVs 7 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 29.6
Horz SD Vert SD
Start wk 1605 sec 415491.0 End wk 1605 sec 415494.0

GPSVEC TP Point ID 2281 DX 21355.559 DY -2528.338
Class Normal DZ 8934.790 Code NG
Obs L1 Fixed H.pr 0.054 V.pr 0.093

GPSQC1 NM Min SVs 7 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 14 VDOP max 1.4
Monitor status Not monitored RMS 34.6
Horz SD Vert SD
Start wk 1605 sec 415507.0 End wk 1605 sec 415520.0

NOTE TS Time Date 10/14/2010 Time 12:48:13

GPSVEC TP Point ID 2282 DX 21883.018 DY -2876.748
Class Normal DZ 8726.062 Code NG
Obs L1 Fixed H.pr 0.030 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 2.4
Relative DOPs Yes HDOP max 1.3
Total GPS pos 5 VDOP max 2.1
Monitor status Not monitored RMS 19.6
Horz SD Vert SD
Start wk 1605 sec 416891.0 End wk 1605 sec 416895.0

GPSVEC TP Point ID 2283 DX 21897.295 DY -2852.055
Class Normal DZ 8770.274 Code TOE
Obs L1 Fixed H.pr 0.022 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 1.7
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 12.3
Horz SD Vert SD
Start wk 1605 sec 416915.0 End wk 1605 sec 416918.0

GPSVEC TP Point ID 2284 DX 21911.692 DY -2812.521
Class Normal DZ 8839.433 Code TOE
Obs L1 Fixed H.pr 0.031 V.pr 0.051

GPSQC1 NM Min SVs 7 PDOP max 1.7
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 17.6
Horz SD Vert SD
Start wk 1605 sec 416962.0 End wk 1605 sec 416965.0

GPSVEC TP Point ID 2285 DX 21915.222 DY -2801.000
Class Normal DZ 8856.052 Code TOP
Obs L1 Fixed H.pr 0.028 V.pr 0.045

GPSQC1 NM Min SVs 7 PDOP max 2.4
Relative DOPs Yes HDOP max 1.3
Total GPS pos 4 VDOP max 2.1
Monitor status Not monitored RMS 11.6
Horz SD Vert SD
Start wk 1605 sec 416978.0 End wk 1605 sec 416982.0

```

```

GPSVEC TP Point ID 2286      DX 21917.358      DY -2795.118
          Class Normal      DZ 8862.402      Code TOE
          Obs L1 Fixed      H.pr 0.030      V.pr 0.050

GPSQC1 NM Min SVs          7          PDOP max 1.7
          Relative DOPs Yes      HDOP max 0.9
          Total GPS pos 4      VDOP max 1.5
          Monitor status Not monitored      RMS 24.3
          Horz SD          Vert SD
          Start wk 1605 sec 416992.0      End wk 1605 sec 416995.0

GPSVEC TP Point ID 2287      DX 21919.452      DY -2789.557
          Class Normal      DZ 8871.308      Code TOE
          Obs L1 Fixed      H.pr 0.032      V.pr 0.052

GPSQC1 NM Min SVs          7          PDOP max 1.7
          Relative DOPs Yes      HDOP max 0.9
          Total GPS pos 3      VDOP max 1.5
          Monitor status Not monitored      RMS 20.7
          Horz SD          Vert SD
          Start wk 1605 sec 417004.0      End wk 1605 sec 417006.0

GPSVEC TP Point ID 2288      DX 21921.425      DY -2785.671
          Class Normal      DZ 8880.998      Code TOP
          Obs L1 Fixed      H.pr 0.032      V.pr 0.053

GPSQC1 NM Min SVs          7          PDOP max 2.4
          Relative DOPs Yes      HDOP max 1.3
          Total GPS pos 4      VDOP max 2.1
          Monitor status Not monitored      RMS 35.3
          Horz SD          Vert SD
          Start wk 1605 sec 417015.0      End wk 1605 sec 417018.0

GPSVEC TP Point ID 2289      DX 21928.999      DY -2772.364
          Class Normal      DZ 8904.180      Code NG
          Obs L1 Fixed      H.pr 0.036      V.pr 0.058

GPSQC1 NM Min SVs          7          PDOP max 1.7
          Relative DOPs Yes      HDOP max 0.9
          Total GPS pos 7      VDOP max 1.5
          Monitor status Not monitored      RMS 28.9
          Horz SD          Vert SD
          Start wk 1605 sec 417032.0      End wk 1605 sec 417038.0

GPSVEC TP Point ID 2290      DX 21937.306      DY -2752.183
          Class Normal      DZ 8938.594      Code NG
          Obs L1 Fixed      H.pr 0.071      V.pr 0.116

GPSQC1 NM Min SVs          7          PDOP max 3.5
          Relative DOPs Yes      HDOP max 1.8
          Total GPS pos 8      VDOP max 3.0
          Monitor status Not monitored      RMS 8.6
          Horz SD          Vert SD
          Start wk 1605 sec 417059.0      End wk 1605 sec 417066.0

GPSVEC CN Point ID 2122821    DX 20038.334      DY -2252.486
          Class Check      DZ 8573.233      Code CS
          Obs L1 Fixed      H.pr 0.025      V.pr 0.042

GPSQC1 NM Min SVs          7          PDOP max 1.3
          Relative DOPs Yes      HDOP max 0.7
          Total GPS pos 97      VDOP max 1.1
          Monitor status Not monitored      RMS 14.5
          Horz SD          Vert SD
          Start wk 1605 sec 418243.0      End wk 1605 sec 418340.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0224809572
          VCV xx 0.0000056071      VCV xy 0.0000040892
          VCV xz -0.0000024023      VCV yy 0.0000112159
          VCV yz -0.0000018547      VCV zz 0.0000079412

POLAR D CN Azmth          76°03'40.757"      H.Dist 0.099
          V.Dist 0.166

SURVEY EVENTKISurvey event Survey ended

NOTE TS Time Date 10/15/2010 Time 07:12:45

SURVEY KI Elev mask 13          PDOP mask 6.0

SURVEY KI Elev mask 10          PDOP mask 6.0

SURVEY KI Elev mask 13          PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000      Measremt True

GPSPOS FD Point ID SRPEAST      Lat 33°25'25.17374"N Lng 111°40'44.55636"W
          Class Normal      Hgt 1375.166      Code <no text>
          Obs User Input      H.pr <null>      V.pr <null>

EQUIP SI Receiver <no text>      Serial no <no text>
          Antenna Zephyr Geodetic - Model 2
          Meas To Antenna Phase Center
          Tape adj 0.000      Serial no <no text>
          H.Offset 0.000      V.Offset 0.000

NOTE NM Receiver firmware version=0.000
    
```

```

GPSANT KI Antenna ht 0.279 Measurement True
GPSREF KI Reference SRPEAST
INIT KI Init event Gained Week 1605
Init type On the fly seconds 483237.0
Init counter 1 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>
EQUIP NM Receiver 5800 Serial no 4251116756
Antenna R8/5800/SPS780 Internal
Meas To Bottom of antenna mount
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.213
NOTE NM Receiver firmware version=2.320
GPSANT KI Antenna ht 6.890 Measurement Uncorrected
GPSVEC CN Point ID 2122821 DX 20038.351 DY -2252.500
Class Check DZ 8573.335 Code CS
Obs L1 Fixed H.pr 0.016 V.pr 0.034
GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.7
Total GPS pos 184 VDOP max 1.4
Monitor status Not monitored RMS 10.5
Horz SD Vert SD
Start wk 1605 sec 483265.0 End wk 1605 sec 483458.0
GPSQC2 NM Ttl satellites 8 Err Scale 0.0244484581
VCV xx 0.0000032147 VCV xy 0.000003157
VCV yz -0.0000011549 VCV yy 0.0000091792
VCV zz -0.0000021653 VCV zz 0.0000020195
POLAR D CN Azmth 127°28'47.449" H.Dist 0.095
V.Dist 0.104
GPSVEC TP Point ID 2291 DX 22462.870 DY -3106.323
Class Normal DZ 8726.949 Code NG
Obs L1 Fixed H.pr 0.030 V.pr 0.050
GPSQC1 NM Min SVs 8 PDOP max 1.9
Relative DOPs Yes HDOP max 0.9
Total GPS pos 9 VDOP max 1.6
Monitor status Not monitored RMS 18.8
Horz SD Vert SD
Start wk 1605 sec 484541.0 End wk 1605 sec 484549.0
GPSVEC TP Point ID 2292 DX 22472.159 DY -3081.661
Class Normal DZ 8769.436 Code TOE
Obs L1 Fixed H.pr 0.025 V.pr 0.039
GPSQC1 NM Min SVs 9 PDOP max 1.9
Relative DOPs Yes HDOP max 0.9
Total GPS pos 5 VDOP max 1.6
Monitor status Not monitored RMS 14.0
Horz SD Vert SD
Start wk 1605 sec 484570.0 End wk 1605 sec 484574.0
GPSVEC TP Point ID 2293 DX 22487.617 DY -3044.474
Class Normal DZ 8834.597 Code TOE
Obs L1 Fixed H.pr 0.036 V.pr 0.061
GPSQC1 NM Min SVs 9 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.1
Monitor status Not monitored RMS 20.0
Horz SD Vert SD
Start wk 1605 sec 484622.0 End wk 1605 sec 484626.0
GPSVEC TP Point ID 2294 DX 22492.314 DY -3032.495
Class Normal DZ 8851.743 Code TOP
Obs L1 Fixed H.pr 0.037 V.pr 0.063
GPSQC1 NM Min SVs 9 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 6 VDOP max 2.1
Monitor status Not monitored RMS 26.3
Horz SD Vert SD
Start wk 1605 sec 484640.0 End wk 1605 sec 484645.0
GPSVEC TP Point ID 2295 DX 22493.861 DY -3025.853
Class Normal DZ 8858.598 Code TOE
Obs L1 Fixed H.pr 0.082 V.pr 0.139
GPSQC1 NM Min SVs 9 PDOP max 1.1
Relative DOPs Yes HDOP max 0.6
Total GPS pos 9 VDOP max 0.9
Monitor status Not monitored RMS 15.7
Horz SD Vert SD
Start wk 1605 sec 484659.0 End wk 1605 sec 484667.0
GPSVEC TP Point ID 2296 DX 22498.313 DY -3015.715
Class Normal DZ 8874.457 Code TOE
Obs L1 Fixed H.pr 0.027 V.pr 0.046

```

```

GPSQC1 NM Min SVs 9 PDOP max 1.8
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 27.6
Horz SD Vert SD
Start wk 1605 sec 484679.0 End wk 1605 sec 484682.0

GPSVEC TP Point ID 2297 DX 22498.676 DY -3012.568
Class Normal DZ 8884.686 Code TOP
Obs L1 Fixed H.pr 0.029 V.pr 0.049

GPSQC1 NM Min SVs 9 PDOP max 0.7
Relative DOPs Yes HDOP max 0.3
Total GPS pos 3 VDOP max 0.6
Monitor status Not monitored RMS 15.3
Horz SD Vert SD
Start wk 1605 sec 484729.0 End wk 1605 sec 484731.0

GPSVEC TP Point ID 2298 DX 22504.717 DY -2999.370
Class Normal DZ 8909.057 Code NG
Obs L1 Fixed H.pr 0.039 V.pr 0.065

GPSQC1 NM Min SVs 9 PDOP max 1.7
Relative DOPs Yes HDOP max 0.9
Total GPS pos 3 VDOP max 1.5
Monitor status Not monitored RMS 23.0
Horz SD Vert SD
Start wk 1605 sec 484759.0 End wk 1605 sec 484761.0

GPSVEC TP Point ID 2299 DX 22512.432 DY -2981.165
Class Normal DZ 8940.427 Code NG
Obs L1 Fixed H.pr 0.032 V.pr 0.053

GPSQC1 NM Min SVs 8 PDOP max 0.6
Relative DOPs Yes HDOP max 0.3
Total GPS pos 3 VDOP max 0.5
Monitor status Not monitored RMS 57.7
Horz SD Vert SD
Start wk 1605 sec 484790.0 End wk 1605 sec 484792.0

NOTE TS Time Date 10/15/2010 Time 08:02:14

GPSVEC TP Point ID 2300 DX 23036.046 DY -3335.340
Class Normal DZ 8728.148 Code NG
Obs L1 Fixed H.pr 0.030 V.pr 0.051

GPSQC1 NM Min SVs 8 PDOP max 1.3
Relative DOPs Yes HDOP max 0.7
Total GPS pos 3 VDOP max 1.2
Monitor status Not monitored RMS 31.0
Horz SD Vert SD
Start wk 1605 sec 486133.0 End wk 1605 sec 486135.0

GPSVEC TP Point ID 2301 DX 23048.563 DY -3307.921
Class Normal DZ 8774.776 Code TOR
Obs L1 Fixed H.pr 0.061 V.pr 0.102

GPSQC1 NM Min SVs 8 PDOP max 3.4
Relative DOPs Yes HDOP max 1.7
Total GPS pos 8 VDOP max 2.9
Monitor status Not monitored RMS 23.2
Horz SD Vert SD
Start wk 1605 sec 486157.0 End wk 1605 sec 486164.0

GPSVEC TP Point ID 2302 DX 23063.849 DY -3272.605
Class Normal DZ 8834.153 Code TOE
Obs L1 Fixed H.pr 0.035 V.pr 0.059

GPSQC1 NM Min SVs 8 PDOP max 1.9
Relative DOPs Yes HDOP max 1.0
Total GPS pos 4 VDOP max 1.6
Monitor status Not monitored RMS 17.2
Horz SD Vert SD
Start wk 1605 sec 486204.0 End wk 1605 sec 486207.0

GPSVEC TP Point ID 2303 DX 23068.040 DY -3259.773
Class Normal DZ 8853.286 Code TOP
Obs L1 Fixed H.pr 0.037 V.pr 0.062

GPSQC1 NM Min SVs 8 PDOP max 1.9
Relative DOPs Yes HDOP max 1.0
Total GPS pos 4 VDOP max 1.7
Monitor status Not monitored RMS 20.9
Horz SD Vert SD
Start wk 1605 sec 486221.0 End wk 1605 sec 486224.0

GPSVEC TP Point ID 2304 DX 23070.647 DY -3253.228
Class Normal DZ 8859.816 Code TOE
Obs L1 Fixed H.pr 0.028 V.pr 0.047

GPSQC1 NM Min SVs 8 PDOP max 1.9
Relative DOPs Yes HDOP max 1.0
Total GPS pos 5 VDOP max 1.7
Monitor status Not monitored RMS 16.6
Horz SD Vert SD
Start wk 1605 sec 486233.0 End wk 1605 sec 486237.0

```

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 2305 Class Normal Obs L1 Fixed | DX 23075.439 DZ 8873.900 H.pr 0.031 | DY -3244.856 Code TOE V.pr 0.053 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 486246.0 | PDOP max 1.9 HDOP max 1.0 VDOP max 1.7 RMS 16.3 Vert SD End wk 1605 sec 486250.0 | |
| GPSVEC | TP | Point ID 2306 Class Normal Obs L1 Fixed | DX 23077.756 DZ 8887.606 H.pr 0.033 | DY -3240.226 Code TOP V.pr 0.057 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 486266.0 | PDOP max 1.4 HDOP max 0.7 VDOP max 1.2 RMS 18.8 Vert SD End wk 1605 sec 486269.0 | |
| GPSVEC | TP | Point ID 2307 Class Normal Obs L1 Fixed | DX 23082.619 DZ 8909.387 H.pr 0.035 | DY -3227.148 Code NG V.pr 0.060 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 486282.0 | PDOP max 1.9 HDOP max 1.0 VDOP max 1.7 RMS 26.9 Vert SD End wk 1605 sec 486286.0 | |
| GPSVEC | TP | Point ID 2308 Class Normal Obs L1 Fixed | DX 23089.284 DZ 8934.968 H.pr 0.035 | DY -3212.945 Code NG V.pr 0.060 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 486304.0 | PDOP max 1.9 HDOP max 1.0 VDOP max 1.7 RMS 31.6 Vert SD End wk 1605 sec 486308.0 | |
| GPSVEC | TP | Point ID 2309 Class Normal Obs L1 Fixed | DX 23615.419 DZ 8715.738 H.pr 0.021 | DY -3551.100 Code NG V.pr 0.037 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 486871.0 | PDOP max 2.1 HDOP max 1.1 VDOP max 1.8 RMS 13.0 Vert SD End wk 1605 sec 486875.0 | |
| GPSVEC | TP | Point ID 2310 Class Normal Obs L1 Fixed | DX 23619.897 DZ 8728.371 H.pr 0.026 | DY -3543.504 Code NG V.pr 0.048 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 486885.0 | PDOP max 2.1 HDOP max 1.0 VDOP max 1.9 RMS 24.6 Vert SD End wk 1605 sec 486889.0 | |
| GPSVEC | TP | Point ID 2311 Class Normal Obs L1 Fixed | DX 23620.876 DZ 8741.669 H.pr 0.023 | DY -3538.839 Code NG V.pr 0.043 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 486900.0 | PDOP max 2.0 HDOP max 1.0 VDOP max 1.8 RMS 23.1 Vert SD End wk 1605 sec 486904.0 | |
| GPSVEC | TP | Point ID 2312 Class Normal Obs L1 Fixed | DX 23624.073 DZ 8762.257 H.pr 0.036 | DY -3528.849 Code TOE V.pr 0.065 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 486917.0 | PDOP max 2.0 HDOP max 1.0 VDOP max 1.8 RMS 24.9 Vert SD End wk 1605 sec 486922.0 | |
| GPSVEC | TP | Point ID 2313 Class Normal Obs L1 Fixed | DX 23653.738 DZ 8896.421 H.pr 0.038 | DY -3451.472 Code TOP V.pr 0.070 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 487007.0 | PDOP max 3.4 HDOP max 1.6 VDOP max 2.9 RMS 21.8 Vert SD End wk 1605 sec 487011.0 | |

```

GPSVEC TP Point ID 2314      DX 23656.768      DY -3440.038
        Class Normal      DZ 8919.250      Code NG
        Obs L1 Fixed      H.pr 0.020      V.pr 0.038

GPSQC1 NM Min SVs          8              PDOP max 2.1
        Relative DOPs Yes      HDOP max 1.0
        Total GPS pos 5        VDOP max 1.8
        Monitor status Not monitored RMS 12.2
        Horz SD              Vert SD
        Start wk 1605 sec 487028.0 End wk 1605 sec 487032.0

GPSVEC TP Point ID 2315      DX 23659.508      DY -3421.964
        Class Normal      DZ 8948.743      Code NG
        Obs L1 Fixed      H.pr 0.019      V.pr 0.035

GPSQC1 NM Min SVs          8              PDOP max 2.1
        Relative DOPs Yes      HDOP max 1.0
        Total GPS pos 5        VDOP max 1.8
        Monitor status Not monitored RMS 11.9
        Horz SD              Vert SD
        Start wk 1605 sec 487050.0 End wk 1605 sec 487054.0

NOTE TS Time Date 10/15/2010 Time 08:37:49

GPSVEC TP Point ID 2316      DX 24190.988      DY -3781.057
        Class Normal      DZ 8732.249      Code NG
        Obs L1 Fixed      H.pr 0.038      V.pr 0.066

GPSQC1 NM Min SVs          8              PDOP max 0.7
        Relative DOPs Yes      HDOP max 0.4
        Total GPS pos 3        VDOP max 0.6
        Monitor status Not monitored RMS 17.7
        Horz SD              Vert SD
        Start wk 1605 sec 488267.0 End wk 1605 sec 488269.0

GPSVEC TP Point ID 2317      DX 24205.413      DY -3755.772
        Class Normal      DZ 8774.567      Code TOE
        Obs L1 Fixed      H.pr 0.036      V.pr 0.062

GPSQC1 NM Min SVs          8              PDOP max 0.9
        Relative DOPs Yes      HDOP max 0.4
        Total GPS pos 6        VDOP max 0.8
        Monitor status Not monitored RMS 13.3
        Horz SD              Vert SD
        Start wk 1605 sec 488294.0 End wk 1605 sec 488300.0

GPSVEC TP Point ID 2318      DX 24214.675      DY -3729.632
        Class Normal      DZ 8818.687      Code TOE
        Obs L1 Fixed      H.pr 0.040      V.pr 0.068

GPSQC1 NM Min SVs          7              PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.3
        Total GPS pos 5        VDOP max 2.3
        Monitor status Not monitored RMS 20.4
        Horz SD              Vert SD
        Start wk 1605 sec 488332.0 End wk 1605 sec 488336.0

GPSVEC TP Point ID 2319      DX 24219.152      DY -3718.215
        Class Normal      DZ 8836.228      Code TOP
        Obs L1 Fixed      H.pr 0.039      V.pr 0.067

GPSQC1 NM Min SVs          8              PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.3
        Total GPS pos 7        VDOP max 2.3
        Monitor status Not monitored RMS 25.5
        Horz SD              Vert SD
        Start wk 1605 sec 488348.0 End wk 1605 sec 488354.0

GPSVEC TP Point ID 2320      DX 24225.321      DY -3702.317
        Class Normal      DZ 8850.865      Code TOE
        Obs L1 Fixed      H.pr 0.038      V.pr 0.065

GPSQC1 NM Min SVs          8              PDOP max 1.4
        Relative DOPs Yes      HDOP max 0.7
        Total GPS pos 6        VDOP max 1.2
        Monitor status Not monitored RMS 29.8
        Horz SD              Vert SD
        Start wk 1605 sec 488370.0 End wk 1605 sec 488375.0

GPSVEC TP Point ID 2321      DX 24231.430      DY -3688.008
        Class Normal      DZ 8874.459      Code TOE
        Obs L1 Fixed      H.pr 0.037      V.pr 0.063

GPSQC1 NM Min SVs          8              PDOP max 1.4
        Relative DOPs Yes      HDOP max 0.7
        Total GPS pos 4        VDOP max 1.2
        Monitor status Not monitored RMS 31.1
        Horz SD              Vert SD
        Start wk 1605 sec 488389.0 End wk 1605 sec 488392.0

GPSVEC TP Point ID 2322      DX 24233.282      DY -3681.705
        Class Normal      DZ 8897.385      Code TOP
        Obs L1 Fixed      H.pr 0.032      V.pr 0.053
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 3 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 20.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488410.0 | End wk 1605 sec | 488413.0 |
| GPSVEC | TP | Point ID 2323 | | DX 24237.663 | DY -3666.983 |
| | | Class Normal | | DZ 8920.721 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.026 | V.pr 0.044 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 21.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488427.0 | End wk 1605 sec | 488432.0 |
| GPSVEC | TP | Point ID 2324 | | DX 24241.947 | DY -3651.485 |
| | | Class Normal | | DZ 8944.098 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.031 | V.pr 0.054 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 20.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488445.0 | End wk 1605 sec | 488449.0 |
| GPSVEC | TP | Point ID 2325 | | DX 24767.111 | DY -4018.788 |
| | | Class Normal | | DZ 8700.388 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.036 | V.pr 0.058 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 25.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488810.0 | End wk 1605 sec | 488813.0 |
| GPSVEC | TP | Point ID 2326 | | DX 24776.955 | DY -3993.458 |
| | | Class Normal | | DZ 8744.599 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.045 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 20.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488853.0 | End wk 1605 sec | 488857.0 |
| GPSVEC | TP | Point ID 2327 | | DX 24790.847 | DY -3944.928 |
| | | Class Normal | | DZ 8824.901 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.035 | V.pr 0.061 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.1 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 5 | VDOP max | 2.7 |
| | | Monitor status | Not monitored | RMS | 16.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488914.0 | End wk 1605 sec | 488918.0 |
| GPSVEC | TP | Point ID 2328 | | DX 24798.795 | DY -3918.967 |
| | | Class Normal | | DZ 8865.170 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.036 | V.pr 0.057 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.3 |
| | | Relative DOPs | Yes | HDOP max | 0.7 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 20.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488937.0 | End wk 1605 sec | 488940.0 |
| GPSVEC | TP | Point ID 2329 | | DX 24803.634 | DY -3901.443 |
| | | Class Normal | | DZ 8892.655 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.034 | V.pr 0.054 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 15.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488955.0 | End wk 1605 sec | 488960.0 |
| GPSVEC | TP | Point ID 2330 | | DX 24803.808 | DY -3895.981 |
| | | Class Normal | | DZ 8903.851 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.031 | V.pr 0.061 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.1 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 2.8 |
| | | Monitor status | Not monitored | RMS | 26.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 488977.0 | End wk 1605 sec | 488982.0 |
| GPSVEC | TP | Point ID 2331 | | DX 24802.146 | DY -3876.294 |
| | | Class Normal | | DZ 8932.268 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.033 | V.pr 0.057 |

GPSQC1 NM Min SVs 7 PDOP max 3.1
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 8 VDOP max 2.7
 Monitor status Not monitored RMS 13.4
 Horz SD Vert SD
 Start wk 1605 sec 489002.0 End wk 1605 sec 489009.0

NOTE TS Time Date 10/15/2010 Time 09:09:37

GPSVEC TP Point ID 2332 DX 25318.922 DY -4242.897
 Class Normal DZ 8686.640 Code NG
 Obs L1 Fixed H.pr 0.016 V.pr 0.033

GPSQC1 NM Min SVs 6 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 6 VDOP max 3.2
 Monitor status Not monitored RMS 9.3
 Horz SD Vert SD
 Start wk 1605 sec 490173.0 End wk 1605 sec 490178.0

GPSVEC TP Point ID 2333 DX 25326.969 DY -4226.423
 Class Normal DZ 8715.525 Code NG
 Obs L1 Fixed H.pr 0.031 V.pr 0.066

GPSQC1 NM Min SVs 6 PDOP max 2.5
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 4 VDOP max 2.2
 Monitor status Not monitored RMS 8.1
 Horz SD Vert SD
 Start wk 1605 sec 490208.0 End wk 1605 sec 490211.0

GPSVEC TP Point ID 2334 DX 25335.306 DY -4218.379
 Class Normal DZ 8732.077 Code TOE
 Obs L1 Fixed H.pr 0.032 V.pr 0.067

GPSQC1 NM Min SVs 6 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 10 VDOP max 3.2
 Monitor status Not monitored RMS 15.8
 Horz SD Vert SD
 Start wk 1605 sec 490227.0 End wk 1605 sec 490236.0

GPSVEC TP Point ID 2335 DX 25347.373 DY -4184.802
 Class Normal DZ 8792.564 Code TOE
 Obs L1 Fixed H.pr 0.028 V.pr 0.058

GPSQC1 NM Min SVs 6 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 5 VDOP max 3.2
 Monitor status Not monitored RMS 9.7
 Horz SD Vert SD
 Start wk 1605 sec 490281.0 End wk 1605 sec 490285.0

GPSVEC TP Point ID 2336 DX 25349.663 DY -4176.965
 Class Normal DZ 8803.528 Code TOP
 Obs L1 Fixed H.pr 0.031 V.pr 0.065

GPSQC1 NM Min SVs 6 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 5 VDOP max 3.2
 Monitor status Not monitored RMS 5.4
 Horz SD Vert SD
 Start wk 1605 sec 490294.0 End wk 1605 sec 490298.0

GPSVEC TP Point ID 2337 DX 25354.220 DY -4164.692
 Class Normal DZ 8815.351 Code TOE
 Obs L1 Fixed H.pr 0.031 V.pr 0.066

GPSQC1 NM Min SVs 6 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 6 VDOP max 3.2
 Monitor status Not monitored RMS 5.2
 Horz SD Vert SD
 Start wk 1605 sec 490309.0 End wk 1605 sec 490314.0

GPSVEC TP Point ID 2338 DX 25364.303 DY -4138.857
 Class Normal DZ 8856.487 Code NG
 Obs L1 Fixed H.pr 0.027 V.pr 0.056

GPSQC1 NM Min SVs 6 PDOP max 2.5
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 5 VDOP max 2.3
 Monitor status Not monitored RMS 13.6
 Horz SD Vert SD
 Start wk 1605 sec 490338.0 End wk 1605 sec 490342.0

GPSVEC TP Point ID 2339 DX 25372.775 DY -4112.229
 Class Normal DZ 8900.220 Code TOE
 Obs L1 Fixed H.pr 0.024 V.pr 0.051

GPSQC1 NM Min SVs 6 PDOP max 2.5
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 4 VDOP max 2.3
 Monitor status Not monitored RMS 15.6
 Horz SD Vert SD
 Start wk 1605 sec 490363.0 End wk 1605 sec 490366.0

```

GPSVEC TP Point ID 2340      DX 25372.508      DY -4104.888
        Class Normal      DZ 8921.339      Code TOP
        Obs L1 Fixed      H.pr 0.021      V.pr 0.045

GPSQC1 NM Min SVs 6      PDOP max 3.6
        Relative DOPs Yes      HDOP max 1.5
        Total GPS pos 7      VDOP max 3.2
        Monitor status Not monitored      RMS 17.0
        Horz SD      Vert SD
        Start wk 1605 sec 490383.0      End wk 1605 sec 490389.0

GPSVEC TP Point ID 2341      DX 25375.172      DY -4089.172
        Class Normal      DZ 8949.125      Code NG
        Obs L1 Fixed      H.pr 0.031      V.pr 0.065

GPSQC1 NM Min SVs 6      PDOP max 3.6
        Relative DOPs Yes      HDOP max 1.5
        Total GPS pos 7      VDOP max 3.2
        Monitor status Not monitored      RMS 15.3
        Horz SD      Vert SD
        Start wk 1605 sec 490403.0      End wk 1605 sec 490409.0

GPSVEC TP Point ID 2342      DX 25380.300      DY -4074.359
        Class Normal      DZ 8974.579      Code NG
        Obs L1 Fixed      H.pr 0.032      V.pr 0.067

GPSQC1 NM Min SVs 6      PDOP max 2.5
        Relative DOPs Yes      HDOP max 1.1
        Total GPS pos 6      VDOP max 2.3
        Monitor status Not monitored      RMS 18.4
        Horz SD      Vert SD
        Start wk 1605 sec 490423.0      End wk 1605 sec 490428.0

GPSVEC CN Point ID 2343      DX 25441.582      DY -4087.628
        Class Normal      DZ 8986.635      Code BC
        Obs L1 Fixed      H.pr 0.022      V.pr 0.046

GPSQC1 NM Min SVs 6      PDOP max 3.6
        Relative DOPs Yes      HDOP max 1.5
        Total GPS pos 92      VDOP max 3.2
        Monitor status Not monitored      RMS 12.8
        Horz SD      Vert SD
        Start wk 1605 sec 490570.0      End wk 1605 sec 490672.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0146066351
        VCV xx 0.0000062908      VCV xy 0.0000070475
        VCV xz -0.0000011137      VCV yy 0.0000151352
        VCV yz -0.0000028766      VCV zz 0.0000050761

FEATURE FC Name BC
ATTRIB FC Name MATERIAL TYPE      Value BRASS
ATTRIB FC Name CAP SIZE      Value 2"
ATTRIB FC Name AGENCY      Value OTHER
ATTRIB FC Name STAMPING      Value US DEPT OF AGRICULTURE 105+00
ATTRIB FC Name ORIENTATION      Value RAISED
ATTRIB FC Name DEPTH/HEIGHT IN FEET      Value 0.300
ATTRIB FC Name LOCATION      Value 200' +/- NORTH OF LEVEE AT CURVE
ATTRIB FC Name NOTE      Value

GPSVEC TP Point ID 2344      DX 25512.842      DY -4506.936
        Class Normal      DZ 8422.546      Code NG
        Obs L1 Fixed      H.pr 0.053      V.pr 0.069

GPSQC1 NM Min SVs 7      PDOP max 3.6
        Relative DOPs Yes      HDOP max 2.2
        Total GPS pos 8      VDOP max 2.9
        Monitor status Not monitored      RMS 23.4
        Horz SD      Vert SD
        Start wk 1605 sec 490893.0      End wk 1605 sec 490900.0

GPSVEC TP Point ID 2345      DX 25570.148      DY -4528.202
        Class Normal      DZ 8421.624      Code TOE
        Obs L1 Fixed      H.pr 0.037      V.pr 0.049

GPSQC1 NM Min SVs 7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.5
        Total GPS pos 5      VDOP max 1.9
        Monitor status Not monitored      RMS 34.4
        Horz SD      Vert SD
        Start wk 1605 sec 490929.0      End wk 1605 sec 490933.0

GPSVEC TP Point ID 2346      DX 25626.257      DY -4541.532
        Class Normal      DZ 8420.348      Code TCE
        Obs L1 Fixed      H.pr 0.036      V.pr 0.047

GPSQC1 NM Min SVs 7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.5
        Total GPS pos 6      VDOP max 1.9
        Monitor status Not monitored      RMS 30.0
        Horz SD      Vert SD
        Start wk 1605 sec 490999.0      End wk 1605 sec 491004.0
    
```

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 2347 Class Normal Obs L1 Fixed | DX 25688.077 DZ 8419.270 H.pr 0.048 | DY -4566.834 Code NG V.pr 0.064 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 491032.0 | PDOP max 2.4 HDOP max 1.5 VDOP max 1.9 RMS 40.4 Vert SD End wk 1605 sec 491036.0 | |
| GPSVEC | TP | Point ID 2348 Class Normal Obs L1 Fixed | DX 25756.878 DZ 8419.003 H.pr 0.047 | DY -4594.149 Code NG V.pr 0.063 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 491064.0 | PDOP max 2.4 HDOP max 1.5 VDOP max 1.9 RMS 31.4 Vert SD End wk 1605 sec 491069.0 | |
| GPSVEC | TP | Point ID 2349 Class Normal Obs L1 Fixed | DX 25806.772 DZ 8420.391 H.pr 0.040 | DY -4614.020 Code TOE V.pr 0.053 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 491092.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 13.7 Vert SD End wk 1605 sec 491095.0 | |
| GPSVEC | TP | Point ID 2350 Class Normal Obs L1 Fixed | DX 25833.510 DZ 8427.443 H.pr 0.055 | DY -4631.402 Code TOP V.pr 0.072 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 491119.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 35.4 Vert SD End wk 1605 sec 491124.0 | |
| GPSVEC | TP | Point ID 2351 Class Normal Obs L1 Fixed | DX 25846.431 DZ 8428.562 H.pr 0.048 | DY -4636.007 Code TOP V.pr 0.064 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 491133.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 21.8 Vert SD End wk 1605 sec 491136.0 | |
| GPSVEC | TP | Point ID 2352 Class Normal Obs L1 Fixed | DX 25852.247 DZ 8428.715 H.pr 0.033 | DY -4637.019 Code TOE V.pr 0.044 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 491144.0 | PDOP max 2.4 HDOP max 1.5 VDOP max 1.9 RMS 22.0 Vert SD End wk 1605 sec 491149.0 | |
| GPSVEC | TP | Point ID 2353 Class Normal Obs L1 Fixed | DX 25908.102 DZ 8426.696 H.pr 0.041 | DY -4660.068 Code NG V.pr 0.055 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 491177.0 | PDOP max 2.4 HDOP max 1.5 VDOP max 1.9 RMS 22.5 Vert SD End wk 1605 sec 491181.0 | |
| GPSVEC | TP | Point ID 2354 Class Normal Obs L1 Fixed | DX 25543.787 DZ 8679.155 H.pr 0.029 | DY -4341.675 Code NG V.pr 0.039 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 491760.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 11.3 Vert SD End wk 1605 sec 491763.0 | |
| GPSVEC | TP | Point ID 2355 Class Normal Obs L1 Fixed | DX 25597.889 DZ 8726.786 H.pr 0.028 | DY -4330.630 Code TOE V.pr 0.038 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 491785.0 | PDOP max 2.4 HDOP max 1.5 VDOP max 2.0 RMS 18.6 Vert SD End wk 1605 sec 491789.0 | |

```

GPSVEC TP Point ID 2356      DX 25642.529      DY -4321.201
        Class Normal      DZ 8765.026      Code TOE
        Obs L1 Fixed      H.pr 0.029      V.pr 0.039

GPSQC1 NM Min SVs          7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.4
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 11.2
        Horz SD      Vert SD
        Start wk 1605 sec 491827.0      End wk 1605 sec 491831.0

GPSVEC TP Point ID 2357      DX 25650.560      DY -4318.199
        Class Normal      DZ 8772.318      Code TOP
        Obs L1 Fixed      H.pr 0.032      V.pr 0.043

GPSQC1 NM Min SVs          7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.4
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 27.4
        Horz SD      Vert SD
        Start wk 1605 sec 491840.0      End wk 1605 sec 491844.0

GPSVEC TP Point ID 2358      DX 25662.239      DY -4312.872
        Class Normal      DZ 8779.018      Code TOE
        Obs L1 Fixed      H.pr 0.065      V.pr 0.088

GPSQC1 NM Min SVs          7      PDOP max 1.4
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 9      VDOP max 1.1
        Monitor status Not monitored      RMS 14.1
        Horz SD      Vert SD
        Start wk 1605 sec 491856.0      End wk 1605 sec 491864.0

GPSVEC TP Point ID 2359      DX 25700.876      DY -4303.037
        Class Normal      DZ 8813.066      Code NG
        Obs L1 Fixed      H.pr 0.037      V.pr 0.050

GPSQC1 NM Min SVs          7      PDOP max 1.7
        Relative DOPs Yes      HDOP max 1.0
        Total GPS pos 4      VDOP max 1.4
        Monitor status Not monitored      RMS 12.2
        Horz SD      Vert SD
        Start wk 1605 sec 491883.0      End wk 1605 sec 491886.0

GPSVEC TP Point ID 2360      DX 25741.136      DY -4295.966
        Class Normal      DZ 8845.918      Code TOE
        Obs L1 Fixed      H.pr 0.039      V.pr 0.053

GPSQC1 NM Min SVs          7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.4
        Total GPS pos 4      VDOP max 2.0
        Monitor status Not monitored      RMS 9.9
        Horz SD      Vert SD
        Start wk 1605 sec 491903.0      End wk 1605 sec 491906.0

GPSVEC TP Point ID 2361      DX 25760.345      DY -4299.586
        Class Normal      DZ 8867.944      Code TOP
        Obs L1 Fixed      H.pr 0.038      V.pr 0.051

GPSQC1 NM Min SVs          7      PDOP max 1.4
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3      VDOP max 1.1
        Monitor status Not monitored      RMS 7.4
        Horz SD      Vert SD
        Start wk 1605 sec 491927.0      End wk 1605 sec 491930.0

GPSVEC TP Point ID 2362      DX 25800.794      DY -4290.730
        Class Normal      DZ 8903.931      Code NG
        Obs L1 Fixed      H.pr 0.031      V.pr 0.042

GPSQC1 NM Min SVs          7      PDOP max 2.4
        Relative DOPs Yes      HDOP max 1.4
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 23.0
        Horz SD      Vert SD
        Start wk 1605 sec 491949.0      End wk 1605 sec 491953.0

NOTE TS Time Date 10/15/2010 Time 09:47:23

GPSVEC TP Point ID 2363      DX 24928.222      DY -4048.787
        Class Normal      DZ 8756.181      Code TOE
        Obs L1 Fixed      H.pr 0.039      V.pr 0.054

GPSQC1 NM Min SVs          7      PDOP max 1.7
        Relative DOPs Yes      HDOP max 1.0
        Total GPS pos 4      VDOP max 1.4
        Monitor status Not monitored      RMS 17.9
        Horz SD      Vert SD
        Start wk 1605 sec 492441.0      End wk 1605 sec 492444.0

GPSVEC TP Point ID 2364      DX 24938.721      DY -4053.324
        Class Normal      DZ 8755.664      Code TOE
        Obs L1 Fixed      H.pr 0.032      V.pr 0.045
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 5 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 18.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492453.0 | End wk 1605 sec | 492457.0 |
| GPSVEC | TP | Point ID 2365 | | DX 24951.390 | DY -4057.954 |
| | | Class Normal | | DZ 8756.240 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.042 | V.pr 0.058 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 10.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492464.0 | End wk 1605 sec | 492467.0 |
| GPSVEC | TP | Point ID 2366 | | DX 24944.669 | DY -4084.438 |
| | | Class Normal | | DZ 8711.152 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.032 | V.pr 0.044 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 17.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492487.0 | End wk 1605 sec | 492491.0 |
| GPSVEC | TP | Point ID 2367 | | DX 24931.950 | DY -4080.918 |
| | | Class Normal | | DZ 8709.302 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.026 | V.pr 0.036 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 11.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492499.0 | End wk 1605 sec | 492502.0 |
| GPSVEC | TP | Point ID 2368 | | DX 24918.266 | DY -4075.920 |
| | | Class Normal | | DZ 8708.137 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.047 | V.pr 0.064 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 6 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 13.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492509.0 | End wk 1605 sec | 492514.0 |
| GPSVEC | TP | Point ID 2369 | | DX 23306.491 | DY -3415.466 |
| | | Class Normal | | DZ 8758.333 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.029 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 14.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492706.0 | End wk 1605 sec | 492710.0 |
| GPSVEC | TP | Point ID 2370 | | DX 23325.183 | DY -3422.827 |
| | | Class Normal | | DZ 8757.661 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.023 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 15.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492719.0 | End wk 1605 sec | 492722.0 |
| GPSVEC | TP | Point ID 2371 | | DX 23345.563 | DY -3430.109 |
| | | Class Normal | | DZ 8760.670 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.020 | V.pr 0.029 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 12.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492731.0 | End wk 1605 sec | 492736.0 |
| GPSVEC | TP | Point ID 2372 | | DX 23338.581 | DY -3460.394 |
| | | Class Normal | | DZ 8715.367 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.043 | V.pr 0.060 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 19.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492757.0 | End wk 1605 sec | 492761.0 |
| GPSVEC | TP | Point ID 2373 | | DX 23321.909 | DY -3451.863 |
| | | Class Normal | | DZ 8714.588 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.038 | V.pr 0.053 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 7 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 8.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492769.0 | End wk 1605 sec | 492775.0 |
| GPSVEC | TP | Point ID 2374 | | DX 23305.444 | DY -3443.124 |
| | | Class Normal | | DZ 8712.543 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.033 | V.pr 0.046 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.3 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 12.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 492785.0 | End wk 1605 sec | 492788.0 |
| GPSVEC | TP | Point ID 2375 | | DX 19963.359 | DY -2075.171 |
| | | Class Normal | | DZ 8790.899 | Code NG |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.039 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 12.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493114.0 | End wk 1605 sec | 493118.0 |
| GPSVEC | TP | Point ID 2376 | | DX 20000.424 | DY -2064.571 |
| | | Class Normal | | DZ 8829.822 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.022 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 11.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493136.0 | End wk 1605 sec | 493141.0 |
| GPSVEC | TP | Point ID 2377 | | DX 20014.108 | DY -2065.304 |
| | | Class Normal | | DZ 8849.949 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.030 | V.pr 0.043 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 17.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493227.0 | End wk 1605 sec | 493230.0 |
| GPSVEC | TP | Point ID 2378 | | DX 20022.763 | DY -2062.497 |
| | | Class Normal | | DZ 8858.852 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.026 | V.pr 0.038 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 3 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 8.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493248.0 | End wk 1605 sec | 493250.0 |
| GPSVEC | TP | Point ID 2379 | | DX 20039.290 | DY -2052.924 |
| | | Class Normal | | DZ 8870.027 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.036 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 15.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493277.0 | End wk 1605 sec | 493280.0 |
| GPSVEC | TP | Point ID 2380 | | DX 20054.241 | DY -2047.871 |
| | | Class Normal | | DZ 8884.577 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.021 | V.pr 0.029 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 12.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493316.0 | End wk 1605 sec | 493320.0 |
| GPSVEC | TP | Point ID 2381 | | DX 20061.146 | DY -2044.342 |
| | | Class Normal | | DZ 8889.721 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.028 | V.pr 0.040 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 11.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 493334.0 | End wk 1605 sec | 493338.0 |
| GPSVEC | TP | Point ID 2382 | | DX 20069.654 | DY -2041.290 |
| | | Class Normal | | DZ 8898.124 | Code TOE |
| | | Obs L1 Fixed | | H.pr 0.025 | V.pr 0.035 |

```

SC V10-70      Copyright © Trimble Navigation Ltd, 1996-2003
              Serial no 85      15-Oct-10 11:13
              Angle Degrees     Dist Feet      Press inch Hg
              Temp Fahrenheit    Coord N-E-Elv H,obs Right

JOB           Job ID PASS MTN DAM2
              Atmos crn No      C and R crn Yes   Refrac cnst 0.20
              Elev Yes          Sea level crn No

NOTE TS      Time Date 10/14/2010 Time 06:01:03

SITE TM      Prj Lat <null>      Nrth Offset 0.000
              Prj Lng <null>      East Offset 0.000
              Prj Hgt 1083.752     Scale 1.0000000000

SHFTGRD TM   File name <no text>

PROJ TM      Transverse Mercator
              Orig Lat 31°00'00.00000°N   Orig Nrth 0.000
              Orig Lng 111°55'00.00000°W   Orig East 700000.000
              Orig Hgt 0.000               Orig Elev 0.000
              Orient 1 0°00'00"           Orient 2 0°00'00"
              Scale 0.9999000000

COORD NM     System Name          US State Plane 1983
              Zone Name           Arizona Central 0202
              Datum Name          NAD 1983 (Conus)
              Coord System Option Chosen from library

LOCELL TM    Local Rad 20925646.325      Flat. 298.2572215381

DATUM TM     Molodensky
              Srce Rad 20925646.325      Srce Flat 298.2572235630
              Rotn X 0°00'00"           Rotn Y 0°00'00"
              Rotn Z 0°00'00"           Trans X 0.000
              Trans Y 0.000             Trans Z 0.000
              Scale 0.000000000

COGO NM      Azmth From North           Dir North-East

HGTADJ TM    Geoid Model
              Orig Nrth 0.000           Slope N 0.000
              Orig East 0.000          Slope E 0.000
              Hgt Const 0.000
              Geoid GEOID03 (Conus)

F FILE FC    File AMEC FIELD CODES_12-23-08.ddfUsed Yes
              ID 07524 Name AMEC

NOTE NM      P:\Tempe\2010\09-115-05010\12_SURVEY\12.03 Data\PASS MTN DAM

GRDPOS KI    Point ID 1C01           Nrth 897277.892      East 802395.209
              Class Del control      Elv 1924.016        Code <no text>
              Obs User Input

NOTE NM      Deleted 11:12:20 AM 10/15/2010

GRDPOS KI    Point ID 1CM1           Nrth 897219.226      East 772235.500
              Class Del control      Elv 1592.257        Code <no text>
              Obs User Input

NOTE NM      Deleted 11:12:24 AM 10/15/2010

GRDPOS KI    Point ID 2123101        Nrth 891901.830      East 799847.151
              Class Del normal       Elv 1745.640        Code <no text>
              Obs User Input

NOTE NM      Deleted 11:12:27 AM 10/15/2010

GRDPOS KI    Point ID 2123001        Nrth 891896.052      East 797210.040
              Class Del normal       Elv 1750.795        Code BC
              Obs User Input

NOTE NM      Deleted 11:12:33 AM 10/15/2010

GRDPOS KI    Point ID 2123821        Nrth 889254.923      East 797217.602
              Class Del normal       Elv 1711.993        Code BC
              Obs User Input

NOTE NM      Deleted 11:12:36 AM 10/15/2010

GRDPOS KI    Point ID 2122921        Nrth 891887.764      East 794568.064
              Class Del normal       Elv 1768.339        Code BC
              Obs User Input

NOTE NM      Deleted 11:12:41 AM 10/15/2010

GRDPOS KI    Point ID 2122821        Nrth 891879.065      East 791925.849
              Class Del normal       Elv 1767.491        Code BC
              Obs User Input

NOTE NM      Deleted 11:12:47 AM 10/15/2010

GRDPOS KI    Point ID 2122721        Nrth 891876.182      East 789283.834
              Class Del normal       Elv 1767.158        Code BC
              Obs User Input

NOTE NM      Deleted 11:12:51 AM 10/15/2010

```

DATA COLLECTION

10/15/2010

JS

PTS. 5000 - 5339

```

GRDPOS KI Point ID 2122621      Nrth 891874.273      East 786642.681
      Class Del normal      Elv 1737.541      Code BC
      Obs User Input

NOTE NM Deleted 11:12:55 AM 10/15/2010

GRDPOS KI Point ID DRINK      Nrth 882559.621      East 786586.229
      Class Del normal      Elv 1577.605      Code <no text>
      Obs User Input

NOTE NM Deleted 11:12:58 AM 10/15/2010

GRDPOS KI Point ID 1BN1      Nrth 881144.141      East 786457.177
      Class Del control      Elv 1552.100      Code <no text>
      Obs User Input

NOTE NM Deleted 11:13:02 AM 10/15/2010

COGO NM Azmth      From North      Dir      North-East

HGTADJ TM Geoid Model
      Orig Nrth 0.000      Slope N 0.000
      Orig East 0.000      Slope E 0.000
      Hgt Const 0.000
      Geoid GEOID03 (Conus)

HGTADJ TM Geoid Model
      Orig Nrth 0.000      Slope N 0.000
      Orig East 0.000      Slope E 0.000
      Hgt Const 0.000
      Geoid GEOID03 (Conus)

PLANE KI Orig Nrth <null>      Orig East <null>
      Trans N <null>      Trans E <null>
      Rotation <null>      Scale <null>

HGTADJ TM Geoid Model
      Orig Nrth 0.000      Slope N 0.000
      Orig East 0.000      Slope E 0.000
      Hgt Const 0.000
      Geoid GEOID03 (Conus)

HGTADJ TM Geoid Model
      Orig Nrth 0.000      Slope N 0.000
      Orig East 0.000      Slope E 0.000
      Hgt Const 0.000
      Geoid GEOID03 (Conus)

HGTADJ TM Geoid Model
      Orig Nrth 0.000      Slope N 0.000
      Orig East 0.000      Slope E 0.000
      Hgt Const 0.000
      Geoid GEOID03 (Conus)

NOTE TS Time Date 10/14/2010 Time 06:53:31

SURVEY KI Elev mask 10      PDOP mask 6.0

SURVEY KI Elev mask 10      PDOP mask 6.0

SURVEY KI Elev mask 10      PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000      Measuremt True

GPSPOS SI Point ID SRPEAST      Lat 33°25'25.17374°N Lng 111°40'44.55636°W
      Class Normal      Hgt 1375.166      Code <no text>
      Obs User Input      H.pr <null>      V.pr <null>

GPSANT KI Antenna ht 0.000      Measuremt True

GPSPOS FD Point ID SRPEAST      Lat 33°25'25.17374°N Lng 111°40'44.55636°W
      Class Normal      Hgt 1375.166      Code <no text>
      Obs User Input      H.pr <null>      V.pr <null>

EQUIP SI Receiver <no text>      Serial no <no text>
      Antenna Zephyr Geodetic 2
      Meas To Antenna Phase Center
      Tape adj 0.000      Serial no <no text>
      H.Offset 0.000      V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279      Measuremt True

GPSREF KI Reference SRPEAST

INIT KI Init event Gained      Week 1605
      Init type On the fly      seconds 395694.0
      Init counter 1      Point ID <no text>
      Survey type Real Time      Plate H.Dist <null>
      Plate V.Dist <null>      Plate azimuth <null>

SURVEY EVENTKISurvey event Survey ended

SURVEY KI Elev mask 10      PDOP mask 6.0

SURVEY KI Elev mask 10      PDOP mask 6.0

```

SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000 Measurement True

GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374"N Lng 111°40'44.55636"W
 Class Normal Hgt 1375.166 Code <no text>
 Obs User Input H.pr <null> V.pr <null>

EQUIP SI Receiver <no text> Serial no <no text>
 Antenna Zephyr Geodetic 2
 Meas To Antenna Phase Center
 Tape adj 0.000 Serial no <no text>
 H.Offset 0.000 V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279 Measurement True

GPSREF KI Reference SRPEAST

INIT KI Init event Gained Week 1605
 Init type On the fly seconds 395978.0
 Init counter 2 Point ID <no text>
 Survey type Real Time Plate H.Dist <null>
 Plate V.Dist <null> Plate azimuth <null>

EQUIP NM Receiver 5800 Serial no 4447140732
 Antenna R8/5800/SPS78x Internal
 Meas To Bottom of antenna mount
 Tape adj 0.000 Serial no <no text>
 H.Offset 0.000 V.Offset 0.213

NOTE NM Receiver firmware version=2.320

GPSANT KI Antenna ht 6.890 Measurement Uncorrected

GPSVEC CN Point ID 21228211 DX 20038.343 DY -2252.491
 Class Normal DZ 8573.354 Code BC
 Obs Ll Fixed H.pr 0.018 V.pr 0.036

GPSQC1 NM Min SVs 9 PDOP max 2.1
 Relative DOPs Yes HDOP max 0.9
 Total GPS pos 61 VDOP max 1.8
 Monitor status Not monitored RMS 13.5
 Horz SD Vert SD
 Start wk 1605 sec 396042.0 End wk 1605 sec 396102.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0155154504
 VCV xx 0.0000028855 VCV xy 0.0000013894
 VCV xz -0.0000023148 VCV yy 0.000004223
 VCV yz -0.0000044589 VCV zz 0.000009656

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value BRASS

ATTRIB FC Name CAP SIZE Value 2 1/4"

ATTRIB FC Name AGENCY Value MCDOT

ATTRIB FC Name STAMPING Value 3-2-10-11 2002

ATTRIB FC Name ORIENTATION Value DIRT HOLE

ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.150

ATTRIB FC Name LOCATION Value

ATTRIB FC Name NOTE Value

NOTE TS Time Date 10/14/2010 Time 08:23:46

GPSVEC TP Point ID 5000 DX 22147.974 DY -2965.362
 Class Normal DZ 8747.047 Code PIPE B -
 Obs Ll Fixed H.pr 0.032 V.pr 0.056

GPSQC1 NM Min SVs 7 PDOP max 1.5
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 6 VDOP max 1.3
 Monitor status Not monitored RMS 26.8
 Horz SD Vert SD
 Start wk 1605 sec 401021.0 End wk 1605 sec 401026.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0080438852
 VCV xx 0.0000145589 VCV xy 0.0000136296
 VCV xz -0.000007116 VCV yy 0.0000204753
 VCV yz -0.0000077794 VCV zz 0.0000080473

FEATURE FC Name PIPE

ATTRIB FC Name TOP/INV Value TOP OF PIPE

ATTRIB FC Name TYPE Value STORM DRAIN

ATTRIB FC Name MATERIAL Value DUCTIL IRON

NOTE NM TOP OF 12' STEEL PIPE

```

INIT   KI   Init event   High RMS           Week           1605
        Init type   On the fly        seconds       401143.0
        Init counter 2                Point ID      <no text>
        Survey type  Real Time        Plate H.Dist  <null>
        Plate V.Dist <null>          Plate azimuth <null>

INIT   KI   Init event   Good RMS           Week           1605
        Init type   On the fly        seconds       401144.0
        Init counter 2                Point ID      <no text>
        Survey type  Real Time        Plate H.Dist  <null>
        Plate V.Dist <null>          Plate azimuth <null>

GPSVEC TP   Point ID 5001      DX  22178.960      DY  -2911.056
        Class Normal      DZ  8843.617      Code PIPE -
        Obs L1 Fixed      H.pr 0.027        V.pr 0.048

GPSQC1 NM   Min SVs      7                PDOP max      1.5
        Relative DOPs Yes      HDOP max      0.8
        Total GPS pos 5        VDOP max      1.3
        Monitor status Not monitored      RMS           24.3
        Horz SD              Vert SD
        Start wk 1605 sec 401186.0      End wk 1605   sec 401190.0

GPSQC2 NM   Ttl satellites 7                Err Scale     0.0063252868
        VCV xx      0.0000037042      VCV xy        0.0000025804
        VCV xz      -0.0000002984      VCV yy        0.00000203727
        VCV yz      -0.0000007477      VCV zz        0.00000069094

FEATURE FC   Name      PIPE
ATTRIB FC   Name      TOP/INV          Value         INVERT OF PIPE
ATTRIB FC   Name      TYPE             Value         STORM DRAIN
ATTRIB FC   Name      MATERIAL         Value         DUCTIL IRON

NOTE   NM   INV OF 12" STEEL PIPE

INIT   KI   Init event   Lost              Week           1605
        Init type   On the fly        seconds       401371.0
        Init counter 2                Point ID      <no text>
        Survey type  Real Time        Plate H.Dist  <null>
        Plate V.Dist <null>          Plate azimuth <null>

INIT   KI   Init event   Gained           Week           1605
        Init type   On the fly        seconds       401384.0
        Init counter 3                Point ID      <no text>
        Survey type  Real Time        Plate H.Dist  <null>
        Plate V.Dist <null>          Plate azimuth <null>

GPSVEC TP   Point ID 5002      DX  22759.791      DY  -3201.383
        Class Normal      DZ  8759.374      Code PIPE NJ -
        Obs L1 Fixed      H.pr 0.023        V.pr 0.040

GPSQC1 NM   Min SVs      7                PDOP max      2.1
        Relative DOPs Yes      HDOP max      1.1
        Total GPS pos 6        VDOP max      1.9
        Monitor status Not monitored      RMS           18.7
        Horz SD              Vert SD
        Start wk 1605 sec 401415.0      End wk 1605   sec 401420.0

GPSQC2 NM   Ttl satellites 7                Err Scale     0.0053989496
        VCV xx      0.0000061417      VCV xy        0.0000030109
        VCV xz      -0.0000010448      VCV yy        0.000013281
        VCV yz      -0.0000034567      VCV zz        0.0000028891

FEATURE FC   Name      PIPE
ATTRIB FC   Name      TOP/INV          Value         TOP OF PIPE
ATTRIB FC   Name      TYPE             Value         STORM DRAIN
ATTRIB FC   Name      MATERIAL         Value         DUCTIL IRON

NOTE   NM   TOP OF 12" STEEL PIPE

GPSVEC TP   Point ID 5003      DX  22700.871      DY  -3109.968
        Class Normal      DZ  8854.399      Code PIPE -
        Obs L1 Fixed      H.pr 0.029        V.pr 0.050

GPSQC1 NM   Min SVs      7                PDOP max      1.5
        Relative DOPs Yes      HDOP max      0.8
        Total GPS pos 3        VDOP max      1.3
        Monitor status Not monitored      RMS           18.5
        Horz SD              Vert SD
        Start wk 1605 sec 401533.0      End wk 1605   sec 401535.0

GPSQC2 NM   Ttl satellites 7                Err Scale     0.0055207452
        VCV xx      0.0000105778      VCV xy        0.0000105546
        VCV xz      -0.0000054108      VCV yy        0.0000162051
        VCV yz      -0.00000687        VCV zz        0.0000078947

FEATURE FC   Name      PIPE
ATTRIB FC   Name      TOP/INV          Value         INVERT OF PIPE
ATTRIB FC   Name      TYPE             Value         STORM DRAIN
ATTRIB FC   Name      MATERIAL         Value         DUCTIL IRON
    
```

NOTE NM INV OF 12" STEEL PIPE

GPSVEC TP Point ID 5004 DX 23271.072 DY -3379.811
Class Normal DZ 8815.116 Code TOP B
Obs L1 Fixed H.pr 0.026 V.pr 0.043

GPSQC1 NM Min SVs 7 PDOP max 1.5
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.3
Monitor status Not monitored RMS 10.9
Horz SD Vert SD
Start wk 1605 sec 401768.0 End wk 1605 sec 401770.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0048125591
VCV xx 0.000007318 VCV xy 0.0000041768
VCV xz -0.0000013979 VCV yy 0.000015693
VCV yz -0.0000039179 VCV zz 0.0000027054

GPSVEC TP Point ID 5005 DX 23280.636 DY -3381.964
Class Normal DZ 8817.097 Code TOP
Obs L1 Fixed H.pr 0.020 V.pr 0.033

GPSQC1 NM Min SVs 7 PDOP max 2.1
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 1.8
Monitor status Not monitored RMS 11.5
Horz SD Vert SD
Start wk 1605 sec 401794.0 End wk 1605 sec 401798.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0042060115
VCV xx 0.0000043004 VCV xy 0.0000026365
VCV xz -0.0000008665 VCV yy 0.0000097469
VCV yz -0.0000024295 VCV zz 0.0000016145

GPSVEC TP Point ID 5006 DX 23302.780 DY -3384.754
Class Normal DZ 8824.858 Code TOP
Obs L1 Fixed H.pr 0.030 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 2.1
Relative DOPs Yes HDOP max 1.1
Total GPS pos 6 VDOP max 1.8
Monitor status Not monitored RMS 15.0
Horz SD Vert SD
Start wk 1605 sec 401819.0 End wk 1605 sec 401824.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0068163569
VCV xx 0.0000093427 VCV xy 0.0000055585
VCV xz -0.0000017625 VCV yy 0.0000213062
VCV yz -0.0000052478 VCV zz 0.000003521

GPSVEC TP Point ID 5007 DX 23316.807 DY -3386.569
Class Normal DZ 8830.274 Code TOP
Obs L1 Fixed H.pr 0.034 V.pr 0.057

GPSQC1 NM Min SVs 7 PDOP max 1.5
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.3
Monitor status Not monitored RMS 27.1
Horz SD Vert SD
Start wk 1605 sec 401861.0 End wk 1605 sec 401864.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0071463501
VCV xx 0.000013496 VCV xy 0.0000077629
VCV xz -0.000002895 VCV yy 0.0000262557
VCV yz -0.0000065655 VCV zz 0.0000050847

GPSVEC TP Point ID 5008 DX 23338.607 DY -3393.546
Class Normal DZ 8832.719 Code TOP
Obs L1 Fixed H.pr 0.030 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 2.1
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 1.8
Monitor status Not monitored RMS 19.2
Horz SD Vert SD
Start wk 1605 sec 401885.0 End wk 1605 sec 401889.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0062413723
VCV xx 0.0000103088 VCV xy 0.0000057302
VCV xz -0.0000018041 VCV yy 0.0000200137
VCV yz -0.000004812 VCV zz 0.0000037643

GPSVEC TP Point ID 5009 DX 23347.849 DY -3393.299
Class Normal DZ 8837.898 Code TOP PC
Obs L1 Fixed H.pr 0.030 V.pr 0.050

GPSQC1 NM Min SVs 7 PDOP max 1.5
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.3
Monitor status Not monitored RMS 26.7
Horz SD Vert SD
Start wk 1605 sec 401911.0 End wk 1605 sec 401914.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0064000939
VCV xx 0.0000103255 VCV xy 0.0000059535
VCV xz -0.0000020679 VCV yy 0.0000215346
VCV yz -0.0000052142 VCV zz 0.0000038617

```

GPSVEC TP Point ID 5010      DX 23353.475      DY -3393.958
        Class Normal      DZ 8840.041      Code TOP
        Obs L1 Fixed      H.pr 0.030      V.pr 0.049

GPSQC1 NM Min SVs          7          PDOP max 1.5
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3      VDOP max 1.3
        Monitor status Not monitored      RMS 20.8
        Horz SD          Vert SD
        Start wk 1605 sec 401933.0      End wk 1605 sec 401936.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0062819896
        VCV xx 0.0000105481      VCV xy 0.0000058807
        VCV xz -0.0000020418      VCV yy 0.000019793
        VCV yz -0.0000047399      VCV zz 0.0000039706

NOTE NM Modified 8:40:00 AM 10/14/2010

NOTE NM Old values TOP PC

GPSVEC TP Point ID 5011      DX 23358.885      DY -3396.557
        Class Normal      DZ 8839.718      Code TOP
        Obs L1 Fixed      H.pr 0.025      V.pr 0.042

GPSQC1 NM Min SVs          7          PDOP max 1.5
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3      VDOP max 1.3
        Monitor status Not monitored      RMS 23.6
        Horz SD          Vert SD
        Start wk 1605 sec 401952.0      End wk 1605 sec 401954.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0047879489
        VCV xx 0.0000072172      VCV xy 0.0000030278
        VCV xz -0.0000011072      VCV yy 0.0000144034
        VCV yz -0.0000032611      VCV zz 0.0000032297

NOTE NM Modified 8:40:09 AM 10/14/2010

NOTE NM Old values TOP PC

GPSVEC TP Point ID 5012      DX 23361.803      DY -3400.852
        Class Normal      DZ 8834.997      Code TOP
        Obs L1 Fixed      H.pr 0.034      V.pr 0.053

GPSQC1 NM Min SVs          8          PDOP max 1.2
        Relative DOPs Yes      HDOP max 0.7
        Total GPS pos 3      VDOP max 1.0
        Monitor status Not monitored      RMS 27.6
        Horz SD          Vert SD
        Start wk 1605 sec 401974.0      End wk 1605 sec 401976.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0078135803
        VCV xx 0.0000122048      VCV xy 0.0000056025
        VCV xz -0.0000020023      VCV yy 0.0000230341
        VCV yz -0.0000050256      VCV zz 0.0000052779

NOTE NM Modified 8:40:21 AM 10/14/2010

NOTE NM Old values TOP PC

GPSVEC TP Point ID 5013      DX 23363.142      DY -3405.779
        Class Normal      DZ 8828.772      Code TOP
        Obs L1 Fixed      H.pr 0.035      V.pr 0.055

GPSQC1 NM Min SVs          7          PDOP max 1.5
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3      VDOP max 1.2
        Monitor status Not monitored      RMS 18.8
        Horz SD          Vert SD
        Start wk 1605 sec 402057.0      End wk 1605 sec 402059.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0059533794
        VCV xx 0.0000114184      VCV xy 0.000004562
        VCV xz -0.0000016924      VCV yy 0.0000224792
        VCV yz -0.0000049196      VCV zz 0.0000051157

GPSVEC TP Point ID 5014      DX 23366.923      DY 3411.591
        Class Normal      DZ 8822.341      Code TOP
        Obs L1 Fixed      H.pr 0.021      V.pr 0.035

GPSQC1 NM Min SVs          7          PDOP max 2.1
        Relative DOPs Yes      HDOP max 1.1
        Total GPS pos 4      VDOP max 1.8
        Monitor status Not monitored      RMS 13.1
        Horz SD          Vert SD
        Start wk 1605 sec 402075.0      End wk 1605 sec 402079.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0044841347
        VCV xx 0.0000049856      VCV xy 0.0000019585
        VCV xz -0.0000007426      VCV yy 0.0000098348
        VCV yz -0.0000021454      VCV zz 0.0000023008

GPSVEC TP Point ID 5015      DX 23372.090      DY -3416.679
        Class Normal      DZ 8817.419      Code TOP
        Obs L1 Fixed      H.pr 0.020      V.pr 0.031
    
```

```

GPSQC1 NM Min SVs      8          PDOP max  1.1
          Relative DOPs Yes        HDOP max  0.6
          Total GPS pos  3         VDOP max  0.9
          Monitor status Not monitored RMS      13.1
          Horz SD          Vert SD
          Start wk 1605 sec 402096.0 End wk 1605  sec 402098.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0045598247
          VCV xx  0.0000040303      VCV xy   0.0000016271
          VCV xz  -0.0000006041     VCV yy   0.000007899
          VCV yz  -0.000001714     VCV zz   0.0000018186

GPSVEC TP Point ID 5016          DX  23380.672      DY  -3421.367
          Class Normal          DZ  8813.501      Code TOP PT
          Obs L1 Fixed          H.pr 0.030      V.pr 0.045

GPSQC1 NM Min SVs      8          PDOP max  1.3
          Relative DOPs Yes        HDOP max  0.7
          Total GPS pos  4         VDOP max  1.1
          Monitor status Not monitored RMS      14.1
          Horz SD          Vert SD
          Start wk 1605 sec 402119.0 End wk 1605  sec 402122.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0067742825
          VCV xx  0.0000060974      VCV xy  -0.0000004523
          VCV xz  0.0000002424     VCV yy   0.0000196268
          VCV yz  -0.0000034473     VCV zz   0.0000045907

GPSVEC TP Point ID 5017          DX  23417.705      DY  -3432.683
          Class Normal          DZ  8810.419      Code TOP
          Obs L1 Fixed          H.pr 0.030      V.pr 0.047

GPSQC1 NM Min SVs      7          PDOP max  2.1
          Relative DOPs Yes        HDOP max  1.1
          Total GPS pos  5         VDOP max  1.7
          Monitor status Not monitored RMS      11.4
          Horz SD          Vert SD
          Start wk 1605 sec 402146.0 End wk 1605  sec 402150.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.005822923
          VCV xx  0.0000077285      VCV xy   0.0000036264
          VCV xz  -0.0000012661     VCV yy   0.0000175041
          VCV yz  -0.0000039277     VCV zz   0.0000029911

GPSVEC TP Point ID 5018          DX  23444.819      DY  -3432.151
          Class Normal          DZ  8819.310      Code TOP
          Obs L1 Fixed          H.pr 0.026      V.pr 0.040

GPSQC1 NM Min SVs      8          PDOP max  1.3
          Relative DOPs Yes        HDOP max  0.7
          Total GPS pos  5         VDOP max  1.1
          Monitor status Not monitored RMS      21.9
          Horz SD          Vert SD
          Start wk 1605 sec 402192.0 End wk 1605  sec 402196.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0065292059
          VCV xx  0.0000054484      VCV xy   0.0000009189
          VCV xz  -0.0000001355     VCV yy   0.0000149436
          VCV yz  -0.0000027608     VCV zz   0.0000029977

GPSVEC TP Point ID 5019          DX  23470.854      DY  -3440.154
          Class Normal          DZ  8821.129      Code TOP
          Obs L1 Fixed          H.pr 0.040      V.pr 0.060

GPSQC1 NM Min SVs      8          PDOP max  1.3
          Relative DOPs Yes        HDOP max  0.7
          Total GPS pos  6         VDOP max  1.1
          Monitor status Not monitored RMS      34.8
          Horz SD          Vert SD
          Start wk 1605 sec 402227.0 End wk 1605  sec 402232.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0106613049
          VCV xx  0.0000155924      VCV xy   0.0000074069
          VCV xz  -0.0000027769     VCV yy   0.0000305963
          VCV yz  -0.0000069509     VCV zz   0.0000071668

GPSVEC TP Point ID 5020          DX  23503.897      DY  -3454.132
          Class Normal          DZ  8819.576      Code TOP
          Obs L1 Fixed          H.pr 0.033      V.pr 0.050

GPSQC1 NM Min SVs      7          PDOP max  1.4
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  3         VDOP max  1.2
          Monitor status Not monitored RMS      10.9
          Horz SD          Vert SD
          Start wk 1605 sec 402257.0 End wk 1605  sec 402259.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0056994855
          VCV xx  0.0000111324      VCV xy   0.0000070003
          VCV xz  -0.0000021795     VCV yy   0.0000174344
          VCV yz  -0.0000039929     VCV zz   0.0000039369

GPSVEC TP Point ID 5021          DX  23531.130      DY  -3459.814
          Class Normal          DZ  8824.840      Code TOP
          Obs L1 Fixed          H.pr 0.031      V.pr 0.049

```

```

GPSQC1 NM Min SVs      7          PDOP max  2.0
          Relative DOPs Yes        HDOP max  1.1
          Total GPS pos  4          VDOP max  1.7
          Monitor status Not monitored RMS       16.3
          Horz SD                    Vert SD
          Start wk 1605 sec 402381.0 End wk 1605  sec 402284.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0053928453
          VCV xx  0.0000100021      VCV xy  0.0000053728
          VCV xz  -0.0000015506     VCV yy  0.0000166404
          VCV yz  -0.0000035319     VCV zz  0.0000041835

GPSVEC TP Point ID 5022          DX  23559.945      DY  -3464.373
          Class Normal          DZ  8830.524      Code TOP
          Obs L1 Fixed          H.pr 0.029      V.pr 0.045

GPSQC1 NM Min SVs      7          PDOP max  1.4
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  5          VDOP max  1.2
          Monitor status Not monitored RMS       26.7
          Horz SD                    Vert SD
          Start wk 1605 sec 402306.0 End wk 1605  sec 402310.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0065859975
          VCV xx  0.0000087043      VCV xy  0.0000031419
          VCV xz  -0.0000013625     VCV yy  0.0000159514
          VCV yz  -0.0000033821     VCV zz  0.0000049935

GPSVEC TP Point ID 5023          DX  23583.663      DY  -3465.302
          Class Normal          DZ  8837.496      Code TOP PC
          Obs L1 Fixed          H.pr 0.026      V.pr 0.039

GPSQC1 NM Min SVs      8          PDOP max  1.4
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  3          VDOP max  1.2
          Monitor status Not monitored RMS       23.5
          Horz SD                    Vert SD
          Start wk 1605 sec 402336.0 End wk 1605  sec 402339.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0058847591
          VCV xx  0.000006023      VCV xy  0.0000016296
          VCV xz  -0.0000000576     VCV yy  0.0000127718
          VCV yz  -0.0000020176     VCV zz  0.0000038173

GPSVEC TP Point ID 5024          DX  23597.445      DY  -3463.577
          Class Normal          DZ  8842.965      Code TOP
          Obs L1 Fixed          H.pr 0.020      V.pr 0.032

GPSQC1 NM Min SVs      7          PDOP max  1.4
          Relative DOPs Yes        HDOP max  0.8
          Total GPS pos  3          VDOP max  1.2
          Monitor status Not monitored RMS       17.2
          Horz SD                    Vert SD
          Start wk 1605 sec 402373.0 End wk 1605  sec 402375.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0038014154
          VCV xx  0.0000043664      VCV xy  0.0000017169
          VCV xz  -0.0000008016     VCV yy  0.0000083299
          VCV yz  -0.0000017393     VCV zz  0.0000019528

GPSVEC TP Point ID 5025          DX  23607.254      DY  -3459.090
          Class Normal          DZ  8849.459      Code TOP TOE B
          Obs L1 Fixed          H.pr 0.026      V.pr 0.038

GPSQC1 NM Min SVs      8          PDOP max  1.3
          Relative DOPs Yes        HDOP max  0.7
          Total GPS pos  4          VDOP max  1.1
          Monitor status Not monitored RMS       26.6
          Horz SD                    Vert SD
          Start wk 1605 sec 402403.0 End wk 1605  sec 402406.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0057745893
          VCV xx  0.0000054203      VCV xy  0.0000003022
          VCV xz  -0.0000000816     VCV yy  0.0000123365
          VCV yz  -0.0000018933     VCV zz  0.000003916

GPSVEC TP Point ID 5026          DX  23567.167      DY  -3442.729
          Class Normal          DZ  8850.295      Code TOE
          Obs L1 Fixed          H.pr 0.028      V.pr 0.042

GPSQC1 NM Min SVs      8          PDOP max  1.3
          Relative DOPs Yes        HDOP max  0.7
          Total GPS pos  3          VDOP max  1.1
          Monitor status Not monitored RMS       18.3
          Horz SD                    Vert SD
          Start wk 1605 sec 402433.0 End wk 1605  sec 402435.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0057077724
          VCV xx  0.0000053465      VCV xy  -0.0000017058
          VCV xz  0.0000001432      VCV yy  0.0000178904
          VCV yz  -0.0000027464     VCV zz  0.0000031731

GPSVEC TP Point ID 5027          DX  23505.946      DY  -3449.126
          Class Normal          DZ  8825.556      Code RIPRAP B -
          Obs L1 Fixed          H.pr 0.035      V.pr 0.055
    
```

```

GPSQC1 NM Min SVs 6 PDOP max 1.7
Relative DOPs Yes HDOP max 0.9
Total GPS pos 5 VDOP max 1.4
Monitor status Not monitored RMS 18.2
Horz SD Vert SD
Start wk 1605 sec 402489.0 End wk 1605 sec 402493.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0065430366
VCV xx 0.0000094467 VCV xy 0.0000032589
VCV xz -0.0000026297 VCV yy 0.0000167577
VCV yz -0.0000042661 VCV zz 0.0000100252

NOTE NM GROUDED RIVER ROCK

GPSVEC TP Point ID 5028 DX 23516.860 DY -3423.521
Class Normal DZ 8849.050 Code RIPRAP TOE
Obs L1 Fixed H.pr 0.026 V.pr 0.038

GPSQC1 NM Min SVs 8 PDOP max 1.3
Relative DOPs Yes HDOP max 0.7
Total GPS pos 5 VDOP max 1.0
Monitor status Not monitored RMS 20.6
Horz SD Vert SD
Start wk 1605 sec 402566.0 End wk 1605 sec 402570.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0063825124
VCV xx 0.0000055492 VCV xy 0.0000005285
VCV xz -0.0000004195 VCV yy 0.00000124823
VCV yz -0.0000020907 VCV zz 0.0000037443

GPSVEC TP Point ID 5029 DX 23471.594 DY -3406.250
Class Normal DZ 8848.005 Code TOE
Obs L1 Fixed H.pr 0.037 V.pr 0.054

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 1.0
Total GPS pos 5 VDOP max 1.5
Monitor status Not monitored RMS 44.1
Horz SD Vert SD
Start wk 1605 sec 402608.0 End wk 1605 sec 402612.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0083632087
VCV xx 0.0000112271 VCV xy 0.0000015714
VCV xz -0.0000005635 VCV yy 0.0000275838
VCV yz -0.0000042609 VCV zz 0.0000058848

GPSVEC TP Point ID 5030 DX 23426.829 DY -3388.473
Class Normal DZ 8848.087 Code TOE
Obs L1 Fixed H.pr 0.044 V.pr 0.064

GPSQC1 NM Min SVs 8 PDOP max 2.4
Relative DOPs Yes HDOP max 1.4
Total GPS pos 5 VDOP max 2.0
Monitor status Not monitored RMS 34.4
Horz SD Vert SD
Start wk 1605 sec 402641.0 End wk 1605 sec 402645.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0074452786
VCV xx 0.0000079503 VCV xy -0.0000069189
VCV xz 0.0000009478 VCV yy 0.0000350632
VCV yz -0.0000054359 VCV zz 0.0000039775

GPSVEC TP Point ID 5031 DX 23402.038 DY -3382.431
Class Normal DZ 8845.318 Code TOE
Obs L1 Fixed H.pr 0.027 V.pr 0.039

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 1.0
Total GPS pos 5 VDOP max 1.5
Monitor status Not monitored RMS 30.1
Horz SD Vert SD
Start wk 1605 sec 402666.0 End wk 1605 sec 402670.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0060751941
VCV xx 0.0000059654 VCV xy 0.0000002212
VCV xz -0.0000001475 VCV yy 0.0000136311
VCV yz -0.0000019195 VCV zz 0.0000038612

GPSVEC TP Point ID 5032 DX 23402.743 DY -3375.255
Class Normal DZ 8853.705 Code TOE
Obs L1 Fixed H.pr 0.033 V.pr 0.047

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 1.0
Total GPS pos 5 VDOP max 1.5
Monitor status Not monitored RMS 31.3
Horz SD Vert SD
Start wk 1605 sec 402684.0 End wk 1605 sec 402688.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0072936667
VCV xx 0.0000088604 VCV xy 0.0000020438
VCV xz -0.0000005253 VCV yy 0.0000185865
VCV yz -0.0000027814 VCV zz 0.0000063054

GPSVEC TP Point ID 5033 DX 23405.448 DY -3366.853
Class Normal DZ 8866.579 Code TOE
Obs L1 Fixed H.pr 0.025 V.pr 0.036

```

```

GPSQC1 NM Min SVs 8 PDOP max 1.4
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.2
Monitor status Not monitored RMS 15.5
Horz SD Vert SD
Start wk 1605 sec 402706.0 End wk 1605 sec 402706.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0044690711
VCV xx 0.0000057433 VCV xy 0.0000029158
VCV xz -0.0000011855 VCV yy 0.0000094827
VCV yz -0.0000019845 VCV zz 0.0000026709

GPSVEC TP Point ID 5034 DX 23409.373 DY -3361.572
Class Normal DZ 8878.729 Code TOE
Obs L1 Fixed H.pr 0.024 V.pr 0.034

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 1.0
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 13.7
Horz SD Vert SD
Start wk 1605 sec 402723.0 End wk 1605 sec 402726.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0047725928
VCV xx 0.0000047454 VCV xy 0.0000015123
VCV xz -0.0000001483 VCV yy 0.0000107825
VCV yz -0.0000013458 VCV zz 0.0000024683

GPSVEC TP Point ID 5035 DX 23429.611 DY -3370.963
Class Normal DZ 8874.229 Code TOE
Obs L1 Fixed H.pr 0.027 V.pr 0.039

GPSQC1 NM Min SVs 7 PDOP max 1.4
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.1
Monitor status Not monitored RMS 10.5
Horz SD Vert SD
Start wk 1605 sec 402743.0 End wk 1605 sec 402746.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0052465075
VCV xx 0.0000069565 VCV xy 0.0000035006
VCV xz -0.0000011072 VCV yy 0.0000111792
VCV yz -0.0000020091 VCV zz 0.0000026119

GPSVEC TP Point ID 5036 DX 23473.815 DY -3388.316
Class Normal DZ 8873.731 Code TOE
Obs L1 Fixed H.pr 0.034 V.pr 0.050

GPSQC1 NM Min SVs 7 PDOP max 1.4
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.1
Monitor status Not monitored RMS 28.9
Horz SD Vert SD
Start wk 1605 sec 402772.0 End wk 1605 sec 402774.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0062925741
VCV xx 0.0000116381 VCV xy 0.0000056838
VCV xz -0.0000020939 VCV yy 0.0000212107
VCV yz -0.000003971 VCV zz 0.0000044755

GPSVEC TP Point ID 5037 DX 23520.973 DY -3406.824
Class Normal DZ 8874.685 Code RIPRAP TOE
Obs L1 Fixed H.pr 0.021 V.pr 0.031

GPSQC1 NM Min SVs 7 PDOP max 1.9
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 1.6
Monitor status Not monitored RMS 21.5
Horz SD Vert SD
Start wk 1605 sec 402813.0 End wk 1605 sec 402818.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0049429191
VCV xx 0.0000048907 VCV xy 0.0000025703
VCV xz -0.0000007142 VCV yy 0.0000077154
VCV yz -0.0000013308 VCV zz 0.0000019556

NOTE TS Time Date 10/14/2010 Time 08:54:12

GPSVEC TP Point ID 5038 DX 23572.570 DY -3428.689
Class Normal DZ 8872.306 Code TOE
Obs L1 Fixed H.pr 0.047 V.pr 0.065

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 1.0
Total GPS pos 6 VDOP max 1.4
Monitor status Not monitored RMS 45.5
Horz SD Vert SD
Start wk 1605 sec 402848.0 End wk 1605 sec 402853.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.011316414
VCV xx 0.0000173955 VCV xy 0.0000023631
VCV xz -0.0000017869 VCV yy 0.0000369787
VCV yz -0.0000049007 VCV zz 0.0000121988

GPSVEC TP Point ID 5039 DX 23610.300 DY -3444.967
Class Normal DZ 8870.821 Code TOE TOP NJ
Obs L1 Fixed H.pr 0.030 V.pr 0.042

```

```

GPSQC1 NM Min SVs 8 PDOP max 1.3
          Relative DOPs Yes HDOP max 0.7
          Total GPS pos 4 VDOP max 1.1
          Monitor status Not monitored RMS 25.5
          Horz SD Vert SD
          Start wk 1605 sec 402887.0 End wk 1605 sec 402890.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0066319206
          VCV xx 0.0000090023 VCV xy 0.0000037066
          VCV xz -0.0000018122 VCV yy 0.0000143314
          VCV yz -0.0000025942 VCV zz 0.0000046089

GPSVEC TP Point ID 5040 DX 23600.019 DY -3435.769
          Class Normal DZ 8884.206 Code TOP
          Obs L1 Fixed H.pr 0.042 V.pr 0.059

GPSQC1 NM Min SVs 8 PDOP max 1.2
          Relative DOPs Yes HDOP max 0.7
          Total GPS pos 3 VDOP max 1.0
          Monitor status Not monitored RMS 33.4
          Horz SD Vert SD
          Start wk 1605 sec 402914.0 End wk 1605 sec 402916.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0083472803
          VCV xx 0.0000094235 VCV xy -0.0000092819
          VCV xz 0.0000007941 VCV yy 0.0000391881
          VCV yz -0.0000044511 VCV zz 0.0000053398

GPSVEC TP Point ID 5041 DX 23572.890 DY -3420.194
          Class Normal DZ 8901.372 Code TOP
          Obs L1 Fixed H.pr 0.047 V.pr 0.065

GPSQC1 NM Min SVs 8 PDOP max 1.8
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 47.0
          Horz SD Vert SD
          Start wk 1605 sec 402938.0 End wk 1605 sec 402941.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0092666717
          VCV xx 0.0000177351 VCV xy 0.0000037233
          VCV xz -0.0000009457 VCV yy 0.0000358778
          VCV yz -0.0000048559 VCV zz 0.0000126909

GPSVEC TP Point ID 5042 DX 23549.356 DY -3407.673
          Class Normal DZ 8910.851 Code TOP
          Obs L1 Fixed H.pr 0.044 V.pr 0.061

GPSQC1 NM Min SVs 8 PDOP max 1.2
          Relative DOPs Yes HDOP max 0.7
          Total GPS pos 3 VDOP max 1.0
          Monitor status Not monitored RMS 38.6
          Horz SD Vert SD
          Start wk 1605 sec 402963.0 End wk 1605 sec 402965.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0087705133
          VCV xx 0.0000161007 VCV xy 0.0000033838
          VCV xz -0.0000013302 VCV yy 0.0000327409
          VCV yz -0.0000044085 VCV zz 0.0000103902

GPSVEC TP Point ID 5043 DX 23526.279 DY -3396.607
          Class Normal DZ 8915.999 Code TOP PT
          Obs L1 Fixed H.pr 0.040 V.pr 0.055

GPSQC1 NM Min SVs 8 PDOP max 1.8
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 36.8
          Horz SD Vert SD
          Start wk 1605 sec 402993.0 End wk 1605 sec 402996.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0079363631
          VCV xx 0.0000136076 VCV xy 0.0000025626
          VCV xz -0.0000009034 VCV yy 0.0000273373
          VCV yz -0.0000032333 VCV zz 0.0000073832

GPSVEC TP Point ID 5044 DX 23526.446 DY -3399.287
          Class Normal DZ 8907.729 Code RIPRAP
          Obs L1 Fixed H.pr 0.029 V.pr 0.040

GPSQC1 NM Min SVs 8 PDOP max 1.7
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 6 VDOP max 1.4
          Monitor status Not monitored RMS 30.8
          Horz SD Vert SD
          Start wk 1605 sec 403028.0 End wk 1605 sec 403033.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0070318906
          VCV xx 0.000006897 VCV xy 0.0000011712
          VCV xz -0.0000004928 VCV yy 0.0000137321
          VCV yz -0.0000017977 VCV zz 0.0000045583

GPSVEC TP Point ID 5045 DX 23478.283 DY -3379.525
          Class Normal DZ 8908.641 Code RIPRAP
          Obs L1 Fixed H.pr 0.025 V.pr 0.034
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|---------------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 5 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 54.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403063.0 | End wk 1605 sec | 403067.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0055613965 |
| | | VCV xx | 0.0000058866 | VCV xy | 0.0000018721 |
| | | VCV xz | -0.0000006601 | VCV yy | 0.000010125 |
| | | VCV yz | -0.0000014566 | VCV zz | 0.000002817 |
| GPSVEC | TP | Point ID 5046 | DX 23479.593 | DY | -3376.132 |
| | | Class Normal | DZ 8919.131 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr 0.031 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.3 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 22.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403084.0 | End wk 1605 sec | 403087.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0046283067 |
| | | VCV xx | 0.0000048707 | VCV xy | 0.0000014536 |
| | | VCV xz | -0.0000006244 | VCV yy | 0.0000079609 |
| | | VCV yz | -0.0000011771 | VCV zz | 0.0000023982 |
| GPSVEC | TP | Point ID 5047 | DX 23437.226 | DY | -3359.406 |
| | | Class Normal | DZ 8921.021 | Code TOP | |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr 0.038 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.2 |
| | | Relative DOPs | Yes | HDOP max | 0.7 |
| | | Total GPS pos | 3 | VDOP max | 1.0 |
| | | Monitor status | Not monitored | RMS | 10.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403114.0 | End wk 1605 sec | 403116.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0055331304 |
| | | VCV xx | 0.000006004 | VCV xy | -0.0000007342 |
| | | VCV xz | -0.0000000203 | VCV yy | 0.0000127621 |
| | | VCV yz | -0.0000012532 | VCV zz | 0.000004393 |
| GPSVEC | TP | Point ID 5048 | DX 23435.991 | DY | -3362.961 |
| | | Class Normal | DZ 8907.890 | Code RIPRAP | |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr 0.032 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 11.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403154.0 | End wk 1605 sec | 403158.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0048968759 |
| | | VCV xx | 0.0000033433 | VCV xy | -0.0000004504 |
| | | VCV xz | -0.0000002554 | VCV yy | 0.0000070375 |
| | | VCV yz | -0.0000009598 | VCV zz | 0.0000054425 |
| GPSVEC | TP | Point ID 5049 | DX 23414.734 | DY | -3355.718 |
| | | Class Normal | DZ 8905.121 | Code RIPRAP | |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr 0.041 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 5 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 24.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403181.0 | End wk 1605 sec | 403185.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0066776788 |
| | | VCV xx | 0.0000074947 | VCV xy | -0.0000000409 |
| | | VCV xz | -0.0000000203 | VCV yy | 0.0000141057 |
| | | VCV yz | -0.0000015034 | VCV zz | 0.0000051596 |
| GPSVEC | TP | Point ID 5050 | DX 23397.579 | DY | -3357.172 |
| | | Class Normal | DZ 8896.991 | Code RIPRAP | |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr 0.040 | |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.2 |
| | | Relative DOPs | Yes | HDOP max | 0.7 |
| | | Total GPS pos | 5 | VDOP max | 1.0 |
| | | Monitor status | Not monitored | RMS | 24.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 403210.0 | End wk 1605 sec | 403214.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0072148344 |
| | | VCV xx | 0.0000069766 | VCV xy | 0.0000001378 |
| | | VCV xz | -0.0000001724 | VCV yy | 0.0000126743 |
| | | VCV yz | -0.0000014979 | VCV zz | 0.0000062893 |
| GPSVEC | TP | Point ID 5051 | DX 23376.954 | DY | -3357.706 |
| | | Class Normal | DZ 8902.977 | Code RIPRAP | |
| | | Obs L1 Fixed | H.pr 0.042 | V.pr 0.058 | |

```

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.3
          Total GPS pos 5 VDOP max 1.8
          Monitor status Not monitored RMS 36.1
          Horz SD Vert SD
          Start wk 1605 sec 403250.0 End wk 1605 sec 403254.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0074812523
          VCV xx 0.0000116271 VCV xy -0.0000005251
          VCV xz -0.0000013855 VCV yy 0.0000222743
          VCV yz -0.0000039744 VCV zz 0.0000187515

GPSVEC TP Point ID 5052 DX 23366.370 DY -3353.817
          Class Normal DZ 8902.911 Code RIPRAP
          Obs L1 Fixed H.pr 0.024 V.pr 0.038

GPSQC1 NM Min SVs 6 PDOP max 2.4
          Relative DOPs Yes HDOP max 1.3
          Total GPS pos 4 VDOP max 2.0
          Monitor status Not monitored RMS 7.9
          Horz SD Vert SD
          Start wk 1605 sec 403277.0 End wk 1605 sec 403280.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.003724555
          VCV xx 0.0000052501 VCV xy 0.0000013294
          VCV xz -0.00000158 VCV yy 0.0000082995
          VCV yz -0.0000021913 VCV zz 0.0000068388

GPSVEC TP Point ID 5053 DX 23359.326 DY -3344.599
          Class Normal DZ 8911.664 Code RIPRAP
          Obs L1 Fixed H.pr 0.030 V.pr 0.042

GPSQC1 NM Min SVs 7 PDOP max 1.5
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 3 VDOP max 1.2
          Monitor status Not monitored RMS 19.6
          Horz SD Vert SD
          Start wk 1605 sec 403296.0 End wk 1605 sec 403298.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0047761076
          VCV xx 0.0000058886 VCV xy -0.0000002581
          VCV xz -0.0000006602 VCV yy 0.0000111016
          VCV yz -0.0000018195 VCV zz 0.0000100116

GPSVEC TP Point ID 5054 DX 23410.714 DY -3349.537
          Class Normal DZ 8924.863 Code TOP PC
          Obs L1 Fixed H.pr 0.025 V.pr 0.040

GPSQC1 NM Min SVs 6 PDOP max 1.7
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 7.5
          Horz SD Vert SD
          Start wk 1605 sec 403333.0 End wk 1605 sec 403336.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0044218348
          VCV xx 0.0000059735 VCV xy 0.0000015883
          VCV xz -0.0000019063 VCV yy 0.0000094032
          VCV yz -0.0000025109 VCV zz 0.000007659

GPSVEC TP Point ID 5055 DX 23394.056 DY -3346.861
          Class Normal DZ 8925.395 Code TOP
          Obs L1 Fixed H.pr 0.026 V.pr 0.036

GPSQC1 NM Min SVs 7 PDOP max 1.5
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 3 VDOP max 1.3
          Monitor status Not monitored RMS 10.0
          Horz SD Vert SD
          Start wk 1605 sec 403355.0 End wk 1605 sec 403357.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0041597881
          VCV xx 0.0000043296 VCV xy -0.0000006396
          VCV xz -0.0000003556 VCV yy 0.0000085147
          VCV yz -0.0000011526 VCV zz 0.0000078179

NOTE NM Modified 9:03:03 AM 10/14/2010

NOTE NM Old values TOP PC

GPSVEC TP Point ID 5056 DX 23379.903 DY -3347.609
          Class Normal DZ 8920.901 Code TOP PT
          Obs L1 Fixed H.pr 0.036 V.pr 0.050

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 4 VDOP max 1.3
          Monitor status Not monitored RMS 17.8
          Horz SD Vert SD
          Start wk 1605 sec 403408.0 End wk 1605 sec 403412.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0070573934
          VCV xx 0.0000089476 VCV xy 0.00000003
          VCV xz -0.0000014199 VCV yy 0.0000159512
          VCV yz -0.0000028335 VCV zz 0.000015067

GPSVEC TP Point ID 5057 DX 23374.957 DY -3355.997
          Class Normal DZ 8906.501 Code TOP
          Obs L1 Fixed H.pr 0.029 V.pr 0.040
    
```



```

GPSQC1 NM  Min SVs      7          PDOP max  2.2
           Relative DOPs Yes       HDOP max  1.3
           Total GPS pos 5         VDOP max  1.8
           Monitor status Not monitored RMS       14.8
           Horz SD                               Vert SD
           Start wk 1605 sec 403572.0         End wk 1605  sec 403576.0

GPSQC2 NM  Ttl satellites 7          Err Scale 0.0055886642
           VCV xx  0.0000067474       VCV xy   0.0000003462
           VCV xz  -0.0000008105       VCV yy   0.0000113977
           VCV yz  -0.0000022435       VCV zz   0.0000126596

INIT  KI  Init event  High RMS       Week       1605
           Init type  On the fly      seconds    403602.0
           Init counter 3             Point ID   <no text>
           Survey type Real Time      Place H.Dist <null>
           Plate V.Dist <null>        Plate azimuth <null>

INIT  KI  Init event  Good RMS       Week       1605
           Init type  On the fly      seconds    403603.0
           Init counter 3             Point ID   <no text>
           Survey type Real Time      Place H.Dist <null>
           Plate V.Dist <null>        Plate azimuth <null>

GPSVEC TP  Point ID 5064          DX  23350.367      DY  -3194.986
           Class Normal              DZ  9119.414      Code TOP
           Obs L1 Fixed              H.pr 0.035       V.pr 0.048

GPSQC1 NM  Min SVs      7          PDOP max  2.2
           Relative DOPs Yes       HDOP max  1.3
           Total GPS pos 3         VDOP max  1.8
           Monitor status Not monitored RMS       27.7
           Horz SD                               Vert SD
           Start wk 1605 sec 403618.0         End wk 1605  sec 403622.0

GPSQC2 NM  Ttl satellites 7          Err Scale 0.0061134207
           VCV xx  0.0000082514       VCV xy   0.0000011518
           VCV xz  -0.0000014869       VCV yy   0.0000137325
           VCV yz  -0.000002522       VCV zz   0.0000151215

GPSVEC TP  Point ID 5065          DX  23320.590      DY  -3133.215
           Class Normal              DZ  9189.368      Code TOP
           Obs L1 Fixed              H.pr 0.027       V.pr 0.038

GPSQC1 NM  Min SVs      5          PDOP max  3.3
           Relative DOPs Yes       HDOP max  1.5
           Total GPS pos 8         VDOP max  3.1
           Monitor status Not monitored RMS       16.9
           Horz SD                               Vert SD
           Start wk 1605 sec 403655.0         End wk 1605  sec 403662.0

GPSQC2 NM  Ttl satellites 7          Err Scale 0.0060656425
           VCV xx  0.0000067318       VCV xy   0.0000062515
           VCV xz  -0.0000028633       VCV yy   0.0000108785
           VCV yz  -0.0000037998       VCV zz   0.0000046382

GPSVEC TP  Point ID 5066          DX  23302.575      DY  -3092.789
           Class Normal              DZ  9237.092      Code TOP TOE1 B
           Obs L1 Fixed              H.pr 0.033       V.pr 0.044

GPSQC1 NM  Min SVs      7          PDOP max  4.7
           Relative DOPs Yes       HDOP max  2.8
           Total GPS pos 7         VDOP max  3.8
           Monitor status Not monitored RMS       11.4
           Horz SD                               Vert SD
           Start wk 1605 sec 403695.0         End wk 1605  sec 403701.0

GPSQC2 NM  Ttl satellites 7          Err Scale 0.0066001243
           VCV xx  0.0000093382       VCV xy   0.0000081255
           VCV xz  -0.000004025       VCV yy   0.0000149353
           VCV yz  -0.0000051731       VCV zz   0.0000069616

GPSVEC TP  Point ID 5067          DX  23298.191      DY  -3096.309
           Class Normal              DZ  9228.478      Code TOE1
           Obs L1 Fixed              H.pr 0.031       V.pr 0.047

GPSQC1 NM  Min SVs      6          PDOP max  1.7
           Relative DOPs Yes       HDOP max  1.0
           Total GPS pos 4         VDOP max  1.4
           Monitor status Not monitored RMS       25.5
           Horz SD                               Vert SD
           Start wk 1605 sec 403726.0         End wk 1605  sec 403729.0

GPSQC2 NM  Ttl satellites 6          Err Scale 0.0052402248
           VCV xx  0.0000105113       VCV xy   0.0000111873
           VCV xz  -0.0000051935       VCV yy   0.0000167279
           VCV yz  -0.000006586       VCV zz   0.0000055564

GPSVEC TP  Point ID 5068          DX  23313.246      DY  -3130.432
           Class Normal              DZ  9187.566      Code TOE1
           Obs L1 Fixed              H.pr 0.035       V.pr 0.048

GPSQC1 NM  Min SVs      7          PDOP max  1.6
           Relative DOPs Yes       HDOP max  0.9
           Total GPS pos 3         VDOP max  1.3
           Monitor status Not monitored RMS       25.9
           Horz SD                               Vert SD
           Start wk 1605 sec 403754.0         End wk 1605  sec 403756.0
    
```

| | | | |
|--------|----|--|---|
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000080044 VCV xz -0.0000012574 VCV yz -0.000002379 | Err Scale 0.0053814496 VCV xy -0.0000000637 VCV yy 0.0000146001 VCV zz 0.0000140217 |
| GPSVEC | TP | Point ID 5069 Class Normal Obs L1 Fixed | DX 23313.139 DZ 9148.601 H.pr 0.029 DY -3156.756 Code TOE1 V.pr 0.039 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403779.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 19.3 Vert SD End wk 1605 sec 403782.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000060555 VCV xz -0.0000018036 VCV yz -0.0000025597 | Err Scale 0.0048946086 VCV xy 0.0000021066 VCV yy 0.00000398306 VCV zz 0.00000384382 |
| GPSVEC | TP | Point ID 5070 Class Normal Obs L1 Fixed | DX 23334.602 DZ 9110.397 H.pr 0.042 DY -3191.718 Code TOE1 V.pr 0.058 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 403807.0 | PDOP max 1.7 HDOP max 1.0 VDOP max 1.4 RMS 29.2 Vert SD End wk 1605 sec 403810.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000131705 VCV xz -0.0000050461 VCV yz -0.0000065739 | Err Scale 0.0066401889 VCV xy 0.0000073501 VCV yy 0.0000201639 VCV zz 0.0000153684 |
| GPSVEC | TP | Point ID 5071 Class Normal Obs L1 Fixed | DX 23362.523 DZ 9037.187 H.pr 0.035 DY -3252.557 Code TOE1 PC V.pr 0.047 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 403849.0 | PDOP max 1.6 HDOP max 1.0 VDOP max 1.3 RMS 22.3 Vert SD End wk 1605 sec 403852.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000076865 VCV xz -0.0000015027 VCV yz -0.0000022418 | Err Scale 0.0058787982 VCV xy 0.0000002116 VCV yy 0.0000133161 VCV zz 0.000014421 |
| GPSVEC | TP | Point ID 5072 Class Normal Obs L1 Fixed | DX 23366.894 DZ 9010.020 H.pr 0.042 DY -3272.401 Code TOE1 V.pr 0.057 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 403875.0 | PDOP max 2.3 HDOP max 1.3 VDOP max 1.8 RMS 32.4 Vert SD End wk 1605 sec 403879.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000117843 VCV xz -0.0000033401 VCV yz -0.0000036295 | Err Scale 0.0070458096 VCV xy 0.0000002361 VCV yy 0.0000200227 VCV zz 0.0000192591 |
| GPSVEC | TP | Point ID 5073 Class Normal Obs L1 Fixed | DX 23363.337 DZ 8983.224 H.pr 0.042 DY -3288.859 Code TOE1 PT V.pr 0.057 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1605 sec 403900.0 | PDOP max 2.3 HDOP max 1.4 VDOP max 1.8 RMS 37.8 Vert SD End wk 1605 sec 403905.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000121205 VCV xz -0.0000033579 VCV yz -0.0000041652 | Err Scale 0.0078027081 VCV xy 0.0000012334 VCV yy 0.0000200815 VCV zz 0.000020162 |
| GPSVEC | TP | Point ID 5074 Class Normal Obs L1 Fixed | DX 23350.692 DZ 8946.822 H.pr 0.031 DY -3308.226 Code TOE1 PT V.pr 0.042 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 403935.0 | PDOP max 0.8 HDOP max 0.5 VDOP max 0.6 RMS 33.0 Vert SD End wk 1605 sec 403937.0 |

```

-----
GPSQC2 NM Ttl satellites 7 Err Scale 0.0074358387
VCV xx 0.0000065765 VCV xy -0.0000001579
VCV xz -0.0000019501 VCV yy 0.0000104522
VCV yz -0.0000019171 VCV zz 0.0000116157

GPSVEC TP Point ID 5075 DX 23336.684 DY -3327.606
Class Normal DZ 8904.726 Code TOE1 RIPRAP
Obs L1 Fixed H.pr 0.035 V.pr 0.044

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 1.0
Total GPS pos 4 VDOP max 1.3
Monitor status Not monitored RMS 31.5
Horz SD Vert SD
Start wk 1605 sec 403973.0 End wk 1605 sec 403976.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0055598603
VCV xx 0.0000065564 VCV xy 0.0000017528
VCV xz -0.0000017868 VCV yy 0.0000106014
VCV yz -0.0000026798 VCV zz 0.0000107557

GPSVEC TP Point ID 5076 DX 23328.138 DY -3344.103
Class Normal DZ 8875.259 Code TOE1 RIPRAP
Obs L1 Fixed H.pr 0.045 V.pr 0.058

GPSQC1 NM Min SVs 7 PDOP max 1.5
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.2
Monitor status Not monitored RMS 28.8
Horz SD Vert SD
Start wk 1605 sec 403998.0 End wk 1605 sec 404001.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0079269912
VCV xx 0.0000172476 VCV xy 0.000007338
VCV xz -0.0000066633 VCV yy 0.0000147938
VCV yz -0.0000058809 VCV zz 0.0000234302

GPSVEC TP Point ID 5077 DX 23353.321 DY -3355.003
Class Normal DZ 8874.447 Code TOE1
Obs L1 Fixed H.pr 0.041 V.pr 0.053

GPSQC1 NM Min SVs 7 PDOP max 1.5
Relative DOPs Yes HDOP max 0.9
Total GPS pos 5 VDOP max 1.2
Monitor status Not monitored RMS 48.8
Horz SD Vert SD
Start wk 1605 sec 404023.0 End wk 1605 sec 404027.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0079648001
VCV xx 0.0000136639 VCV xy 0.0000049846
VCV xz -0.0000053165 VCV yy 0.0000122021
VCV yz -0.0000046596 VCV zz 0.0000209289

GPSVEC TP Point ID 5078 DX 23350.679 DY -3365.194
Class Normal DZ 8858.553 Code TOE1
Obs L1 Fixed H.pr 0.035 V.pr 0.045

GPSQC1 NM Min SVs 7 PDOP max 2.1
Relative DOPs Yes HDOP max 1.3
Total GPS pos 4 VDOP max 1.7
Monitor status Not monitored RMS 21.6
Horz SD Vert SD
Start wk 1605 sec 404041.0 End wk 1605 sec 404044.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0055450313
VCV xx 0.00000951 VCV xy 0.0000028015
VCV xz -0.0000037665 VCV yy 0.000008304
VCV yz -0.0000031413 VCV zz 0.0000162714

GPSVEC TP Point ID 5079 DX 23325.118 DY -3353.915
Class Normal DZ 8859.595 Code TOE1 RIPRAP TOP1
Obs L1 Fixed H.pr 0.034 V.pr 0.043

F-CODE TP Code TOE1 RIPRAP TOP1 B

GPSQC1 NM Min SVs 7 PDOP max 2.1
Relative DOPs Yes HDOP max 1.3
Total GPS pos 5 VDOP max 1.7
Monitor status Not monitored RMS 20.5
Horz SD Vert SD
Start wk 1605 sec 404066.0 End wk 1605 sec 404070.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0059083099
VCV xx 0.0000080378 VCV xy 0.0000039976
VCV xz -0.000003343 VCV yy 0.0000116294
VCV yz -0.0000040158 VCV zz 0.0000113728

NOTE NM Modified 9:15:17 AM 10/14/2010

NOTE NM Old values TOE1 RIPRAP

GPSVEC TP Point ID 5080 DX 23290.001 DY -3341.050
Class Normal DZ 8858.348 Code TOE1
Obs L1 Fixed H.pr 0.035 V.pr 0.045

```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 6 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 26.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404126.0 | End wk 1605 sec | 404131.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.006642425 |
| | | VCV xx | 0.0000106863 | VCV xy | 0.0000047291 |
| | | VCV xz | -0.0000043116 | VCV yy | 0.0000078123 |
| | | VCV yz | -0.0000035759 | VCV zz | 0.0000143945 |
| GPSVEC | TP | Point ID 5081 | DX 23266.799 | DY | -3331.552 |
| | | Class Normal | DZ 8858.172 | Code TOE1 | |
| | | Obs L1 Fixed | H.pr 0.039 | V.pr 0.050 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 6 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 46.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404150.0 | End wk 1605 sec | 404155.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0074923984 |
| | | VCV xx | 0.0000117776 | VCV xy | 0.0000039389 |
| | | VCV xz | -0.0000049223 | VCV yy | 0.000011458 |
| | | VCV yz | -0.0000043264 | VCV zz | 0.0000187121 |
| GPSVEC | TP | Point ID 5082 | DX 23271.229 | DY | -3322.215 |
| | | Class Normal | DZ 8873.782 | Code TOE1 NJ | |
| | | Obs L1 Fixed | H.pr 0.043 | V.pr 0.055 | |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 54.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404176.0 | End wk 1605 sec | 404181.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0086701261 |
| | | VCV xx | 0.0000173021 | VCV xy | 0.0000157782 |
| | | VCV xz | -0.0000074252 | VCV yy | 0.0000224 |
| | | VCV yz | -0.0000088422 | VCV zz | 0.0000109723 |
| GPSVEC | TP | Point ID 5083 | DX 23279.231 | DY | -3325.013 |
| | | Class Normal | DZ 8873.815 | Code TOE1 PC | |
| | | Obs L1 Fixed | H.pr 0.053 | V.pr 0.069 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 11 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 46.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404199.0 | End wk 1605 sec | 404209.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0112134758 |
| | | VCV xx | 0.0000242133 | VCV xy | 0.0000185739 |
| | | VCV xz | -0.0000100568 | VCV yy | 0.0000227716 |
| | | VCV yz | -0.0000100034 | VCV zz | 0.0000163492 |
| GPSVEC | TP | Point ID 5084 | DX 23293.367 | DY | -3327.382 |
| | | Class Normal | DZ 8879.011 | Code TOE1 | |
| | | Obs L1 Fixed | H.pr 0.047 | V.pr 0.061 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 8 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 37.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404229.0 | End wk 1605 sec | 404236.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.008983545 |
| | | VCV xx | 0.0000191162 | VCV xy | 0.0000144989 |
| | | VCV xz | -0.0000079792 | VCV yy | 0.000017512 |
| | | VCV yz | -0.0000078273 | VCV zz | 0.0000131764 |
| GPSVEC | TP | Point ID 5085 | DX 23306.327 | DY | -3324.299 |
| | | Class Normal | DZ 8890.765 | Code TOE1 | |
| | | Obs L1 Fixed | H.pr 0.058 | V.pr 0.074 | |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 11 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 62.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404252.0 | End wk 1605 sec | 404262.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0121723777 |
| | | VCV xx | 0.0000287335 | VCV xy | 0.0000219244 |
| | | VCV xz | -0.0000108372 | VCV yy | 0.0000265072 |
| | | VCV yz | -0.000011079 | VCV zz | 0.0000197316 |
| GPSVEC | TP | Point ID 5086 | DX 23306.945 | DY | -3317.070 |
| | | Class Normal | DZ 8901.845 | Code TOE1 PT E | |
| | | Obs L1 Fixed | H.pr 0.059 | V.pr 0.075 | |


```

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.1
Total GPS pos 3 VDOP max 1.5
Monitor status Not monitored RMS 12.3
Horz SD Vert SD
Start wk 1605 sec 404470.0 End wk 1605 sec 404472.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0061588478
VCV xx 0.0000249499 VCV xy 0.0000168311
VCV xz -0.0000209197 VCV yy 0.0000139072
VCV yz -0.0000150215 VCV zz 0.0000270465

GPSVEC TP Point ID 5093 DX 23264.022 DY -3337.976
Class Normal DZ 8851.566 Code TOE1 E
Obs L1 Fixed H.pr 0.037 V.pr 0.052

GPSQC1 NM Min SVs 5 PDOP max 3.2
Relative DOPs Yes HDOP max 1.6
Total GPS pos 5 VDOP max 2.9
Monitor status Not monitored RMS 7.5
Horz SD Vert SD
Start wk 1605 sec 404502.0 End wk 1605 sec 404506.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0032807114
VCV xx 0.000003765 VCV xy 0.0000059804
VCV xz -0.000002182 VCV yy 0.0000174277
VCV yz -0.0000055472 VCV zz 0.0000029953

GPSVEC TP Point ID 5094 DX 23291.343 DY -3351.381
Class Normal DZ 8847.704 Code TOE1 B
Obs L1 Fixed H.pr 0.043 V.pr 0.055

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.1
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 21.7
Horz SD Vert SD
Start wk 1605 sec 404568.0 End wk 1605 sec 404571.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0059495261
VCV xx 0.0000182096 VCV xy 0.0000138948
VCV xz -0.0000086857 VCV yy 0.0000159211
VCV yz -0.0000083663 VCV zz 0.0000153509

GPSVEC TP Point ID 5095 DX 23272.095 DY -3350.978
Class Normal DZ 8838.754 Code TOE1
Obs L1 Fixed H.pr 0.026 V.pr 0.033

GPSQC1 NM Min SVs 6 PDOP max 2.6
Relative DOPs Yes HDOP max 1.6
Total GPS pos 5 VDOP max 2.1
Monitor status Not monitored RMS 10.9
Horz SD Vert SD
Start wk 1605 sec 404594.0 End wk 1605 sec 404598.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0035967499
VCV xx 0.0000071334 VCV xy 0.0000048096
VCV xz -0.000002637 VCV yy 0.0000050935
VCV yz -0.000002493 VCV zz 0.0000058827

GPSVEC TP Point ID 5096 DX 23258.889 DY -3349.068
Class Normal DZ 8835.492 Code TOE1 E
Obs L1 Fixed H.pr 0.047 V.pr 0.061

GPSQC1 NM Min SVs 6 PDOP max 1.5
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.2
Monitor status Not monitored RMS 9.0
Horz SD Vert SD
Start wk 1605 sec 404620.0 End wk 1605 sec 404624.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0078142528
VCV xx 0.0000217877 VCV xy 0.0000179122
VCV xz -0.000008017 VCV yy 0.0000225953
VCV yz -0.0000090483 VCV zz 0.0000167495

NOTE TS Time Date 10/14/2010 Time 09:24:30

GPSVEC TP Point ID 5097 DX 23315.393 DY -3381.707
Class Normal DZ 8834.579 Code RIPRAP
Obs L1 Fixed H.pr 0.032 V.pr 0.041

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 9.2
Horz SD Vert SD
Start wk 1605 sec 404667.0 End wk 1605 sec 404670.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0044717942
VCV xx 0.0000099468 VCV xy 0.000006991
VCV xz -0.0000088128 VCV yy 0.0000059136
VCV yz -0.0000066642 VCV zz 0.0000122279

GPSVEC TP Point ID 5098 DX 23339.701 DY -3390.700
Class Normal DZ 8836.334 Code RIPRAP
Obs L1 Fixed H.pr 0.023 V.pr 0.030

```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404689.0 | End wk 1605 sec | 404692.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0032334463 |
| | | VCV xx | 0.0000055206 | VCV xy | 0.0000040541 |
| | | VCV xz | -0.0000018914 | VCV yy | 0.0000046542 |
| | | VCV yz | -0.0000020241 | VCV zz | 0.0000045245 |
| GPSVEC | TP | Point ID 5099 | DX 23350.652 | DY | -3389.973 |
| | | Class Normal | DZ 8843.238 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.043 | V.pr | 0.056 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 3 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 8.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404707.0 | End wk 1605 sec | 404709.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0054126382 |
| | | VCV xx | 0.0000190249 | VCV xy | 0.0000145111 |
| | | VCV xz | -0.000006155 | VCV yy | 0.0000172295 |
| | | VCV yz | -0.0000069719 | VCV zz | 0.0000152687 |
| GPSVEC | TP | Point ID 5100 | DX 23359.939 | DY | -3393.451 |
| | | Class Normal | DZ 8843.353 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.035 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 16.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404727.0 | End wk 1605 sec | 404730.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0038493332 |
| | | VCV xx | 0.0000079037 | VCV xy | 0.0000056493 |
| | | VCV xz | -0.0000027035 | VCV yy | 0.0000063236 |
| | | VCV yz | -0.0000028409 | VCV zz | 0.0000066362 |
| GPSVEC | TP | Point ID 5101 | DX 23357.520 | DY | -3374.918 |
| | | Class Normal | DZ 8857.161 | Code | CONC |
| | | Obs L1 Fixed | H.pr 0.066 | V.pr | 0.084 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.1 |
| | | Relative DOPs | Yes | HDOP max | 1.9 |
| | | Total GPS pos | 9 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 21.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404780.0 | End wk 1605 sec | 404790.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.008629337 |
| | | VCV xx | 0.0000201897 | VCV xy | 0.0000240286 |
| | | VCV xz | -0.0000089048 | VCV yy | 0.0000387228 |
| | | VCV yz | -0.0000132768 | VCV zz | 0.000013026 |
| GPSVEC | TP | Point ID 5102 | DX 23367.843 | DY | -3378.826 |
| | | Class Normal | DZ 8856.909 | Code | CONC |
| | | Obs L1 Fixed | H.pr 0.048 | V.pr | 0.062 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 23.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404801.0 | End wk 1605 sec | 404805.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0073443558 |
| | | VCV xx | 0.0000226741 | VCV xy | 0.0000180057 |
| | | VCV xz | -0.0000079755 | VCV yy | 0.0000212885 |
| | | VCV yz | -0.0000091003 | VCV zz | 0.0000194871 |
| GPSVEC | TP | Point ID 5103 | DX 23372.195 | DY | -3362.945 |
| | | Class Normal | DZ 8882.479 | Code | CONC |
| | | Obs L1 Fixed | H.pr 0.035 | V.pr | 0.046 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.1 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 6 | VDOP max | 1.7 |
| | | Monitor status | Not monitored | RMS | 9.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 404821.0 | End wk 1605 sec | 404826.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0057123327 |
| | | VCV xx | 0.0000096732 | VCV xy | 0.0000113943 |
| | | VCV xz | -0.0000041955 | VCV yy | 0.0000183414 |
| | | VCV yz | -0.0000062604 | VCV zz | 0.0000063716 |
| GPSVEC | TP | Point ID 5104 | DX 23363.702 | DY | -3359.631 |
| | | Class Normal | DZ 8882.543 | Code | CONC |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.029 |

```

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 7.3
Horz SD Vert SD
Start wk 1605 sec 404837.0 End wk 1605 sec 404840.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.003177498
VCV xx 0.000005252 VCV xy 0.0000038726
VCV xz -0.0000018231 VCV yy 0.0000044724
VCV yz -0.0000019999 VCV zz 0.0000045417

GPSVEC TP Point ID 5105 DX 23355.988 DY -3350.920
Class Normal DZ 8888.597 Code CONC
Obs L1 Fixed H.pr 0.038 V.pr 0.049

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 3 VDOP max 1.5
Monitor status Not monitored RMS 10.2
Horz SD Vert SD
Start wk 1605 sec 404853.0 End wk 1605 sec 404855.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0047651599
VCV xx 0.0000141287 VCV xy 0.0000112666
VCV xz -0.0000052966 VCV yy 0.0000139056
VCV yz -0.0000060793 VCV zz 0.0000120862

GPSVEC TP Point ID 5106 DX 23346.575 DY -3344.310
Class Normal DZ 8896.921 Code CONC
Obs L1 Fixed H.pr 0.025 V.pr 0.032

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 8.1
Horz SD Vert SD
Start wk 1605 sec 404867.0 End wk 1605 sec 404870.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0034178533
VCV xx 0.0000057938 VCV xy 0.0000045856
VCV xz -0.0000023906 VCV yy 0.0000055344
VCV yz -0.0000026274 VCV zz 0.0000051898

GPSVEC TP Point ID 5107 DX 23386.940 DY -3393.520
Class Normal DZ 8837.466 Code RIPRAP
Obs L1 Fixed H.pr 0.027 V.pr 0.034

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 3 VDOP max 1.5
Monitor status Not monitored RMS 22.4
Horz SD Vert SD
Start wk 1605 sec 404923.0 End wk 1605 sec 404925.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0032814471
VCV xx 0.0000068432 VCV xy 0.0000052536
VCV xz -0.0000023068 VCV yy 0.0000060753
VCV yz -0.000002689 VCV zz 0.0000061348

GPSVEC TP Point ID 5108 DX 23394.082 DY -3401.601
Class Normal DZ 8829.774 Code RIPRAP
Obs L1 Fixed H.pr 0.029 V.pr 0.037

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 28.9
Horz SD Vert SD
Start wk 1605 sec 404943.0 End wk 1605 sec 404946.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0039741122
VCV xx 0.0000083306 VCV xy 0.0000058641
VCV xz -0.0000028457 VCV yy 0.0000062959
VCV yz -0.0000030789 VCV zz 0.0000077374

GPSVEC TP Point ID 5109 DX 23417.595 DY -3414.951
Class Normal DZ 8825.919 Code RIPRAP
Obs L1 Fixed H.pr 0.033 V.pr 0.042

GPSQC1 NM Min SVs 6 PDOP max 1.5
Relative DOPs Yes HDOP max 0.9
Total GPS pos 7 VDOP max 1.2
Monitor status Not monitored RMS 16.0
Horz SD Vert SD
Start wk 1605 sec 404972.0 End wk 1605 sec 404978.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.006061262
VCV xx 0.0000103861 VCV xy 0.000007861
VCV xz -0.0000033111 VCV yy 0.0000089738
VCV yz -0.0000038961 VCV zz 0.000009553

GPSVEC TP Point ID 5110 DX 23462.573 DY -3431.873
Class Normal DZ 8826.220 Code RIPRAP CLS E
Obs L1 Fixed H.pr 0.032 V.pr 0.041

```

```

GPSQC1 NM Min SVs 6 PDOP max 1.5
Relative DOPs Yes HDOP max 1.0
Total GPS pos 3 VDOP max 1.2
Monitor status Not monitored RMS 18.1
Horz SD Vert SD
Start wk 1605 sec 405013.0 End wk 1605 sec 405017.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0052424329
VCV xx 0.0000102122 VCV xy 0.0000074313
VCV xz -0.0000029344 VCV yy 0.0000085454
VCV yz -0.0000035558 VCV zz 0.000009061

GPSVEC TP Point ID 5111 DX 23317.706 DY -3094.671
Class Normal DZ 9242.469 Code TOP NJ TOE1 B
Obs L1 Fixed H.pr 0.047 V.pr 0.059

GPSQC1 NM Min SVs 6 PDOP max 2.7
Relative DOPs Yes HDOP max 1.7
Total GPS pos 8 VDOP max 2.1
Monitor status Not monitored RMS 34.2
Horz SD Vert SD
Start wk 1605 sec 405298.0 End wk 1605 sec 405305.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0081742397
VCV xx 0.0000220512 VCV xy 0.0000154468
VCV xz -0.0000036181 VCV yy 0.0000170034
VCV yz -0.000005977 VCV zz 0.0000199797

GPSVEC TP Point ID 5112 DX 23332.510 DY -3134.299
Class Normal DZ 9194.609 Code TOP
Obs L1 Fixed H.pr 0.047 V.pr 0.059

GPSQC1 NM Min SVs 6 PDOP max 1.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 7 VDOP max 1.5
Monitor status Not monitored RMS 26.8
Horz SD Vert SD
Start wk 1605 sec 405331.0 End wk 1605 sec 405338.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0086303297
VCV xx 0.0000209604 VCV xy 0.000016115
VCV xz -0.0000028228 VCV yy 0.0000200372
VCV yz -0.0000057014 VCV zz 0.0000174477

GPSVEC TP Point ID 5113 DX 23368.742 DY -3142.648
Class Normal DZ 9198.800 Code TOE1
Obs L1 Fixed H.pr 0.022 V.pr 0.041

GPSQC1 NM Min SVs 4 PDOP max 3.1
Relative DOPs Yes HDOP max 1.7
Total GPS pos 4 VDOP max 2.6
Monitor status Not monitored RMS 9.7
Horz SD Vert SD
Start wk 1605 sec 405363.0 End wk 1605 sec 405366.0

GPSQC2 NM Ttl satellites 5 Err Scale 0.0023321866
VCV xx 0.0000050357 VCV xy 0.0000066251
VCV xz -0.0000008758 VCV yy 0.0000120925
VCV yz -0.0000015246 VCV zz 0.0000031757

GPSVEC TP Point ID 5114 DX 23388.616 DY -3189.782
Class Normal DZ 9138.033 Code TOE1
Obs L1 Fixed H.pr 0.120 V.pr 0.150

GPSQC1 NM Min SVs 6 PDOP max 4.4
Relative DOPs Yes HDOP max 2.8
Total GPS pos 13 VDOP max 3.4
Monitor status Not monitored RMS 43.8
Horz SD Vert SD
Start wk 1605 sec 405419.0 End wk 1605 sec 405431.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0159499608
VCV xx 0.0000527219 VCV xy 0.0000648259
VCV xz -0.0000699929 VCV yy 0.000080732
VCV yz -0.0000859957 VCV zz 0.0000955819

INIT KI Init event Lost Week 1605
Init type On the fly seconds 405437.0
Init counter 3 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1605
Init type On the fly seconds 405497.0
Init counter 4 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

GPSVEC TP Point ID 5115 DX 23360.435 DY -3195.031
Class Normal DZ 9124.699 Code TOP
Obs L1 Fixed H.pr 0.040 V.pr 0.050

GPSQC1 NM Min SVs 6 PDOP max 2.7
Relative DOPs Yes HDOP max 1.7
Total GPS pos 4 VDOP max 2.1
Monitor status Not monitored RMS 11.2
Horz SD Vert SD
Start wk 1605 sec 405503.0 End wk 1605 sec 405507.0
    
```

```

GPSQC2 NM Ttl satellites 6 Err Scale 0.0055416785
          VCV xx 0.0000133289 VCV xy 0.0000115074
          VCV xz -0.0000053979 VCV yy 0.0000147464
          VCV yz -0.0000073182 VCV zz 0.0000150339

GPSVEC TP Point ID 5116 DX 23392.248 DY -3259.518
          Class Normal DZ 9051.970 Code TOP PC
          Obs L1 Fixed H.pr 0.031 V.pr 0.039

GPSQC1 NM Min SVs 6 PDOP max 1.5
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 4 VDOP max 1.2
          Monitor status Not monitored RMS 19.8
          Horz SD Vert SD
          Start wk 1605 sec 405545.0 End wk 1605 sec 405548.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0046844352
          VCV xx 0.0000082144 VCV xy 0.0000069615
          VCV xz -0.0000023105 VCV yy 0.0000089649
          VCV yz -0.0000035936 VCV zz 0.0000084421

GPSVEC TP Point ID 5117 DX 23424.104 DY -3259.663
          Class Normal DZ 9056.051 Code TOE1 PC
          Obs L1 Fixed H.pr 0.037 V.pr 0.047

GPSQC1 NM Min SVs 6 PDOP max 2.6
          Relative DOPs Yes HDOP max 1.7
          Total GPS pos 5 VDOP max 2.1
          Monitor status Not monitored RMS 23.7
          Horz SD Vert SD
          Start wk 1605 sec 405577.0 End wk 1605 sec 405581.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0051227775
          VCV xx 0.0000116439 VCV xy 0.0000100192
          VCV xz -0.0000030435 VCV yy 0.000013382
          VCV yz -0.0000049938 VCV zz 0.0000116813

INIT KI Init event Lost Week 1605
          Init type On the fly seconds 405599.0
          Init counter 0 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1605
          Init type On the fly seconds 405668.0
          Init counter 5 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

GPSVEC TP Point ID 5118 DX 23443.294 DY -3279.848
          Class Normal DZ 9035.049 Code TOE1
          Obs L1 Fixed H.pr 0.045 V.pr 0.056

GPSQC1 NM Min SVs 6 PDOP max 2.0
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 4 VDOP max 1.5
          Monitor status Not monitored RMS 8.4
          Horz SD Vert SD
          Start wk 1605 sec 405684.0 End wk 1605 sec 405687.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0049915155
          VCV xx 0.0000070916 VCV xy 0.0000080082
          VCV xz -0.0000027031 VCV yy 0.000022103
          VCV yz -0.0000075292 VCV zz 0.0000074217

GPSVEC TP Point ID 5119 DX 23400.291 DY -3284.510
          Class Normal DZ 9021.244 Code TOP
          Obs L1 Fixed H.pr 0.037 V.pr 0.046

GPSQC1 NM Min SVs 6 PDOP max 6.4
          Relative DOPs Yes HDOP max 4.0
          Total GPS pos 10 VDOP max 5.0
          Monitor status Not monitored RMS 8.7
          Horz SD Vert SD
          Start wk 1605 sec 405713.0 End wk 1605 sec 405722.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0071646837
          VCV xx 0.000007453 VCV xy 0.0000073819
          VCV xz -0.000001218 VCV yy 0.0000211082
          VCV yz -0.0000031283 VCV zz 0.0000070537

GPSVEC TP Point ID 5120 DX 23397.500 DY -3308.619
          Class Normal DZ 8985.783 Code TOP PT
          Obs L1 Fixed H.pr 0.034 V.pr 0.042

GPSQC1 NM Min SVs 6 PDOP max 1.9
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 3 VDOP max 1.4
          Monitor status Not monitored RMS 7.0
          Horz SD Vert SD
          Start wk 1605 sec 405745.0 End wk 1605 sec 405747.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0041549248
          VCV xx 0.0000099393 VCV xy 0.0000076617
          VCV xz -0.0000021989 VCV yy 0.0000090562
          VCV yz -0.0000038484 VCV zz 0.0000108939
    
```

```

GPSVEC TP Point ID 5121      DX 23388.987      DY -3333.761
        Class Normal      DZ 8944.856      Code TOP
        Obs L1 Fixed      H.pr 0.041      V.pr 0.050

GPSQC1 NM Min SVs          6          PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 9.8
        Horz SD          Vert SD
        Start wk 1605 sec 405770.0      End wk 1605 sec 405775.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0061104894
        VCV xx 0.0000142822      VCV xy 0.0000110335
        VCV xz -0.0000030689      VCV yy 0.0000130704
        VCV yz -0.0000055098      VCV zz 0.000015667

GPSVEC TP Point ID 5122      DX 23415.999      DY -3342.304
        Class Normal      DZ 8938.963      Code TOP
        Obs L1 Fixed      H.pr 0.030      V.pr 0.036

GPSQC1 NM Min SVs          6          PDOP max 2.6
        Relative DOPs Yes      HDOP max 1.7
        Total GPS pos 5      VDOP max 2.0
        Monitor status Not monitored      RMS 14.2
        Horz SD          Vert SD
        Start wk 1605 sec 405790.0      End wk 1605 sec 405794.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0040515084
        VCV xx 0.0000074677      VCV xy 0.000005795
        VCV xz -0.0000016502      VCV yy 0.000006876
        VCV yz -0.0000029455      VCV zz 0.0000083208

GPSVEC TP Point ID 5123      DX 23440.100      DY -3352.418
        Class Normal      DZ 8933.323      Code TOP
        Obs L1 Fixed      H.pr 0.035      V.pr 0.043

GPSQC1 NM Min SVs          6          PDOP max 1.9
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 5      VDOP max 1.4
        Monitor status Not monitored      RMS 6.8
        Horz SD          Vert SD
        Start wk 1605 sec 405808.0      End wk 1605 sec 405812.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0051977136
        VCV xx 0.0000102435      VCV xy 0.0000079166
        VCV xz -0.0000022538      VCV yy 0.0000093036
        VCV yz -0.000004047      VCV zz 0.0000115001

GPSVEC TP Point ID 5124      DX 23436.436      DY -3316.073
        Class Normal      DZ 8977.407      Code TOE1
        Obs L1 Fixed      H.pr 0.032      V.pr 0.058

GPSQC1 NM Min SVs          5          PDOP max 2.7
        Relative DOPs Yes      HDOP max 1.3
        Total GPS pos 5      VDOP max 2.4
        Monitor status Not monitored      RMS 5.1
        Horz SD          Vert SD
        Start wk 1605 sec 405841.0      End wk 1605 sec 405845.0

GPSQC2 NM Ttl satellites 5      Err Scale 0.0043213465
        VCV xx 0.0000082418      VCV xy 0.0000074152
        VCV xz -0.0000014878      VCV yy 0.0000289727
        VCV yz -0.0000089371      VCV zz 0.0000084305

GPSVEC TP Point ID 5125      DX 23438.459      DY -3329.273
        Class Normal      DZ 8960.419      Code TOE1
        Obs L1 Fixed      H.pr 0.048      V.pr 0.059

GPSQC1 NM Min SVs          6          PDOP max 3.8
        Relative DOPs Yes      HDOP max 2.4
        Total GPS pos 6      VDOP max 3.0
        Monitor status Not monitored      RMS 7.0
        Horz SD          Vert SD
        Start wk 1605 sec 405859.0      End wk 1605 sec 405864.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0049757371
        VCV xx 0.0000103193      VCV xy 0.0000123107
        VCV xz -0.0000030814      VCV yy 0.0000217345
        VCV yz -0.0000061996      VCV zz 0.0000092629

GPSVEC TP Point ID 5126      DX 23450.438      DY -3340.193
        Class Normal      DZ 8951.150      Code TOE1 PT
        Obs L1 Fixed      H.pr 0.030      V.pr 0.037

GPSQC1 NM Min SVs          6          PDOP max 1.9
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 4      VDOP max 1.4
        Monitor status Not monitored      RMS 9.3
        Horz SD          Vert SD
        Start wk 1605 sec 405882.0      End wk 1605 sec 405885.0

GPSQC2 NM Ttl satellites 6      Err Scale 0.0041210977
        VCV xx 0.0000076077      VCV xy 0.0000059606
        VCV xz -0.0000015377      VCV yy 0.0000071521
        VCV yz -0.0000029797      VCV zz 0.000008535

GPSVEC TP Point ID 5127      DX 23488.206      DY -3360.853
        Class Normal      DZ 8943.944      Code TOE1 PT
        Obs L1 Fixed      H.pr 0.028      V.pr 0.034
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 4 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 11.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 405907.0 | End wk 1605 sec | 405910.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0034037861 |
| | | VCV xx | 0.0000064671 | VCV xy | 0.000005078 |
| | | VCV xz | -0.0000012586 | VCV yy | 0.000006108 |
| | | VCV yz | -0.0000025123 | VCV zz | 0.0000072501 |
| GPSVEC | TP | Point ID 5128 | DX 23512.972 | DY | -3379.374 |
| | | Class Normal | DZ 8933.590 | Code | TOE1 PT |
| | | Obs L1 Fixed | H.pr 0.038 | V.pr | 0.047 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 17.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 405930.0 | End wk 1605 sec | 405933.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0052602827 |
| | | VCV xx | 0.0000122687 | VCV xy | 0.0000095941 |
| | | VCV xz | -0.0000025445 | VCV yy | 0.0000113846 |
| | | VCV yz | -0.0000049395 | VCV zz | 0.0000141591 |
| GPSVEC | TP | Point ID 5129 | DX 23484.087 | DY | -3370.189 |
| | | Class Normal | DZ 8930.217 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.024 | V.pr | 0.030 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 3 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 10.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 405951.0 | End wk 1605 sec | 405953.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0030062762 |
| | | VCV xx | 0.0000039093 | VCV xy | 0.0000045545 |
| | | VCV xz | -0.0000009552 | VCV yy | 0.0000080442 |
| | | VCV yz | -0.0000021141 | VCV zz | 0.000003459 |
| GPSVEC | TP | Point ID 5130 | DX 23528.720 | DY | -3389.797 |
| | | Class Normal | DZ 8927.606 | Code | TOP TOE1 E |
| | | Obs L1 Fixed | H.pr 0.072 | V.pr | 0.089 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.8 |
| | | Relative DOPs | Yes | HDOP max | 2.4 |
| | | Total GPS pos | 9 | VDOP max | 2.9 |
| | | Monitor status | Not monitored | RMS | 13.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 405981.0 | End wk 1605 sec | 405989.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0068624904 |
| | | VCV xx | 0.0000142692 | VCV xy | 0.0000140805 |
| | | VCV xz | -0.0000169404 | VCV yy | 0.0000160865 |
| | | VCV yz | -0.0000199031 | VCV zz | 0.0000353635 |
| GPSVEC | TP | Point ID 5131 | DX 23555.894 | DY | -3400.897 |
| | | Class Normal | DZ 8924.730 | Code | TOP PC |
| | | Obs L1 Fixed | H.pr 0.027 | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 7.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406014.0 | End wk 1605 sec | 406018.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0036809251 |
| | | VCV xx | 0.0000059462 | VCV xy | 0.0000046954 |
| | | VCV xz | -0.0000010557 | VCV yy | 0.0000056915 |
| | | VCV yz | -0.0000023104 | VCV zz | 0.0000067495 |
| GPSVEC | TP | Point ID 5132 | DX 23590.332 | DY | -3415.310 |
| | | Class Normal | DZ 8918.366 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.031 | V.pr | 0.038 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 9.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 406037.0 | End wk 1605 sec | 406041.0 |
| GPSQC2 | NM | Ttl satellites | 6 | Err Scale | 0.0043159584 |
| | | VCV xx | 0.0000080976 | VCV xy | 0.0000064017 |
| | | VCV xz | -0.0000015305 | VCV yy | 0.0000077178 |
| | | VCV yz | -0.0000032638 | VCV zz | 0.0000094141 |
| GPSVEC | TP | Point ID 5133 | DX 23613.963 | DY | -3433.508 |
| | | Class Normal | DZ 8896.124 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.031 | V.pr | 0.037 |

GPSQC1 NM Min SVs 6 PDOP max 5.4
 Relative DOPs Yes HDOP max 3.4
 Total GPS pos 9 VDOP max 4.2
 Monitor status Not monitored RMS 18.0
 Horz SD Vert SD
 Start wk 1605 sec 406058.0 End wk 1605 sec 406066.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0056729624
 VCV xx 0.000005945 VCV xy 0.0000052862
 VCV xz -0.0000045157 VCV yy 0.0000061646
 VCV yz -0.0000058424 VCV zz 0.0000120585

GPSVEC TP Point ID 5134 DX 23627.407 DY -3450.555
 Class Normal DZ 8872.914 Code TOP PT TOE NJ
 Obs L1 Fixed H.pr 0.049 V.pr 0.059

GPSQC1 NM Min SVs 6 PDOP max 2.6
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 5 VDOP max 2.0
 Monitor status Not monitored RMS 26.8
 Horz SD Vert SD
 Start wk 1605 sec 406093.0 End wk 1605 sec 406097.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.006712677
 VCV xx 0.000018721 VCV xy 0.0000156646
 VCV xz -0.000002646 VCV yy 0.0000215761
 VCV yz -0.0000070978 VCV zz 0.0000204376

GPSVEC TP Point ID 5135 DX 23651.777 DY -3460.177
 Class Normal DZ 8872.700 Code TOE
 Obs L1 Fixed H.pr 0.029 V.pr 0.036

GPSQC1 NM Min SVs 6 PDOP max 2.6
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 6 VDOP max 2.0
 Monitor status Not monitored RMS 18.7
 Horz SD Vert SD
 Start wk 1605 sec 406113.0 End wk 1605 sec 406118.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.004451002
 VCV xx 0.0000046971 VCV xy 0.0000047191
 VCV xz -0.0000054608 VCV yy 0.0000055523
 VCV yz -0.0000067211 VCV zz 0.0000119628

GPSVEC TP Point ID 5136 DX 23645.459 DY -3475.496
 Class Normal DZ 8846.759 Code TOE NJ
 Obs L1 Fixed H.pr 0.025 V.pr 0.031

GPSQC1 NM Min SVs 6 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 1.4
 Monitor status Not monitored RMS 17.4
 Horz SD Vert SD
 Start wk 1605 sec 406141.0 End wk 1605 sec 406145.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0038483099
 VCV xx 0.0000045153 VCV xy 0.0000044588
 VCV xz -0.0000008203 VCV yy 0.0000074702
 VCV yz -0.0000021778 VCV zz 0.0000045786

GPSVEC TP Point ID 5137 DX 23630.251 DY -3470.390
 Class Normal DZ 8845.997 Code TOE
 Obs L1 Fixed H.pr 0.048 V.pr 0.058

GPSQC1 NM Min SVs 6 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 1.4
 Monitor status Not monitored RMS 9.2
 Horz SD Vert SD
 Start wk 1605 sec 406165.0 End wk 1605 sec 406168.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0065809661
 VCV xx 0.0000179832 VCV xy 0.0000145773
 VCV xz -0.0000038068 VCV yy 0.0000189469
 VCV yz -0.0000083522 VCV zz 0.0000210747

GPSVEC TP Point ID 5138 DX 23619.073 DY -3475.944
 Class Normal DZ 8831.469 Code TOE PIPE NJ -
 Obs L1 Fixed H.pr 0.029 V.pr 0.035

GPSQC1 NM Min SVs 6 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 1.4
 Monitor status Not monitored RMS 16.6
 Horz SD Vert SD
 Start wk 1605 sec 406205.0 End wk 1605 sec 406208.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0039507132
 VCV xx 0.000006678 VCV xy 0.0000052867
 VCV xz -0.0000009875 VCV yy 0.0000064118
 VCV yz -0.0000025794 VCV zz 0.0000077379

FEATURE FC Name PIPE

ATTRIB FC Name TOP/INV Value INVERT OF PIPE

ATTRIB FC Name TYPE Value STORM DRAIN

ATTRIB FC Name MATERIAL Value DUCTIL IRON

```

NOTE    NM    INV OF 12" STEEL PIPE

GPSVEC  TP    Point ID 5139      DX  23625.116      DY  -3467.189
          Class Normal          DZ  8847.809      Code TOP NJ TOE E
          Obs L1 Fixed          H.pr 0.030      V.pr 0.036

GPSQC1  NM    Min SVs          6                PDOP max 1.8
          Relative DOPs Yes      HDOP max 1.2
          Total GPS pos 8        VDOP max 1.4
          Monitor status Not monitored RMS 18.2
          Horz SD                Vert SD
          Start wk 1605 sec 406262.0 End wk 1605 sec 406269.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.0055753859
          VCV xx 0.0000073046      VCV xy 0.0000058244
          VCV xz -0.0000010313     VCV yy 0.0000071257
          VCV yz -0.0000028387     VCV zz 0.0000084876

GPSVEC  TP    Point ID 5140      DX  23601.926      DY  -3471.071
          Class Normal          DZ  8835.179      Code TOP
          Obs L1 Fixed          H.pr 0.048      V.pr 0.058

GPSQC1  NM    Min SVs          6                PDOP max 2.6
          Relative DOPs Yes      HDOP max 1.6
          Total GPS pos 4        VDOP max 2.0
          Monitor status Not monitored RMS 16.3
          Horz SD                Vert SD
          Start wk 1605 sec 406289.0 End wk 1605 sec 406292.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.0046783173
          VCV xx 0.0000102468      VCV xy 0.0000118709
          VCV xz -0.000001942      VCV yy 0.0000212973
          VCV yz -0.0000052569     VCV zz 0.0000095487

GPSVEC  TP    Point ID 5141      DX  23587.212      DY  -3473.115
          Class Normal          DZ  8828.635      Code TOP
          Obs L1 Fixed          H.pr 0.036      V.pr 0.044

GPSQC1  NM    Min SVs          6                PDOP max 3.6
          Relative DOPs Yes      HDOP max 2.3
          Total GPS pos 6        VDOP max 2.8
          Monitor status Not monitored RMS 15.2
          Horz SD                Vert SD
          Start wk 1605 sec 406305.0 End wk 1605 sec 406310.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.0055122105
          VCV xx 0.0000099398      VCV xy 0.000008722
          VCV xz -0.0000017142     VCV yy 0.0000122327
          VCV yz -0.000004489      VCV zz 0.0000112947

GPSVEC  TP    Point ID 5142      DX  23562.872      DY  -3472.789
          Class Normal          DZ  8820.487      Code TOP
          Obs L1 Fixed          H.pr 0.028      V.pr 0.034

GPSQC1  NM    Min SVs          6                PDOP max 2.6
          Relative DOPs Yes      HDOP max 1.6
          Total GPS pos 6        VDOP max 2.0
          Monitor status Not monitored RMS 7.5
          Horz SD                Vert SD
          Start wk 1605 sec 406323.0 End wk 1605 sec 406328.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.0042063859
          VCV xx 0.0000062335      VCV xy 0.0000049456
          VCV xz -0.0000007644     VCV yy 0.0000060956
          VCV yz -0.0000023627     VCV zz 0.0000071262

GPSVEC  TP    Point ID 5143      DX  23518.575      DY  -3468.926
          Class Normal          DZ  8807.382      Code TOP
          Obs L1 Fixed          H.pr 0.025      V.pr 0.030

GPSQC1  NM    Min SVs          6                PDOP max 2.6
          Relative DOPs Yes      HDOP max 1.6
          Total GPS pos 5        VDOP max 2.0
          Monitor status Not monitored RMS 14.9
          Horz SD                Vert SD
          Start wk 1605 sec 406363.0 End wk 1605 sec 406367.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.003464317
          VCV xx 0.0000050428      VCV xy 0.000004004
          VCV xz -0.0000005915     VCV yy 0.0000049079
          VCV yz -0.0000019049     VCV zz 0.000005825

GPSVEC  TP    Point ID 5144      DX  23573.252      DY  -3491.606
          Class Normal          DZ  8805.852      Code TOP
          Obs L1 Fixed          H.pr 0.044      V.pr 0.053

GPSQC1  NM    Min SVs          6                PDOP max 2.6
          Relative DOPs Yes      HDOP max 1.6
          Total GPS pos 8        VDOP max 2.0
          Monitor status Not monitored RMS 10.9
          Horz SD                Vert SD
          Start wk 1605 sec 406390.0 End wk 1605 sec 406397.0

GPSQC2  NM    Ttl satellites 6      Err Scale 0.0076729609
          VCV xx 0.0000137428      VCV xy 0.000012357
          VCV xz -0.0000034646     VCV yy 0.0000169469
          VCV yz -0.0000075844     VCV zz 0.0000175456
    
```

```

GPSVEC TP Point ID 5145 DX 23574.270 DY -3479.086
Class Normal DZ 8816.856 Code NG
Obs L1 Fixed H.pr 0.046 V.pr 0.056

GPSQC1 NM Min SVs 6 PDOP max 2.6
Relative DOPs Yes HDOP max 1.6
Total GPS pos 7 VDOP max 2.0
Monitor status Not monitored RMS 13.9
Horz SD Vert SD
Start wk 1605 sec 406416.0 End wk 1605 sec 406422.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0075761499
VCV xx 0.0000170018 VCV xy 0.0000136743
VCV xz -0.000001911 VCV yy 0.0000170525
VCV yz -0.000006478 VCV zz 0.0000195568

GPSVEC TP Point ID 5146 DX 23593.968 DY -3476.375
Class Normal DZ 8827.114 Code TOP NJ
Obs L1 Fixed H.pr 0.032 V.pr 0.038

GPSQC1 NM Min SVs 6 PDOP max 1.8
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 1.4
Monitor status Not monitored RMS 8.4
Horz SD Vert SD
Start wk 1605 sec 406444.0 End wk 1605 sec 406448.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0048192167
VCV xx 0.0000080244 VCV xy 0.0000064302
VCV xz -0.0000008537 VCV yy 0.0000079624
VCV yz -0.0000030257 VCV zz 0.000009256

GPSVEC TP Point ID 5147 DX 23595.726 DY -3482.025
Class Normal DZ 8821.278 Code TOP
Obs L1 Fixed H.pr 0.046 V.pr 0.056

GPSQC1 NM Min SVs 6 PDOP max 1.8
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 10.0
Horz SD Vert SD
Start wk 1605 sec 406457.0 End wk 1605 sec 406460.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0064420453
VCV xx 0.0000170942 VCV xy 0.0000137743
VCV xz -0.0000018887 VCV yy 0.0000170819
VCV yz -0.0000065459 VCV zz 0.0000198852

NOTE NM Modified 9:55:06 AM 10/14/2010
NOTE NM Old values TOP NJ
NOTE TS Time Date 10/14/2010 Time 09:54:52

GPSVEC TP Point ID 5148 DX 23635.044 DY -3496.411
Class Normal DZ 8821.586 Code TOP TOE B
Obs L1 Fixed H.pr 0.036 V.pr 0.044

GPSQC1 NM Min SVs 6 PDOP max 1.8
Relative DOPs Yes HDOP max 1.1
Total GPS pos 3 VDOP max 1.4
Monitor status Not monitored RMS 10.3
Horz SD Vert SD
Start wk 1605 sec 406490.0 End wk 1605 sec 406492.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0045427145
VCV xx 0.0000072957 VCV xy 0.0000044143
VCV xz -0.000001237 VCV yy 0.0000091211
VCV yz -0.0000064931 VCV zz 0.0000170801

GPSVEC TP Point ID 5149 DX 23638.821 DY -3487.207
Class Normal DZ 8835.384 Code TOP
Obs L1 Fixed H.pr 0.031 V.pr 0.037

GPSQC1 NM Min SVs 6 PDOP max 1.8
Relative DOPs Yes HDOP max 1.1
Total GPS pos 3 VDOP max 1.4
Monitor status Not monitored RMS 9.3
Horz SD Vert SD
Start wk 1605 sec 406523.0 End wk 1605 sec 406525.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0038472076
VCV xx 0.0000041143 VCV xy 0.000001111
VCV xz -0.000000019 VCV yy 0.0000064584
VCV yz -0.000005875 VCV zz 0.000013375

GPSVEC TP Point ID 5150 DX 23645.255 DY -3490.329
Class Normal DZ 8834.924 Code TOP E
Obs L1 Fixed H.pr 0.034 V.pr 0.041

GPSQC1 NM Min SVs 6 PDOP max 1.8
Relative DOPs Yes HDOP max 1.1
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 16.7
Horz SD Vert SD
Start wk 1605 sec 406540.0 End wk 1605 sec 406543.0

```

```

GPSQC2 NM Ttl satellites 6 Err Scale 0.0047150042
          VCV xx 0.0000050208 VCV xy 0.0000013189
          VCV xz -0.0000001208 VCV yy 0.0000078439
          VCV yz -0.0000007062 VCV zz 0.0000162288

GPSVEC TP Point ID 5151 DX 23640.919 DY -3498.289
          Class Normal DZ 8822.281 Code TOE E
          Obs L1 Fixed H.pr 0.036 V.pr 0.043

GPSQC1 NM Min SVs 6 PDOP max 1.8
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 9.1
          Horz SD Vert SD
          Start wk 1605 sec 406563.0 End wk 1605 sec 406566.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.005030103
          VCV xx 0.0000055837 VCV xy 0.0000014854
          VCV xz -0.0000000931 VCV yy 0.0000091128
          VCV yz -0.00000078623 VCV zz 0.000017925

GPSVEC TP Point ID 5152 DX 23620.224 DY -3543.652
          Class Del normal DZ 8731.391 Code PIPE
          Obs L1 Fixed H.pr 0.028 V.pr 0.034

GPSQC1 NM Min SVs 6 PDOP max 1.8
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 15.3
          Horz SD Vert SD
          Start wk 1605 sec 406655.0 End wk 1605 sec 406658.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0039782543
          VCV xx 0.000003621 VCV xy 0.0000008767
          VCV xz 0.0000002444 VCV yy 0.0000053712
          VCV yz -0.0000045618 VCV zz 0.0000112312

FEATURE FC Name PIPE
ATTRIB FC Name TOP/INV Value TOP OF PIPE
ATTRIB FC Name TYPE Value STORM DRAIN
ATTRIB FC Name MATERIAL Value DUCTIL IRON
NOTE NM Deleted 9:58:29 AM 10/14/2010

GPSVEC TP Point ID 5152 DX 23620.203 DY -3543.659
          Class Normal DZ 8731.402 Code PIPE -
          Obs L1 Fixed H.pr 0.026 V.pr 0.031

GPSQC1 NM Min SVs 6 PDOP max 2.5
          Relative DOPs Yes HDOP max 1.6
          Total GPS pos 5 VDOP max 1.9
          Monitor status Not monitored RMS 10.8
          Horz SD Vert SD
          Start wk 1605 sec 406697.0 End wk 1605 sec 406701.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0036743933
          VCV xx 0.0000031298 VCV xy 0.000000739
          VCV xz 0.0000003068 VCV yy 0.0000045446
          VCV yz -0.0000037611 VCV zz 0.0000095065

FEATURE FC Name PIPE
ATTRIB FC Name TOP/INV Value TOP OF PIPE
ATTRIB FC Name TYPE Value STORM DRAIN
ATTRIB FC Name MATERIAL Value DUCTIL IRON
NOTE NM TOP OF 12" STEEL PIPE

INIT KI Init event Lost Week 1605
          Init type On the fly seconds 406745.0
          Init counter 0 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1605
          Init type On the fly seconds 406820.0
          Init counter 6 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

GPSVEC TP Point ID 5153 DX 23531.818 DY -3480.870
          Class Normal DZ 8797.746 Code TOP B
          Obs L1 Fixed H.pr 0.047 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 3.0
          Relative DOPs Yes HDOP max 2.0
          Total GPS pos 11 VDOP max 2.2
          Monitor status Not monitored RMS 66.5
          Horz SD Vert SD
          Start wk 1605 sec 406901.0 End wk 1605 sec 406911.0
    
```

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.010994005
          VCV xx 0.0000102739 VCV xy 0.0000046407
          VCV xz -0.00000933 VCV yy 0.0000071813
          VCV yz -0.0000112377 VCV zz 0.0000304

GPSVEC TP Point ID 5154 DX 23529.411 DY -3484.150
          Class Normal DZ 8788.527 Code TOE B
          Obs Ll Fixed H.pr 0.048 V.pr 0.051

GPSQC1 NM Min SVs 7 PDOP max 1.5
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 4 VDOP max 1.1
          Monitor status Not monitored RMS 34.4
          Horz SD Vert SD
          Start wk 1605 sec 406932.0 End wk 1605 sec 406935.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0072571011
          VCV xx 0.0000103149 VCV xy 0.0000023604
          VCV xz -0.0000011768 VCV yy 0.0000098274
          VCV yz -0.0000100691 VCV zz 0.000029741

GPSVEC TP Point ID 5155 DX 23501.189 DY -3473.598
          Class Normal DZ 8787.351 Code TOE
          Obs Ll Fixed H.pr 0.037 V.pr 0.045

GPSQC1 NM Min SVs 6 PDOP max 2.4
          Relative DOPs Yes HDOP max 1.6
          Total GPS pos 4 VDOP max 1.9
          Monitor status Not monitored RMS 10.5
          Horz SD Vert SD
          Start wk 1605 sec 406955.0 End wk 1605 sec 406959.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0058421167
          VCV xx 0.0000066619 VCV xy 0.0000024733
          VCV xz -0.0000009066 VCV yy 0.0000109978
          VCV yz -0.0000070537 VCV zz 0.0000176829

GPSVEC TP Point ID 5156 DX 23468.980 DY -3463.705
          Class Normal DZ 8781.279 Code TOE
          Obs Ll Fixed H.pr 0.034 V.pr 0.045

GPSQC1 NM Min SVs 5 PDOP max 3.5
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 6 VDOP max 2.9
          Monitor status Not monitored RMS 6.4
          Horz SD Vert SD
          Start wk 1605 sec 406979.0 End wk 1605 sec 406984.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0037355947
          VCV xx 0.0000032809 VCV xy 0.0000017945
          VCV xz -0.0000006374 VCV yy 0.0000115243
          VCV yz -0.0000049661 VCV zz 0.0000088455

GPSVEC TP Point ID 5157 DX 23471.553 DY -3457.002
          Class Normal DZ 8798.405 Code TOP
          Obs Ll Fixed H.pr 0.027 V.pr 0.029

GPSQC1 NM Min SVs 7 PDOP max 2.5
          Relative DOPs Yes HDOP max 1.7
          Total GPS pos 4 VDOP max 1.8
          Monitor status Not monitored RMS 9.4
          Horz SD Vert SD
          Start wk 1605 sec 407000.0 End wk 1605 sec 407004.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.003577298
          VCV xx 0.0000027994 VCV xy 0.0000006623
          VCV xz 0.0000007834 VCV yy 0.0000037241
          VCV yz -0.0000023045 VCV zz 0.0000072767

SURVEY EVENTKISurvey event Survey ended

SURVEY KI Elev mask 10 PDOP mask 6.0
SURVEY KI Elev mask 10 PDOP mask 6.0
SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000 Measurement True

GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374"N Lng 111°40'44.55636"W
          Class Normal Hgt 1375.166 Code <no text>
          Obs User Input H.pr <null> V.pr <null>

EQUIP SI Receiver <no text> Serial no <no text>
          Antenna Zephyr Geodetic 2
          Meas To Antenna Phase Center
          Tape adj 0.000 Serial no <no text>
          H.Offset 0.000 V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279 Measurement True

GPSREF KI Reference SRPEAST
    
```

```

INIT   KI   Init event   Gained           Week           1605
        Init type     On the fly       seconds        407121.0
        Init counter   7               Point ID       <no text>
        Survey type    Real Time       Plate H.Dist   <null>
        Plate V.Dist   <null>         Plate azimuth  <null>

EQUIP  NM   Receiver    5800            Serial no 4447140732
        Antenna       R8/5800/SPS78x Internal
        Meas To       Bottom of antenna mount
        Tape adj      0.000          Serial no <no text>
        H.Offset      0.000          V.Offset 0.213

NOTE   NM   Receiver firmware version=2.320

GPSANT KI   Antenna ht 6.890           Measuremt Uncorrected

GPSVEC TP   Point ID 5158           DX 23440.277       DY -3446.056
        Class Normal           DZ 8799.279       Code TOP
        Obs L1 Fixed           H.pr 0.028        V.pr 0.030

GPSQC1 NM   Min SVs           7                 PDOP max 1.5
        Relative DOPs Yes       HDOP max 1.0
        Total GPS pos 3         VDOP max 1.1
        Monitor status Not monitored
        Horz SD                 RMS 12.9
        Start wk 1605 sec 407129.0
        End wk 1605 sec 407131.0

GPSQC2 NM   Ttl satellites 7           Err Scale 0.0039032963
        VCV xx 0.0000036193     VCV xy 0.000000927
        VCV xz 0.0000010769     VCV yy 0.0000056317
        VCV yz -0.000002625     VCV zz 0.0000083765

GPSVEC TP   Point ID 5159           DX 23414.579       DY -3438.155
        Class Normal           DZ 8800.989       Code TOP
        Obs L1 Fixed           H.pr 0.037        V.pr 0.044

GPSQC1 NM   Min SVs           6                 PDOP max 1.7
        Relative DOPs Yes       HDOP max 1.1
        Total GPS pos 4         VDOP max 1.3
        Monitor status Not monitored
        Horz SD                 RMS 14.4
        Start wk 1605 sec 407150.0
        End wk 1605 sec 407153.0

GPSQC2 NM   Ttl satellites 6           Err Scale 0.0052895164
        VCV xx 0.0000066137     VCV xy 0.0000020413
        VCV xz 0.0000009322     VCV yy 0.0000112285
        VCV yz -0.0000056414     VCV zz 0.0000163645

GPSVEC TP   Point ID 5160           DX 23378.114       DY -3427.228
        Class Normal           DZ 8803.587       Code TOP
        Obs L1 Fixed           H.pr 0.040        V.pr 0.044

GPSQC1 NM   Min SVs           7                 PDOP max 1.7
        Relative DOPs Yes       HDOP max 1.2
        Total GPS pos 4         VDOP max 1.3
        Monitor status Not monitored
        Horz SD                 RMS 17.9
        Start wk 1605 sec 407173.0
        End wk 1605 sec 407176.0

GPSQC2 NM   Ttl satellites 7           Err Scale 0.005471115
        VCV xx 0.0000062696     VCV xy 0.0000018227
        VCV xz 0.0000014721     VCV yy 0.0000107225
        VCV yz -0.0000048388     VCV zz 0.0000147408

GPSVEC TP   Point ID 5161           DX 23349.973       DY -3417.575
        Class Normal           DZ 8805.186       Code TOP
        Obs L1 Fixed           H.pr 0.039        V.pr 0.042

GPSQC1 NM   Min SVs           7                 PDOP max 1.5
        Relative DOPs Yes       HDOP max 1.0
        Total GPS pos 5         VDOP max 1.1
        Monitor status Not monitored
        Horz SD                 RMS 21.8
        Start wk 1605 sec 407194.0
        End wk 1605 sec 407198.0

GPSQC2 NM   Ttl satellites 7           Err Scale 0.0066457987
        VCV xx 0.0000074567     VCV xy 0.00000162
        VCV xz 0.0000013294     VCV yy 0.0000085345
        VCV yz -0.0000052984     VCV zz 0.000017817

GPSVEC TP   Point ID 5162           DX 23269.249       DY -3385.844
        Class Normal           DZ 8805.589       Code TOP
        Obs L1 Fixed           H.pr 0.032        V.pr 0.038

GPSQC1 NM   Min SVs           6                 PDOP max 2.5
        Relative DOPs Yes       HDOP max 1.6
        Total GPS pos 4         VDOP max 1.9
        Monitor status Not monitored
        Horz SD                 RMS 14.4
        Start wk 1605 sec 407230.0
        End wk 1605 sec 407233.0

GPSQC2 NM   Ttl satellites 6           Err Scale 0.0041063321
        VCV xx 0.0000057841     VCV xy 0.0000015423
        VCV xz 0.0000020267     VCV yy 0.0000068267
        VCV yz -0.0000031966     VCV zz 0.0000130003

GPSVEC TP   Point ID 5163           DX 23439.400       DY -3455.291
        Class Normal           DZ 8775.353       Code TOE
        Obs L1 Fixed           H.pr 0.148        V.pr 0.167
    
```

| | | | | | |
|--------|----|----------------|-------------------|-----------|-------------------|
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 4.7 |
| | | Relative DOPs | Yes | HDOP max | 3.0 |
| | | Total GPS pos | 8 | VDOP max | 3.6 |
| | | Monitor status | Not monitored | RMS | 24.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407302.0 | End wk | 1605 sec 407310.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0163048971 |
| | | VCV xx | 0.0000798977 | VCV xy | 0.0000437489 |
| | | VCV xz | -0.0001143992 | VCV yy | 0.0000244802 |
| | | VCV yz | -0.0000632843 | VCV zz | 0.0001658425 |
| GPSVEC | TP | Point ID | 5164 | DX | 23381.834 |
| | | Class | Normal | DZ | 8770.784 |
| | | Obs | L1 Fixed | Code | TOE |
| | | | | H.pr | 0.037 |
| | | | | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 5 | PDOP max | 3.4 |
| | | Relative DOPs | Yes | HDOP max | 1.8 |
| | | Total GPS pos | 6 | VDOP max | 2.8 |
| | | Monitor status | Not monitored | RMS | 10.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407332.0 | End wk | 1605 sec 407337.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0053397999 |
| | | VCV xx | 0.0000060345 | VCV xy | 0.0000019186 |
| | | VCV xz | 0.0000022991 | VCV yy | 0.0000107578 |
| | | VCV yz | -0.0000034109 | VCV zz | 0.0000126696 |
| GPSVEC | TP | Point ID | 5165 | DX | 23360.824 |
| | | Class | Normal | DZ | 8765.060 |
| | | Obs | L1 Fixed | Code | TOE |
| | | | | H.pr | 0.025 |
| | | | | V.pr | 0.028 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 6 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 11.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407348.0 | End wk | 1605 sec 407353.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0044374857 |
| | | VCV xx | 0.0000036614 | VCV xy | 0.0000006616 |
| | | VCV xz | 0.0000013919 | VCV yy | 0.0000033101 |
| | | VCV yz | -0.0000018297 | VCV zz | 0.0000078422 |
| GPSVEC | TP | Point ID | 5166 | DX | 23333.257 |
| | | Class | Normal | DZ | 8756.684 |
| | | Obs | L1 Fixed | Code | TOE |
| | | | | H.pr | 0.031 |
| | | | | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.2 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 5 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 20.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407369.0 | End wk | 1605 sec 407373.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0048166919 |
| | | VCV xx | 0.0000046639 | VCV xy | 0.0000003658 |
| | | VCV xz | 0.0000020141 | VCV yy | 0.0000067921 |
| | | VCV yz | -0.0000033255 | VCV zz | 0.000010151 |
| GPSVEC | TP | Point ID | 5167 | DX | 23293.635 |
| | | Class | Normal | DZ | 8757.099 |
| | | Obs | L1 Fixed | Code | TOE |
| | | | | H.pr | 0.028 |
| | | | | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 15.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407390.0 | End wk | 1605 sec 407394.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0036224874 |
| | | VCV xx | 0.0000039512 | VCV xy | 0.0000011336 |
| | | VCV xz | 0.0000015902 | VCV yy | 0.0000047224 |
| | | VCV yz | -0.0000016449 | VCV zz | 0.0000079363 |
| GPSVEC | TP | Point ID | 5168 | DX | 23274.347 |
| | | Class | Normal | DZ | 8761.468 |
| | | Obs | L1 Fixed | Code | TOE |
| | | | | H.pr | 0.043 |
| | | | | V.pr | 0.047 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.4 |
| | | Relative DOPs | Yes | HDOP max | 2.3 |
| | | Total GPS pos | 4 | VDOP max | 2.5 |
| | | Monitor status | Not monitored | RMS | 14.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk | 1605 sec 407406.0 | End wk | 1605 sec 407409.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0038387547 |
| | | VCV xx | 0.0000037148 | VCV xy | 0.0000020397 |
| | | VCV xz | 0.0000013805 | VCV yy | 0.0000152659 |
| | | VCV yz | -0.000002932 | VCV zz | 0.0000073721 |
| GPSVEC | TP | Point ID | 5169 | DX | 23251.011 |
| | | Class | Normal | DZ | 8761.448 |
| | | Obs | L1 Fixed | Code | TOE E |
| | | | | H.pr | 0.025 |
| | | | | V.pr | 0.028 |

GPSQC1 NM Min SVs 7 PDOP max 2.4
 Relative DOPs Yes HDOP max 1.6
 Total GPS pos 5 VDOP max 1.8
 Monitor status Not monitored RMS 14.8
 Horz SD Vert SD
 Start wk 1605 sec 407427.0 End wk 1605 sec 407431.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0043827319
 VCV xx 0.0000027349 VCV xy 0.0000009854
 VCV xz 0.0000010538 VCV yy 0.0000061743
 VCV yz -0.0000015193 VCV zz 0.0000054211

GPSVEC TP Point ID 5170 DX 23327.976 DY -3402.149
 Class Normal DZ 8815.482 Code NG
 Obs L1 Fixed H.pr 0.035 V.pr 0.040

GPSQC1 NM Min SVs 7 PDOP max 1.5
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 4 VDOP max 1.1
 Monitor status Not monitored RMS 27.7
 Horz SD Vert SD
 Start wk 1605 sec 407475.0 End wk 1605 sec 407478.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0057035345
 VCV xx 0.0000077185 VCV xy 0.000001476
 VCV xz 0.0000027186 VCV yy 0.0000060847
 VCV yz -0.0000031655 VCV zz 0.0000151768

NOTE TS Time Date 10/14/2010 Time 10:44:46

GPSVEC TP Point ID 5171 DX 24921.432 DY -4014.881
 Class Normal DZ 8818.121 Code RIPRAP B -
 Obs L1 Fixed H.pr 0.028 V.pr 0.042

GPSQC1 NM Min SVs 8 PDOP max 2.1
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 3 VDOP max 1.7
 Monitor status Not monitored RMS 22.3
 Horz SD Vert SD
 Start wk 1605 sec 409484.0 End wk 1605 sec 409487.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0049777343
 VCV xx 0.0000115227 VCV xy 0.0000059615
 VCV xz 0.000000308 VCV yy 0.0000102519
 VCV yz 0.0000001204 VCV zz 0.0000043181

NOTE NM GROUTED RIVER ROCK

GPSVEC TP Point ID 5172 DX 24939.917 DY -4022.063
 Class Normal DZ 8818.189 Code RIPRAP
 Obs L1 Fixed H.pr 0.034 V.pr 0.053

GPSQC1 NM Min SVs 8 PDOP max 2.1
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 24.1
 Horz SD Vert SD
 Start wk 1605 sec 409546.0 End wk 1605 sec 409550.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0069217817
 VCV xx 0.0000174193 VCV xy 0.0000114967
 VCV xz 0.0000010038 VCV yy 0.0000175131
 VCV yz 0.0000005486 VCV zz 0.0000057834

GPSVEC TP Point ID 5173 DX 24953.083 DY -4018.177
 Class Normal DZ 8830.602 Code RIPRAP
 Obs L1 Fixed H.pr 0.033 V.pr 0.051

GPSQC1 NM Min SVs 8 PDOP max 2.1
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 28.2
 Horz SD Vert SD
 Start wk 1605 sec 409563.0 End wk 1605 sec 409567.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0067041405
 VCV xx 0.0000177217 VCV xy 0.0000110764
 VCV xz -0.0000017007 VCV yy 0.0000144672
 VCV yz -0.0000010045 VCV zz 0.0000060962

GPSVEC TP Point ID 5174 DX 24960.892 DY -4021.506
 Class Normal DZ 8830.379 Code RIPRAP
 Obs L1 Fixed H.pr 0.028 V.pr 0.044

GPSQC1 NM Min SVs 8 PDOP max 2.1
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 16.9
 Horz SD Vert SD
 Start wk 1605 sec 409575.0 End wk 1605 sec 409579.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0057349019
 VCV xx 0.0000126078 VCV xy 0.0000080158
 VCV xz 0.0000005953 VCV yy 0.0000114335
 VCV yz 0.0000003111 VCV zz 0.0000040201

GPSVEC TP Point ID 5175 DX 24978.557 DY -4022.566
 Class Normal DZ 8825.056 Code RIPRAP
 Obs L1 Fixed H.pr 0.036 V.pr 0.060

```

GPSQC1 NM Min SVs 6 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 4 VDOP max 2.1
          Monitor status Not monitored RMS 19.6
          Horz SD Vert SD
          Start wk 1605 sec 409613.0 End wk 1605 sec 409616.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0042115175
          VCV xx 0.0000132774 VCV xy 0.0000079979
          VCV xz -0.0000029984 VCV yy 0.000010076
          VCV yz -0.000001245 VCV zz 0.0000085135

GPSVEC TP Point ID 5176 DX 24986.115 DY -4033.210
          Class Normal DZ 8813.913 Code RIPRAP
          Obs L1 Fixed H.pr 0.044 V.pr 0.069

GPSQC1 NM Min SVs 7 PDOP max 2.0
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 11 VDOP max 1.7
          Monitor status Not monitored RMS 18.5
          Horz SD Vert SD
          Start wk 1605 sec 409630.0 End wk 1605 sec 409641.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0105579523
          VCV xx 0.0000237552 VCV xy 0.0000152648
          VCV xz -0.0000032673 VCV yy 0.0000194429
          VCV yz -0.0000016527 VCV zz 0.0000085366

GPSVEC TP Point ID 5177 DX 25018.703 DY -4046.492
          Class Normal DZ 8813.741 Code RIPRAP
          Obs L1 Fixed H.pr 0.034 V.pr 0.052

GPSQC1 NM Min SVs 8 PDOP max 2.8
          Relative DOPs Yes HDOP max 1.5
          Total GPS pos 5 VDOP max 2.3
          Monitor status Not monitored RMS 13.9
          Horz SD Vert SD
          Start wk 1605 sec 409660.0 End wk 1605 sec 409664.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0050529065
          VCV xx 0.0000139691 VCV xy 0.0000089085
          VCV xz -0.0000014749 VCV yy 0.0000114136
          VCV yz -0.0000009435 VCV zz 0.0000042407

GPSVEC TP Point ID 5178 DX 25048.704 DY -4057.647
          Class Normal DZ 8813.417 Code RIPRAP
          Obs L1 Fixed H.pr 0.029 V.pr 0.041

GPSQC1 NM Min SVs 9 PDOP max 1.2
          Relative DOPs Yes HDOP max 0.7
          Total GPS pos 4 VDOP max 1.0
          Monitor status Not monitored RMS 15.4
          Horz SD Vert SD
          Start wk 1605 sec 409680.0 End wk 1605 sec 409683.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0066084852
          VCV xx 0.0000120828 VCV xy 0.0000076479
          VCV xz 0.0000004564 VCV yy 0.0000106514
          VCV yz 0.0000001909 VCV zz 0.0000031566

GPSVEC TP Point ID 5179 DX 25058.823 DY -4033.855
          Class Normal DZ 8835.254 Code RIPRAP TOE B
          Obs L1 Fixed H.pr 0.022 V.pr 0.042

GPSQC1 NM Min SVs 7 PDOP max 2.8
          Relative DOPs Yes HDOP max 1.3
          Total GPS pos 4 VDOP max 2.5
          Monitor status Not monitored RMS 14.5
          Horz SD Vert SD
          Start wk 1605 sec 409718.0 End wk 1605 sec 409721.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0033807931
          VCV xx 0.0000097517 VCV xy 0.000005261
          VCV xz -0.0000004479 VCV yy 0.000010262
          VCV yz -0.000001363 VCV zz 0.000002918

GPSVEC TP Point ID 5180 DX 25009.991 DY -4013.534
          Class Normal DZ 8835.312 Code TOE
          Obs L1 Fixed H.pr 0.037 V.pr 0.060

GPSQC1 NM Min SVs 8 PDOP max 2.0
          Relative DOPs Yes HDOP max 1.0
          Total GPS pos 4 VDOP max 1.7
          Monitor status Not monitored RMS 28.6
          Horz SD Vert SD
          Start wk 1605 sec 409752.0 End wk 1605 sec 409755.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0072682598
          VCV xx 0.0000225449 VCV xy 0.0000136538
          VCV xz -0.0000022644 VCV yy 0.0000202107
          VCV yz -0.0000020999 VCV zz 0.0000085317

NOTE NM Modified 10:50:30 AM 10/14/2010

NOTE NM Old values RIPRAP

GPSVEC TP Point ID 5181 DX 24996.123 DY -4010.820
          Class Normal DZ 8833.395 Code TOE
          Obs L1 Fixed H.pr 0.025 V.pr 0.041
    
```

```

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.3
Monitor status Not monitored RMS 12.6
Horz SD Vert SD
Start wk 1605 sec 409766.0 End wk 1605 sec 409769.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0049157003
VCV xx 0.0000103963 VCV xy 0.0000062774
VCV xz -0.0000008665 VCV yy 0.0000095806
VCV yz -0.0000009232 VCV zz 0.0000036105

NOTE NM Modified 10:50:37 AM 10/14/2010

NOTE NM Old values RIPRAP

GPSVEC TP Point ID 5182 DX 24997.555 DY -4002.939
Class Normal DZ 8843.384 Code TOE
Obs L1 Fixed H.pr 0.023 V.pr 0.038

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.3
Monitor status Not monitored RMS 19.9
Horz SD Vert SD
Start wk 1605 sec 409779.0 End wk 1605 sec 409782.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0046018157
VCV xx 0.000010539 VCV xy 0.0000053765
VCV xz -0.0000010584 VCV yy 0.0000067417
VCV yz -0.0000006767 VCV zz 0.0000034956

NOTE NM Modified 10:50:43 AM 10/14/2010

NOTE NM Old values RIPRAP

GPSVEC TP Point ID 5183 DX 25004.638 DY -3983.281
Class Normal DZ 8874.823 Code TOE
Obs L1 Fixed H.pr 0.022 V.pr 0.044

GPSQC1 NM Min SVs 7 PDOP max 2.0
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.8
Monitor status Not monitored RMS 18.4
Horz SD Vert SD
Start wk 1605 sec 409802.0 End wk 1605 sec 409805.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0038434791
VCV xx 0.0000113535 VCV xy 0.0000074341
VCV xz -0.0000010061 VCV yy 0.0000100936
VCV yz -0.0000008553 VCV zz 0.0000033129

NOTE NM Modified 10:50:50 AM 10/14/2010

NOTE NM Old values RIPRAP

GPSVEC TP Point ID 5184 DX 25007.905 DY -3981.256
Class Normal DZ 8881.097 Code TOE
Obs L1 Fixed H.pr 0.027 V.pr 0.054

GPSQC1 NM Min SVs 7 PDOP max 2.9
Relative DOPs Yes HDOP max 1.3
Total GPS pos 6 VDOP max 2.6
Monitor status Not monitored RMS 10.0
Horz SD Vert SD
Start wk 1605 sec 409814.0 End wk 1605 sec 409819.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.005215806
VCV xx 0.0000171542 VCV xy 0.0000115764
VCV xz -0.0000018308 VCV yy 0.0000158729
VCV yz -0.0000013444 VCV zz 0.0000052413

NOTE NM Modified 10:50:57 AM 10/14/2010

NOTE NM Old values RIPRAP

GPSVEC TP Point ID 5185 DX 25017.409 DY -3985.813
Class Normal DZ 8879.040 Code TOE
Obs L1 Fixed H.pr 0.026 V.pr 0.052

GPSQC1 NM Min SVs 7 PDOP max 2.9
Relative DOPs Yes HDOP max 1.3
Total GPS pos 5 VDOP max 2.6
Monitor status Not monitored RMS 22.2
Horz SD Vert SD
Start wk 1605 sec 409873.0 End wk 1605 sec 409877.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0044670226
VCV xx 0.0000153535 VCV xy 0.0000109485
VCV xz -0.0000014906 VCV yy 0.0000152968
VCV yz -0.000001112 VCV zz 0.0000040906

GPSVEC TP Point ID 5186 DX 25068.251 DY -4006.403
Class Normal DZ 8877.869 Code TOE E RIPRAP
Obs L1 Fixed H.pr 0.027 V.pr 0.047
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 22.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409915.0 | End wk 1605 sec | 409918.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0054546422 |
| | | VCV xx | 0.0000154433 | VCV xy | 0.0000080708 |
| | | VCV xz | -0.0000010145 | VCV yy | 0.0000109527 |
| | | VCV yz | -0.0000011162 | VCV zz | 0.0000044222 |
| GPSVEC | TP | Point ID 5187 | DX 25073.764 | DY | -3997.762 |
| | | Class Normal | DZ 8912.333 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.022 | V.pr | 0.038 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 10.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409946.0 | End wk 1605 sec | 409949.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0038387815 |
| | | VCV xx | 0.0000106526 | VCV xy | 0.0000076827 |
| | | VCV xz | -0.0000012316 | VCV yy | 0.0000074617 |
| | | VCV yz | -0.0000009237 | VCV zz | 0.0000012126 |
| GPSVEC | TP | Point ID 5188 | DX 25075.343 | DY | -3995.372 |
| | | Class Normal | DZ 8919.739 | Code | TOP B |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.053 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.0 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 5 | VDOP max | 2.7 |
| | | Monitor status | Not monitored | RMS | 12.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409966.0 | End wk 1605 sec | 409970.0 |
| GPSQC2 | NM | Ttl satellites | 7 | Err Scale | 0.0044302032 |
| | | VCV xx | 0.0000155676 | VCV xy | 0.0000113017 |
| | | VCV xz | -0.0000017183 | VCV yy | 0.0000161308 |
| | | VCV yz | -0.0000014763 | VCV zz | 0.0000042159 |
| GPSVEC | TP | Point ID 5189 | DX 25039.458 | DY | -3984.417 |
| | | Class Normal | DZ 8911.587 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.037 | V.pr | 0.066 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 3.0 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 6 | VDOP max | 2.7 |
| | | Monitor status | Not monitored | RMS | 24.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 409997.0 | End wk 1605 sec | 410002.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0081074331 |
| | | VCV xx | 0.0000274137 | VCV xy | 0.0000156522 |
| | | VCV xz | -0.0000026109 | VCV yy | 0.0000232806 |
| | | VCV yz | -0.0000025018 | VCV zz | 0.0000080242 |
| GPSVEC | TP | Point ID 5190 | DX 25008.579 | DY | -3971.783 |
| | | Class Normal | DZ 8912.424 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.024 | V.pr | 0.042 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 13.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410021.0 | End wk 1605 sec | 410025.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0047138934 |
| | | VCV xx | 0.0000124252 | VCV xy | 0.0000063646 |
| | | VCV xz | -0.0000013764 | VCV yy | 0.0000076217 |
| | | VCV yz | -0.0000008227 | VCV zz | 0.0000040079 |
| GPSVEC | TP | Point ID 5191 | DX 24997.344 | DY | -3976.506 |
| | | Class Normal | DZ 8899.289 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.034 | V.pr | 0.060 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 5 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 29.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 410044.0 | End wk 1605 sec | 410048.0 |
| GPSQC2 | NM | Ttl satellites | 8 | Err Scale | 0.0072963317 |
| | | VCV xx | 0.0000249988 | VCV xy | 0.0000135315 |
| | | VCV xz | -0.0000032379 | VCV yy | 0.0000162879 |
| | | VCV yz | -0.0000019046 | VCV zz | 0.0000071931 |
| GPSVEC | TP | Point ID 5192 | DX 24978.619 | DY | -3976.744 |
| | | Class Normal | DZ 8903.354 | Code | RIPRAP |
| | | Obs L1 Fixed | H.pr 0.027 | V.pr | 0.049 |

```

GPSQC1 NM Min SVs 8 PDOP max 2.0
Relative DOPs Yes HDOP max 1.0
Total GPS pos 3 VDOP max 1.8
Monitor status Not monitored RMS 16.5
Horz SD Vert SD
Start wk 1605 sec 410075.0 End wk 1605 sec 410078.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0044597252
VCV xx 0.000023267 VCV xy 0.000001469
VCV xz 0.000000605 VCV yy 0.000022851
VCV yz -0.0000051294 VCV zz 0.0000016997

GPSVEC TP Point ID 5193 DX 25033.691 DY -3978.713
Class Normal DZ 8925.827 Code TOP
Obs L1 Fixed H.pr 0.032 V.pr 0.058

GPSQC1 NM Min SVs 7 PDOP max 1.9
Relative DOPs Yes HDOP max 0.9
Total GPS pos 4 VDOP max 1.6
Monitor status Not monitored RMS 11.3
Horz SD Vert SD
Start wk 1605 sec 410109.0 End wk 1605 sec 410112.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0053832773
VCV xx 0.0000227845 VCV xy 0.0000084019
VCV xz -0.0000172904 VCV yy 0.0000036332
VCV yz -0.0000060833 VCV zz 0.0000148067

GPSVEC TP Point ID 5194 DX 25009.925 DY -3968.671
Class Normal DZ 8931.767 Code TOP
Obs L1 Fixed H.pr 0.031 V.pr 0.061

GPSQC1 NM Min SVs 7 PDOP max 2.2
Relative DOPs Yes HDOP max 0.9
Total GPS pos 7 VDOP max 2.0
Monitor status Not monitored RMS 20.1
Horz SD Vert SD
Start wk 1605 sec 410126.0 End wk 1605 sec 410132.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0056437734
VCV xx 0.0000150268 VCV xy 0.0000119161
VCV xz -0.0000017926 VCV yy 0.0000177223
VCV yz -0.0000016599 VCV zz 0.0000036398

GPSVEC TP Point ID 5195 DX 24996.682 DY -3963.966
Class Normal DZ 8933.090 Code TOP
Obs L1 Fixed H.pr 0.021 V.pr 0.039

GPSQC1 NM Min SVs 8 PDOP max 1.7
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 16.6
Horz SD Vert SD
Start wk 1605 sec 410144.0 End wk 1605 sec 410147.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0041798493
VCV xx 0.0000103906 VCV xy 0.0000053548
VCV xz -0.0000012372 VCV yy 0.0000064278
VCV yz -0.0000007898 VCV zz 0.0000030959

GPSVEC TP Point ID 5196 DX 24991.737 DY -3964.710
Class Normal DZ 8930.010 Code TOP
Obs L1 Fixed H.pr 0.031 V.pr 0.056

GPSQC1 NM Min SVs 8 PDOP max 1.7
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.5
Monitor status Not monitored RMS 19.5
Horz SD Vert SD
Start wk 1605 sec 410156.0 End wk 1605 sec 410158.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0054137311
VCV xx 0.0000214758 VCV xy 0.0000116633
VCV xz -0.0000028809 VCV yy 0.0000140515
VCV yz -0.0000017303 VCV zz 0.0000064374

GPSVEC TP Point ID 5197 DX 24978.625 DY -3975.262
Class Normal DZ 8907.239 Code TOP
Obs L1 Fixed H.pr 0.029 V.pr 0.054

GPSQC1 NM Min SVs 8 PDOP max 1.7
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 26.1
Horz SD Vert SD
Start wk 1605 sec 410175.0 End wk 1605 sec 410178.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0058408673
VCV xx 0.0000191142 VCV xy 0.0000112516
VCV xz -0.0000029045 VCV yy 0.0000140068
VCV yz -0.0000016508 VCV zz 0.0000062854

GPSVEC TP Point ID 5198 DX 24973.424 DY -3973.046
Class Normal DZ 8907.198 Code TOP
Obs L1 Fixed H.pr 0.023 V.pr 0.042

```



```

GPSQC1 NM Min SVs 8 PDOP max 2.5
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.2
Monitor status Not monitored RMS 14.3
Horz SD Vert SD
Start wk 1605 sec 410321.0 End wk 1605 sec 410325.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0040039853
VCV xx 0.0000101205 VCV xy 0.0000058614
VCV xz -0.0000016329 VCV yy 0.0000068245
VCV yz -0.0000010533 VCV zz 0.0000027894

GPSVEC TP Point ID 5205 DX 25019.585 DY -3847.510
Class Normal DZ 9109.958 Code TOP
Obs L1 Fixed H.pr 0.026 V.pr 0.059

GPSQC1 NM Min SVs 5 PDOP max 3.7
Relative DOPs Yes HDOP max 1.5
Total GPS pos 5 VDOP max 3.3
Monitor status Not monitored RMS 7.0
Horz SD Vert SD
Start wk 1605 sec 410357.0 End wk 1605 sec 410361.0

GPSQC2 NM Ttl satellites 5 Err Scale 0.0030829615
VCV xx 0.0000075478 VCV xy 0.0000119699
VCV xz -0.0000018181 VCV yy 0.0000033101
VCV yz -0.0000044435 VCV zz 0.0000016375

GPSVEC TP Point ID 5206 DX 25043.686 DY -3789.807
Class Normal DZ 9204.734 Code TOP TOE B
Obs L1 Fixed H.pr 0.030 V.pr 0.059

GPSQC1 NM Min SVs 8 PDOP max 2.5
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 2.3
Monitor status Not monitored RMS 9.9
Horz SD Vert SD
Start wk 1605 sec 410416.0 End wk 1605 sec 410419.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0059163696
VCV xx 0.0000185226 VCV xy 0.0000134269
VCV xz -0.0000029217 VCV yy 0.0000218429
VCV yz -0.0000035495 VCV zz 0.000004523

GPSVEC TP Point ID 5207 DX 25056.365 DY -3793.690
Class Normal DZ 9206.345 Code TOP NJ TOE1 B
Obs L1 Fixed H.pr 0.021 V.pr 0.042

GPSQC1 NM Min SVs 8 PDOP max 2.6
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 2.3
Monitor status Not monitored RMS 15.2
Horz SD Vert SD
Start wk 1605 sec 410448.0 End wk 1605 sec 410451.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0037748718
VCV xx 0.0000109386 VCV xy 0.0000074853
VCV xz -0.0000018784 VCV yy 0.0000095003
VCV yz -0.0000014341 VCV zz 0.000002729

GPSVEC TP Point ID 5208 DX 25030.859 DY -3852.218
Class Normal DZ 9109.582 Code TOP
Obs L1 Fixed H.pr 0.023 V.pr 0.045

GPSQC1 NM Min SVs 7 PDOP max 2.3
Relative DOPs Yes HDOP max 1.1
Total GPS pos 4 VDOP max 2.0
Monitor status Not monitored RMS 43.7
Horz SD Vert SD
Start wk 1605 sec 410488.0 End wk 1605 sec 410491.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0041445587
VCV xx 0.0000083302 VCV xy 0.0000035567
VCV xz -0.0000049529 VCV yy 0.0000040288
VCV yz -0.0000010725 VCV zz 0.0000131555

GPSVEC TP Point ID 5209 DX 25044.453 DY -3854.553
Class Normal DZ 9108.827 Code TOE1
Obs L1 Fixed H.pr 0.028 V.pr 0.055

GPSQC1 NM Min SVs 8 PDOP max 1.8
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.6
Monitor status Not monitored RMS 12.6
Horz SD Vert SD
Start wk 1605 sec 410507.0 End wk 1605 sec 410509.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0048363982
VCV xx 0.0000182008 VCV xy 0.0000124867
VCV xz -0.0000030542 VCV yy 0.0000163424
VCV yz -0.0000025833 VCV zz 0.0000044569

GPSVEC TP Point ID 5210 DX 25005.136 DY -3838.680
Class Normal DZ 9108.257 Code TOE
Obs L1 Fixed H.pr 0.025 V.pr 0.053

```



```

GPSVEC TP Point ID 5215      DX 24993.657      DY 3955.679
        Class Normal      DZ 8945.231      Code TOP
        Obs L1 Fixed      H.pr 0.025      V.pr 0.053

GPSQC1 NM Min SVs      8      PDOP max 2.1
        Relative DOPs Yes      HDOP max 0.9
        Total GPS pos 4      VDOP max 1.9
        Monitor status Not monitored      RMS 10.4
        Horz SD      Vert SD
        Start wk 1605 sec 410709.0      End wk 1605 sec 410712.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.0045022033
        VCV xx 0.0000150291      VCV xy 0.0000096812
        VCV xz 0.0000002055      VCV yy 0.0000110746
        VCV yz -0.0000002674      VCV zz 0.0000061885

GPSVEC TP Point ID 5216      DX 25034.353      DY -3971.568
        Class Normal      DZ 8935.680      Code TOP
        Obs L1 Fixed      H.pr 0.030      V.pr 0.063

GPSQC1 NM Min SVs      8      PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 4      VDOP max 1.7
        Monitor status Not monitored      RMS 22.3
        Horz SD      Vert SD
        Start wk 1605 sec 410729.0      End wk 1605 sec 410732.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.005857233
        VCV xx 0.0000249699      VCV xy 0.0000166627
        VCV xz -0.0000041642      VCV yy 0.0000192829
        VCV yz -0.0000031784      VCV zz 0.00000605

GPSVEC TP Point ID 5217      DX 25027.545      DY -3937.017
        Class Normal      DZ 8976.846      Code TOE1
        Obs L1 Fixed      H.pr 0.029      V.pr 0.061

GPSQC1 NM Min SVs      8      PDOP max 10.1
        Relative DOPs Yes      HDOP max 4.2
        Total GPS pos 5      VDOP max 9.2
        Monitor status Not monitored      RMS 24.7
        Horz SD      Vert SD
        Start wk 1605 sec 410766.0      End wk 1605 sec 410770.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.0059724762
        VCV xx 0.0000156042      VCV xy 0.0000119718
        VCV xz -0.0000015577      VCV yy 0.0000275671
        VCV yz -0.0000051893      VCV zz 0.0000037287

GPSVEC TP Point ID 5218      DX 25045.758      DY -3951.793
        Class Normal      DZ 8965.799      Code TOE1
        Obs L1 Fixed      H.pr 0.025      V.pr 0.053

GPSQC1 NM Min SVs      8      PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 4      VDOP max 1.8
        Monitor status Not monitored      RMS 23.1
        Horz SD      Vert SD
        Start wk 1605 sec 410789.0      End wk 1605 sec 410792.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.0048478288
        VCV xx 0.0000159354      VCV xy 0.0000106394
        VCV xz -0.0000038959      VCV yy 0.0000127256
        VCV yz -0.0000019505      VCV zz 0.000006655

GPSVEC TP Point ID 5219      DX 25040.592      DY -3961.385
        Class Normal      DZ 8949.265      Code TOE1
        Obs L1 Fixed      H.pr 0.026      V.pr 0.055

GPSQC1 NM Min SVs      8      PDOP max 2.7
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 5      VDOP max 2.5
        Monitor status Not monitored      RMS 16.9
        Horz SD      Vert SD
        Start wk 1605 sec 410803.0      End wk 1605 sec 410807.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.0050099911
        VCV xx 0.0000189832      VCV xy 0.0000119581
        VCV xz -0.0000027406      VCV yy 0.000014216
        VCV yz -0.0000024246      VCV zz 0.0000047481

GPSVEC TP Point ID 5220      DX 25076.526      DY -3987.124
        Class Normal      DZ 8931.785      Code TOE1 E TOP E
        Obs L1 Fixed      H.pr 0.028      V.pr 0.060

GPSQC1 NM Min SVs      8      PDOP max 2.8
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 5      VDOP max 2.5
        Monitor status Not monitored      RMS 29.4
        Horz SD      Vert SD
        Start wk 1605 sec 410848.0      End wk 1605 sec 410852.0

GPSQC2 NM Ttl satellites 8      Err Scale 0.0053777872
        VCV xx 0.0000216963      VCV xy 0.0000147615
        VCV xz -0.0000035383      VCV yy 0.0000178211
        VCV yz -0.0000031531      VCV zz 0.0000049967

GPSVEC TP Point ID 5221      DX 24957.664      DY -3929.055
        Class Normal      DZ 8947.955      Code TOE
        Obs L1 Fixed      H.pr 0.048      V.pr 0.104
    
```



```

GPSQC1 NM Min SVs      8          PDOP max  2.0
          Relative DOPs Yes       HDOP max  0.8
          Total GPS pos  4        VDOP max  1.8
          Monitor status Not monitored RMS      20.3
          Horz SD                               Vert SD
          Start wk 1605 sec 411023.0          End wk 1605 sec 411026.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0049590478
          VCV xx  0.0000181811       VCV xy  0.0000139228
          VCV xz  -0.0000038723     VCV yy  0.0000181234
          VCV yz  -0.0000036104     VCV zz  0.0000040988

GPSVEC TP Point ID 5228          DX  24930.603      DY  -3989.199
          Class Normal          DZ  8839.796      Code TOE E RIPRAP CLS
          Obs L1 Fixed          H.pr 0.029      V.pr 0.063

F-CODE TP Code TOE E RIPRAP CLS E

GPSQC1 NM Min SVs      8          PDOP max  2.0
          Relative DOPs Yes       HDOP max  0.8
          Total GPS pos  4        VDOP max  1.9
          Monitor status Not monitored RMS      25.2
          Horz SD                               Vert SD
          Start wk 1605 sec 411055.0          End wk 1605 sec 411058.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0054762443
          VCV xx  0.0000219292       VCV xy  0.0000169754
          VCV xz  -0.0000056196     VCV yy  0.0000221098
          VCV yz  -0.0000046519     VCV zz  0.0000057839

GPSVEC TP Point ID 5229          DX  24944.832      DY  -4008.544
          Class Normal          DZ  8830.153      Code CONC
          Obs L1 Fixed          H.pr 0.026      V.pr 0.056

GPSQC1 NM Min SVs      7          PDOP max  2.4
          Relative DOPs Yes       HDOP max  1.0
          Total GPS pos  5        VDOP max  2.2
          Monitor status Not monitored RMS      23.6
          Horz SD                               Vert SD
          Start wk 1605 sec 411080.0          End wk 1605 sec 411084.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.00463486
          VCV xx  0.0000152384       VCV xy  0.000010449
          VCV xz  -0.0000061896     VCV yy  0.0000130984
          VCV yz  -0.0000029353     VCV zz  0.0000081639

GPSVEC TP Point ID 5230          DX  24959.267      DY  -4003.519
          Class Normal          DZ  8844.012      Code CONC
          Obs L1 Fixed          H.pr 0.023      V.pr 0.052

GPSQC1 NM Min SVs      8          PDOP max  2.8
          Relative DOPs Yes       HDOP max  1.1
          Total GPS pos  7        VDOP max  2.5
          Monitor status Not monitored RMS      15.5
          Horz SD                               Vert SD
          Start wk 1605 sec 411104.0          End wk 1605 sec 411111.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.004418001
          VCV xx  0.0000111857       VCV xy  0.0000110423
          VCV xz  -0.000003061      VCV yy  0.0000121897
          VCV yz  -0.0000030576     VCV zz  0.000001238

GPSVEC TP Point ID 5231          DX  24969.354      DY  -4007.796
          Class Normal          DZ  8843.603      Code CONC
          Obs L1 Fixed          H.pr 0.019      V.pr 0.043

GPSQC1 NM Min SVs      8          PDOP max  2.1
          Relative DOPs Yes       HDOP max  0.8
          Total GPS pos  3        VDOP max  1.9
          Monitor status Not monitored RMS      21.1
          Horz SD                               Vert SD
          Start wk 1605 sec 411122.0          End wk 1605 sec 411124.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0032858951
          VCV xx  0.0000101796       VCV xy  0.0000081767
          VCV xz  -0.0000028674     VCV yy  0.0000103071
          VCV yz  -0.0000024016     VCV zz  0.0000024387

GPSVEC TP Point ID 5232          DX  24976.885      DY  -3981.717
          Class Normal          DZ  8885.384      Code CONC
          Obs L1 Fixed          H.pr 0.029      V.pr 0.065

GPSQC1 NM Min SVs      8          PDOP max  3.9
          Relative DOPs Yes       HDOP max  1.6
          Total GPS pos  4        VDOP max  3.6
          Monitor status Not monitored RMS      18.2
          Horz SD                               Vert SD
          Start wk 1605 sec 411144.0          End wk 1605 sec 411149.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.004520196
          VCV xx  0.0000146732       VCV xy  0.0000145722
          VCV xz  -0.000004004      VCV yy  0.0000212331
          VCV yz  -0.0000042829     VCV zz  0.0000031343

GPSVEC TP Point ID 5233          DX  24967.932      DY  -3977.415
          Class Normal          DZ  8886.715      Code CONC
          Obs L1 Fixed          H.pr 0.027      V.pr 0.061
    
```

```

GPSQC1 NM Min SVs      8          PDOP max  2.9
          Relative DOPs Yes       HDOP max  1.2
          Total GPS pos  5        VDOP max  2.7
          Monitor status Not monitored RMS      21.7
          Horz SD          Vert SD
          Start wk 1605 sec 411158.0 End wk 1605 sec 411162.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0051414543
          VCV xx  0.0000195341      VCV xy  0.0000163938
          VCV xz  -0.0000052782     VCV yy  0.0000215143
          VCV yz  -0.0000048239     VCV zz  0.0000043908

GPSVEC TP Point ID 5234          DX  24960.123      DY  -3967.100
          Class Normal          DZ  8895.686      Code CONC
          Obs L1 Fixed          H.pr 0.027      V.pr 0.061

GPSQC1 NM Min SVs      8          PDOP max  2.9
          Relative DOPs Yes       HDOP max  1.2
          Total GPS pos  11       VDOP max  2.7
          Monitor status Not monitored RMS      22.0
          Horz SD          Vert SD
          Start wk 1605 sec 411174.0 End wk 1605 sec 411185.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0079962183
          VCV xx  0.0000199364      VCV xy  0.000016717
          VCV xz  -0.0000058499     VCV yy  0.0000213216
          VCV yz  -0.0000049389     VCV zz  0.0000048116

GPSVEC TP Point ID 5235          DX  24994.409      DY  -4051.166
          Class Normal          DZ  8803.603      Code TOP B
          Obs L1 Fixed          H.pr 0.025      V.pr 0.057

GPSQC1 NM Min SVs      8          PDOP max  2.3
          Relative DOPs Yes       HDOP max  0.9
          Total GPS pos  4        VDOP max  2.1
          Monitor status Not monitored RMS      9.1
          Horz SD          Vert SD
          Start wk 1605 sec 411248.0 End wk 1605 sec 411251.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0044095828
          VCV xx  0.0000153127      VCV xy  0.0000083883
          VCV xz  -0.0000000858     VCV yy  0.0000050105
          VCV yz  -0.0000001565     VCV zz  0.0000165161

GPSVEC TP Point ID 5236          DX  25025.971      DY  -4057.239
          Class Normal          DZ  8806.384      Code TOP B
          Obs L1 Fixed          H.pr 0.027      V.pr 0.062

GPSQC1 NM Min SVs      8          PDOP max  2.1
          Relative DOPs Yes       HDOP max  0.8
          Total GPS pos  9        VDOP max  1.9
          Monitor status Not monitored RMS      27.6
          Horz SD          Vert SD
          Start wk 1605 sec 411266.0 End wk 1605 sec 411274.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0072689867
          VCV xx  0.0000204214      VCV xy  0.0000167875
          VCV xz  -0.0000058448     VCV yy  0.0000215081
          VCV yz  -0.0000051732     VCV zz  0.0000049501

NOTE TS Time Date 10/14/2010 Time 11:14:54

GPSVEC TP Point ID 5237          DX  25046.683      DY  -4061.600
          Class Normal          DZ  8809.363      Code TOP B
          Obs L1 Fixed          H.pr 0.022      V.pr 0.045

GPSQC1 NM Min SVs      9          PDOP max  3.0
          Relative DOPs Yes       HDOP max  1.3
          Total GPS pos  5        VDOP max  2.7
          Monitor status Not monitored RMS      13.0
          Horz SD          Vert SD
          Start wk 1605 sec 411291.0 End wk 1605 sec 411295.0

GPSQC2 NM Ttl satellites 9          Err Scale 0.00379301
          VCV xx  0.0000101654      VCV xy  0.0000084722
          VCV xz  -0.0000027217     VCV yy  0.0000103962
          VCV yz  -0.0000023626     VCV zz  0.0000022248

GPSVEC TP Point ID 5238          DX  25064.779      DY  -4069.275
          Class Normal          DZ  8808.477      Code TOP
          Obs L1 Fixed          H.pr 0.020      V.pr 0.041

GPSQC1 NM Min SVs      9          PDOP max  2.7
          Relative DOPs Yes       HDOP max  1.2
          Total GPS pos  5        VDOP max  2.4
          Monitor status Not monitored RMS      9.5
          Horz SD          Vert SD
          Start wk 1605 sec 411306.0 End wk 1605 sec 411310.0

GPSQC2 NM Ttl satellites 9          Err Scale 0.0039043219
          VCV xx  0.0000098333      VCV xy  0.0000081563
          VCV xz  -0.000002553      VCV yy  0.0000100437
          VCV yz  -0.0000020997     VCV zz  0.0000016964

GPSVEC TP Point ID 5239          DX  25067.849      DY  -4077.564
          Class Normal          DZ  8798.463      Code TOP E
          Obs L1 Fixed          H.pr 0.020      V.pr 0.042
    
```

```

GPSQC1 NM Min SVs 9 PDOP max 2.7
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 2.4
Monitor status Not monitored RMS 12.3
Horz SD Vert SD
Start wk 1605 sec 411319.0 End wk 1605 sec 411322.0

SURVEY EVENTKISurvey event Survey ended

SURVEY KI Elev mask 10 PDOP mask 6.0
SURVEY KI Elev mask 10 PDOP mask 6.0
SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000 Measurement True

GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374"N Lng 111°40'44.55636"W
Class Normal Hgt 1375.166 Code <no text>
Obs User Input H.pr <null> V.pr <null>

EQUIP SI Receiver <no text> Serial no <no text>
Antenna Zephyr Geodetic 2
Meas To Antenna Phase Center
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279 Measurement True

GPSREF KI Reference SRPEAST

INIT KI Init event Gained Week 1605
Init type On the fly seconds 411704.0
Init counter 10 Point ID <no text>
Survey type Real Time Plate H.Distance <null>
Plate V.Distance <null> Plate azimuth <null>

SURVEY EVENTKISurvey event Communications error

EQUIP NM Receiver 5800 Serial no 4447140732
Antenna R8/5800/SPS78x Internal
Meas To Bottom of antenna mount
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.213

NOTE NM Receiver firmware version=2.320

GPSANT KI Antenna ht 6.890 Measurement Uncorrected

GPSVEC TP Point ID 5240 DX 25627.425 DY -4437.775
Class Normal DZ 8602.186 Code RIPRAP B -
Obs L1 Fixed H.pr 0.025 V.pr 0.055

GPSQC1 NM Min SVs 9 PDOP max 3.0
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.7
Monitor status Not monitored RMS 28.7
Horz SD Vert SD
Start wk 1605 sec 412401.0 End wk 1605 sec 412405.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0046458556
VCV xx 0.0000141351 VCV xy 0.0000151905
VCV xz -0.0000056535 VCV yy 0.0000204522
VCV yz -0.0000063513 VCV zz 0.0000030614

NOTE NM GROUTED RIVER ROCK

GPSVEC TP Point ID 5241 DX 25624.978 DY -4449.046
Class Normal DZ 8584.614 Code RIPRAP
Obs L1 Fixed H.pr 0.019 V.pr 0.043

GPSQC1 NM Min SVs 9 PDOP max 2.1
Relative DOPs Yes HDOP max 0.8
Total GPS pos 9 VDOP max 1.9
Monitor status Not monitored RMS 26.0
Horz SD Vert SD
Start wk 1605 sec 412448.0 End wk 1605 sec 412457.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.005447479
VCV xx 0.0000083517 VCV xy 0.000009296
VCV xz -0.0000033344 VCV yy 0.0000130671
VCV yz -0.0000038486 VCV zz 0.0000018965

GPSVEC TP Point ID 5242 DX 25633.953 DY -4458.593
Class Normal DZ 8576.356 Code RIPRAP
Obs L1 Fixed H.pr 0.027 V.pr 0.061

GPSQC1 NM Min SVs 9 PDOP max 2.1
Relative DOPs Yes HDOP max 0.8
Total GPS pos 8 VDOP max 1.9
Monitor status Not monitored RMS 38.9
Horz SD Vert SD
Start wk 1605 sec 412474.0 End wk 1605 sec 412481.0
    
```

```

GPSQC2 NM Ttl satellites 9 Err Scale 0.0069185067
VCV xx 0.0000162734 VCV xy 0.0000183803
VCV xz -0.0000069735 VCV yy 0.0000256111
VCV yz -0.0000080218 VCV zz 0.0000038406

GPSVEC TP Point ID 5243 DX 25631.713 DY -4463.042
Class Normal DZ 8568.435 Code RIPRAP
Obs L1 Fixed H.pr 0.030 V.pr 0.066

GPSQC1 NM Min SVs 9 PDOP max 2.9
Relative DOPs Yes HDOP max 1.2
Total GPS pos 11 VDOP max 2.7
Monitor status Not monitored RMS 14.1
Horz SD Vert SD
Start wk 1605 sec 412494.0 End wk 1605 sec 412504.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0083536673
VCV xx 0.0000194076 VCV xy 0.0000218001
VCV xz -0.0000078366 VCV yy 0.0000304031
VCV yz -0.0000090474 VCV zz 0.0000044636

GPSVEC TP Point ID 5244 DX 25630.757 DY -4466.510
Class Normal DZ 8542.616 Code RIPRAP
Obs L1 Fixed H.pr 0.029 V.pr 0.065

GPSQC1 NM Min SVs 8 PDOP max 3.2
Relative DOPs Yes HDOP max 1.3
Total GPS pos 7 VDOP max 2.9
Monitor status Not monitored RMS 38.6
Horz SD Vert SD
Start wk 1605 sec 412560.0 End wk 1605 sec 412566.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0058425735
VCV xx 0.0000159227 VCV xy 0.0000166064
VCV xz -0.0000051804 VCV yy 0.0000266751
VCV yz -0.0000082101 VCV zz 0.0000047605

GPSVEC TP Point ID 5245 DX 25611.633 DY -4466.835
Class Normal DZ 8531.373 Code RIPRAP
Obs L1 Fixed H.pr 0.030 V.pr 0.066

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 10 VDOP max 1.9
Monitor status Not monitored RMS 34.4
Horz SD Vert SD
Start wk 1605 sec 412583.0 End wk 1605 sec 412592.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0084576895
VCV xx 0.0000186338 VCV xy 0.0000212983
VCV xz -0.0000081181 VCV yy 0.0000310446
VCV yz -0.00000974 VCV zz 0.000004713

GPSVEC TP Point ID 5246 DX 25599.513 DY -4493.704
Class Normal DZ 8486.484 Code RIPRAP
Obs L1 Fixed H.pr 0.034 V.pr 0.075

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 9 VDOP max 1.9
Monitor status Not monitored RMS 51.2
Horz SD Vert SD
Start wk 1605 sec 412617.0 End wk 1605 sec 412625.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0092319027
VCV xx 0.0000230605 VCV xy 0.0000275317
VCV xz -0.0000096017 VCV yy 0.0000417375
VCV yz -0.0000118651 VCV zz 0.0000057959

GPSVEC TP Point ID 5247 DX 25610.996 DY -4503.298
Class Normal DZ 8478.631 Code RIPRAP
Obs L1 Fixed H.pr 0.032 V.pr 0.072

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 8 VDOP max 1.8
Monitor status Not monitored RMS 45.2
Horz SD Vert SD
Start wk 1605 sec 412643.0 End wk 1605 sec 412650.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0083386879
VCV xx 0.0000206967 VCV xy 0.000025096
VCV xz -0.0000088462 VCV yy 0.0000377492
VCV yz -0.0000110146 VCV zz 0.0000050494

GPSVEC TP Point ID 5248 DX 25609.088 DY -4513.967
Class Normal DZ 8462.100 Code RIPRAP
Obs L1 Fixed H.pr 0.037 V.pr 0.082

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 5 VDOP max 1.8
Monitor status Not monitored RMS 41.6
Horz SD Vert SD
Start wk 1605 sec 412677.0 End wk 1605 sec 412682.0

```

GPSQC2 NM Ttl satellites 9 Err Scale 0.0084816858
VCV xx 0.000026863 VCV xy 0.0000331142
VCV xz -0.0000113551 VCV yy 0.0000503783
VCV yz -0.0000142724 VCV zz 0.0000063873

NOTE NM START OF HAND PLACED RIVER ROCK

GPSVEC TP Point ID 5249 DX 25597.527 DY -4539.973
Class Normal DZ 8419.808 Code RIPRAP
Obs L1 Fixed H.pr 0.028 V.pr 0.062

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 6 VDOP max 1.8
Monitor status Not monitored RMS 17.3
Horz SD Vert SD
Start wk 1605 sec 412764.0 End wk 1605 sec 412769.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0064717019
VCV xx 0.0000154488 VCV xy 0.0000182172
VCV xz -0.0000068563 VCV yy 0.0000274673
VCV yz -0.000008529 VCV zz 0.0000042805

GPSVEC TP Point ID 5250 DX 25624.916 DY -4543.919
Class Normal DZ 8415.828 Code RIPRAP TOE B
Obs L1 Fixed H.pr 0.030 V.pr 0.064

GPSQC1 NM Min SVs 9 PDOP max 2.0
Relative DOPs Yes HDOP max 0.8
Total GPS pos 5 VDOP max 1.8
Monitor status Not monitored RMS 31.2
Horz SD Vert SD
Start wk 1605 sec 412804.0 End wk 1605 sec 412808.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0063178861
VCV xx 0.0000165622 VCV xy 0.0000198717
VCV xz -0.0000074653 VCV yy 0.0000305134
VCV yz -0.0000094011 VCV zz 0.0000046261

GPSVEC TP Point ID 5251 DX 25633.358 DY -4517.160
Class Normal DZ 8458.006 Code RIPRAP TOE B
Obs L1 Fixed H.pr 0.030 V.pr 0.064

GPSQC1 NM Min SVs 9 PDOP max 2.8
Relative DOPs Yes HDOP max 1.2
Total GPS pos 10 VDOP max 2.5
Monitor status Not monitored RMS 45.6
Horz SD Vert SD
Start wk 1605 sec 412865.0 End wk 1605 sec 412875.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0086080926
VCV xx 0.0000158861 VCV xy 0.0000193537
VCV xz -0.0000072979 VCV yy 0.000030556
VCV yz -0.0000094799 VCV zz 0.0000045892

NOTE NM END OF HAND PLACED RIVER ROCK

GPSVEC TP Point ID 5252 DX 25672.912 DY -4534.087
Class Normal DZ 8456.821 Code RIPRAP
Obs L1 Fixed H.pr 0.029 V.pr 0.062

GPSQC1 NM Min SVs 9 PDOP max 3.1
Relative DOPs Yes HDOP max 1.3
Total GPS pos 14 VDOP max 2.8
Monitor status Not monitored RMS 42.1
Horz SD Vert SD
Start wk 1605 sec 412946.0 End wk 1605 sec 412959.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0084601706
VCV xx 0.0000141425 VCV xy 0.0000161248
VCV xz -0.0000076757 VCV yy 0.0000229252
VCV yz -0.0000088019 VCV zz 0.0000051777

GPSVEC TP Point ID 5253 DX 25724.290 DY -4552.793
Class Normal DZ 8459.113 Code RIPRAP
Obs L1 Fixed H.pr 0.030 V.pr 0.063

GPSQC1 NM Min SVs 9 PDOP max 2.7
Relative DOPs Yes HDOP max 1.1
Total GPS pos 7 VDOP max 2.4
Monitor status Not monitored RMS 41.4
Horz SD Vert SD
Start wk 1605 sec 412987.0 End wk 1605 sec 412993.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0070046023
VCV xx 0.0000157179 VCV xy 0.0000192051
VCV xz -0.0000074504 VCV yy 0.0000300238
VCV yz -0.0000095021 VCV zz 0.0000047149

NOTE NM START OF HAND PLACED RIVER ROCK

GPSVEC TP Point ID 5254 DX 25716.416 DY -4566.467
Class Normal DZ 8434.862 Code RIPRAP
Obs L1 Fixed H.pr 0.024 V.pr 0.050


```

GPSQC1 NM Min SVs 9 PDOP max 2.6
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.3
Monitor status Not monitored RMS 20.1
Horz SD Vert SD
Start wk 1605 sec 413233.0 End wk 1605 sec 413238.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0058216937
VCV xx 0.0000101174 VCV xy 0.0000126788
VCV xz -0.0000053941 VCV yy 0.0000226169
VCV yz -0.000007915 VCV zz 0.0000041621

GPSVEC TP Point ID 5261 DX 25614.364 DY -4571.584
Class Normal DZ 8371.902 Code TOE NJ CLS E
Obs L1 Fixed H.pr 0.027 V.pr 0.055

GPSQC1 NM Min SVs 9 PDOP max 2.6
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.3
Monitor status Not monitored RMS 23.7
Horz SD Vert SD
Start wk 1605 sec 413271.0 End wk 1605 sec 413275.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0054517835
VCV xx 0.0000103212 VCV xy 0.000013066
VCV xz -0.0000057287 VCV yy 0.0000233008
VCV yz -0.0000083377 VCV zz 0.0000045423

GPSVEC TP Point ID 5262 DX 25772.504 DY -4580.291
Class Normal DZ 8461.073 Code RIPRAP
Obs L1 Fixed H.pr 0.035 V.pr 0.070

GPSQC1 NM Min SVs 9 PDOP max 3.0
Relative DOPs Yes HDOP max 1.4
Total GPS pos 9 VDOP max 2.7
Monitor status Not monitored RMS 18.8
Horz SD Vert SD
Start wk 1605 sec 413349.0 End wk 1605 sec 413357.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0059278449
VCV xx 0.0000130712 VCV xy 0.000013253
VCV xz -0.0000089251 VCV yy 0.0000170556
VCV yz -0.0000093308 VCV zz 0.0000067256

GPSVEC TP Point ID 5263 DX 25745.298 DY -4568.241
Class Normal DZ 8461.895 Code RIPRAP
Obs L1 Fixed H.pr 0.029 V.pr 0.057

GPSQC1 NM Min SVs 9 PDOP max 2.5
Relative DOPs Yes HDOP max 1.1
Total GPS pos 7 VDOP max 2.2
Monitor status Not monitored RMS 17.5
Horz SD Vert SD
Start wk 1605 sec 413379.0 End wk 1605 sec 413385.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0069626099
VCV xx 0.000011473 VCV xy 0.0000146785
VCV xz -0.0000059988 VCV yy 0.0000256487
VCV yz -0.0000082787 VCV zz 0.0000043248

NOTE NM END HAND PLACED RIVER ROCK

GPSVEC TP Point ID 5264 DX 25748.866 DY -4557.874
Class Normal DZ 8478.254 Code RIPRAP
Obs L1 Fixed H.pr 0.031 V.pr 0.061

GPSQC1 NM Min SVs 9 PDOP max 1.7
Relative DOPs Yes HDOP max 0.8
Total GPS pos 9 VDOP max 1.5
Monitor status Not monitored RMS 47.1
Horz SD Vert SD
Start wk 1605 sec 413433.0 End wk 1605 sec 413441.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0090795225
VCV xx 0.0000128567 VCV xy 0.0000163044
VCV xz -0.0000068398 VCV yy 0.0000300825
VCV yz -0.0000096918 VCV zz 0.0000051099

GPSVEC TP Point ID 5265 DX 25766.024 DY -4557.474
Class Normal DZ 8488.423 Code RIPRAP
Obs L1 Fixed H.pr 0.026 V.pr 0.051

GPSQC1 NM Min SVs 9 PDOP max 2.4
Relative DOPs Yes HDOP max 1.1
Total GPS pos 7 VDOP max 2.1
Monitor status Not monitored RMS 37.5
Horz SD Vert SD
Start wk 1605 sec 413455.0 End wk 1605 sec 413461.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0063690706
VCV xx 0.0000086979 VCV xy 0.0000111879
VCV xz -0.000004568 VCV yy 0.0000213724
VCV yz -0.0000066846 VCV zz 0.000003356

GPSVEC TP Point ID 5266 DX 25775.264 DY -4530.883
Class Normal DZ 8531.598 Code RIPRAP
Obs L1 Fixed H.pr 0.048 V.pr 0.094
    
```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|--------------|
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 9 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 54.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413483.0 | End wk 1605 sec | 413492.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0148791438 |
| | | VCV xx | 0.0000296886 | VCV xy | 0.0000398905 |
| | | VCV xz | -0.0000151188 | VCV yy | 0.0000740407 |
| | | VCV yz | -0.0000217749 | VCV zz | 0.0000107446 |
| GPSVEC | TP | Point ID | 5267 | DX | 25762.319 |
| | | Class | Normal | DZ | 8542.601 |
| | | Obs | L1 Fixed | Code | RIPRAP |
| | | | | H.pr | 0.039 |
| | | | | V.pr | 0.076 |
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 8 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 52.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413510.0 | End wk 1605 sec | 413517.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0109954011 |
| | | VCV xx | 0.0000203297 | VCV xy | 0.0000261482 |
| | | VCV xz | -0.0000111486 | VCV yy | 0.0000468302 |
| | | VCV yz | -0.0000153794 | VCV zz | 0.0000082927 |
| GPSVEC | TP | Point ID | 5268 | DX | 25763.601 |
| | | Class | Normal | DZ | 8568.722 |
| | | Obs | L1 Fixed | Code | RIPRAP |
| | | | | H.pr | 0.034 |
| | | | | V.pr | 0.065 |
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 5 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 29.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413552.0 | End wk 1605 sec | 413557.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0083907135 |
| | | VCV xx | 0.0000139421 | VCV xy | 0.0000187018 |
| | | VCV xz | -0.000007475 | VCV yy | 0.0000354135 |
| | | VCV yz | -0.0000112628 | VCV zz | 0.0000060347 |
| GPSVEC | TP | Point ID | 5269 | DX | 25763.586 |
| | | Class | Normal | DZ | 8575.535 |
| | | Obs | L1 Fixed | Code | RIPRAP |
| | | | | H.pr | 0.041 |
| | | | | V.pr | 0.077 |
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 6 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 35.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413569.0 | End wk 1605 sec | 413578.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0125885932 |
| | | VCV xx | 0.0000206088 | VCV xy | 0.0000267138 |
| | | VCV xz | -0.0000113696 | VCV yy | 0.0000493514 |
| | | VCV yz | -0.0000159749 | VCV zz | 0.0000086617 |
| GPSVEC | TP | Point ID | 5270 | DX | 25779.172 |
| | | Class | Normal | DZ | 8584.980 |
| | | Obs | L1 Fixed | Code | RIPRAP |
| | | | | H.pr | 0.033 |
| | | | | V.pr | 0.062 |
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 9 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 54.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413593.0 | End wk 1605 sec | 413602.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0096657937 |
| | | VCV xx | 0.0000132658 | VCV xy | 0.0000171799 |
| | | VCV xz | -0.0000073527 | VCV yy | 0.0000315828 |
| | | VCV yz | -0.0000101654 | VCV zz | 0.0000055453 |
| GPSVEC | TP | Point ID | 5271 | DX | 25783.249 |
| | | Class | Normal | DZ | 8602.086 |
| | | Obs | L1 Fixed | Code | RIPRAP |
| | | | | H.pr | 0.044 |
| | | | | V.pr | 0.082 |
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 14 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 69.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1605 sec | 413616.0 | End wk 1605 sec | 413629.0 |
| GPSQC2 | NM | Ttl satellites | 9 | Err Scale | 0.0153677007 |
| | | VCV xx | 0.0000237958 | VCV xy | 0.0000303267 |
| | | VCV xz | -0.0000133586 | VCV yy | 0.0000556532 |
| | | VCV yz | -0.0000184043 | VCV zz | 0.0000104658 |
| GPSVEC | TP | Point ID | 5272 | DX | 25763.281 |
| | | Class | Normal | DZ | 8634.663 |
| | | Obs | L1 Fixed | Code | TOE B |
| | | | | H.pr | 0.035 |
| | | | | V.pr | 0.064 |

```

GPSQC1 NM Min SVs 9 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 7 VDOP max 1.4
Monitor status Not monitored RMS 47.6
Horz SD Vert SD
Start wk 1605 sec 413674.0 End wk 1605 sec 413680.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0092056524
VCV xx 0.0000140677 VCV xy 0.0000175628
VCV xz -0.0000085874 VCV yy 0.0000338062
VCV yz -0.0000120813 VCV zz 0.0000071686

GPSVEEC TP Point ID 5273 DX 25754.289 DY -4477.662
Class Normal DZ 8596.664 Code TOE RIPRAP
Obs L1 Fixed H.pr 0.034 V.pr 0.063

GPSQC1 NM Min SVs 8 PDOP max 1.9
Relative DOPs Yes HDOP max 0.9
Total GPS pos 3 VDOP max 1.7
Monitor status Not monitored RMS 10.6
Horz SD Vert SD
Start wk 1605 sec 413710.0 End wk 1605 sec 413712.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0053178486
VCV xx 0.0000084617 VCV xy 0.000011956
VCV xz -0.0000047157 VCV yy 0.0000301008
VCV yz -0.0000106064 VCV zz 0.0000060222

GPSVEEC TP Point ID 5274 DX 25751.624 DY -4488.617
Class Normal DZ 8579.855 Code TOE
Obs L1 Fixed H.pr 0.037 V.pr 0.068

GPSQC1 NM Min SVs 9 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 10 VDOP max 1.4
Monitor status Not monitored RMS 60.3
Horz SD Vert SD
Start wk 1605 sec 413728.0 End wk 1605 sec 413737.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0116225965
VCV xx 0.0000149745 VCV xy 0.0000192864
VCV xz -0.0000087373 VCV yy 0.000040006
VCV yz -0.0000130113 VCV zz 0.0000072004

GPSVEEC TP Point ID 5275 DX 25702.332 DY -4468.952
Class Normal DZ 8579.308 Code TOE
Obs L1 Fixed H.pr 0.029 V.pr 0.053

GPSQC1 NM Min SVs 9 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 9 VDOP max 2.1
Monitor status Not monitored RMS 42.1
Horz SD Vert SD
Start wk 1605 sec 413760.0 End wk 1605 sec 413768.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0076554213
VCV xx 0.0000072789 VCV xy 0.0000100159
VCV xz -0.0000044985 VCV yy 0.0000234681
VCV yz -0.0000079684 VCV zz 0.0000042323

GPSVEEC TP Point ID 5276 DX 25708.060 DY -4459.514
Class Normal DZ 8595.691 Code RIPRAP
Obs L1 Fixed H.pr 0.035 V.pr 0.063

GPSQC1 NM Min SVs 9 PDOP max 2.2
Relative DOPs Yes HDOP max 1.1
Total GPS pos 9 VDOP max 1.9
Monitor status Not monitored RMS 58.5
Horz SD Vert SD
Start wk 1605 sec 413785.0 End wk 1605 sec 413794.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.010375265
VCV xx 0.0000128789 VCV xy 0.0000165631
VCV xz -0.0000080684 VCV yy 0.0000332121
VCV yz -0.0000117651 VCV zz 0.0000069935

GPSVEEC TP Point ID 5277 DX 25661.308 DY 4453.401
Class Normal DZ 8579.110 Code TOE
Obs L1 Fixed H.pr 0.031 V.pr 0.055

GPSQC1 NM Min SVs 9 PDOP max 1.6
Relative DOPs Yes HDOP max 0.8
Total GPS pos 7 VDOP max 1.4
Monitor status Not monitored RMS 36.8
Horz SD Vert SD
Start wk 1605 sec 413829.0 End wk 1605 sec 413835.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0082049305
VCV xx 0.0000096138 VCV xy 0.0000126421
VCV xz -0.0000056488 VCV yy 0.0000263804
VCV yz -0.0000084506 VCV zz 0.0000047217

GPSVEEC TP Point ID 5278 DX 25658.707 DY -4450.045
Class Normal DZ 8582.003 Code TOE
Obs L1 Fixed H.pr 0.042 V.pr 0.077
    
```

```

GPSQC1 NM  Min SVs      8                PDOP max  1.7
           Relative DOPs Yes            HDOP max  0.8
           Total GPS pos 10            VDOP max  1.5
           Monitor status Not monitored RMS      47.7
           Horz SD                               Vert SD
           Start wk 1605 sec 413846.0      End wk 1605  sec 413855.0

GPSQC2 NM  Ttl satellites 8                Err Scale 0.0125404643
           VCV xx      0.000016516        VCV xy    0.0000224693
           VCV xz     -0.0000100392       VCV yy    0.0000540619
           VCV yz     -0.0000176037       VCV zz    0.0000092434

GPSVEC TP  Point ID 5279                DX  25663.492      DY  -4441.749
           Class Normal                    DZ  8596.369      Code TOE RIPRAP CLS E
           Obs L1 Fixed                      H.pr 0.037      V.pr 0.065

GPSQC1 NM  Min SVs      9                PDOP max  1.5
           Relative DOPs Yes            HDOP max  0.8
           Total GPS pos  5            VDOP max  1.3
           Monitor status Not monitored RMS      53.1
           Horz SD                               Vert SD
           Start wk 1605 sec 413938.0      End wk 1605  sec 413942.0

GPSQC2 NM  Ttl satellites 9                Err Scale 0.0087197637
           VCV xx      0.0000139552       VCV xy    0.0000176352
           VCV xz     -0.0000090947       VCV yy    0.0000363475
           VCV yz     -0.0000127786       VCV zz    0.000008151

GPSVEC TP  Point ID 5280                DX  25672.960      DY  -4417.105
           Class Normal                    DZ  8636.647      Code TOE E
           Obs L1 Fixed                      H.pr 0.036      V.pr 0.063

GPSQC1 NM  Min SVs      8                PDOP max  1.6
           Relative DOPs Yes            HDOP max  0.8
           Total GPS pos  3            VDOP max  1.4
           Monitor status Not monitored RMS      34.8
           Horz SD                               Vert SD
           Start wk 1605 sec 413965.0      End wk 1605  sec 413967.0

GPSQC2 NM  Ttl satellites 8                Err Scale 0.0066675227
           VCV xx      0.0000191222       VCV xy    0.000010962
           VCV xz     -0.0000056752       VCV yy    0.0000184953
           VCV yz     -0.000010141        VCV zz    0.0000162055

GPSVEC TP  Point ID 5281                DX  25713.796      DY  -4430.164
           Class Normal                    DZ  8640.448      Code NG
           Obs L1 Fixed                      H.pr 0.031      V.pr 0.062

GPSQC1 NM  Min SVs      7                PDOP max  2.6
           Relative DOPs Yes            HDOP max  1.1
           Total GPS pos  6            VDOP max  2.3
           Monitor status Not monitored RMS      32.8
           Horz SD                               Vert SD
           Start wk 1605 sec 413985.0      End wk 1605  sec 413990.0

GPSQC2 NM  Ttl satellites 7                Err Scale 0.0067654857
           VCV xx      0.000016195        VCV xy    0.0000126114
           VCV xz     -0.0000097976       VCV yy    0.000017342
           VCV yz     -0.0000130143       VCV zz    0.0000164326

GPSVEC TP  Point ID 5282                DX  25748.042      DY  -4497.654
           Class Normal                    DZ  8573.228      Code CONC
           Obs L1 Fixed                      H.pr 0.030      V.pr 0.057

GPSQC1 NM  Min SVs      6                PDOP max  3.5
           Relative DOPs Yes            HDOP max  1.8
           Total GPS pos 11            VDOP max  3.0
           Monitor status Not monitored RMS      39.9
           Horz SD                               Vert SD
           Start wk 1605 sec 414034.0      End wk 1605  sec 414044.0

GPSQC2 NM  Ttl satellites 7                Err Scale 0.0085322401
           VCV xx      0.000015227        VCV xy    0.0000135505
           VCV xz     -0.0000097118       VCV yy    0.0000161797
           VCV yz     -0.0000123141       VCV zz    0.0000118407

GPSVEC TP  Point ID 5283                DX  25745.292      DY  -4502.146
           Class Normal                    DZ  8565.847      Code CONC
           Obs L1 Fixed                      H.pr 0.031      V.pr 0.062

GPSQC1 NM  Min SVs      7                PDOP max  2.5
           Relative DOPs Yes            HDOP max  1.1
           Total GPS pos  5            VDOP max  2.3
           Monitor status Not monitored RMS      36.1
           Horz SD                               Vert SD
           Start wk 1605 sec 414053.0      End wk 1605  sec 414057.0

GPSQC2 NM  Ttl satellites 7                Err Scale 0.0062448056
           VCV xx      0.0000156589       VCV xy    0.0000121101
           VCV xz     -0.0000095746       VCV yy    0.0000171879
           VCV yz     -0.0000130119       VCV zz    0.0000168035

GPSVEC TP  Point ID 5284                DX  25703.176      DY  -4485.724
           Class Normal                    DZ  8565.667      Code CONC
           Obs L1 Fixed                      H.pr 0.033      V.pr 0.057
    
```

```

GPSQC1 NM Min SVs      8          PDOP max 2.2
          Relative DOPs Yes       HDOP max 1.1
          Total GPS pos 5         VDOP max 1.9
          Monitor status Not monitored RMS      28.5
          Horz SD                 Vert SD
          Start wk 1605 sec 414075.0 End wk 1605 sec 414080.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0068995305
          VCV xx 0.0000145474       VCV xy 0.0000068913
          VCV xz -0.0000029878      VCV yy 0.0000164739
          VCV yz -0.0000093065      VCV zz 0.0000130714

GPSVEC TP Point ID 5285          DX 25704.426      DY -4480.219
          Class Normal           DZ 8573.653       Code CONC
          Obs L1 Fixed           H.pr 0.023       V.pr 0.040

GPSQC1 NM Min SVs      8          PDOP max 2.1
          Relative DOPs Yes       HDOP max 1.1
          Total GPS pos 5         VDOP max 1.9
          Monitor status Not monitored RMS      13.4
          Horz SD                 Vert SD
          Start wk 1605 sec 414090.0 End wk 1605 sec 414094.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0049382159
          VCV xx 0.0000072867       VCV xy 0.0000044356
          VCV xz -0.0000026128      VCV yy 0.0000081447
          VCV yz -0.0000050684      VCV zz 0.0000070336

GPSVEC TP Point ID 5286          DX 25654.793      DY -4460.500
          Class Normal           DZ 8574.054      Code CONC
          Obs L1 Fixed           H.pr 0.023       V.pr 0.044

GPSQC1 NM Min SVs      7          PDOP max 2.6
          Relative DOPs Yes       HDOP max 1.2
          Total GPS pos 5         VDOP max 2.3
          Monitor status Not monitored RMS      11.6
          Horz SD                 Vert SD
          Start wk 1605 sec 414117.0 End wk 1605 sec 414121.0

GPSQC2 NM Ttl satellites 7          Err Scale 0.0044118399
          VCV xx 0.0000069667       VCV xy 0.0000027787
          VCV xz -0.0000013327      VCV yy 0.0000106353
          VCV yz -0.00000653       VCV zz 0.0000081034

GPSVEC TP Point ID 5287          DX 25653.176      DY -4465.821
          Class Normal           DZ 8565.348      Code CONC
          Obs L1 Fixed           H.pr 0.028       V.pr 0.050

GPSQC1 NM Min SVs      7          PDOP max 1.8
          Relative DOPs Yes       HDOP max 0.8
          Total GPS pos 4         VDOP max 1.6
          Monitor status Not monitored RMS      19.6
          Horz SD                 Vert SD
          Start wk 1605 sec 414131.0 End wk 1605 sec 414134.0

GPSQC2 NM Ttl satellites 8          Err Scale 0.0046418849
          VCV xx 0.000007645        VCV xy 0.0000027638
          VCV xz -0.0000010832      VCV yy 0.0000112234
          VCV yz -0.0000067977      VCV zz 0.0000087017

GPSVEC TP Point ID 5288          DX 25649.323      DY -4471.406
          Class Normal           DZ 8525.359      Code CONC
          Obs L1 Fixed           H.pr 0.048       V.pr 0.140

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes       HDOP max 0.8
          Total GPS pos 11        VDOP max 2.5
          Monitor status Not monitored RMS      36.6
          Horz SD                 Vert SD
          Start wk 1605 sec 414175.0 End wk 1605 sec 414185.0

GPSQC2 NM Ttl satellites 6          Err Scale 0.0141644198
          VCV xx 0.000028345        VCV xy 0.0000519612
          VCV xz -0.0000451887      VCV yy 0.00010959
          VCV yz -0.0000970376      VCV zz 0.0000876911

GPSVEC TP Point ID 5289          DX 25640.359      DY -4497.321
          Class Normal           DZ 8481.812      Code CONC
          Obs L1 Fixed           H.pr 0.017       V.pr 0.049

GPSQC1 NM Min SVs      6          PDOP max 2.6
          Relative DOPs Yes       HDOP max 0.8
          Total GPS pos 4         VDOP max 2.5
          Monitor status Not monitored RMS      13.7
          Horz SD                 Vert SD
          Start wk 1605 sec 414207.0 End wk 1605 sec 414210.0

GPSQC2 NM Ttl satellites 6          Err Scale 0.0032281075
          VCV xx 0.0000060474       VCV xy 0.0000054403
          VCV xz -0.0000040247      VCV yy 0.000012168
          VCV yz -0.0000094426      VCV zz 0.0000099337

GPSVEC TP Point ID 5290          DX 25683.775      DY -4514.384
          Class Normal           DZ 8481.449      Code CONC
          Obs L1 Fixed           H.pr 0.047       V.pr 0.088
    
```

```

GPSQC1 NM Min SVs 7 PDOP max 3.2
          Relative DOPs Yes HDOP max 1.5
          Total GPS pos 10 VDOP max 2.8
          Monitor status Not monitored RMS 40.4
          Horz SD Vert SD
          Start wk 1605 sec 414231.0 End wk 1605 sec 414240.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0100096418
          VCV xx 0.0000346549 VCV xy 0.0000277386
          VCV xz -0.0000163114 VCV yy 0.0000277602
          VCV yz -0.0000170802 VCV zz 0.0000156493

GPSVECTP Point ID 5291 DX 25733.120 DY -4533.631
          Class Normal DZ 8482.189 Code CONC
          Obs L1 Fixed H.pr 0.030 V.pr 0.057

GPSQC1 NM Min SVs 7 PDOP max 1.7
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 3 VDOP max 1.5
          Monitor status Not monitored RMS 30.9
          Horz SD Vert SD
          Start wk 1605 sec 414265.0 End wk 1605 sec 414267.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.005398964
          VCV xx 0.0000134438 VCV xy 0.0000105407
          VCV xz -0.0000073328 VCV yy 0.0000153262
          VCV yz -0.0000110881 VCV zz 0.0000137657

GPSVECTP Point ID 5292 DX 25744.688 DY -4508.851
          Class Normal DZ 8524.705 Code CONC
          Obs L1 Fixed H.pr 0.031 V.pr 0.058

GPSQC1 NM Min SVs 7 PDOP max 2.5
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 2.2
          Monitor status Not monitored RMS 22.8
          Horz SD Vert SD
          Start wk 1605 sec 414290.0 End wk 1605 sec 414294.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0059572202
          VCV xx 0.0000125662 VCV xy 0.0000090269
          VCV xz -0.0000043961 VCV yy 0.0000130106
          VCV yz -0.0000043069 VCV zz 0.0000168333

GPSVECTP Point ID 5293 DX 25696.368 DY -4488.905
          Class Normal DZ 8524.386 Code CONC
          Obs L1 Fixed H.pr 0.016 V.pr 0.046

GPSQC1 NM Min SVs 6 PDOP max 3.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 3.1
          Monitor status Not monitored RMS 4.8
          Horz SD Vert SD
          Start wk 1605 sec 414322.0 End wk 1605 sec 414326.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.002638252
          VCV xx 0.0000049154 VCV xy -0.0000014151
          VCV xz -0.0000027994 VCV yy 0.0000094848
          VCV yz -0.0000029122 VCV zz 0.0000053555

INIT KI Init event Lost Week 1605
          Init type On the fly seconds 414348.0
          Init counter 10 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1605
          Init type On the fly seconds 414378.0
          Init counter 11 Point ID <no text>
          Survey type Real Time Plate H.Dist <null>
          Plate V.Dist <null> Plate azimuth <null>

GPSVECTP Point ID 5294 DX 25690.691 DY -4505.129
          Class Normal DZ 8498.457 Code CONC
          Obs L1 Fixed H.pr 0.035 V.pr 0.063

GPSQC1 NM Min SVs 7 PDOP max 2.4
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 8 VDOP max 2.1
          Monitor status Not monitored RMS 48.5
          Horz SD Vert SD
          Start wk 1605 sec 414383.0 End wk 1605 sec 414391.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0093468986
          VCV xx 0.0000172014 VCV xy 0.0000124326
          VCV xz -0.0000083748 VCV yy 0.0000174651
          VCV yz -0.0000116104 VCV zz 0.0000193437

GPSVECTP Point ID 5295 DX 25637.386 DY -4507.257
          Class Normal DZ 8474.774 Code CONC
          Obs L1 Fixed H.pr 0.015 V.pr 0.043

GPSQC1 NM Min SVs 6 PDOP max 2.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 2.5
          Monitor status Not monitored RMS 7.8
          Horz SD Vert SD
          Start wk 1605 sec 414422.0 End wk 1605 sec 414425.0
    
```

```

GPSQC2 NM Ttl satellites 6 Err Scale 0.0028333459
          VCV xx 0.0000037829 VCV xy 0.0000331866
          VCV xz -0.0000026508 VCV yy 0.0000992079
          VCV yz -0.0000076198 VCV zz 0.0000387873

GPSVEC TP Point ID 5296 DX 25677.781 DY -4522.972
          Class Normal DZ 8474.713 Code CONC
          Obs L1 Fixed H.pr 0.034 V.pr 0.055

GPSQC1 NM Min SVs 8 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 6 VDOP max 2.0
          Monitor status Not monitored RMS 25.3
          Horz SD Vert SD
          Start wk 1605 sec 414445.0 End wk 1605 sec 414450.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0068576192
          VCV xx 0.0000114656 VCV xy 0.0000081884
          VCV xz -0.0000064715 VCV yy 0.0000116039
          VCV yz -0.0000082293 VCV zz 0.0000127665

GPSVEC TP Point ID 5297 DX 25728.862 DY -4543.653
          Class Normal DZ 8474.654 Code CONC
          Obs L1 Fixed H.pr 0.036 V.pr 0.059

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 7 VDOP max 2.0
          Monitor status Not monitored RMS 32.1
          Horz SD Vert SD
          Start wk 1605 sec 414473.0 End wk 1605 sec 414479.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0053767031
          VCV xx 0.0000039406 VCV xy 0.0000056707
          VCV xz -0.000002029 VCV yy 0.000020915
          VCV yz -0.0000068032 VCV zz 0.0000044456

GPSVEC TP Point ID 5298 DX 25825.793 DY -4649.782
          Class Normal DZ 8396.424 Code TOP B
          Obs L1 Fixed H.pr 0.053 V.pr 0.082

GPSQC1 NM Min SVs 6 PDOP max 3.5
          Relative DOPs Yes HDOP max 2.2
          Total GPS pos 7 VDOP max 2.7
          Monitor status Not monitored RMS 20.5
          Horz SD Vert SD
          Start wk 1605 sec 414553.0 End wk 1605 sec 414559.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0053922231
          VCV xx 0.0000023724 VCV xy 0.0000036732
          VCV xz -0.0000036032 VCV yy 0.0000187748
          VCV yz -0.0000197348 VCV zz 0.0000225519

GPSVEC TP Point ID 5299 DX 25836.121 DY -4614.663
          Class Normal DZ 8452.783 Code TOP
          Obs L1 Fixed H.pr 0.028 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 2.6
          Relative DOPs Yes HDOP max 1.3
          Total GPS pos 3 VDOP max 2.3
          Monitor status Not monitored RMS 9.0
          Horz SD Vert SD
          Start wk 1605 sec 414592.0 End wk 1605 sec 414594.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0031223262
          VCV xx 0.00000321 VCV xy 0.0000019784
          VCV xz -0.0000020847 VCV yy 0.000009097
          VCV yz -0.0000063189 VCV zz 0.0000074906

GPSVEC TP Point ID 5300 DX 25830.322 DY -4607.268
          Class Normal DZ 8459.409 Code TOP
          Obs L1 Fixed H.pr 0.029 V.pr 0.050

GPSQC1 NM Min SVs 7 PDOP max 2.1
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 3 VDOP max 1.8
          Monitor status Not monitored RMS 9.8
          Horz SD Vert SD
          Start wk 1605 sec 414608.0 End wk 1605 sec 414611.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0039271624
          VCV xx 0.0000033833 VCV xy 0.0000020422
          VCV xz -0.0000021231 VCV yy 0.0000095641
          VCV yz -0.0000065496 VCV zz 0.0000079412

GPSVEC TP Point ID 5301 DX 25798.035 DY -4589.986
          Class Normal DZ 8463.956 Code TOP
          Obs L1 Fixed H.pr 0.037 V.pr 0.063

GPSQC1 NM Min SVs 7 PDOP max 3.7
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 6 VDOP max 3.2
          Monitor status Not monitored RMS 15.5
          Horz SD Vert SD
          Start wk 1605 sec 414627.0 End wk 1605 sec 414632.0
    
```

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.0049331519
          VCV xx 0.000005208 VCV xy 0.0000047409
          VCV xz -0.0000039466 VCV yy 0.0000135584
          VCV yz -0.0000120312 VCV zz 0.0000142148

GPSVEC TP Point ID 5302 DX 25771.455 DY -4577.303
          Class Normal DZ 8467.483 Code TOP
          Obs L1 Fixed H.pr 0.022 V.pr 0.039

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 1.9
          Monitor status Not monitored RMS 21.8
          Horz SD Vert SD
          Start wk 1605 sec 414648.0 End wk 1605 sec 414652.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0045866449
          VCV xx 0.0000048945 VCV xy 0.0000031554
          VCV xz -0.0000027204 VCV yy 0.0000058773
          VCV yz -0.0000060276 VCV zz 0.0000097634

GPSVEC TP Point ID 5303 DX 25752.468 DY -4569.337
          Class Normal DZ 8467.409 Code TOP
          Obs L1 Fixed H.pr 0.022 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 6 VDOP max 1.9
          Monitor status Not monitored RMS 10.0
          Horz SD Vert SD
          Start wk 1605 sec 414664.0 End wk 1605 sec 414669.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0048672706
          VCV xx 0.000004528 VCV xy 0.0000029266
          VCV xz -0.0000025364 VCV yy 0.0000055514
          VCV yz -0.000005694 VCV zz 0.0000092137

GPSVEC TP Point ID 5304 DX 25756.230 DY -4565.446
          Class Normal DZ 8476.443 Code TOP
          Obs L1 Fixed H.pr 0.037 V.pr 0.064

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 1.9
          Monitor status Not monitored RMS 17.1
          Horz SD Vert SD
          Start wk 1605 sec 414677.0 End wk 1605 sec 414681.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0076446235
          VCV xx 0.0000143393 VCV xy 0.0000095714
          VCV xz -0.0000081424 VCV yy 0.0000162403
          VCV yz -0.0000168158 VCV zz 0.000026584

GPSVEC TP Point ID 5305 DX 25775.538 DY -4566.966
          Class Normal DZ 8487.841 Code TOP
          Obs L1 Fixed H.pr 0.029 V.pr 0.050

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 1.9
          Monitor status Not monitored RMS 22.4
          Horz SD Vert SD
          Start wk 1605 sec 414693.0 End wk 1605 sec 414697.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0059557897
          VCV xx 0.0000085481 VCV xy 0.0000060255
          VCV xz -0.000004871 VCV yy 0.0000107911
          VCV yz -0.0000104177 VCV zz 0.0000153984

GPSVEC TP Point ID 5306 DX 25784.268 DY -4563.571
          Class Normal DZ 8500.722 Code TOP
          Obs L1 Fixed H.pr 0.024 V.pr 0.041

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 1.9
          Monitor status Not monitored RMS 17.0
          Horz SD Vert SD
          Start wk 1605 sec 414708.0 End wk 1605 sec 414712.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0048530744
          VCV xx 0.0000054444 VCV xy 0.0000038015
          VCV xz -0.0000029767 VCV yy 0.0000072741
          VCV yz -0.0000069345 VCV zz 0.0000103729

GPSVEC TP Point ID 5307 DX 25794.879 DY -4546.753
          Class Normal DZ 8536.928 Code TOP
          Obs L1 Fixed H.pr 0.035 V.pr 0.066

GPSQC1 NM Min SVs 6 PDOP max 3.7
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 9 VDOP max 3.5
          Monitor status Not monitored RMS 15.5
          Horz SD Vert SD
          Start wk 1605 sec 414731.0 End wk 1605 sec 414739.0
    
```

| | | | |
|--------|----|---|---|
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000098766 VCV xz -0.0000064074 VCV yz -0.0000192306 | Err Scale 0.0094819516 VCV xy 0.0000077478 VCV yy 0.0000223043 VCV zz 0.000024705 |
| GPSVEC | TP | Point ID 5308 Class Normal Obs L1 Fixed | DX 25785.818 DZ 8554.222 H.pr 0.032 DY -4533.761 Code TOP V.pr 0.055 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 414752.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 21.7 Vert SD End wk 1605 sec 414755.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000076258 VCV xz -0.000005218 VCV yz -0.0000138852 | Err Scale 0.0057885232 VCV xy 0.0000064419 VCV yy 0.0000165992 VCV zz 0.0000169817 |
| GPSVEC | TP | Point ID 5309 Class Normal Obs L1 Fixed | DX 25768.399 DZ 8568.769 H.pr 0.035 DY -4517.939 Code TOP V.pr 0.060 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 414772.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 12.5 Vert SD End wk 1605 sec 414775.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.000012149 VCV xz -0.000007547 VCV yz -0.0000151205 | Err Scale 0.0071302112 VCV xy 0.000008725 VCV yy 0.0000160635 VCV zz 0.0000218871 |
| GPSVEC | TP | Point ID 5310 Class Normal Obs L1 Fixed | DX 25768.564 DZ 8576.082 H.pr 0.034 DY -4512.915 Code TOP V.pr 0.058 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1605 sec 414784.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 42.0 Vert SD End wk 1605 sec 414788.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000114302 VCV xz -0.0000069923 VCV yz -0.000014171 | Err Scale 0.0068893987 VCV xy 0.0000083342 VCV yy 0.0000148847 VCV zz 0.0000205098 |
| GPSVEC | TP | Point ID 5311 Class Normal Obs L1 Fixed | DX 25783.500 DZ 8584.488 H.pr 0.037 DY -4513.405 Code TOP V.pr 0.063 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 9 Monitor status Not monitored Horz SD Start wk 1605 sec 414800.0 | PDOP max 2.6 HDOP max 1.3 VDOP max 2.3 RMS 22.4 Vert SD End wk 1605 sec 414808.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000066244 VCV xz -0.0000046141 VCV yz -0.0000111774 | Err Scale 0.0064053847 VCV xy 0.0000058794 VCV yy 0.0000135003 VCV zz 0.0000134109 |
| GPSVEC | TP | Point ID 5312 Class Normal Obs L1 Fixed | DX 25787.432 DZ 8604.215 H.pr 0.035 DY -4501.446 Code TOP V.pr 0.061 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 10 Monitor status Not monitored Horz SD Start wk 1605 sec 414822.0 | PDOP max 3.0 HDOP max 1.3 VDOP max 2.6 RMS 8.4 Vert SD End wk 1605 sec 414831.0 |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000103218 VCV xz -0.0000069083 VCV yz -0.0000165804 | Err Scale 0.0104290294 VCV xy 0.0000081643 VCV yy 0.0000175262 VCV zz 0.0000227666 |
| GPSVEC | TP | Point ID 5313 Class Normal Obs L1 Fixed | DX 25796.832 DZ 8646.778 H.pr 0.035 DY -4474.704 Code TOP V.pr 0.061 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 414851.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 41.2 Vert SD End wk 1605 sec 414854.0 |

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.0064591644
          VCV xx 0.0000119455 VCV xy 0.0000083905
          VCV xz -0.0000070432 VCV yy 0.000015955
          VCV yz -0.0000155344 VCV zz 0.0000238572

GPSVEC TP Point ID 5314 DX 25810.334 DY -4479.015
          Class Normal DZ 8647.837 Code TOP NJ
          Obs L1 Fixed H.pr 0.038 V.pr 0.067

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 9 VDOP max 1.9
          Monitor status Not monitored RMS 56.7
          Horz SD Vert SD
          Start wk 1605 sec 414870.0 End wk 1605 sec 414878.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0105075985
          VCV xx 0.0000123286 VCV xy 0.0000089017
          VCV xz -0.0000078075 VCV yy 0.0000190589
          VCV yz -0.0000194404 VCV zz 0.000029613

GPSVEC TP Point ID 5315 DX 25818.402 DY -4479.906
          Class Normal DZ 8647.931 Code TOE B
          Obs L1 Fixed H.pr 0.044 V.pr 0.076

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 10 VDOP max 1.9
          Monitor status Not monitored RMS 55.2
          Horz SD Vert SD
          Start wk 1605 sec 414901.0 End wk 1605 sec 414910.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0126070585
          VCV xx 0.0000180043 VCV xy 0.0000124127
          VCV xz -0.0000088085 VCV yy 0.0000237496
          VCV yz -0.0000231923 VCV zz 0.0000375211

NOTE TS Time Date 10/14/2010 Time 12:15:36

GPSVEC TP Point ID 5316 DX 25819.743 DY -4491.869
          Class Normal DZ 8631.675 Code TOE
          Obs L1 Fixed H.pr 0.047 V.pr 0.081

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 11 VDOP max 1.9
          Monitor status Not monitored RMS 62.1
          Horz SD Vert SD
          Start wk 1605 sec 414926.0 End wk 1605 sec 414936.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.014165963
          VCV xx 0.0000211656 VCV xy 0.0000142918
          VCV xz -0.0000101805 VCV yy 0.0000268471
          VCV yz -0.0000259395 VCV zz 0.0000432148

GPSVEC TP Point ID 5317 DX 25807.508 DY -4489.839
          Class Normal DZ 8631.697 Code TOP
          Obs L1 Fixed H.pr 0.050 V.pr 0.086

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 8 VDOP max 1.9
          Monitor status Not monitored RMS 51.1
          Horz SD Vert SD
          Start wk 1605 sec 414952.0 End wk 1605 sec 414959.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0128163267
          VCV xx 0.0000252502 VCV xy 0.0000162202
          VCV xz -0.0000121858 VCV yy 0.0000291329
          VCV yz -0.000027884 VCV zz 0.0000485525

GPSVEC TP Point ID 5318 DX 25812.257 DY -4497.002
          Class Normal DZ 8624.276 Code TOP
          Obs L1 Fixed H.pr 0.035 V.pr 0.061

GPSQC1 NM Min SVs 7 PDOP max 2.2
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 6 VDOP max 1.9
          Monitor status Not monitored RMS 44.2
          Horz SD Vert SD
          Start wk 1605 sec 414969.0 End wk 1605 sec 414974.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0078252414
          VCV xx 0.0000128983 VCV xy 0.0000085516
          VCV xz -0.0000065535 VCV yy 0.0000149374
          VCV yz -0.0000139228 VCV zz 0.0000234158

GPSVEC TP Point ID 5319 DX 25857.825 DY -4512.078
          Class Normal DZ 8626.523 Code TOP
          Obs L1 Fixed H.pr 0.036 V.pr 0.062

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 6 VDOP max 1.4
          Monitor status Not monitored RMS 48.1
          Horz SD Vert SD
          Start wk 1605 sec 414995.0 End wk 1605 sec 415003.0
    
```

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.0101847043
          VCV xx 0.0000124896 VCV xy 0.000008618
          VCV xz -0.0000074643 VCV yy 0.0000157064
          VCV yz -0.0000150126 VCV zz 0.0000240464

GPSVEC TP Point ID 5320 DX 25858.945 DY -4508.577
          Class Normal DZ 8630.575 Code TOE
          Obs L1 Fixed H.pr 0.036 V.pr 0.062

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 7 VDOP max 1.4
          Monitor status Not monitored RMS 35.6
          Horz SD Vert SD
          Start wk 1605 sec 415015.0 End wk 1605 sec 415021.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0091590974
          VCV xx 0.0000120039 VCV xy 0.0000083862
          VCV xz -0.0000078746 VCV yy 0.0000150648
          VCV yz -0.0000158511 VCV zz 0.0000258548

GPSVEC TP Point ID 5321 DX 25856.903 DY -4516.852
          Class Normal DZ 8619.529 Code TOP NJ
          Obs L1 Fixed H.pr 0.036 V.pr 0.062

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 42.0
          Horz SD Vert SD
          Start wk 1605 sec 415038.0 End wk 1605 sec 415042.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0079677748
          VCV xx 0.0000123265 VCV xy 0.0000087057
          VCV xz -0.0000073972 VCV yy 0.0000155589
          VCV yz -0.0000158036 VCV zz 0.000025648

GPSVEC TP Point ID 5322 DX 25856.803 DY -4519.271
          Class Normal DZ 8614.322 Code TOE NJ
          Obs L1 Fixed H.pr 0.033 V.pr 0.058

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 2.0
          Monitor status Not monitored RMS 39.6
          Horz SD Vert SD
          Start wk 1605 sec 415055.0 End wk 1605 sec 415059.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0067356522
          VCV xx 0.0000096042 VCV xy 0.0000068328
          VCV xz -0.0000050669 VCV yy 0.0000132829
          VCV yz -0.0000138843 VCV zz 0.0000231125

GPSVEC TP Point ID 5323 DX 25820.771 DY -4507.608
          Class Normal DZ 8611.220 Code TOE
          Obs L1 Fixed H.pr 0.014 V.pr 0.038

GPSQC1 NM Min SVs 6 PDOP max 2.6
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos 5 VDOP max 2.4
          Monitor status Not monitored RMS 8.8
          Horz SD Vert SD
          Start wk 1605 sec 415078.0 End wk 1605 sec 415082.0

GPSQC2 NM Ttl satellites 6 Err Scale 0.0027545097
          VCV xx 0.0000026741 VCV xy 0.0000012249
          VCV xz -0.0000012815 VCV yy 0.0000073449
          VCV yz -0.000004431 VCV zz 0.0000068991

GPSVEC TP Point ID 5324 DX 25812.702 DY -4502.232
          Class Normal DZ 8617.288 Code TOP
          Obs L1 Fixed H.pr 0.044 V.pr 0.076

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 9 VDOP max 2.0
          Monitor status Not monitored RMS 66.5
          Horz SD Vert SD
          Start wk 1605 sec 415095.0 End wk 1605 sec 415104.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0124457739
          VCV xx 0.0000173745 VCV xy 0.0000110782
          VCV xz -0.0000072138 VCV yy 0.0000196778
          VCV yz -0.0000220466 VCV zz 0.0000418619

GPSVEC TP Point ID 5325 DX 25814.922 DY -4528.957
          Class Normal DZ 8579.424 Code TOP
          Obs L1 Fixed H.pr 0.065 V.pr 0.113

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 9 VDOP max 1.4
          Monitor status Not monitored RMS 51.3
          Horz SD Vert SD
          Start wk 1605 sec 415124.0 End wk 1605 sec 415133.0
    
```

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.0193985365
          VCV xx 0.0000251983 VCV xy 0.0000146723
          VCV xz -0.0000082073 VCV yy 0.0000376967
          VCV yz -0.000054149 VCV zz 0.0001119822

GPSVEC TP Point ID 5326 DX 25821.219 DY -4529.488
          Class Normal DZ 8579.805 Code TOE
          Obs L1 Fixed H.pr 0.042 V.pr 0.073

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 7 VDOP max 1.4
          Monitor status Not monitored RMS 49.2
          Horz SD Vert SD
          Start wk 1605 sec 415148.0 End wk 1605 sec 415154.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0106882043
          VCV xx 0.0000159384 VCV xy 0.0000099257
          VCV xz -0.0000063754 VCV yy 0.000017537
          VCV yz -0.0000201024 VCV zz 0.0000397214

GPSVEC TP Point ID 5327 DX 25830.987 DY -4564.541
          Class Normal DZ 8529.872 Code TOP TOE
          Obs L1 Fixed H.pr 0.032 V.pr 0.056

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 33.1
          Horz SD Vert SD
          Start wk 1605 sec 415194.0 End wk 1605 sec 415198.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0070736795
          VCV xx 0.0000093684 VCV xy 0.0000062272
          VCV xz -0.0000041415 VCV yy 0.0000116331
          VCV yz -0.0000119369 VCV zz 0.000021985

GPSVEC TP Point ID 5328 DX 25841.057 DY -4584.184
          Class Normal DZ 8502.109 Code TOP
          Obs L1 Fixed H.pr 0.031 V.pr 0.054

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 2.0
          Monitor status Not monitored RMS 13.8
          Horz SD Vert SD
          Start wk 1605 sec 415214.0 End wk 1605 sec 415218.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0062469398
          VCV xx 0.0000099511 VCV xy 0.0000063772
          VCV xz -0.0000042818 VCV yy 0.0000103493
          VCV yz -0.000010398 VCV zz 0.0000200343

GPSVEC TP Point ID 5329 DX 25852.457 DY -4608.586
          Class Normal DZ 8471.582 Code TOP
          Obs L1 Fixed H.pr 0.033 V.pr 0.057

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 5 VDOP max 2.0
          Monitor status Not monitored RMS 23.3
          Horz SD Vert SD
          Start wk 1605 sec 415233.0 End wk 1605 sec 415237.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.00652014
          VCV xx 0.0000106809 VCV xy 0.0000069147
          VCV xz -0.0000047482 VCV yy 0.0000114029
          VCV yz -0.0000114702 VCV zz 0.0000219624

GPSVEC TP Point ID 5330 DX 25850.727 DY -4629.552
          Class Normal DZ 8440.170 Code TOP
          Obs L1 Fixed H.pr 0.031 V.pr 0.053

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 21.4
          Horz SD Vert SD
          Start wk 1605 sec 415254.0 End wk 1605 sec 415257.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0061280006
          VCV xx 0.0000081978 VCV xy 0.0000050583
          VCV xz -0.0000038127 VCV yy 0.000010193
          VCV yz -0.0000106058 VCV zz 0.0000206168

GPSVEC TP Point ID 5331 DX 25856.189 DY -4629.381
          Class Normal DZ 8442.305 Code TOE NJ
          Obs L1 Fixed H.pr 0.031 V.pr 0.054

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 1.4
          Monitor status Not monitored RMS 30.2
          Horz SD Vert SD
          Start wk 1605 sec 415272.0 End wk 1605 sec 415275.0
    
```

```

GPSQC2 NM Ttl satellites 7 Err Scale 0.0062275883
          VCV xx 0.000082985 VCV xy 0.0000349971
          VCV xz -0.000004118 VCV yy 0.0000102498
          VCV yz -0.0000110601 VCV zz 0.0000218316

GPSVEC TP Point ID 5332 DX 25843.019 DY -4658.823
          Class Normal DZ 8391.549 Code TOE E
          Obs L1 Fixed H.pr 0.033 V.pr 0.057

GPSQC1 NM Min SVs 7 PDOP max 1.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 5 VDOP max 1.4
          Monitor status Not monitored RMS 13.1
          Horz SD Vert SD
          Start wk 1605 sec 415304.0 End wk 1605 sec 415309.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0077901739
          VCV xx 0.0000087074 VCV xy 0.0000052256
          VCV xz -0.0000042768 VCV yy 0.0000117286
          VCV yz -0.0000126829 VCV zz 0.0000248924

GPSVEC TP Point ID 5333 DX 25837.805 DY -4658.017
          Class Normal DZ 8391.912 Code TOP E
          Obs L1 Fixed H.pr 0.022 V.pr 0.038

GPSQC1 NM Min SVs 7 PDOP max 2.3
          Relative DOPs Yes HDOP max 1.1
          Total GPS pos 4 VDOP max 2.0
          Monitor status Not monitored RMS 20.0
          Horz SD Vert SD
          Start wk 1605 sec 415321.0 End wk 1605 sec 415324.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0039449506
          VCV xx 0.0000033674 VCV xy 0.0000020088
          VCV xz -0.00000153 VCV yy 0.0000056427
          VCV yz -0.0000060011 VCV zz 0.0000113765

GPSVEC TP Point ID 5334 DX 25805.809 DY -4580.174
          Class Normal DZ 8487.686 Code NG
          Obs L1 Fixed H.pr 0.031 V.pr 0.053

GPSQC1 NM Min SVs 7 PDOP max 3.6
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 5 VDOP max 3.1
          Monitor status Not monitored RMS 7.3
          Horz SD Vert SD
          Start wk 1605 sec 415368.0 End wk 1605 sec 415372.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0038768281
          VCV xx 0.0000038789 VCV xy 0.0000026585
          VCV xz -0.0000020577 VCV yy 0.0000091491
          VCV yz -0.0000076161 VCV zz 0.0000119376

GPSVEC TP Point ID 5335 DX 25792.784 DY -4523.919
          Class Normal DZ 8574.862 Code NG
          Obs L1 Fixed H.pr 0.034 V.pr 0.059

GPSQC1 NM Min SVs 7 PDOP max 3.6
          Relative DOPs Yes HDOP max 1.8
          Total GPS pos 6 VDOP max 3.1
          Monitor status Not monitored RMS 12.7
          Horz SD Vert SD
          Start wk 1605 sec 415405.0 End wk 1605 sec 415410.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0046731532
          VCV xx 0.0000046979 VCV xy 0.0000030486
          VCV xz -0.0000023413 VCV yy 0.0000110913
          VCV yz -0.0000089691 VCV zz 0.0000144593

GPSVEC CN Point ID 1 DX 25544.310 DY -4332.845
          Class Normal DZ 8693.239 Code BC
          Obs L1 Fixed H.pr 0.029 V.pr 0.049

GPSQC1 NM Min SVs 7 PDOP max 2.4
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 90 VDOP max 2.0
          Monitor status Not monitored RMS 40.0
          Horz SD Vert SD
          Start wk 1605 sec 415724.0 End wk 1605 sec 415815.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0235770531
          VCV xx 0.0000057579 VCV xy 0.000003235
          VCV xz -0.0000023001 VCV yy 0.0000085731
          VCV yz -0.0000084904 VCV zz 0.0000193162

FEATURE FC Name BC
ATTRIB FC Name MATERIAL TYPE Value BRASS
ATTRIB FC Name CAP SIZE Value 2 1/2"
ATTRIB FC Name AGENCY Value OTHER
ATTRIB FC Name STAMPING Value US DEPT OF AGRICULTURE 110+00
ATTRIB FC Name ORIENTATION Value FLUSH
ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.000
    
```

| | | | | | |
|---------|----|---|--|--|----------------|
| ATTRIB | FC | Name | LOCATION | Value | |
| ATTRIB | FC | Name | NOTE | Value | |
| GPSVEC | TP | Point ID 5336 Class Normal Obs L1 Fixed | DX 25410.964 DZ 8694.935 H.pr 0.050 | DY -4272.627 Code PIPE NJ - V.pr 0.085 | |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 12 Monitor status Not monitored Horz SD Start wk 1605 sec 416098.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 47.5 Vert SD End wk 1605 sec 416109.0 | | |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000185302 VCV xz -0.0000065408 VCV yz -0.0000215856 | Err Scale 0.0144225471 VCV xy 0.0000101962 VCV yy 0.0000227741 VCV zz 0.0000591612 | | |
| FEATURE | FC | Name | PIPE | | |
| ATTRIB | FC | Name | TOP/INV | Value | TOP OF PIPE |
| ATTRIB | FC | Name | TYPE | Value | STORM DRAIN |
| ATTRIB | FC | Name | MATERIAL | Value | DUCTIL IRON |
| NOTE | NM | TOP OF 12" STEEL PIPE | | | |
| GPSVEC | TP | Point ID 5337 Class Normal Obs L1 Fixed | DX 25440.181 DZ 8812.713 H.pr 0.029 | DY -4199.728 Code PIPE - V.pr 0.050 | |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1605 sec 416265.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 26.5 Vert SD End wk 1605 sec 416268.0 | | |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000063191 VCV xz -0.0000020146 VCV yz -0.0000068472 | Err Scale 0.0048386967 VCV xy 0.0000034031 VCV yy 0.0000077993 VCV zz 0.0000203051 | | |
| FEATURE | FC | Name | PIPE | | |
| ATTRIB | FC | Name | TOP/INV | Value | INVERT OF PIPE |
| ATTRIB | FC | Name | TYPE | Value | STORM DRAIN |
| ATTRIB | FC | Name | MATERIAL | Value | DUCTIL IRON |
| NOTE | NM | INV OF 12" STEEL PIPE | | | |
| GPSVEC | TP | Point ID 5338 Class Normal Obs L1 Fixed | DX 24244.080 DZ 8751.745 H.pr 0.030 | DY -3779.197 Code PIPE NJ - V.pr 0.050 | |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1605 sec 416698.0 | PDOP max 1.7 HDOP max 0.9 VDOP max 1.5 RMS 18.8 Vert SD End wk 1605 sec 416700.0 | | |
| GPSQC2 | NM | Ttl satellites 7 VCV xx 0.0000065249 VCV xz -0.0000020709 VCV yz -0.0000056527 | Err Scale 0.004867956 VCV xy 0.0000036273 VCV yy 0.0000084607 VCV zz 0.0000203886 | | |
| FEATURE | FC | Name | PIPE | | |
| ATTRIB | FC | Name | TOP/INV | Value | TOP OF PIPE |
| ATTRIB | FC | Name | TYPE | Value | STORM DRAIN |
| ATTRIB | FC | Name | MATERIAL | Value | DUCTIL IRON |
| NOTE | NM | TOP OF 12" STEEL PIPE | | | |
| NOTE | TS | Time Date 10/14/2010 Time 12:46:41 | | | |
| INIT | KI | Init event High RMS Init type On the fly Init counter 11 Survey type Real Time Plate V.Dist <null> | Week 1605 seconds 416800.0 Point ID <no text> Plate H.Dist <null> Plate azimuth <null> | | |
| INIT | KI | Init event Good RMS Init type On the fly Init counter 11 Survey type Real Time Plate V.Dist <null> | Week 1605 seconds 416801.0 Point ID <no text> Plate H.Dist <null> Plate azimuth <null> | | |
| GPSVEC | TP | Point ID 5339 Class Normal Obs L1 Fixed | DX 24207.523 DZ 8846.123 H.pr 0.027 | DY -3698.642 Code PIPE - V.pr 0.045 | |

GPSQC1 NM Min SVs 7 PDOP max 2.2
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 1.9
 Monitor status Not monitored RMS 29.7
 Horz SD Vert SD
 Start wk 1605 sec 416814.0 End wk 1605 sec 416818.0

GPSQC2 NM Ttl satellites 7 Err Scale 0.0053262138
 VCV xx 0.0000045433 VCV xy 0.0000025212
 VCV xz -0.0000014525 VCV yy 0.000009529
 VCV yz -0.0000029561 VCV zz 0.0000140842

FEATURE FC Name PIPE
 ATTRIB FC Name TOP/INV Value INVERT OF PIPE
 ATTRIB FC Name TYPE Value STORM DRAIN
 ATTRIB FC Name MATERIAL Value DUCTIL IRON

NOTE NM INV OF 12" STEEL PIPE

GPSVEC CN Point ID 2122821 DX 20038.435 DY -2252.399
 Class Check DZ 8573.159 Code BC
 Obs L1 Fixed H.pr 0.022 V.pr 0.034

GPSQC1 NM Min SVs 8 PDOP max 1.5
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 68 VDOP max 1.2
 Monitor status Not monitored RMS 18.5
 Horz SD Vert SD
 Start wk 1605 sec 418398.0 End wk 1605 sec 418465.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.0166256242
 VCV xx 0.0000037928 VCV xy 0.0000032539
 VCV xz -0.0000014426 VCV yy 0.0000084086
 VCV yz -0.0000010783 VCV zz 0.0000048793

POLAR D CN Azmth 58°33'09.544" H.Dist 0.040
 V.Dist 0.305

FEATURE FC Name BC
 ATTRIB FC Name MATERIAL TYPE Value BRASS
 ATTRIB FC Name CAP SIZE Value 2 1/2"
 ATTRIB FC Name AGENCY Value MCDOT
 ATTRIB FC Name STAMPING Value 2
 ATTRIB FC Name ORIENTATION Value DIRT HOLE
 ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.150
 ATTRIB FC Name LOCATION Value
 ATTRIB FC Name NOTE Value

SURVEY EVENTKISurvey event Survey ended

NOTE TS Time Date 10/15/2010 Time 07:03:06

SURVEY KI Elev mask 10 PDOP mask 6.0
 SURVEY KI Elev mask 10 PDOP mask 6.0
 SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

SURVEY EVENTKISurvey event Survey ended

SURVEY KI Elev mask 10 PDOP mask 6.0
 SURVEY KI Elev mask 10 PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT KI Antenna ht 0.000 Measurement True

GPSPOS FD Point ID SRPEAST Lat 33°25'25.17374"N Lng 111°40'44.55636"W
 Class Normal Hgt 1375.166 Code <no text>
 Obs User Input H.pr <null> V.pr <null>

```

EQUIP SI Receiver <no text> Serial no <no text>
        Antenna Zephyr Geodetic 2
        Meas To Antenna Phase Center
        Tape adj 0.000
        H.Offset 0.000
        Serial no <no text>
        V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 0.279 Measurement True

GPSREF KI Reference SRPEAST

INIT KI Init event Gained Week 1605
        Init type On the fly seconds 483248.0
        Init counter 1 Point ID <no text>
        Survey type Real Time Plate H.Dist <null>
        Plate V.Dist <null> Plate azimuth <null>

EQUIP NM Receiver 5800 Serial no 4447140732
        Antenna R8/5800/SPS78x Internal
        Meas To Bottom of antenna mount
        Tape adj 0.000
        H.Offset 0.000
        Serial no <no text>
        V.Offset 0.213

NOTE NM Receiver firmware version=2.320

GPSANT KI Antenna ht 6.890 Measurement Uncorrected

GPSVEC CN Point ID 1BN11 DX 12815.350 DY -5550.355
        Class Normal DZ -492.252 Code BC
        Obs L1 Fixed H.pr 0.024 V.pr 0.039

GPSQC1 NM Min SVs 9 PDOP max 1.2
        Relative DOPs Yes HDOP max 0.6
        Total GPS pos 100 VDOP max 1.0
        Monitor status Not monitored RMS 29.2
        Horz SD Vert SD
        Start wk 1605 sec 483455.0 End wk 1605 sec 483578.0

GPSQC2 NM Ttl satellites 10 Err Scale 0.0313882828
        VCV xx 0.0000054824 VCV xy 0.0000030941
        VCV xz -0.0000015524 VCV yy 0.0000119364
        VCV yz -0.0000022005 VCV zz 0.0000042558

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value STAINLESS STEEL
ATTRIB FC Name CAP SIZE Value 3/4"
ATTRIB FC Name AGENCY Value MCDOT
ATTRIB FC Name STAMPING Value NONE
ATTRIB FC Name ORIENTATION Value HAND HOLE
ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.800
ATTRIB FC Name LOCATION Value
ATTRIB FC Name NOTE Value

INIT KI Init event Lost Week 1605
        Init type On the fly seconds 483873.0
        Init counter 0 Point ID <no text>
        Survey type Real Time Plate H.Dist <null>
        Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1605
        Init type On the fly seconds 484220.0
        Init counter 2 Point ID <no text>
        Survey type Real Time Plate H.Dist <null>
        Plate V.Dist <null> Plate azimuth <null>

NOTE TS Time Date 10/15/2010 Time 07:37:13

GPSVEC CN Point ID DRINK1 DX 13218.140 DY -4894.470
        Class Normal DZ 702.896 Code BC
        Obs L1 Fixed H.pr 0.024 V.pr 0.039

GPSQC1 NM Min SVs 10 PDOP max 1.1
        Relative DOPs Yes HDOP max 0.6
        Total GPS pos 98 VDOP max 0.9
        Monitor status Not monitored RMS 22.5
        Horz SD Vert SD
        Start wk 1605 sec 484514.0 End wk 1605 sec 484612.0

GPSQC2 NM Ttl satellites 10 Err Scale 0.0312729739
        VCV xx 0.0000068626 VCV xy 0.0000047303
        VCV xz -0.0000010895 VCV yy 0.0000121973
        VCV yz -0.0000013486 VCV zz 0.0000030079

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value BRASS
ATTRIB FC Name CAP SIZE Value 3 1/4"
ATTRIB FC Name AGENCY Value MARICOPA COUNTY
    
```

```

ATTRIB FC Name      STAMPING          Value      515 DRINK 3-2009 LS 33310
ATTRIB FC Name      ORIENTATION        Value      FLUSH
ATTRIB FC Name      DEPTH/HEIGHT IN FEET Value      0.800
ATTRIB FC Name      LOCATION            Value
ATTRIB FC Name      NOTE                Value
INIT   KI   Init event   High RMS          Week        1605
          Init type    On the fly        seconds     485040.0
          Init counter  2                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Good RMS          Week        1605
          Init type    On the fly        seconds     485041.0
          Init counter  2                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
NOTE   TS   Time Date 10/15/2010 Time 08:07:42
GPSVEC CN   Point ID 21230011   DX  24957.466     DY  -4185.215
          Class Normal   DZ  8565.175     Code BC
          Obs L1 Fixed   H.pr 0.024      V.pr 0.042
GPSQC1 NM   Min SVs      9                PDOP max    1.8
          Relative DOPs Yes          HDOP max    0.9
          Total GPS pos 95          VDOP max    1.6
          Monitor status Not monitored RMS          27.4
          Horz SD          Vert SD
          Start wk 1605 sec 486351.0 End wk 1605 sec 486446.0
GPSQC2 NM   Ttl satellites 9                Err Scale 0.0263572335
          VCV xx      0.0000095177    VCV xy      0.000007552
          VCV xz      -0.0000042475   VCV yy      0.0000102299
          VCV yz      -0.0000033328   VCV zz      0.0000040526
FEATURE FC Name      BC
ATTRIB FC Name      MATERIAL TYPE      Value      BRASS
ATTRIB FC Name      CAP SIZE           Value      2 1/4"
ATTRIB FC Name      AGENCY             Value      GLO
ATTRIB FC Name      STAMPING           Value      S 2-1-11-12 1921
ATTRIB FC Name      ORIENTATION        Value      RAISED
ATTRIB FC Name      DEPTH/HEIGHT IN FEET Value      0.500
ATTRIB FC Name      LOCATION            Value
ATTRIB FC Name      NOTE                Value
INIT   KI   Init event   Lost              Week        1605
          Init type    On the fly        seconds     486578.0
          Init counter  2                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Gained           Week        1605
          Init type    On the fly        seconds     486609.0
          Init counter  3                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   High RMS          Week        1605
          Init type    On the fly        seconds     486710.0
          Init counter  3                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Good RMS          Week        1605
          Init type    On the fly        seconds     486712.0
          Init counter  3                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Lost              Week        1605
          Init type    On the fly        seconds     486721.0
          Init counter  0                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Gained           Week        1605
          Init type    On the fly        seconds     486812.0
          Init counter  4                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>
INIT   KI   Init event   Lost              Week        1605
          Init type    On the fly        seconds     487039.0
          Init counter  0                 Point ID    <no text>
          Survey type  Real Time         Plate H.Dist <null>
          Plate V.Dist <null>           Plate azimuth <null>

```

INIT KI Init event Gained Week 1605
 Init type On the fly seconds 487093.0
 Init counter 5 Point ID <no text>
 Survey type Real Time Plate H.Dist <null>
 Plate V.Dist <null> Plate azimuth <null>

GPSVEEC CN Point ID 21229211 DX 22495.171 DY -3225.909
 Class Normal DZ 8574.429 Code BC
 Obs L1 Fixed H.pr 0.026 V.pr 0.048

GPSQC1 NM Min SVs 8 PDOP max 1.5
 Relative DOPs Yes HDOP max 0.7
 Total GPS pos 97 VDOP max 1.3
 Monitor status Not monitored RMS 27.2
 Horz SD Vert SD
 Start wk 1605 sec 487285.0 End wk 1605 sec 487385.0

GPSQC2 NM Ttl satellites 8 Err Scale 0.026968481
 VCV xx 0.0000079665 VCV xy 0.0000051261
 VCV xz -0.0000002512 VCV yy 0.0000181631
 VCV yz -0.0000048058 VCV zz 0.000004468

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value BRASS
 ATTRIB FC Name CAP SIZE Value 2"
 ATTRIB FC Name AGENCY Value MARICOPA COUNTY
 ATTRIB FC Name STAMPING Value 1/4 2-11 LS 15573
 ATTRIB FC Name ORIENTATION Value FLUSH
 ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.000
 ATTRIB FC Name LOCATION Value
 ATTRIB FC Name NOTE Value

NOTE TS Time Date 10/15/2010 Time 10:29:48

GPSVEEC CN Point ID 21228212 DX 20038.373 DY -2252.443
 Class Normal DZ 8573.312 Code BC
 Obs L1 Fixed H.pr 0.028 V.pr 0.046

GPSQC1 NM Min SVs 9 PDOP max 1.2
 Relative DOPs Yes HDOP max 0.6
 Total GPS pos 95 VDOP max 1.0
 Monitor status Not monitored RMS 23.6
 Horz SD Vert SD
 Start wk 1605 sec 494872.0 End wk 1605 sec 494971.0

GPSQC2 NM Ttl satellites 9 Err Scale 0.0323117785
 VCV xx 0.0000087733 VCV xy 0.0000023673
 VCV xz 0.0000012587 VCV yy 0.0000131072
 VCV yz -0.0000006578 VCV zz 0.0000086108

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value BRASS
 ATTRIB FC Name CAP SIZE Value 2"
 ATTRIB FC Name AGENCY Value MARICOPA COUNTY
 ATTRIB FC Name STAMPING Value 1/4 2-11 LS 15573
 ATTRIB FC Name ORIENTATION Value FLUSH
 ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.000
 ATTRIB FC Name LOCATION Value
 ATTRIB FC Name NOTE Value

SURVEY EVENTKISurvey event Survey ended

NOTE TS Time Date 10/15/2010 Time 11:13:36

HGTADJ TM Geoid Model
 Orig Nrth 0.000 Slope N 0.000
 Orig East 0.000 Slope E 0.000
 Hgt Const 0.000
 Geoid GEOID03 (Conus)

SC V10-70 Copyright © Trimble Navigation Ltd, 1996-2003
 Serial no 85 09-Nov-10 14:37
 Angle Degrees Dist Feet Press inch Hg
 Temp Fahrenheit Coord N-E-Elv H.obs Right

JOB Job ID PASS MTN 11-09
 Atmos crn No C and R crn Yes Refrac cnst 0.20
 Elev Yes Sea level crn No

NOTE TS Time Date 11/09/2010 Time 07:13:19

F FILE FC File AMEC FIELD CODES_12-23-08.ddfUsed Yes
 ID 07524 Name AMEC

COGO NM Azmth From North Dir North-East

LOCELL KI Local Rad 20925646.325 Flat. 298.2572215382

SITE KI Prj Lat <null> Nrth Offset 0.000
 Prj Lng <null> East Offset 0.000
 Prj Hgt 1200.000 Scale 1 0000000000

DATA COLLECTION

11/9/2010

JS

PTS 3000-3258

SHFTGRD KI File name <no text>

PROJ KI Transverse Mercator
 Orig Lat 31°00'00.000000"N Orig Nrth 0.000
 Orig Lng 111°55'00.000000"W Orig East 700000.000
 Orig Hgt <null> Orig Elev <null>
 Orient 1 <null> Orient 2 <null>
 Scale 0.9999000000

DATUM KI Molodensky
 Srce Rad 20925646.325 Srce Flat 298.2572229329
 Rotn X 0°00'00" Rotn Y 0°00'00"
 Rotn Z 0°00'00" Trans X 0.000
 Trans Y 0.000 Trans Z 0.000
 Scale 0.00000000

PLANE KI Orig Nrth <null> Orig East <null>
 Trans N <null> Trans E <null>
 Rotation <null> Scale <null>

HGTADJ KI Geoid Model
 Orig Nrth 0.000 Slope N 0.000
 Orig East 0.000 Slope E 0.000
 Hgt Const 0.000
 Geoid GEOID03 (Conus)

COORD NM System Name US State Plane 1983
 Zone Name Arizona Central 0202
 Datum Name NAD 1983 (Conus)
 Coord System Option Chosen from library

GRDPOS CC Point ID 2000 Nrth 892441.631 East 791526.956
 Class Normal Elv 1782.989 Code TOP B
 Obs Copied

SURVEY KI Elev mask 10 PDOP mask 6.0
 SURVEY KI Elev mask 10 PDOP mask 6.0

NOTE TS Time Date 11/09/2010 Time 07:46:48

SURVEY KI Elev mask 13 PDOP mask 6.0
 SURVEY KI Elev mask 13 PDOP mask 6.0

SURVEY EVENTKISurvey even: Base survey started

SURVEY EVENTKISurvey event Survey ended

NOTE NM Following data copied from another job: PASS MTN DAM2(1)

LOCELL TM Local Rad 20925646.325 Flat. 298.2572215381

SITE TM Prj Lat <null> Nrth Offset 0.000
 Prj Lng <null> East Offset 0.000
 Prj Hgt 1083.752 Scale 1.0000000000

SHFTGRD TM File name <no text>

```

PROJ    TM    Transverse Mercator
          Orig Lat  31°00'00.00000°N      Orig Nrth 0.000
          Orig Lng  111°55'00.00000°W     Orig East 700000.000
          Orig Hgt  0.000                  Orig Elev 0.000
          Orient 1  0°00'00"              Orient 2  0°00'00"
          Scale     0.9999000000

DATUM   TM    Molodensky
          Srce Rad  20925646.325          Srce Flat 298.2572235630
          Rotn X    0°00'00"              Rotn Y    0°00'00"
          Rotn Z    0°00'00"              Trans X   0.000
          Trans Y   0.000                  Trans Z   0.000
          Scale     0.00000000

PLANE   TM    Orig Nrth 891887.639        Orig East 794567.906
          Trans N   -0.012                Trans E   0.078
          Rotation  -0°00'02.910303"     Scale    0.99999207

HGTADJ  TM    Geoid + Inclined Plane
          Orig Nrth 891879.086            Slope N   24.470
          Orig East 791925.872            Slope E  -22.238
          Hgt Const 0.142
          Geoid     GEOID03 (Conus)

COORD   NM    System Name      <no text>
          Zone Name      <no text>
          Datum Name     <no text>
          Coord System Option Keyed in

COGO     NM    Azmth      From North      Dir      North-East

GRDPOS   KI    Point ID 1      Nrth 892048.153  East 797809.475
          Class Normal      Elv 1755.643    Code BC
          Obs User Input

FEATURE  FC    Name      BC
ATTRIB   FC    Name      MATERIAL TYPE    Value  BRASS
ATTRIB   FC    Name      CAP SIZE        Value  2 1/2"
ATTRIB   FC    Name      AGENCY          Value  OTHER
ATTRIB   FC    Name      STAMPING        Value  US DEPT OF AGRICULTURE 110+00
ATTRIB   FC    Name      ORIENTATION     Value  FLUSH
ATTRIB   FC    Name      DEPTH/HEIGHT IN FEET Value  0.000
ATTRIB   FC    Name      LOCATION        Value
ATTRIB   FC    Name      NOTE            Value

SURVEY   KI    Elev mask 13          PDOP mask 6.0
SURVEY   KI    Elev mask 13          PDOP mask 6.0
SURVEY   KI    Elev mask 13          PDOP mask 6.0

SURVEY EVENTKISurvey event Base survey started

GPSANT   KI    Antenna ht 0.000          Measurem True
GPSPOS   FD    Point ID 1      Lat 33°27'06.32718°N Lng 111°35'45.53989°W
          Class Check      Hgt 1659.446          Code BC
          Obs User Input    H.pr <null>          V.pr <null>

EQUIP    BA    Receiver 5700          Serial no 0220344135
          Antenna Zephyr Geodetic
          Meas To Bottom of notch
          Tape adj 0.000          Serial no <no text>
          H.Offset 0.557          V.Offset 0.029

NOTE     NM    Receiver firmware version=2.210

GPSANT   KI    Antenna ht 4.560          Measurem Uncorrected
GPSREF   BA    Reference 1
SURVEY   KI    Elev mask 13          PDOP mask 6.0
SURVEY   KI    Elev mask 13          PDOP mask 6.0
SURVEY   KI    Elev mask 13          PDOP mask 6.0

SURVEY EVENTKISurvey event Rover survey started

GPSANT   KI    Antenna ht 0.000          Measurem True
GPSPOS   SI    Point ID 1      Lat 33°27'06.32718°N Lng 111°35'45.53989°W
          Class Check      Hgt 1659.446          Code BC
          Obs User Input    H.pr <null>          V.pr <null>

GPSANT   KI    Antenna ht 0.000          Measurem True
GPSPOS   FD    Point ID 1      Lat 33°27'06.32718°N Lng 111°35'45.53989°W
          Class Check      Hgt 1659.446          Code BC
          Obs User Input    H.pr <null>          V.pr <null>
    
```

```

EQUIP  SI  Receiver  5700                      Serial no <no text>
          Antenna  Zephyr Geodetic
          Meas To  Antenna Phase Center
          Tape adj  0.000                      Serial no <no text>
          H.Offset 0.000                      V.Offset  0.000

NOTE    NM  Receiver firmware version=0.000

GPSANT  KI  Antenna ht 4.554                    Measuremt True

GPSREF  KI  Reference 1

INIT    KI  Init event  Gained                    Week          1609
          Init type   On the fly                 seconds       226240.0
          Init counter 1                       Point ID      <no text>
          Survey type  Real Time                 Plate H.Dist  <null>
          Plate V.Dist <null>                   Plate azimuth <null>

NOTE    NM  Following data copied from another job: PASS MTN DAM2(1)

GRDPOS  KI  Point ID 2122821                    Nrth 891879.065    East 791925.849
          Class Control Elv 1767.465            Code BC
          Obs User Input

EQUIP    NM  Receiver  5800                      Serial no 4447140732
          Antenna  R8/5800/SPS78x Internal
          Meas To  Bottom of antenna mount
          Tape adj  0.000                      Serial no <no text>
          H.Offset 0.000                      V.Offset  0.213

NOTE    NM  Receiver firmware version=2.320

GPSANT  KI  Antenna ht 6.890                    Measuremt Uncorrected

GPSVEC  TP  Point ID 2122821                    DX  -5506.811      DY  2078.328
          Class Check DZ  -118.456              Code BC
          Obs L1 Fixed H.pr 0.040              V.pr 0.055

GPSQC1  NM  Min SVs      7                      PDOP max 2.3
          Relative DOPs Yes HDOP max 1.4
          Total GPS pos  5                      VDOP max 1.9
          Monitor status Not monitored          RMS      28.9
          Horz SD                               Vert SD
          Start wk 1609 sec 227049.0           End wk 1609 sec 227053.0

POLAR D TP  Azmth      108°20'47.045"           H.Dist      0.027
          V.Dist      -0.139

FEATURE FC  Name      BC
ATTRIB FC  Name      MATERIAL TYPE            Value      ALUMINUM
ATTRIB FC  Name      CAP SIZE                  Value      3"
ATTRIB FC  Name      AGENCY                    Value      MCDOT
ATTRIB FC  Name      STAMPING                  Value      2
ATTRIB FC  Name      ORIENTATION               Value      DIRT HOLE
ATTRIB FC  Name      DEPTH/HEIGHT IN FEET      Value      0.150
ATTRIB FC  Name      LOCATION                  Value
ATTRIB FC  Name      NOTE                      Value

GRDPOS  CC  Point ID 2002                    Nrth 892367.917    East 791615.205
          Class Normal Elv 1782.474            Code TOP
          Obs Copied

GPSVEC  TP  Point ID 3000                    DX  -5711.140      DY  2443.305
          Class Normal DZ  308.882              Code TOP
          Obs L1 Fixed H.pr 0.037              V.pr 0.052

GPSQC1  NM  Min SVs      7                      PDOP max 2.2
          Relative DOPs Yes HDOP max 1.3
          Total GPS pos  4                      VDOP max 1.8
          Monitor status Not monitored          RMS      8.7
          Horz SD                               Vert SD
          Start wk 1609 sec 227658.0           End wk 1609 sec 227661.0

GPSVEC  TP  Point ID 3001                    DX  -5720.495      DY  2441.329
          Class Normal DZ  300.495              Code TOP1
          Obs L1 Fixed H.pr 0.022              V.pr 0.032

GPSQC1  NM  Min SVs      7                      PDOP max 1.6
          Relative DOPs Yes HDOP max 0.9
          Total GPS pos  4                      VDOP max 1.3
          Monitor status Not monitored          RMS      9.1
          Horz SD                               Vert SD
          Start wk 1609 sec 227792.0           End wk 1609 sec 227795.0

NOTE    TS  Time Date 11/09/2010 Time 08:18:19

GPSVEC  TP  Point ID 3002                    DX  -5654.297      DY  2386.479
          Class Normal DZ  259.321              Code TOP
          Obs L1 Fixed H.pr 0.031              V.pr 0.044
    
```

| | | | | | |
|--------|----|-------------------|-----------------|-----------------|------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 26.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 227897.0 | End wk 1609 sec | 227900.0 |
| GPSVEC | TP | Point ID 3003 | DX -5663.368 | DY | 2384.358 |
| | | Class Normal | DZ 251.738 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.024 | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.5 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 227912.0 | End wk 1609 sec | 227915.0 |
| GRDPOS | CC | Point ID 2006 | Nrth 892233.685 | East | 791798.275 |
| | | Class Normal | Elv 1782.034 | Code | TOP |
| | | Obs Copied | | | |
| GPSVEC | TP | Point ID 3004 | DX -5596.681 | DY | 2329.380 |
| | | Class Normal | DZ 211.012 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.021 | V.pr | 0.028 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.4 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 10.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228331.0 | End wk 1609 sec | 228334.0 |
| GPSVEC | TP | Point ID 3005 | DX -5604.933 | DY | 2326.725 |
| | | Class Normal | DZ 202.801 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.039 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.4 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 13.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228347.0 | End wk 1609 sec | 228350.0 |
| GPSVEC | TP | Point ID 3006 | DX -5529.848 | DY | 2274.019 |
| | | Class Normal | DZ 170.514 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.020 | V.pr | 0.028 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 15.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228475.0 | End wk 1609 sec | 228478.0 |
| GPSVEC | TP | Point ID 3007 | DX -5537.268 | DY | 2270.379 |
| | | Class Normal | DZ 161.463 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.021 | V.pr | 0.029 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.4 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.1 |
| | | Monitor status | Not monitored | RMS | 10.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228491.0 | End wk 1609 sec | 228494.0 |
| GRDPOS | CC | Point ID 2008 | Nrth 892189.769 | East | 791900.036 |
| | | Class Normal | Elv 1781.993 | Code | TOP |
| | | Obs Copied | | | |
| GPSVEC | TP | Point ID 3008 | DX -5452.852 | DY | 2224.845 |
| | | Class Normal | DZ 144.140 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 14.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228730.0 | End wk 1609 sec | 228735.0 |
| GPSVEC | TP | Point ID 3009 | DX -5459.836 | DY | 2220.295 |
| | | Class Normal | DZ 133.313 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.021 | V.pr | 0.031 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.9 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 13.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 228830.0 | End wk 1609 sec | 228834.0 |
| GPSVEC | TP | Point ID 3010 | DX -5365.507 | DY | 2182.888 |
| | | Class Normal | DZ 133.638 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.033 |

```

GPSQC1 NM Min SVs      8          PDOP max 1.1
          Relative DOPs Yes        HDOP max 0.6
          Total GPS pos 3          VDOP max 0.9
          Monitor status Not monitored RMS    13.8
          Horz SD                               Vert SD
          Start wk 1609 sec 228979.0      End wk 1609  sec 228981.0

GPSVEC TP Point ID 3011      DX  -5368.260      DY  2177.258
          Class Del normal      DZ  124.445      Code TOP1
          Obs L1 Fixed          H.pr 0.021      V.pr 0.031

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.0
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    16.2
          Horz SD                               Vert SD
          Start wk 1609 sec 228993.0      End wk 1609  sec 228997.0

NOTE NM Deleted 8:38:01 AM 11/9/2010

GPSVEC TP Point ID 3011      DX  -5370.818      DY  2178.491
          Class Normal          DZ  124.841      Code TOP1
          Obs L1 Fixed          H.pr 0.019      V.pr 0.029

GPSQC1 NM Min SVs      8          PDOP max 1.9
          Relative DOPs Yes        HDOP max 1.0
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    13.3
          Horz SD                               Vert SD
          Start wk 1609 sec 229072.0      End wk 1609  sec 229076.0

GRDPOS CC Point ID 2027      Nrth 892172.002      East 792138.554
          Class Normal          Elv  1781.958      Code TOP
          Obs Copied

GPSVEC TP Point ID 3012      DX  -5277.588      DY  2147.883
          Class Normal          DZ  133.075      Code TOP
          Obs L1 Fixed          H.pr 0.024      V.pr 0.038

GPSQC1 NM Min SVs      9          PDOP max 1.7
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 1.4
          Monitor status Not monitored RMS    17.1
          Horz SD                               Vert SD
          Start wk 1609 sec 229253.0      End wk 1609  sec 229256.0

SURVEY EVENTKISurvey event Error while setting receiver mode

SURVEY EVENTKISurvey event Communications error

GPSVEC TP Point ID 3013      DX  -5280.105      DY  2141.850
          Class Normal          DZ  123.257      Code TOP1
          Obs L1 Fixed          H.pr 0.023      V.pr 0.037

GPSQC1 NM Min SVs      9          PDOP max 0.5
          Relative DOPs Yes        HDOP max 0.3
          Total GPS pos 3          VDOP max 0.4
          Monitor status Not monitored RMS    18.8
          Horz SD                               Vert SD
          Start wk 1609 sec 229290.0      End wk 1609  sec 229301.0

GPSVEC TP Point ID 3014      DX  -5278.805      DY  2144.348
          Class Normal          DZ  127.653      Code NG
          Obs L1 Fixed          H.pr 0.020      V.pr 0.032

GPSQC1 NM Min SVs      9          PDOP max 1.7
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 5          VDOP max 1.4
          Monitor status Not monitored RMS    13.6
          Horz SD                               Vert SD
          Start wk 1609 sec 229361.0      End wk 1609  sec 229365.0

NOTE TS Time Date 11/09/2010 Time 08:49:29

GPSVEC TP Point ID 3015      DX  -1053.863      DY  474.375
          Class Normal          DZ  112.901      Code NG
          Obs L1 Fixed          H.pr 0.019      V.pr 0.031

GPSQC1 NM Min SVs      9          PDOP max 1.7
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 5          VDOP max 1.5
          Monitor status Not monitored RMS    14.0
          Horz SD                               Vert SD
          Start wk 1609 sec 229766.0      End wk 1609  sec 229770.0

GPSVEC TP Point ID 3016      DX  -909.418      DY  410.053
          Class Normal          DZ  101.534      Code NG
          Obs L1 Fixed          H.pr 0.020      V.pr 0.034

GPSQC1 NM Min SVs      9          PDOP max 1.7
          Relative DOPs Yes        HDOP max 0.9
          Total GPS pos 4          VDOP max 1.5
          Monitor status Not monitored RMS    15.1
          Horz SD                               Vert SD
          Start wk 1609 sec 229820.0      End wk 1609  sec 229823.0

GPSVEC TP Point ID 3017      DX  -600.717      DY  290.690
          Class Normal          DZ  107.048      Code NG
          Obs L1 Fixed          H.pr 0.026      V.pr 0.047
    
```

```

GPSQC1 NM Min SVs      8          PDOP max 2.5
          Relative DOPs Yes       HDOP max 1.2
          Total GPS pos 4         VDOP max 2.1
          Monitor status Not monitored RMS    10.4
          Horz SD              Vert SD
          Start wk 1609 sec 229916.0 End wk 1609 sec 229919.0

LINE KI Line 1          Code <no text>
      Start Pt 3014     End Pt 3015
      St North 892165.041 End North 892168.072
      St East 792112.609 End East 796654.820
      St Elev 1781.975  End Elev 1771.024
      Start Stn 0.000   Stn Int 95.000

LINE KI Line 2          Code <no text>
      Start Pt 3015     End Pt 3016
      St North 892168.072 End North 892155.418
      St East 796654.820 End East 796812.812
      St Elev 1771.024  End Elev 1770.236
      Start Stn 0.000   Stn Int 95.000

GPSVEC TP Point ID 3018      DX -5191.762    DY 2106.443
          Class Normal      DZ 123.177      Code TOP1
          Obs L1 Fixed      H.pr 0.016      V.pr 0.031

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 5         VDOP max 1.8
          Monitor status Not monitored RMS    9.9
          Horz SD              Vert SD
          Start wk 1609 sec 230614.0 End wk 1609 sec 230618.0

GPSVEC TP Point ID 3019      DX -5189.320    DY 2112.081
          Class Normal      DZ 132.431      Code TOP
          Obs L1 Fixed      H.pr 0.019      V.pr 0.038

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 4         VDOP max 1.8
          Monitor status Not monitored RMS    8.8
          Horz SD              Vert SD
          Start wk 1609 sec 230638.0 End wk 1609 sec 230641.0

GPSVEC TP Point ID 3020      DX -5101.071    DY 2076.888
          Class Normal      DZ 132.237      Code TOP
          Obs L1 Fixed      H.pr 0.015      V.pr 0.030

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 6         VDOP max 1.8
          Monitor status Not monitored RMS    10.9
          Horz SD              Vert SD
          Start wk 1609 sec 230708.0 End wk 1609 sec 230713.0

GPSVEC TP Point ID 3021      DX -5103.521    DY 2071.037
          Class Normal      DZ 122.672      Code TOP1
          Obs L1 Fixed      H.pr 0.015      V.pr 0.030

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 5         VDOP max 1.8
          Monitor status Not monitored RMS    10.5
          Horz SD              Vert SD
          Start wk 1609 sec 230736.0 End wk 1609 sec 230740.0

GPSVEC TP Point ID 3022      DX -5013.096    DY 2041.231
          Class Normal      DZ 131.161      Code TOP
          Obs L1 Fixed      H.pr 0.016      V.pr 0.032

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 5         VDOP max 1.8
          Monitor status Not monitored RMS    10.5
          Horz SD              Vert SD
          Start wk 1609 sec 230820.0 End wk 1609 sec 230824.0

GPSVEC TP Point ID 3023      DX -5015.274    DY 2036.063
          Class Normal      DZ 122.518      Code TOP1
          Obs L1 Fixed      H.pr 0.016      V.pr 0.032

GPSQC1 NM Min SVs      8          PDOP max 2.0
          Relative DOPs Yes       HDOP max 0.9
          Total GPS pos 5         VDOP max 1.8
          Monitor status Not monitored RMS    12.1
          Horz SD              Vert SD
          Start wk 1609 sec 230841.0 End wk 1609 sec 230845.0

GRDPOS CC Point ID 2025      Nrth 892172.215 East 792014.925
          Class Normal      Elv 1781.925    Code TOP
          Obs Copied

GRDPOS CC Point ID 2035      Nrth 892171.717 East 792634.630
          Class Normal      Elv 1782.035    Code TOP
          Obs Copied

GPSVEC TP Point ID 3024      DX -5096.886    DY 2028.932
          Class Normal      DZ 49.112       Code NG
          Obs L1 Fixed      H.pr 0.018      V.pr 0.035
    
```

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.9
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 13.2
 Horz SD Vert SD
 Start wk 1609 sec 231290.0 End wk 1609 sec 231294.0

GPSVEC TP Point ID 3025 DX -5086.441 DY 2054.415
 Class Normal DZ 91.178 Code TOE1
 Obs L1 Fixed H.pr 0.016 V.pr 0.032

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.9
 Total GPS pos 4 VDOP max 1.7
 Monitor status Not monitored RMS 13.8
 Horz SD Vert SD
 Start wk 1609 sec 231331.0 End wk 1609 sec 231334.0

GPSVEC TP Point ID 3026 DX -5085.047 DY 2062.702
 Class Del normal DZ 122.677 Code TOP
 Obs L1 Fixed H.pr 0.018 V.pr 0.037

GPSQC1 NM Min SVs 9 PDOP max 1.4
 Relative DOPs Yes HDOP max 0.6
 Total GPS pos 3 VDOP max 1.2
 Monitor status Not monitored RMS 13.8
 Horz SD Vert SD
 Start wk 1609 sec 231381.0 End wk 1609 sec 231383.0

NOTE NM Deleted 9:16:56 AM 11/9/2010

GPSVEC TP Point ID 3026 DX -5083.020 DY 2062.744
 Class Normal DZ 122.697 Code TOP1
 Obs L1 Fixed H.pr 0.016 V.pr 0.033

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.9
 Total GPS pos 6 VDOP max 1.7
 Monitor status Not monitored RMS 13.6
 Horz SD Vert SD
 Start wk 1609 sec 231409.0 End wk 1609 sec 231414.0

GPSVEC TP Point ID 3027 DX -5080.523 DY 2068.942
 Class Normal DZ 132.766 Code TOP
 Obs L1 Fixed H.pr 0.016 V.pr 0.033

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 4 VDOP max 1.7
 Monitor status Not monitored RMS 11.0
 Horz SD Vert SD
 Start wk 1609 sec 231440.0 End wk 1609 sec 231443.0

GPSVEC TP Point ID 3028 DX -5074.032 DY 2084.946
 Class Normal DZ 147.115 Code TOE NJ
 Obs L1 Fixed H.pr 0.025 V.pr 0.051

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 4 VDOP max 1.7
 Monitor status Not monitored RMS 27.0
 Horz SD Vert SD
 Start wk 1609 sec 231482.0 End wk 1609 sec 231486.0

NOTE NM Modified 1:15:53 PM 11/9/2010

NOTE NM Old values TOE2

GPSVEC TP Point ID 3029 DX -5068.797 DY 2097.079
 Class Normal DZ 165.275 Code TOP NJ
 Obs L1 Fixed H.pr 0.019 V.pr 0.039

GPSQC1 NM Min SVs 9 PDOP max 1.4
 Relative DOPs Yes HDOP max 0.6
 Total GPS pos 4 VDOP max 1.2
 Monitor status Not monitored RMS 12.2
 Horz SD Vert SD
 Start wk 1609 sec 231551.0 End wk 1609 sec 231554.0

NOTE NM Modified 1:16:12 PM 11/9/2010

NOTE NM Old values TOP2

NOTE TS Time Date 11/09/2010 Time 09:19:36

GPSVEC TP Point ID 3030 DX -5065.783 DY 2104.461
 Class Normal DZ 172.479 Code TOE NJ
 Obs L1 Fixed H.pr 0.016 V.pr 0.033

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 4 VDOP max 1.7
 Monitor status Not monitored RMS 15.9
 Horz SD Vert SD
 Start wk 1609 sec 231573.0 End wk 1609 sec 231576.0

NOTE NM Modified 1:16:25 PM 11/9/2010

NOTE NM Old values TOE3

```

GPSVEC TP Point ID 3031      DX -5063.482      DY 2109.928
        Class Normal      DZ 181.424      Code TOE NJ
        Obs L1 Fixed      H.pr 0.015      V.pr 0.031

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 4        VDOP max 1.7
        Monitor status Not monitored RMS 10.6
        Horz SD              Vert SD
        Start wk 1609 sec 231590.0 End wk 1609 sec 231593.0

NOTE NM Modified 1:16:37 PM 11/9/2010

NOTE NM Old values TOE4

GPSVEC TP Point ID 3032      DX -5063.132      DY 2113.472
        Class Normal      DZ 193.324      Code TOP NJ
        Obs L1 Fixed      H.pr 0.030      V.pr 0.061

GPSQC1 NM Min SVs          8          PDOP max 2.7
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 5        VDOP max 2.4
        Monitor status Not monitored RMS 44.8
        Horz SD              Vert SD
        Start wk 1609 sec 231623.0 End wk 1609 sec 231627.0

NOTE NM Modified 1:16:48 PM 11/9/2010

NOTE NM Old values TOP3

GPSVEC TP Point ID 3033      DX -5052.990      DY 2137.670
        Class Normal      DZ 234.026      Code NG
        Obs L1 Fixed      H.pr 0.025      V.pr 0.050

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.9
        Total GPS pos 4        VDOP max 1.7
        Monitor status Not monitored RMS 10.4
        Horz SD              Vert SD
        Start wk 1609 sec 231670.0 End wk 1609 sec 231673.0

GPSVEC TP Point ID 3034      DX -5044.596      DY 2159.334
        Class Normal      DZ 271.447      Code NG
        Obs L1 Fixed      H.pr 0.015      V.pr 0.031

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 5        VDOP max 1.7
        Monitor status Not monitored RMS 10.1
        Horz SD              Vert SD
        Start wk 1609 sec 231736.0 End wk 1609 sec 231740.0

INIT KI Init event High RMS      Week 1609
        Init type On the fly      seconds 231764.0
        Init counter 1          Point ID <no text>
        Survey type Real Time      Plate H.Dist <null>
        Plate V.Dist <null>      Plate azimuth <null>

INIT KI Init event Good RMS      Week 1609
        Init type On the fly      seconds 231765.0
        Init counter 1          Point ID <no text>
        Survey type Real Time      Plate H.Dist <null>
        Plate V.Dist <null>      Plate azimuth <null>

GPSVEC TP Point ID 3035      DX -4924.828      DY 2006.691
        Class Normal      DZ 131.548      Code TOP
        Obs L1 Fixed      H.pr 0.017      V.pr 0.035

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 5        VDOP max 1.7
        Monitor status Not monitored RMS 21.5
        Horz SD              Vert SD
        Start wk 1609 sec 231889.0 End wk 1609 sec 231893.0

GPSVEC TP Point ID 3036      DX -4926.766      DY 2000.903
        Class Normal      DZ 122.490      Code TOP1
        Obs L1 Fixed      H.pr 0.018      V.pr 0.037

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 4        VDOP max 1.7
        Monitor status Not monitored RMS 15.8
        Horz SD              Vert SD
        Start wk 1609 sec 231909.0 End wk 1609 sec 231912.0

GPSVEC TP Point ID 3037      DX -4936.010      DY 1971.867
        Class Normal      DZ 131.715      Code TOP
        Obs L1 Fixed      H.pr 0.016      V.pr 0.033

GPSQC1 NM Min SVs          9          PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 5        VDOP max 1.7
        Monitor status Not monitored RMS 13.9
        Horz SD              Vert SD
        Start wk 1609 sec 232074.0 End wk 1609 sec 232078.0

NOTE NM Modified 1:17:10 PM 11/9/2010

```

NOTE NM Old values TOP NJ

GPSVEC TP Point ID 3038 DX -4838.439 DY 1966.061
 Class Normal DZ 122.627 Code TOP1
 Obs L1 Fixed H.pr 0.018 V.pr 0.036

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 13.0
 Horz SD Vert SD
 Start wk 1609 sec 232102.0 End wk 1609 sec 232106.0

NOTE NM Modified 1:17:19 PM 11/9/2010

NOTE NM Old values TOPI NJ

GRDPOS CC Point ID 2045 Nrth 892169.793 East 793250.913
 Class Normal Elv 1781.896 Code TOP
 Obs Copied

GRDPOS CC Point ID 2078 Nrth 892169.181 East 793872.542
 Class Normal Elv 1782.354 Code TOP
 Obs Copied

GRDPOS CC Point ID 2088 Nrth 892166.771 East 794491.485
 Class Normal Elv 1781.792 Code TOP
 Obs Copied

GRDPOS CC Point ID 2098 Nrth 892168.652 East 795111.922
 Class Normal Elv 1782.063 Code TOP
 Obs Copied

GRDPOS CC Point ID 2111 Nrth 892166.714 East 795730.458
 Class Normal Elv 1770.678 Code TOP
 Obs Copied

GRDPOS CC Point ID 2121 Nrth 892168.926 East 796351.849
 Class Normal Elv 1770.778 Code TOP
 Obs Copied

GPSVEC TP Point ID 3039 DX -4747.730 DY 1936.412
 Class Normal DZ 131.437 Code TOP
 Obs L1 Fixed H.pr 0.023 V.pr 0.051

GPSQC1 NM Min SVs 9 PDOP max 2.9
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 2.7
 Monitor status Not monitored RMS 11.3
 Horz SD Vert SD
 Start wk 1609 sec 232860.0 End wk 1609 sec 232863.0

NOTE NM Modified 1:17:38 PM 11/9/2010

NOTE NM Old values TOP NJ

GPSVEC TP Point ID 3040 DX -4750.699 DY 1930.825
 Class Normal DZ 122.113 Code TOP1
 Obs L1 Fixed H.pr 0.028 V.pr 0.063

GPSQC1 NM Min SVs 9 PDOP max 2.9
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 5 VDOP max 2.7
 Monitor status Not monitored RMS 7.5
 Horz SD Vert SD
 Start wk 1609 sec 232893.0 End wk 1609 sec 232897.0

GPSVEC TP Point ID 3041 DX -4661.989 DY 1895.040
 Class Normal DZ 121.104 Code TOP1
 Obs L1 Fixed H.pr 0.021 V.pr 0.046

GPSQC1 NM Min SVs 9 PDOP max 2.9
 Relative DOPs Yes HDOP max 1.2
 Total GPS pos 4 VDOP max 2.7
 Monitor status Not monitored RMS 12.0
 Horz SD Vert SD
 Start wk 1609 sec 232989.0 End wk 1609 sec 232992.0

GPSVEC TP Point ID 3042 DX -4659.496 DY 1901.041
 Class Normal DZ 130.844 Code TOP
 Obs L1 Fixed H.pr 0.019 V.pr 0.044

GPSQC1 NM Min SVs 9 PDOP max 2.1
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 3 VDOP max 1.9
 Monitor status Not monitored RMS 12.8
 Horz SD Vert SD
 Start wk 1609 sec 233004.0 End wk 1609 sec 233006.0

GPSVEC TP Point ID 3043 DX -4571.492 DY 1865.526
 Class Normal DZ 129.964 Code TOP
 Obs L1 Fixed H.pr 0.024 V.pr 0.055

GPSQC1 NM Min SVs 9 PDOP max 2.1
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 5 VDOP max 1.9
 Monitor status Not monitored RMS 31.1
 Horz SD Vert SD
 Start wk 1609 sec 233057.0 End wk 1609 sec 233061.0

```

GPSVEC TP Point ID 3044      DX -4573.456      DY 1859.634
        Class Normal      DZ 120.615      Code TOP1
        Obs L1 Fixed      H.pr 0.021      V.pr 0.046

GPSQC1 NM Min SVs          9      PDOP max 2.1
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 5      VDOP max 1.9
        Monitor status Not monitored      RMS 15.9
        Horz SD      Vert SD
        Start wk 1609 sec 233073.0      End wk 1609 sec 233077.0

GPSVEC TP Point ID 3045      DX -4485.528      DY 1824.500
        Class Normal      DZ 120.122      Code TOP1
        Obs L1 Fixed      H.pr 0.027      V.pr 0.061

GPSQC1 NM Min SVs          9      PDOP max 2.9
        Relative DOPs Yes      HDOP max 1.2
        Total GPS pos 13      VDOP max 2.7
        Monitor status Not monitored      RMS 46.5
        Horz SD      Vert SD
        Start wk 1609 sec 233134.0      End wk 1609 sec 233146.0

GPSVEC TP Point ID 3046      DX -4482.806      DY 1830.841
        Class Normal      DZ 130.520      Code TOP
        Obs L1 Fixed      H.pr 0.024      V.pr 0.054

GPSQC1 NM Min SVs          9      PDOP max 2.1
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 5      VDOP max 1.9
        Monitor status Not monitored      RMS 13.6
        Horz SD      Vert SD
        Start wk 1609 sec 233168.0      End wk 1609 sec 233172.0

INIT KI Init event High RMS      Week 1609
        Init type On the fly      seconds 233252.0
        Init counter 1      Point ID <no text>
        Survey type Real Time      Plate H.Dist <null>
        Plate V.Dist <null>      Plate azimuth <null>

INIT KI Init event Good RMS      Week 1609
        Init type On the fly      seconds 233252.0
        Init counter 1      Point ID <no text>
        Survey type Real Time      Plate H.Dist <null>
        Plate V.Dist <null>      Plate azimuth <null>

NOTE TS Time Date 11/09/2010 Time 09:54:33

GPSVEC TP Point ID 3047      DX -4499.911      DY 1790.104
        Class Normal      DZ 40.445      Code NG
        Obs L1 Fixed      H.pr 0.026      V.pr 0.056

GPSQC1 NM Min SVs          9      PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 3      VDOP max 1.7
        Monitor status Not monitored      RMS 20.7
        Horz SD      Vert SD
        Start wk 1609 sec 233671.0      End wk 1609 sec 233673.0

GPSVEC TP Point ID 3048      DX -4493.225      DY 1806.613
        Class Normal      DZ 68.372      Code NG
        Obs L1 Fixed      H.pr 0.026      V.pr 0.055

GPSQC1 NM Min SVs          9      PDOP max 2.7
        Relative DOPs Yes      HDOP max 1.1
        Total GPS pos 6      VDOP max 2.4
        Monitor status Not monitored      RMS 13.8
        Horz SD      Vert SD
        Start wk 1609 sec 233728.0      End wk 1609 sec 233733.0

GPSVEC TP Point ID 3049      DX -4491.061      DY 1813.259
        Class Normal      DZ 78.173      Code TOE NJ
        Obs L1 Fixed      H.pr 0.028      V.pr 0.060

GPSQC1 NM Min SVs          9      PDOP max 2.7
        Relative DOPs Yes      HDOP max 1.1
        Total GPS pos 5      VDOP max 2.4
        Monitor status Not monitored      RMS 15.3
        Horz SD      Vert SD
        Start wk 1609 sec 233746.0      End wk 1609 sec 233750.0

GPSVEC TP Point ID 3050      DX -4474.455      DY 1852.444
        Class Normal      DZ 149.807      Code TOE NJ
        Obs L1 Fixed      H.pr 0.027      V.pr 0.056

GPSQC1 NM Min SVs          9      PDOP max 1.9
        Relative DOPs Yes      HDOP max 0.8
        Total GPS pos 4      VDOP max 1.7
        Monitor status Not monitored      RMS 12.0
        Horz SD      Vert SD
        Start wk 1609 sec 233812.0      End wk 1609 sec 233815.0

GPSVEC TP Point ID 3051      DX -4469.769      DY 1862.777
        Class Normal      DZ 164.053      Code TOP NJ
        Obs L1 Fixed      H.pr 0.019      V.pr 0.041
    
```

```

GPSQC1 NM Min SVs 9 PDOP max 1.9
Relative DOPs Yes HDOP max 0.8
Total GPS pos 3 VDOP max 1.7
Monitor status Not monitored RMS 13.4
Horz SD Vert SD
Start wk 1609 sec 233831.0 End wk 1609 sec 233833.0

GPSVEC TP Point ID 3052 DX -4467.317 DY 1870.243
Class Normal DZ 173.134 Code TOE NJ
Obs L1 Fixed H.pr 0.030 V.pr 0.063

GPSQC1 NM Min SVs 9 PDOP max 2.6
Relative DOPs Yes HDOP max 1.1
Total GPS pos 12 VDOP max 2.4
Monitor status Not monitored RMS 46.5
Horz SD Vert SD
Start wk 1609 sec 233853.0 End wk 1609 sec 233864.0

GPSVEC TP Point ID 3053 DX -4464.579 DY 1881.419
Class Normal DZ 190.824 Code NG
Obs L1 Fixed H.pr 0.031 V.pr 0.064

GPSQC1 NM Min SVs 9 PDOP max 2.6
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.3
Monitor status Not monitored RMS 41.0
Horz SD Vert SD
Start wk 1609 sec 233879.0 End wk 1609 sec 233883.0

GPSVEC TP Point ID 3054 DX -4443.423 DY 1928.523
Class Normal DZ 271.603 Code NG
Obs L1 Fixed H.pr 0.026 V.pr 0.053

GPSQC1 NM Min SVs 9 PDOP max 2.6
Relative DOPs Yes HDOP max 1.1
Total GPS pos 3 VDOP max 2.3
Monitor status Not monitored RMS 14.2
Horz SD Vert SD
Start wk 1609 sec 233934.0 End wk 1609 sec 233937.0

INIT KI Init event Lost Week 1609
Init type On the fly seconds 233950.0
Init counter 0 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

INIT KI Init event Gained Week 1609
Init type On the fly seconds 234011.0
Init counter 2 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

GPSVEC TP Point ID 3055 DX -4394.970 DY 1795.172
Class Normal DZ 129.873 Code TOP
Obs L1 Fixed H.pr 0.028 V.pr 0.057

GPSQC1 NM Min SVs 9 PDOP max 1.8
Relative DOPs Yes HDOP max 0.8
Total GPS pos 5 VDOP max 1.6
Monitor status Not monitored RMS 22.2
Horz SD Vert SD
Start wk 1609 sec 234071.0 End wk 1609 sec 234075.0

GPSVEC TP Point ID 3056 DX -4397.464 DY 1789.239
Class Normal DZ 119.981 Code TOP1
Obs L1 Fixed H.pr 0.033 V.pr 0.065

GPSQC1 NM Min SVs 9 PDOP max 2.5
Relative DOPs Yes HDOP max 1.1
Total GPS pos 7 VDOP max 2.2
Monitor status Not monitored RMS 17.3
Horz SD Vert SD
Start wk 1609 sec 234087.0 End wk 1609 sec 234093.0

GPSVEC TP Point ID 3057 DX -4309.387 DY 1754.347
Class Normal DZ 119.864 Code TOP1
Obs L1 Fixed H.pr 0.020 V.pr 0.040

GPSQC1 NM Min SVs 9 PDOP max 2.4
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.2
Monitor status Not monitored RMS 16.2
Horz SD Vert SD
Start wk 1609 sec 234139.0 End wk 1609 sec 234143.0

GPSVEC TP Point ID 3058 DX -4307.070 DY 1759.968
Class Normal DZ 128.926 Code TOP
Obs L1 Fixed H.pr 0.023 V.pr 0.045

GPSQC1 NM Min SVs 9 PDOP max 1.7
Relative DOPs Yes HDOP max 0.8
Total GPS pos 4 VDOP max 1.5
Monitor status Not monitored RMS 29.7
Horz SD Vert SD
Start wk 1609 sec 234157.0 End wk 1609 sec 234160.0

GPSVEC TP Point ID 3059 DX -4218.670 DY 1724.689
Class Normal DZ 128.286 Code TOP
Obs L1 Fixed H.pr 0.023 V.pr 0.045

```

| | | | | | |
|--------|----|-------------------|---------------|-----------------|----------|
| GPSQC1 | NM | Min SVs | 9 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 4 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 20.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234204.0 | End wk 1609 sec | 234207.0 |
| GPSVEC | TP | Point ID 3060 | DX -4221.181 | DY | 1719.076 |
| | | Class Normal | DZ 119.025 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 15.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234222.0 | End wk 1609 sec | 234225.0 |
| GPSVEC | TP | Point ID 3061 | DX -4132.332 | DY | 1683.942 |
| | | Class Normal | DZ 119.320 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.033 | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.8 |
| | | Monitor status | Not monitored | RMS | 17.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234273.0 | End wk 1609 sec | 234276.0 |
| GPSVEC | TP | Point ID 3062 | DX -4129.893 | DY | 1689.938 |
| | | Class Normal | DZ 128.699 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 7 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 30.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234288.0 | End wk 1609 sec | 234294.0 |
| GPSVEC | TP | Point ID 3063 | DX -4042.093 | DY | 1654.924 |
| | | Class Normal | DZ 128.614 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr | 0.048 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 22.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234343.0 | End wk 1609 sec | 234347.0 |
| GPSVEC | TP | Point ID 3064 | DX -4044.405 | DY | 1648.431 |
| | | Class Normal | DZ 118.252 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.052 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 6 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 18.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234362.0 | End wk 1609 sec | 234367.0 |
| GPSVEC | TP | Point ID 3065 | DX -3956.195 | DY | 1613.650 |
| | | Class Normal | DZ 118.507 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr | 0.047 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 32.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234430.0 | End wk 1609 sec | 234433.0 |
| GPSVEC | TP | Point ID 3066 | DX -3974.614 | DY | 1568.329 |
| | | Class Normal | DZ 23.552 | Code | NG |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.058 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 5.0 |
| | | Relative DOPs | Yes | HDOP max | 2.2 |
| | | Total GPS pos | 5 | VDOP max | 4.5 |
| | | Monitor status | Not monitored | RMS | 7.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234505.0 | End wk 1609 sec | 234509.0 |
| GPSVEC | TP | Point ID 3067 | DX -3965.970 | DY | 1590.140 |
| | | Class Normal | DZ 60.010 | Code | NG |
| | | Obs L1 Fixed | H.pr 0.017 | V.pr | 0.049 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 2.4 |
| | | Monitor status | Not monitored | RMS | 13.6 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 234550.0 | End wk 1609 sec | 234553.0 |
| GPSVEC | TP | Point ID 3068 | DX -3960.832 | DY | 1602.437 |
| | | Class Normal | DZ 78.162 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.022 | V.pr | 0.064 |

```

GPSQC1 NM Min SVs 6 PDOP max 3.5
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 3.4
          Monitor status Not monitored RMS 7.8
          Horz SD Vert SD
          Start wk 1609 sec 234577.0 End wk 1609 sec 234581.0

GPSVEC TP Point ID 3069 DX -3953.920 DY 1619.079
          Class Normal DZ 127.557 Code TOP
          Obs L1 Fixed H.pr 0.020 V.pr 0.058

GPSQC1 NM Min SVs 6 PDOP max 3.6
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 3.4
          Monitor status Not monitored RMS 20.4
          Horz SD Vert SD
          Start wk 1609 sec 234635.0 End wk 1609 sec 234639.0

GPSVEC TP Point ID 3070 DX -3945.638 DY 1639.705
          Class Normal DZ 146.059 Code TOE NJ
          Obs L1 Fixed H.pr 0.014 V.pr 0.040

GPSQC1 NM Min SVs 6 PDOP max 3.6
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 4 VDOP max 3.4
          Monitor status Not monitored RMS 8.0
          Horz SD Vert SD
          Start wk 1609 sec 234686.0 End wk 1609 sec 234689.0

GPSVEC TP Point ID 3071 DX -3940.372 DY 1651.448
          Class Normal DZ 163.465 Code TOP NJ
          Obs L1 Fixed H.pr 0.021 V.pr 0.062

GPSQC1 NM Min SVs 6 PDOP max 3.7
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 6 VDOP max 3.5
          Monitor status Not monitored RMS 16.8
          Horz SD Vert SD
          Start wk 1609 sec 234712.0 End wk 1609 sec 234717.0

GPSVEC TP Point ID 3072 DX -3937.316 DY 1559.425
          Class Normal DZ 169.609 Code TOE NJ
          Obs L1 Fixed H.pr 0.017 V.pr 0.050

GPSQC1 NM Min SVs 6 PDOP max 3.7
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 3.5
          Monitor status Not monitored RMS 7.1
          Horz SD Vert SD
          Start wk 1609 sec 234730.0 End wk 1609 sec 234734.0

GPSVEC TP Point ID 3073 DX -3934.800 DY 1664.366
          Class Normal DZ 179.329 Code TOE NJ
          Obs L1 Fixed H.pr 0.018 V.pr 0.052

GPSQC1 NM Min SVs 6 PDOP max 2.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 4 VDOP max 2.4
          Monitor status Not monitored RMS 7.9
          Horz SD Vert SD
          Start wk 1609 sec 234745.0 End wk 1609 sec 234748.0

GPSVEC TP Point ID 3074 DX -3933.853 DY 1668.233
          Class Normal DZ 191.769 Code TOP NJ
          Obs L1 Fixed H.pr 0.019 V.pr 0.056

GPSQC1 NM Min SVs 6 PDOP max 2.6
          Relative DOPs Yes HDOP max 0.8
          Total GPS pos 3 VDOP max 2.4
          Monitor status Not monitored RMS 12.8
          Horz SD Vert SD
          Start wk 1609 sec 234766.0 End wk 1609 sec 234768.0

GPSVEC TP Point ID 3075 DX -3916.114 DY 1713.751
          Class Normal DZ 269.747 Code NG
          Obs L1 Fixed H.pr 0.022 V.pr 0.063

GPSQC1 NM Min SVs 6 PDOP max 3.7
          Relative DOPs Yes HDOP max 1.2
          Total GPS pos 5 VDOP max 3.5
          Monitor status Not monitored RMS 18.2
          Horz SD Vert SD
          Start wk 1609 sec 234819.0 End wk 1609 sec 234823.0

GPSVEC TP Point ID 3076 DX -3927.100 DY 1687.787
          Class Normal DZ 225.512 Code NG
          Obs L1 Fixed H.pr 0.013 V.pr 0.038

GPSQC1 NM Min SVs 6 PDOP max 5.1
          Relative DOPs Yes HDOP max 1.6
          Total GPS pos 5 VDOP max 4.8
          Monitor status Not monitored RMS 5.0
          Horz SD Vert SD
          Start wk 1609 sec 234854.0 End wk 1609 sec 234858.0
    
```

NOTE TS Time Date 11/09/2010 Time 10:26:24

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 3077 Class Normal Obs L1 Fixed | DX -3867.587 DZ 120.255 H.pr 0.013 | DY 1579.520 Code TOP1 V.pr 0.036 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 235580.0 | PDOP max 3.7 HDOP max 1.2 VDOP max 3.5 RMS 9.1 Vert SD End wk 1609 sec 235584.0 | |
| GPSVEC | TP | Point ID 3078 Class Normal Obs L1 Fixed | DX -3865.482 DZ 129.220 H.pr 0.034 | DY 1585.032 Code NG V.pr 0.060 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 235606.0 | PDOP max 3.7 HDOP max 1.8 VDOP max 3.2 RMS 5.9 Vert SD End wk 1609 sec 235610.0 | |
| GPSVEC | TP | Point ID 3079 Class Normal Obs L1 Fixed | DX -3861.674 DZ 145.196 H.pr 0.030 | DY 1595.329 Code TOP V.pr 0.056 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235641.0 | PDOP max 3.7 HDOP max 1.3 VDOP max 3.5 RMS 5.0 Vert SD End wk 1609 sec 235644.0 | |
| GPSVEC | TP | Point ID 3080 Class Normal Obs L1 Fixed | DX -3777.380 DZ 128.530 H.pr 0.021 | DY 1549.716 Code TOP V.pr 0.038 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235714.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 9.7 Vert SD End wk 1609 sec 235717.0 | |
| GPSVEC | TP | Point ID 3081 Class Normal Obs L1 Fixed | DX -3775.289 DZ 134.635 H.pr 0.020 | DY 1553.865 Code TOP NJ V.pr 0.036 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235728.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 11.5 Vert SD End wk 1609 sec 235731.0 | |
| GPSVEC | TP | Point ID 3082 Class Normal Obs L1 Fixed | DX -3779.272 DZ 118.534 H.pr 0.019 | DY 1543.552 Code TOP1 V.pr 0.033 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1609 sec 235749.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 19.0 Vert SD End wk 1609 sec 235751.0 | |
| GPSVEC | TP | Point ID 3083 Class Normal Obs L1 Fixed | DX -3691.575 DZ 118.086 H.pr 0.020 | DY 1508.354 Code TOP1 V.pr 0.035 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235807.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 17.3 Vert SD End wk 1609 sec 235810.0 | |
| GPSVEC | TP | Point ID 3084 Class Normal Obs L1 Fixed | DX -3689.012 DZ 127.267 H.pr 0.020 | DY 1513.788 Code TOP V.pr 0.036 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235820.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 8.9 Vert SD End wk 1609 sec 235823.0 | |
| GPSVEC | TP | Point ID 3085 Class Normal Obs L1 Fixed | DX -3600.905 DZ 126.382 H.pr 0.020 | DY 1478.048 Code TOP V.pr 0.035 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 235864.0 | PDOP max 2.0 HDOP max 1.0 VDOP max 1.7 RMS 14.4 Vert SD End wk 1609 sec 235867.0 | |

```

GPSVEC TP Point ID 3086      DX -3603.189      DY 1472.833
Class Normal      DZ 117.510      Code TOP1
Obs L1 Fixed      H.pr 0.021      V.pr 0.037

GPSQC1 NM Min SVs          7      PDOP max 2.3
Relative DOPs Yes      HDOP max 1.1
Total GPS pos 5      VDOP max 2.0
Monitor status Not monitored      RMS 9.5
Horz SD      Vert SD
Start wk 1609 sec 235877.0      End wk 1609 sec 235881.0

GPSVEC TP Point ID 3087      DX -3515.108      DY 1437.964
Class Normal      DZ 117.908      Code TOP1
Obs L1 Fixed      H.pr 0.025      V.pr 0.045

GPSQC1 NM Min SVs          7      PDOP max 2.8
Relative DOPs Yes      HDOP max 1.4
Total GPS pos 5      VDOP max 2.5
Monitor status Not monitored      RMS 12.6
Horz SD      Vert SD
Start wk 1609 sec 235924.0      End wk 1609 sec 235928.0

GPSVEC TP Point ID 3088      DX -3512.968      DY 1443.488
Class Normal      DZ 126.368      Code TOP
Obs L1 Fixed      H.pr 0.020      V.pr 0.036

GPSQC1 NM Min SVs          7      PDOP max 2.3
Relative DOPs Yes      HDOP max 1.1
Total GPS pos 5      VDOP max 2.0
Monitor status Not monitored      RMS 16.4
Horz SD      Vert SD
Start wk 1609 sec 235938.0      End wk 1609 sec 235942.0

GPSVEC TP Point ID 3089      DX -3424.200      DY 1408.778
Class Normal      DZ 126.784      Code TOP
Obs L1 Fixed      H.pr 0.020      V.pr 0.035

GPSQC1 NM Min SVs          7      PDOP max 1.6
Relative DOPs Yes      HDOP max 0.8
Total GPS pos 4      VDOP max 1.4
Monitor status Not monitored      RMS 10.0
Horz SD      Vert SD
Start wk 1609 sec 235987.0      End wk 1609 sec 235990.0

GPSVEC TP Point ID 3090      DX -3426.524      DY 1403.003
Class Normal      DZ 117.647      Code TOP1
Obs L1 Fixed      H.pr 0.023      V.pr 0.042

GPSQC1 NM Min SVs          7      PDOP max 1.6
Relative DOPs Yes      HDOP max 0.8
Total GPS pos 4      VDOP max 1.4
Monitor status Not monitored      RMS 10.3
Horz SD      Vert SD
Start wk 1609 sec 236001.0      End wk 1609 sec 236004.0

GPSVEC TP Point ID 3091      DX -3353.720      DY 1330.263
Class Normal      DZ 29.065      Code NG
Obs L1 Fixed      H.pr 0.032      V.pr 0.057

GPSQC1 NM Min SVs          7      PDOP max 3.7
Relative DOPs Yes      HDOP max 1.8
Total GPS pos 4      VDOP max 3.2
Monitor status Not monitored      RMS 8.6
Horz SD      Vert SD
Start wk 1609 sec 236123.0      End wk 1609 sec 236126.0

GPSVEC TP Point ID 3092      DX -3347.697      DY 1345.299
Class Normal      DZ 54.533      Code NG
Obs L1 Fixed      H.pr 0.017      V.pr 0.045

GPSQC1 NM Min SVs          6      PDOP max 3.7
Relative DOPs Yes      HDOP max 1.3
Total GPS pos 4      VDOP max 3.4
Monitor status Not monitored      RMS 5.4
Horz SD      Vert SD
Start wk 1609 sec 236150.0      End wk 1609 sec 236153.0

GPSVEC TP Point ID 3093      DX -3343.502      DY 1355.504
Class Normal      DZ 71.300      Code TOE NJ
Obs L1 Fixed      H.pr 0.029      V.pr 0.051

GPSQC1 NM Min SVs          7      PDOP max 3.7
Relative DOPs Yes      HDOP max 1.8
Total GPS pos 4      VDOP max 3.2
Monitor status Not monitored      RMS 15.5
Horz SD      Vert SD
Start wk 1609 sec 236179.0      End wk 1609 sec 236182.0

GPSVEC TP Point ID 3094      DX -3338.647      DY 1367.701
Class Normal      DZ 116.305      Code TOP1
Obs L1 Fixed      H.pr 0.029      V.pr 0.051

GPSQC1 NM Min SVs          7      PDOP max 3.9
Relative DOPs Yes      HDOP max 1.9
Total GPS pos 5      VDOP max 3.4
Monitor status Not monitored      RMS 7.8
Horz SD      Vert SD
Start wk 1609 sec 236220.0      End wk 1609 sec 236224.0

```

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 3095 Class Normal Obs L1 Fixed | DX -3336.023 DZ 125.923 H.pr 0.025 | DY 1373.349 Code TOP V.pr 0.044 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236237.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 7.8 Vert SD End wk 1609 sec 236240.0 | |
| GPSVEC | TP | Point ID 3096 Class Normal Obs L1 Fixed | DX -3326.501 DZ 147.255 H.pr 0.020 | DY 1397.146 Code TOE NJ V.pr 0.035 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236274.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 13.9 Vert SD End wk 1609 sec 236277.0 | |
| GPSVEC | TP | Point ID 3097 Class Normal Obs L1 Fixed | DX -3321.077 DZ 165.704 H.pr 0.023 | DY 1409.819 Code TOP NJ V.pr 0.042 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236302.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 11.4 Vert SD End wk 1609 sec 236305.0 | |
| GPSVEC | TP | Point ID 3098 Class Normal Obs L1 Fixed | DX -3319.163 DZ 173.167 H.pr 0.018 | DY 1415.708 Code TOE NJ V.pr 0.032 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236324.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 11.2 Vert SD End wk 1609 sec 236327.0 | |
| GPSVEC | TP | Point ID 3099 Class Normal Obs L1 Fixed | DX -3316.891 DZ 180.858 H.pr 0.022 | DY 1420.200 Code TOE NJ V.pr 0.039 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236340.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 11.1 Vert SD End wk 1609 sec 236343.0 | |
| GPSVEC | TP | Point ID 3100 Class Normal Obs L1 Fixed | DX -3315.410 DZ 187.272 H.pr 0.023 | DY 1423.280 Code TOP NJ V.pr 0.040 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236354.0 | PDOP max 1.7 HDOP max 0.8 VDOP max 1.5 RMS 12.1 Vert SD End wk 1609 sec 236357.0 | |
| GPSVEC | TP | Point ID 3101 Class Normal Obs L1 Fixed | DX -3305.791 DZ 231.477 H.pr 0.021 | DY 1448.728 Code NG V.pr 0.036 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236384.0 | PDOP max 3.6 HDOP max 1.8 VDOP max 3.2 RMS 10.9 Vert SD End wk 1609 sec 236387.0 | |
| GPSVEC | TP | Point ID 3102 Class Normal Obs L1 Fixed | DX -3295.943 DZ 273.926 H.pr 0.021 | DY 1472.130 Code NG V.pr 0.037 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236420.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 10.0 Vert SD End wk 1609 sec 236424.0 | |
| GPSVEC | TP | Point ID 3103 Class Normal Obs L1 Fixed | DX -3248.364 DZ 124.194 H.pr 0.028 | DY 1337.426 Code TOP V.pr 0.054 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236521.0 | PDOP max 3.1 HDOP max 1.4 VDOP max 2.8 RMS 7.5 Vert SD End wk 1609 sec 236525.0 | |

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 3104 Class Normal Obs L1 Fixed | DX -3250.682 DZ 114.888 H.pr 0.030 | DY 1331.392 Code TOP1 V.pr 0.052 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236536.0 | PDOP max 3.1 HDOP max 1.5 VDOP max 2.7 RMS 10.8 Vert SD End wk 1609 sec 236539.0 | |
| GPSVEC | TP | Point ID 3105 Class Normal Obs L1 Fixed | DX -3162.341 DZ 114.337 H.pr 0.028 | DY 1296.385 Code TOP1 V.pr 0.049 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 236581.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 5.8 Vert SD End wk 1609 sec 236584.0 | |
| GPSVEC | TP | Point ID 3106 Class Normal Obs L1 Fixed | DX -3160.170 DZ 123.744 H.pr 0.018 | DY 1302.422 Code TOP V.pr 0.032 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236598.0 | PDOP max 2.4 HDOP max 1.2 VDOP max 2.1 RMS 9.2 Vert SD End wk 1609 sec 236602.0 | |
| GPSVEC | TP | Point ID 3107 Class Normal Obs L1 Fixed | DX -3071.948 DZ 123.222 H.pr 0.023 | DY 1267.096 Code TOP V.pr 0.041 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236644.0 | PDOP max 3.2 HDOP max 1.5 VDOP max 2.8 RMS 5.6 Vert SD End wk 1609 sec 236648.0 | |
| GPSVEC | TP | Point ID 3108 Class Normal Obs L1 Fixed | DX -3073.746 DZ 113.735 H.pr 0.019 | DY 1260.928 Code TOP1 V.pr 0.034 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236659.0 | PDOP max 3.2 HDOP max 1.6 VDOP max 2.8 RMS 9.7 Vert SD End wk 1609 sec 236663.0 | |
| GPSVEC | TP | Point ID 3109 Class Normal Obs L1 Fixed | DX -2985.798 DZ 114.226 H.pr 0.033 | DY 1226.051 Code TOP1 V.pr 0.065 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1609 sec 236704.0 | PDOP max 3.2 HDOP max 1.5 VDOP max 2.9 RMS 6.1 Vert SD End wk 1609 sec 236709.0 | |
| GPSVEC | TP | Point ID 3110 Class Normal Obs L1 Fixed | DX -2983.654 DZ 123.366 H.pr 0.023 | DY 1231.932 Code TOP V.pr 0.042 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236722.0 | PDOP max 3.3 HDOP max 1.5 VDOP max 2.9 RMS 6.9 Vert SD End wk 1609 sec 236726.0 | |
| GPSVEC | TP | Point ID 3111 Class Normal Obs L1 Fixed | DX -2895.365 DZ 122.975 H.pr 0.025 | DY 1196.632 Code TOP V.pr 0.044 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236778.0 | PDOP max 2.5 HDOP max 1.2 VDOP max 2.1 RMS 27.8 Vert SD End wk 1609 sec 236782.0 | |
| GPSVEC | TP | Point ID 3112 Class Normal Obs L1 Fixed | DX -2898.046 DZ 114.001 H.pr 0.018 | DY 1191.159 Code TOP1 V.pr 0.032 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 236793.0 | PDOP max 2.5 HDOP max 1.2 VDOP max 2.1 RMS 14.7 Vert SD End wk 1609 sec 236797.0 | |

```

GPSVEEC TP Point ID 3113      DX -2809.092      DY 1156.149
          Class Normal      DZ 114.259      Code TOP1
          Obs L1 Fixed      H.pr 0.019      V.pr 0.033

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.2
          Total GPS pos 4      VDOP max 2.1
          Monitor status Not monitored      RMS 9.2
          Horz SD      Vert SD
          Start wk 1609 sec 236863.0      End wk 1609 sec 236866.0

GPSVEEC TP Point ID 3114      DX -2806.961      DY 1161.870
          Class Normal      DZ 123.246      Code TOP
          Obs L1 Fixed      H.pr 0.022      V.pr 0.038

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.2
          Total GPS pos 4      VDOP max 2.1
          Monitor status Not monitored      RMS 8.3
          Horz SD      Vert SD
          Start wk 1609 sec 236877.0      End wk 1609 sec 236880.0

SURVEY EVENTKISurvey event Communications error

GPSVEEC TP Point ID 3115      DX -2778.726      DY 1150.370
          Class Normal      DZ 123.003      Code TOP
          Obs L1 Fixed      H.pr 0.019      V.pr 0.032

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.3
          Total GPS pos 4      VDOP max 2.2
          Monitor status Not monitored      RMS 13.8
          Horz SD      Vert SD
          Start wk 1609 sec 237362.0      End wk 1609 sec 237365.0

NOTE TS Time Date 11/09/2010 Time 10:56:25

GPSVEEC TP Point ID 3116      DX -2780.814      DY 1144.742
          Class Normal      DZ 114.173      Code TOP1
          Obs L1 Fixed      H.pr 0.024      V.pr 0.040

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.3
          Total GPS pos 4      VDOP max 2.2
          Monitor status Not monitored      RMS 12.1
          Horz SD      Vert SD
          Start wk 1609 sec 237382.0      End wk 1609 sec 237385.0

GPSVEEC TP Point ID 3117      DX -2785.379      DY 1136.275
          Class Normal      DZ 80.366      Code TOE NJ
          Obs L1 Fixed      H.pr 0.026      V.pr 0.044

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.3
          Total GPS pos 4      VDOP max 2.2
          Monitor status Not monitored      RMS 21.1
          Horz SD      Vert SD
          Start wk 1609 sec 237426.0      End wk 1609 sec 237429.0

GPSVEEC TP Point ID 3118      DX -2785.713      DY 1134.536
          Class Normal      DZ 76.690      Code TOP NJ
          Obs L1 Fixed      H.pr 0.019      V.pr 0.032

GPSQC1 NM Min SVs          7      PDOP max 1.8
          Relative DOPs Yes      HDOP max 0.9
          Total GPS pos 4      VDOP max 1.5
          Monitor status Not monitored      RMS 8.0
          Horz SD      Vert SD
          Start wk 1609 sec 237438.0      End wk 1609 sec 237441.0

GPSVEEC TP Point ID 3119      DX -2786.508      DY 1131.817
          Class Normal      DZ 67.646      Code TOE NJ
          Obs L1 Fixed      H.pr 0.031      V.pr 0.053

GPSQC1 NM Min SVs          7      PDOP max 2.5
          Relative DOPs Yes      HDOP max 1.3
          Total GPS pos 7      VDOP max 2.2
          Monitor status Not monitored      RMS 36.3
          Horz SD      Vert SD
          Start wk 1609 sec 237472.0      End wk 1609 sec 237479.0

```

| | | | | |
|--------|----|--|---|--|
| GPSVEC | TP | Point ID 3120 Class Normal Obs L1 Fixed | DX -2787.626 DZ 63.031 H.pr 0.028 | DY 1129.412 Code TOE NJ V.pr 0.047 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237498.0 | PDOP max 2.5 HDOP max 1.3 VDOP max 2.2 RMS 18.8 Vert SD End wk 1609 sec 237502.0 | |
| GPSVEC | TP | Point ID 3121 Class Normal Obs L1 Fixed | DX -2790.368 DZ 55.903 H.pr 0.024 | DY 1123.318 Code TOP NJ V.pr 0.041 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237525.0 | PDOP max 2.5 HDOP max 1.3 VDOP max 2.2 RMS 9.9 Vert SD End wk 1609 sec 237529.0 | |
| GPSVEC | TP | Point ID 3122 Class Normal Obs L1 Fixed | DX -2799.008 DZ 17.483 H.pr 0.036 | DY 1100.887 Code NG V.pr 0.061 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237559.0 | PDOP max 2.5 HDOP max 1.3 VDOP max 2.2 RMS 22.3 Vert SD End wk 1609 sec 237563.0 | |
| GPSVEC | TP | Point ID 3123 Class Normal Obs L1 Fixed | DX -2770.140 DZ 142.572 H.pr 0.025 | DY 1173.231 Code TOE NJ V.pr 0.042 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237654.0 | PDOP max 3.2 HDOP max 1.6 VDOP max 2.7 RMS 7.4 Vert SD End wk 1609 sec 237658.0 | |
| GPSVEC | TP | Point ID 3124 Class Normal Obs L1 Fixed | DX -2764.555 DZ 162.454 H.pr 0.018 | DY 1186.321 Code TOP NJ V.pr 0.031 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 237681.0 | PDOP max 1.8 HDOP max 0.9 VDOP max 1.5 RMS 13.5 Vert SD End wk 1609 sec 237684.0 | |
| GPSVEC | TP | Point ID 3125 Class Normal Obs L1 Fixed | DX -2762.665 DZ 166.851 H.pr 0.022 | DY 1190.150 Code TOE NJ V.pr 0.037 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237694.0 | PDOP max 2.5 HDOP max 1.3 VDOP max 2.1 RMS 13.9 Vert SD End wk 1609 sec 237698.0 | |
| GPSVEC | TP | Point ID 3126 Class Normal Obs L1 Fixed | DX -2758.621 DZ 180.825 H.pr 0.022 | DY 1198.719 Code TOE NJ V.pr 0.039 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 237712.0 | PDOP max 3.1 HDOP max 1.5 VDOP max 2.8 RMS 11.3 Vert SD End wk 1609 sec 237716.0 | |
| GPSVEC | TP | Point ID 3127 Class Normal Obs L1 Fixed | DX -2757.264 DZ 193.570 H.pr 0.038 | DY 1204.830 Code TOP NJ V.pr 0.064 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1609 sec 237747.0 | PDOP max 2.5 HDOP max 1.3 VDOP max 2.1 RMS 33.4 Vert SD End wk 1609 sec 237753.0 | |
| GPSVEC | TP | Point ID 3128 Class Normal Obs L1 Fixed | DX -2729.444 DZ 278.468 H.pr 0.026 | DY 1251.033 Code NG V.pr 0.043 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 237808.0 | PDOP max 1.8 HDOP max 0.9 VDOP max 1.5 RMS 19.9 Vert SD End wk 1609 sec 237811.0 | |

| | | | | |
|--------|----|--|---|---------------------------------------|
| GPSVEC | TP | Point ID 3137 Class Normal Obs L1 Fixed | DX -2453.427 DZ 122.770 H.pr 0.025 | DY 1021.692 Code TOP V.pr 0.039 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 238267.0 | PDOP max 2.0 HDOP max 1.1 VDOP max 1.7 RMS 10.7 Vert SD End wk 1609 sec 238270.0 | |
| GPSVEC | TP | Point ID 3138 Class Normal Obs L1 Fixed | DX -2365.223 DZ 122.796 H.pr 0.025 | DY 987.076 Code TOP V.pr 0.038 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 238316.0 | PDOP max 4.8 HDOP max 2.6 VDOP max 4.0 RMS 9.6 Vert SD End wk 1609 sec 238319.0 | |
| GPSVEC | TP | Point ID 3139 Class Normal Obs L1 Fixed | DX -2367.185 DZ 113.428 H.pr 0.021 | DY 981.010 Code TOP1 V.pr 0.033 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 238332.0 | PDOP max 2.0 HDOP max 1.1 VDOP max 1.7 RMS 14.2 Vert SD End wk 1609 sec 238335.0 | |
| GPSVEC | TP | Point ID 3140 Class Normal Obs L1 Fixed | DX -2279.350 DZ 113.397 H.pr 0.025 | DY 946.155 Code TOP1 V.pr 0.039 |
| GPSQC1 | NM | Min SVs 6 Relative DOPs Yes Total GPS pos 7 Monitor status Not monitored Horz SD Start wk 1609 sec 238377.0 | PDOP max 3.4 HDOP max 1.7 VDOP max 3.0 RMS 4.1 Vert SD End wk 1609 sec 238383.0 | |
| GPSVEC | TP | Point ID 3141 Class Normal Obs L1 Fixed | DX -2276.705 DZ 123.143 H.pr 0.020 | DY 951.884 Code TOP V.pr 0.030 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 238396.0 | PDOP max 2.0 HDOP max 1.1 VDOP max 1.7 RMS 20.0 Vert SD End wk 1609 sec 238400.0 | |
| NOTE | TS | Time Date 11/09/2010 Time 11:26:44 | | |
| GPSVEC | TP | Point ID 3142 Class Normal Obs L1 Fixed | DX -2191.939 DZ 110.467 H.pr 0.021 | DY 910.397 Code TOP1 V.pr 0.036 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 239201.0 | PDOP max 2.3 HDOP max 1.2 VDOP max 2.0 RMS 11.5 Vert SD End wk 1609 sec 239204.0 | |
| GPSVEC | TP | Point ID 3143 Class Normal Obs L1 Fixed | DX -2188.559 DZ 121.982 H.pr 0.018 | DY 916.677 Code NG V.pr 0.030 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 239221.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 9.0 Vert SD End wk 1609 sec 239224.0 | |
| GPSVEC | TP | Point ID 3144 Class Normal Obs L1 Fixed | DX -2183.518 DZ 141.762 H.pr 0.019 | DY 928.922 Code TOP V.pr 0.032 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 239258.0 | PDOP max 2.3 HDOP max 1.2 VDOP max 2.0 RMS 8.9 Vert SD End wk 1609 sec 239262.0 | |
| GPSVEC | TP | Point ID 3145 Class Normal Obs L1 Fixed | DX -2097.384 DZ 117.239 H.pr 0.024 | DY 889.220 Code TOP V.pr 0.041 |

| | | | | | |
|--------|----|----------------|---------------|--------------|--------------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 12.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239333.0 | End wk 1609 | sec 239337.0 |
| GPSVEC | TP | Point ID 3146 | | DX -2099.897 | DY 882.381 |
| | | Class Normal | | DZ 105.643 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.019 | V.pr 0.033 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 3 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 9.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239356.0 | End wk 1609 | sec 239358.0 |
| GPSVEC | TP | Point ID 3147 | | DX -2009.001 | DY 854.335 |
| | | Class Normal | | DZ 114.348 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.017 | V.pr 0.031 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.5 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 4 | VDOP max | 3.0 |
| | | Monitor status | Not monitored | RMS | 5.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239410.0 | End wk 1609 | sec 239413.0 |
| GPSVEC | TP | Point ID 3148 | | DX -2012.086 | DY 848.080 |
| | | Class Normal | | DZ 103.376 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.030 | V.pr 0.052 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.4 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 5 | VDOP max | 3.0 |
| | | Monitor status | Not monitored | RMS | 7.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239429.0 | End wk 1609 | sec 239433.0 |
| GPSVEC | TP | Point ID 3149 | | DX -1922.994 | DY 813.217 |
| | | Class Normal | | DZ 104.432 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.019 | V.pr 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.0 |
| | | Monitor status | Not monitored | RMS | 8.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239481.0 | End wk 1609 | sec 239485.0 |
| GPSVEC | TP | Point ID 3150 | | DX -1920.809 | DY 818.903 |
| | | Class Normal | | DZ 113.702 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.018 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 8.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 239497.0 | End wk 1609 | sec 239500.0 |
| GPSVEC | TP | Point ID 3151 | | DX -1832.451 | DY 783.690 |
| | | Class Normal | | DZ 113.345 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.017 | V.pr 0.029 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 11.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 240207.0 | End wk 1609 | sec 240211.0 |
| GPSVEC | TP | Point ID 3152 | | DX -1835.058 | DY 778.237 |
| | | Class Normal | | DZ 104.123 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.018 | V.pr 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 10.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 240223.0 | End wk 1609 | sec 240227.0 |
| GPSVEC | TP | Point ID 3153 | | DX -1746.184 | DY 743.073 |
| | | Class Normal | | DZ 104.565 | Code TOP1 |
| | | Obs L1 Fixed | | H.pr 0.019 | V.pr 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 7.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 240288.0 | End wk 1609 | sec 240291.0 |
| GPSVEC | TP | Point ID 3154 | | DX -1743.785 | DY 748.583 |
| | | Class Normal | | DZ 113.740 | Code TOP |
| | | Obs L1 Fixed | | H.pr 0.021 | V.pr 0.037 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|----------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 9.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240305.0 | End wk 1609 sec | 240308.0 |
| GPSVEC | TP | Point ID 3155 | DX -1655.851 | DY | 714.425 |
| | | Class Normal | DZ 114.016 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.036 | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 9 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 26.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240351.0 | End wk 1609 sec | 240359.0 |
| GPSVEC | TP | Point ID 3156 | DX -1657.913 | DY | 708.402 |
| | | Class Normal | DZ 104.371 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.041 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 30.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240373.0 | End wk 1609 sec | 240376.0 |
| GPSVEC | TP | Point ID 3157 | DX -1638.244 | DY | 667.125 |
| | | Class Normal | DZ 50.684 | Code | NS |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr | 0.031 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 8.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240465.0 | End wk 1609 sec | 240469.0 |
| GPSVEC | TP | Point ID 3158 | DX -1628.014 | DY | 692.893 |
| | | Class Normal | DZ 95.420 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.019 | V.pr | 0.033 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 12.4 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240506.0 | End wk 1609 sec | 240509.0 |
| GPSVEC | TP | Point ID 3159 | DX -1626.903 | DY | 696.267 |
| | | Class Normal | DZ 104.774 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr | 0.044 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 12.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240524.0 | End wk 1609 sec | 240527.0 |
| GPSVEC | TP | Point ID 3160 | DX -1624.359 | DY | 701.730 |
| | | Class Normal | DZ 113.965 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.028 | V.pr | 0.049 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.8 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 10.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240539.0 | End wk 1609 sec | 240542.0 |
| GPSVEC | TP | Point ID 3161 | DX -1621.096 | DY | 709.064 |
| | | Class Normal | DZ 121.132 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.019 | V.pr | 0.034 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 12.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240556.0 | End wk 1609 sec | 240559.0 |
| GPSVEC | TP | Point ID 3162 | DX -1615.681 | DY | 722.415 |
| | | Class Normal | DZ 140.429 | Code | TOP NJ |
| | | Obs L1 Fixed | H.pr 0.023 | V.pr | 0.041 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 12.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 240581.0 | End wk 1609 sec | 240584.0 |
| GPSVEC | TP | Point ID 3163 | DX -1607.682 | DY | 742.351 |
| | | Class Normal | DZ 159.081 | Code | TGE NJ |
| | | Obs L1 Fixed | H.pr 0.021 | V.pr | 0.037 |

| | | | | | |
|--------|----|------------------------------------|---------------|--------------------------|---------|
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 12.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240611.0 | | End wk 1609 sec 240614.0 | |
| GPSVEC | TP | Point ID 3164 | DX -1501.738 | DY | 754.655 |
| | | Class Normal | DZ 179.148 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.029 | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 8.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240629.0 | | End wk 1609 sec 240632.0 | |
| GPSVEC | TP | Point ID 3165 | DX -1598.552 | DY | 767.154 |
| | | Class Normal | DZ 221.183 | Code | TOP NJ |
| | | Obs L1 Fixed | H.pr 0.025 | V.pr | 0.043 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 3.1 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 5 | VDOP max | 2.7 |
| | | Monitor status | Not monitored | RMS | 7.8 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240670.0 | | End wk 1609 sec 240674.0 | |
| GPSVEC | TP | Point ID 3166 | DX -1587.348 | DY | 791.766 |
| | | Class Normal | DZ 263.770 | Code | NG |
| | | Obs L1 Fixed | H.pr 0.030 | V.pr | 0.052 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 14.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240711.0 | | End wk 1609 sec 240715.0 | |
| GPSVEC | TP | Point ID 3167 | DX -1578.210 | DY | 816.958 |
| | | Class Normal | DZ 305.163 | Code | NG |
| | | Obs L1 Fixed | H.pr 0.031 | V.pr | 0.054 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 12.0 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240749.0 | | End wk 1609 sec 240752.0 | |
| GPSVEC | TP | Point ID 3168 | DX -1567.556 | DY | 679.382 |
| | | Class Normal | DZ 113.753 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr | 0.030 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 4 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 7.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240925.0 | | End wk 1609 sec 240928.0 | |
| GPSVEC | TP | Point ID 3169 | DX -1569.381 | DY | 673.838 |
| | | Class Normal | DZ 105.097 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.018 | V.pr | 0.031 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 3 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 12.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240941.0 | | End wk 1609 sec 240943.0 | |
| GPSVEC | TP | Point ID 3170 | DX -1480.981 | DY | 639.004 |
| | | Class Normal | DZ 105.142 | Code | TOP1 |
| | | Obs L1 Fixed | H.pr 0.024 | V.pr | 0.041 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.2 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 9.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 240999.0 | | End wk 1609 sec 241003.0 | |
| NOTE | TS | Time Date 11/09/2010 Time 11:56:59 | | | |
| GPSVEC | TP | Point ID 3171 | DX -1478.450 | DY | 644.296 |
| | | Class Normal | DZ 113.920 | Code | TOP |
| | | Obs L1 Fixed | H.pr 0.019 | V.pr | 0.032 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 9.9 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec 241016.0 | | End wk 1609 sec 241019.0 | |

GPSVEC TP Point ID 3172 DX -1390.678 DY 609.097
Class Normal DZ 114.433 Code TOP
Obs Ll Fixed H.pr 0.025 V.pr 0.043

GPSQC1 NM Min SVs 7 PDOP max 4.2
Relative DOPs Yes HDOP max 2.0
Total GPS pos 6 VDOP max 3.7
Monitor status Not monitored RMS 7.4
Horz SD Vert SD
Start wk 1609 sec 241066.0 End wk 1609 sec 241071.0

GPSVEC TP Point ID 3173 DX -1392.932 DY 603.267
Class Normal DZ 104.843 Code TOP1
Obs Ll Fixed H.pr 0.029 V.pr 0.048

GPSQC1 NM Min SVs 7 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 4 VDOP max 2.1
Monitor status Not monitored RMS 9.8
Horz SD Vert SD
Start wk 1609 sec 241083.0 End wk 1609 sec 241086.0

GPSVEC TP Point ID 3174 DX -1305.235 DY 568.495
Class Normal DZ 104.771 Code TOP1
Obs Ll Fixed H.pr 0.025 V.pr 0.042

GPSQC1 NM Min SVs 7 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.1
Monitor status Not monitored RMS 15.3
Horz SD Vert SD
Start wk 1609 sec 241140.0 End wk 1609 sec 241144.0

GPSVEC TP Point ID 3175 DX -1302.826 DY 574.594
Class Normal DZ 114.475 Code TOP
Obs Ll Fixed H.pr 0.022 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 2.4
Relative DOPs Yes HDOP max 1.2
Total GPS pos 5 VDOP max 2.1
Monitor status Not monitored RMS 8.2
Horz SD Vert SD
Start wk 1609 sec 241158.0 End wk 1609 sec 241162.0

GRDPOS CC Point ID 2050 Nrth 892158.220 East 793501.053
Class Normal Elv 1782.160 Code TOP1
Obs Copied

GRDPOS CC Point ID 2150 Nrth 892162.721 East 796967.728
Class Normal Elv 1770.145 Code TOP
Obs Copied

SURVEY EVENTKISurvey event Communications error

INIT KI Init event Lost Week 0
Init type On the fly seconds 10.0
Init counter 0 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

NOTE NM New base station detected

GPSANT KI Antenna ht 0.000 Measurement True

GPSPOS PD Point ID 1 Lat 33°27'06.32718"N Lng 111°35'45.53989"W
Class Check Hgt 1659.446 Code BC
Obs User Input H.pr <null> V.pr <null>

EQUIP SI Receiver 5700 Serial no <no text>
Antenna Zephyr Geodetic
Meas To Antenna Phase Center
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.000

NOTE NM Receiver firmware version=0.000

GPSANT KI Antenna ht 4.554 Measurement True

GPSREF KI Reference 1

INIT KI Init event Gained Week 1609
Init type On the fly seconds 242354.0
Init counter 1 Point ID <no text>
Survey type Real Time Plate H.Dist <null>
Plate V.Dist <null> Plate azimuth <null>

EQUIP NM Receiver 5800 Serial no 4447140732
Antenna R8/5800/SPS78x Internal
Meas To Bottom of antenna mount
Tape adj 0.000 Serial no <no text>
H.Offset 0.000 V.Offset 0.213

NOTE NM Receiver firmware version=2.320

GPSANT KI Antenna ht 5.890 Measurement Uncorrected

GPSVEC TP Point ID 3176 DX -1214.224 DY 539.109
Class Normal DZ 113.741 Code TOP
Obs Ll Fixed H.pr 0.023 V.pr 0.041

```

GPSQC1 NM Min SVs 8 PDOP max 2.2
Relative DOPs Yes HDOP max 1.0
Total GPS pos 3 VDOP max 1.9
Monitor status Not monitored RMS 23.0
Horz SD Vert SD
Start wk 1609 sec 242801.0 End wk 1609 sec 242805.0

NOTE TS Time Date 11/09/2010 Time 12:27:00

GPSVEC TP Point ID 3177 DX -1215.849 DY 533.504
Class Normal DZ 104.931 Code TOP1
Obs L1 Fixed H.pr 0.017 V.pr 0.031

GPSQC1 NM Min SVs 8 PDOP max 2.2
Relative DOPs Yes HDOP max 1.0
Total GPS pos 5 VDOP max 1.9
Monitor status Not monitored RMS 14.9
Horz SD Vert SD
Start wk 1609 sec 242816.0 End wk 1609 sec 242820.0

GPSVEC TP Point ID 3178 DX -1127.772 DY 498.356
Class Normal DZ 104.924 Code TOP1
Obs L1 Fixed H.pr 0.023 V.pr 0.041

GPSQC1 NM Min SVs 8 PDOP max 1.5
Relative DOPs Yes HDOP max 0.7
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 23.2
Horz SD Vert SD
Start wk 1609 sec 242870.0 End wk 1609 sec 242873.0

GPSVEC TP Point ID 3179 DX -1125.472 DY 504.433
Class Normal DZ 114.754 Code TOP
Obs L1 Fixed H.pr 0.021 V.pr 0.038

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.7
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 8.7
Horz SD Vert SD
Start wk 1609 sec 242949.0 End wk 1609 sec 242952.0

GPSVEC TP Point ID 3180 DX -1039.476 DY 454.170
Class Normal DZ 106.207 Code TOP1
Obs L1 Fixed H.pr 0.019 V.pr 0.036

GPSQC1 NM Min SVs 8 PDOP max 2.2
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.0
Monitor status Not monitored RMS 9.2
Horz SD Vert SD
Start wk 1609 sec 242996.0 End wk 1609 sec 243000.0

GPSVEC TP Point ID 3181 DX -1042.950 DY 454.492
Class Normal DZ 71.669 Code TOE NJ
Obs L1 Fixed H.pr 0.018 V.pr 0.034

GPSQC1 NM Min SVs 8 PDOP max 2.2
Relative DOPs Yes HDOP max 1.1
Total GPS pos 5 VDOP max 2.0
Monitor status Not monitored RMS 14.2
Horz SD Vert SD
Start wk 1609 sec 243049.0 End wk 1609 sec 243053.0

GPSVEC TP Point ID 3182 DX -1053.791 DY 430.810
Class Normal DZ 31.707 Code NG
Obs L1 Fixed H.pr 0.016 V.pr 0.030

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.7
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 11.6
Horz SD Vert SD
Start wk 1609 sec 243099.0 End wk 1609 sec 243102.0

GPSVEC TP Point ID 3183 DX -1037.472 DY 469.684
Class Normal DZ 115.825 Code NG
Obs L1 Fixed H.pr 0.017 V.pr 0.032

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.7
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 8.9
Horz SD Vert SD
Start wk 1609 sec 243171.0 End wk 1609 sec 243174.0

GPSVEC TP Point ID 3184 DX -1033.587 DY 479.796
Class Normal DZ 131.215 Code TOP
Obs L1 Fixed H.pr 0.018 V.pr 0.034

GPSQC1 NM Min SVs 8 PDOP max 1.6
Relative DOPs Yes HDOP max 0.7
Total GPS pos 4 VDOP max 1.4
Monitor status Not monitored RMS 11.6
Horz SD Vert SD
Start wk 1609 sec 243197.0 End wk 1609 sec 243200.0

```

| | | | | |
|--------|----|--|---|---|
| GPSVEC | TP | Point ID 3185 Class Normal Obs L1 Fixed | DX -1021.152 DZ 157.748 H.pr 0.027 | DY 509.292 Code TOE NJ V.pr 0.051 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243248.0 | PDOP max 2.5 HDOP max 1.1 VDOP max 2.2 RMS 16.3 Vert SD End wk 1609 sec 243251.0 | |
| GPSVEC | TP | Point ID 3186 Class Normal Obs L1 Fixed | DX -1014.952 DZ 181.434 H.pr 0.020 | DY 523.935 Code TOE NJ V.pr 0.037 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243270.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 13.9 Vert SD End wk 1609 sec 243274.0 | |
| GPSVEC | TP | Point ID 3187 Class Normal Obs L1 Fixed | DX -1013.325 DZ 198.212 H.pr 0.017 | DY 528.455 Code TOP NJ V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243304.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 11.2 Vert SD End wk 1609 sec 243307.0 | |
| GPSVEC | TP | Point ID 3188 Class Normal Obs L1 Fixed | DX -1004.155 DZ 239.104 H.pr 0.023 | DY 551.781 Code NG V.pr 0.045 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243342.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 19.8 Vert SD End wk 1609 sec 243346.0 | |
| GPSVEC | TP | Point ID 3189 Class Normal Obs L1 Fixed | DX -993.863 DZ 282.811 H.pr 0.018 | DY 577.284 Code NG V.pr 0.034 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1609 sec 243372.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 10.7 Vert SD End wk 1609 sec 243374.0 | |
| GPSVEC | TP | Point ID 3190 Class Normal Obs L1 Fixed | DX -950.298 DZ 109.528 H.pr 0.023 | DY 431.461 Code TOP V.pr 0.044 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243511.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 18.2 Vert SD End wk 1609 sec 243515.0 | |
| GPSVEC | TP | Point ID 3191 Class Normal Obs L1 Fixed | DX -953.867 DZ 98.519 H.pr 0.020 | DY 425.096 Code TOP1 V.pr 0.039 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243527.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 9.7 Vert SD End wk 1609 sec 243530.0 | |
| GPSVEC | TP | Point ID 3192 Class Normal Obs L1 Fixed | DX -864.961 DZ 96.549 H.pr 0.024 | DY 389.038 Code TOP1 V.pr 0.045 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1609 sec 243572.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 17.3 Vert SD End wk 1609 sec 243577.0 | |
| GPSVEC | TP | Point ID 3193 Class Normal Obs L1 Fixed | DX -862.818 DZ 106.089 H.pr 0.026 | DY 395.084 Code TOP V.pr 0.049 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243588.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 19.2 Vert SD End wk 1609 sec 243592.0 | |

| | | | | |
|--------|----|--|---|---------------------------------------|
| GPSVEC | TP | Point ID 3194 Class Normal Obs L1 Fixed | DX -773.961 DZ 106.829 H.pr 0.025 | DY 360.249 Code TOP V.pr 0.047 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243631.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 14.9 Vert SD End wk 1609 sec 243635.0 | |
| GPSVEC | TP | Point ID 3195 Class Normal Obs L1 Fixed | DX -775.800 DZ 96.921 H.pr 0.024 | DY 353.893 Code TOP1 V.pr 0.046 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243647.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 18.9 Vert SD End wk 1609 sec 243651.0 | |
| GPSVEC | TP | Point ID 3196 Class Normal Obs L1 Fixed | DX -687.697 DZ 99.531 H.pr 0.019 | DY 320.388 Code TOP1 V.pr 0.036 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 6 Monitor status Not monitored Horz SD Start wk 1609 sec 243694.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 13.4 Vert SD End wk 1609 sec 243699.0 | |
| GPSVEC | TP | Point ID 3197 Class Normal Obs L1 Fixed | DX -685.349 DZ 110.872 H.pr 0.025 | DY 327.284 Code TOP V.pr 0.047 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243714.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.5 RMS 19.6 Vert SD End wk 1609 sec 243717.0 | |
| GPSVEC | TP | Point ID 3198 Class Normal Obs L1 Fixed | DX -596.799 DZ 111.060 H.pr 0.023 | DY 292.154 Code NG V.pr 0.043 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 3 Monitor status Not monitored Horz SD Start wk 1609 sec 243767.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.5 RMS 16.5 Vert SD End wk 1609 sec 243769.0 | |
| GPSVEC | TP | Point ID 3199 Class Normal Obs L1 Fixed | DX -599.438 DZ 100.314 H.pr 0.022 | DY 285.481 Code TOP1 V.pr 0.042 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243786.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 14.8 Vert SD End wk 1609 sec 243790.0 | |
| GPSVEC | TP | Point ID 3200 Class Normal Obs L1 Fixed | DX -509.087 DZ 94.460 H.pr 0.021 | DY 255.948 Code TOP1 V.pr 0.039 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243840.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 15.1 Vert SD End wk 1609 sec 243844.0 | |
| GPSVEC | TP | Point ID 3201 Class Normal Obs L1 Fixed | DX -506.280 DZ 104.256 H.pr 0.027 | DY 261.508 Code TOP V.pr 0.051 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243857.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.1 RMS 24.3 Vert SD End wk 1609 sec 243861.0 | |
| GPSVEC | TP | Point ID 3202 Class Normal Obs L1 Fixed | DX -418.558 DZ 100.519 H.pr 0.016 | DY 225.146 Code TOP V.pr 0.030 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243905.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.5 RMS 8.6 Vert SD End wk 1609 sec 243908.0 | |

| | | | | |
|--------|----|--|---|---------------------------------------|
| GPSVEC | TP | Point ID 3203 Class Normal Obs L1 Fixed | DX -420.705 DZ 91.511 H.pr 0.032 | DY 219.818 Code TOP1 V.pr 0.061 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 243920.0 | PDOP max 2.4 HDOP max 1.1 VDOP max 2.1 RMS 20.0 Vert SD End wk 1609 sec 243923.0 | |
| GPSVEC | TP | Point ID 3204 Class Normal Obs L1 Fixed | DX -334.132 DZ 85.238 H.pr 0.023 | DY 180.973 Code TOP1 V.pr 0.043 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243965.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 9.8 Vert SD End wk 1609 sec 243969.0 | |
| GPSVEC | TP | Point ID 3205 Class Normal Obs L1 Fixed | DX -330.382 DZ 95.669 H.pr 0.017 | DY 186.631 Code TOP V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 243981.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 14.2 Vert SD End wk 1609 sec 243985.0 | |
| GPSVEC | TP | Point ID 3206 Class Normal Obs L1 Fixed | DX -245.748 DZ 84.044 H.pr 0.018 | DY 144.681 Code TOP V.pr 0.034 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244029.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 9.7 Vert SD End wk 1609 sec 244032.0 | |
| GPSVEC | TP | Point ID 3207 Class Normal Obs L1 Fixed | DX -248.981 DZ 73.561 H.pr 0.017 | DY 138.529 Code TOP1 V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 244058.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 10.4 Vert SD End wk 1609 sec 244062.0 | |
| GPSVEC | TP | Point ID 3208 Class Normal Obs L1 Fixed | DX -161.446 DZ 70.667 H.pr 0.018 | DY 102.228 Code TOP1 V.pr 0.034 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244108.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 9.2 Vert SD End wk 1609 sec 244111.0 | |
| GPSVEC | TP | Point ID 3209 Class Normal Obs L1 Fixed | DX -159.441 DZ 81.011 H.pr 0.018 | DY 108.507 Code TOP V.pr 0.034 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 244124.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 8.9 Vert SD End wk 1609 sec 244128.0 | |
| GPSVEC | TP | Point ID 3210 Class Normal Obs L1 Fixed | DX -70.498 DZ 80.743 H.pr 0.017 | DY 73.374 Code TOP V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244180.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 11.6 Vert SD End wk 1609 sec 244183.0 | |
| GPSVEC | TP | Point ID 3211 Class Normal Obs L1 Fixed | DX -71.903 DZ 71.086 H.pr 0.017 | DY 66.886 Code TOP1 V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244197.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 10.2 Vert SD End wk 1609 sec 244200.0 | |

| | | | | |
|--------|----|---|---|--|
| GPSVEC | TP | Point ID 3212 Class Normal Obs L1 Fixed | DX 17.531 DZ 79.308 H.pr 0.024 | DY 37.326 Code TOP V.pr 0.045 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 244247.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 21.1 Vert SD End wk 1609 sec 244251.0 | |
| GPSVEC | TP | Point ID 3213 Class Normal Obs L1 Fixed | DX 14.181 DZ 69.103 H.pr 0.018 | DY 31.643 Code TOP1 V.pr 0.034 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244265.0 | PDOP max 1.6 HDOP max 0.8 VDOP max 1.4 RMS 10.5 Vert SD End wk 1609 sec 244268.0 | |
| GPSVEC | TP | Point ID 3214 Class Normal Obs L1 Fixed | DX 83.260 DZ 32.079 H.pr 0.030 | DY -21.455 Code TOP1 V.pr 0.054 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 244369.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 11.2 Vert SD End wk 1609 sec 244373.0 | |
| GPSVEC | TP | Point ID 3215 Class Normal Obs L1 Fixed | DX 90.756 DZ 45.996 H.pr 0.018 | DY -14.960 Code TOP V.pr 0.033 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244425.0 | PDOP max 2.3 HDOP max 1.1 VDOP max 2.0 RMS 10.5 Vert SD End wk 1609 sec 244428.0 | |
| GPSVEC | TP | Point ID 3216 Class Normal Obs L1 Fixed | DX 93.255 DZ -32.933 H.pr 0.020 | DY -71.863 Code TOP V.pr 0.035 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 244503.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 15.2 Vert SD End wk 1609 sec 244507.0 | |
| GPSVEC | TP | Point ID 3217 Class Normal Obs L1 Fixed | DX 82.830 DZ -32.736 H.pr 0.019 | DY -67.670 Code TOP1 V.pr 0.033 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244542.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 14.4 Vert SD End wk 1609 sec 244545.0 | |
| GPSVEC | TP | Point ID 3218 Class Normal Obs L1 Fixed | DX 64.802 DZ -111.229 H.pr 0.027 | DY -117.010 Code NG V.pr 0.047 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 12 Monitor status Not monitored Horz SD Start wk 1609 sec 244604.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 12.2 Vert SD End wk 1609 sec 244615.0 | |
| NOTE | TS | Time Date 11/09/2010 Time 12:57:12 | | |
| GPSVEC | TP | Point ID 3219 Class Normal Obs L1 Fixed | DX 52.355 DZ -109.332 H.pr 0.025 | DY -110.927 Code TCPI V.pr 0.044 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 244628.0 | PDOP max 2.2 HDOP max 1.1 VDOP max 1.9 RMS 10.2 Vert SD End wk 1609 sec 244631.0 | |
| GPSVEC | TP | Point ID 3220 Class Normal Obs L1 Fixed | DX 26.458 DZ -192.441 H.pr 0.020 | DY -148.312 Code TOP1 V.pr 0.034 |

GPSQC1 NM Min SVs 9 PDOP max 1.6
 Relative DOPs Yes HDOP max 0.8
 Total GPS pos 5 VDOP max 1.3
 Monitor status Not monitored RMS 15.1
 Horz SD Vert SD
 Start wk 1609 sec 244682.0 End wk 1609 sec 244686.0

GPSVEC TP Point ID 3221 DX 40.844 DY -153.271
 Class Normal DZ -190.580 Code TOP
 Obs L1 Fixed H.pr 0.021 V.pr 0.035

GPSQC1 NM Min SVs 9 PDOP max 1.4
 Relative DOPs Yes HDOP max 0.7
 Total GPS pos 4 VDOP max 1.2
 Monitor status Not monitored RMS 12.2
 Horz SD Vert SD
 Start wk 1609 sec 244699.0 End wk 1609 sec 244702.0

GPSVEC TP Point ID 3222 DX 30.273 DY -201.432
 Class Normal DZ -270.694 Code TOP1
 Obs L1 Fixed H.pr 0.023 V.pr 0.039

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 6 VDOP max 1.7
 Monitor status Not monitored RMS 22.1
 Horz SD Vert SD
 Start wk 1609 sec 244768.0 End wk 1609 sec 244773.0

GPSVEC TP Point ID 3223 DX 42.990 DY -204.668
 Class Normal DZ -268.406 Code TOP
 Obs L1 Fixed H.pr 0.022 V.pr 0.038

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 17.6
 Horz SD Vert SD
 Start wk 1609 sec 244785.0 End wk 1609 sec 244789.0

GPSVEC TP Point ID 3224 DX 50.067 DY -206.153
 Class Normal DZ -267.531 Code TOP NJ
 Obs L1 Fixed H.pr 0.020 V.pr 0.033

GPSQC1 NM Min SVs 9 PDOP max 1.9
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 5 VDOP max 1.7
 Monitor status Not monitored RMS 9.9
 Horz SD Vert SD
 Start wk 1609 sec 244800.0 End wk 1609 sec 244804.0

GPSVEC TP Point ID 3225 DX 14.544 DY -251.333
 Class Normal DZ -349.515 Code TOP1
 Obs L1 Fixed H.pr 0.019 V.pr 0.032

GPSQC1 NM Min SVs 8 PDOP max 2.0
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 4 VDOP max 1.7
 Monitor status Not monitored RMS 13.6
 Horz SD Vert SD
 Start wk 1609 sec 244916.0 End wk 1609 sec 244919.0

GPSVEC TP Point ID 3226 DX 31.668 DY -257.650
 Class Normal DZ -349.991 Code TOP
 Obs L1 Fixed H.pr 0.018 V.pr 0.030

GPSQC1 NM Min SVs 8 PDOP max 1.4
 Relative DOPs Yes HDOP max 0.7
 Total GPS pos 4 VDOP max 1.2
 Monitor status Not monitored RMS 9.2
 Horz SD Vert SD
 Start wk 1609 sec 244936.0 End wk 1609 sec 244939.0

NOTE NM Following data copied from another job: PASS MTN DAM2(1)

GRDPOS KI Point ID 2343 Nrth 892397.150 East 797622.654
 Class Normal Elv 1758.696 Code BC
 Obs User Input

FEATURE FC Name BC
 ATTRIB FC Name MATERIAL TYPE Value BRASS
 ATTRIB FC Name CAP SIZE Value 2"
 ATTRIB FC Name AGENCY Value OTHER
 ATTRIB FC Name STAMPING Value US DEPT OF AGRICULTURE 105+00
 ATTRIB FC Name ORIENTATION Value RAISED
 ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.300
 ATTRIB FC Name LOCATION Value 200' +/- NORTH OF LEVEE AT CURVE
 ATTRIB FC Name NOTE Value

| | | | | |
|--------|----|---|---|---|
| GPSVEC | TP | Point ID 3227 Class Normal Obs L1 Fixed | DX 48.026 DZ 237.630 H.pr 0.038 | DY 144.075 Code TOP NJ V.pr 0.059 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 12 Monitor status Not monitored Horz SD Start wk 1609 sec 246249.0 | PDOP max 3.5 HDOP max 1.9 VDOP max 2.9 RMS 25.2 Vert SD End wk 1609 sec 246260.0 | |
| GPSVEC | TP | Point ID 3228 Class Normal Obs L1 Fixed | DX 115.606 DZ 225.545 H.pr 0.019 | DY 107.673 Code TOP NJ V.pr 0.029 |
| GPSQC1 | NM | Min SVs 7 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 246291.0 | PDOP max 2.9 HDOP max 1.6 VDOP max 2.4 RMS 9.5 Vert SD End wk 1609 sec 246294.0 | |
| GPSVEC | TP | Point ID 3229 Class Normal Obs L1 Fixed | DX 165.014 DZ 210.409 H.pr 0.023 | DY 77.659 Code TOP NJ V.pr 0.032 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 246317.0 | PDOP max 2.4 HDOP max 1.4 VDOP max 2.0 RMS 9.7 Vert SD End wk 1609 sec 246321.0 | |
| GPSVEC | TP | Point ID 3230 Class Normal Obs L1 Fixed | DX 205.062 DZ 183.301 H.pr 0.024 | DY 41.127 Code TOP NJ V.pr 0.033 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 4 Monitor status Not monitored Horz SD Start wk 1609 sec 246358.0 | PDOP max 1.6 HDOP max 0.9 VDOP max 1.3 RMS 8.4 Vert SD End wk 1609 sec 246362.0 | |
| GPSVEC | TP | Point ID 3231 Class Normal Obs L1 Fixed | DX 226.751 DZ 162.723 H.pr 0.023 | DY 17.107 Code TOP NJ V.pr 0.033 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 246381.0 | PDOP max 2.3 HDOP max 1.3 VDOP max 1.9 RMS 9.7 Vert SD End wk 1609 sec 246385.0 | |
| GPSVEC | TP | Point ID 3232 Class Normal Obs L1 Fixed | DX 245.890 DZ 130.289 H.pr 0.027 | DY -12.940 Code TOP NJ V.pr 0.039 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 246408.0 | PDOP max 2.3 HDOP max 1.3 VDOP max 1.9 RMS 15.0 Vert SD End wk 1609 sec 246412.0 | |
| NOTE | TS | Time Date 11/09/2010 Time 13:27:16 | | |
| GPSVEC | TP | Point ID 3233 Class Normal Obs L1 Fixed | DX 259.027 DZ 92.085 H.pr 0.022 | DY -43.799 Code TOP NJ V.pr 0.031 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 246432.0 | PDOP max 2.3 HDOP max 1.3 VDOP max 1.9 RMS 20.7 Vert SD End wk 1609 sec 246436.0 | |
| GPSVEC | TP | Point ID 3234 Class Normal Obs L1 Fixed | DX 269.968 DZ 74.561 H.pr 0.028 | DY -62.217 Code TOP NJ V.pr 0.040 |
| GPSQC1 | NM | Min SVs 8 Relative DOPs Yes Total GPS pos 5 Monitor status Not monitored Horz SD Start wk 1609 sec 246450.0 | PDOP max 2.3 HDOP max 1.3 VDOP max 1.9 RMS 13.6 Vert SD End wk 1609 sec 246454.0 | |
| GPSVEC | TP | Point ID 3235 Class Normal Obs L1 Fixed | DX 275.924 DZ 61.722 H.pr 0.026 | DY -76.920 Code TOP NJ V.pr 0.038 |

| | | | | | |
|--------|----|-------------------|---------------|-----------------|----------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.6 |
| | | Relative DOPs | Yes | HDOP max | 0.9 |
| | | Total GPS pos | 3 | VDOP max | 1.3 |
| | | Monitor status | Not monitored | RMS | 12.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246470.0 | End wk 1609 sec | 246472.0 |
| GPSVEC | TP | Point ID 3236 | | DX | 240.355 |
| | | Class Normal | | DZ | 49.758 |
| | | Obs L1 Fixed | | H.pr | 0.030 |
| | | | | DY | -57.198 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.043 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.3 |
| | | Relative DOPs | Yes | HDOP max | 1.3 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 19.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246505.0 | End wk 1609 sec | 246508.0 |
| GPSVEC | TP | Point ID 3237 | | DX | 236.707 |
| | | Class Normal | | DZ | 79.854 |
| | | Obs L1 Fixed | | H.pr | 0.039 |
| | | | | DY | -34.041 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.059 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 3 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 21.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246525.0 | End wk 1609 sec | 246527.0 |
| GPSVEC | TP | Point ID 3238 | | DX | 222.910 |
| | | Class Normal | | DZ | 114.465 |
| | | Obs L1 Fixed | | H.pr | 0.030 |
| | | | | DY | -3.789 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.043 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 3 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 14.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246546.0 | End wk 1609 sec | 246548.0 |
| GPSVEC | TP | Point ID 3239 | | DX | 202.324 |
| | | Class Normal | | DZ | 146.327 |
| | | Obs L1 Fixed | | H.pr | 0.027 |
| | | | | DY | 27.111 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.038 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.4 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 4 | VDOP max | 1.9 |
| | | Monitor status | Not monitored | RMS | 12.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246567.0 | End wk 1609 sec | 246570.0 |
| GPSVEC | TP | Point ID 3240 | | DX | 170.846 |
| | | Class Normal | | DZ | 172.798 |
| | | Obs L1 Fixed | | H.pr | 0.040 |
| | | | | DY | 57.659 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.6 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 8 | VDOP max | 3.2 |
| | | Monitor status | Not monitored | RMS | 19.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246592.0 | End wk 1609 sec | 246599.0 |
| GPSVEC | TP | Point ID 3241 | | DX | 135.353 |
| | | Class Normal | | DZ | 194.110 |
| | | Obs L1 Fixed | | H.pr | 0.036 |
| | | | | DY | 86.894 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.059 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.7 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 12 | VDOP max | 3.2 |
| | | Monitor status | Not monitored | RMS | 10.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246620.0 | End wk 1609 sec | 246631.0 |
| GPSVEC | TP | Point ID 3242 | | DX | 91.052 |
| | | Class Normal | | DZ | 205.303 |
| | | Obs L1 Fixed | | H.pr | 0.040 |
| | | | | DY | 112.593 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.063 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.7 |
| | | Relative DOPs | Yes | HDOP max | 1.7 |
| | | Total GPS pos | 11 | VDOP max | 3.2 |
| | | Monitor status | Not monitored | RMS | 28.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246650.0 | End wk 1609 sec | 246660.0 |
| GPSVEC | TP | Point ID 3243 | | DX | 42.648 |
| | | Class Normal | | DZ | 206.464 |
| | | Obs L1 Fixed | | H.pr | 0.041 |
| | | | | DY | 132.383 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.062 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.6 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 15.2 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 sec | 246681.0 | End wk 1609 sec | 246685.0 |
| GPSVEC | TP | Point ID 3244 | | DX | 5.649 |
| | | Class Normal | | DZ | 125.131 |
| | | Obs L1 Fixed | | H.pr | 0.021 |
| | | | | DY | 89.494 |
| | | | | Code | TOE NJ |
| | | | | V.pr | 0.030 |

| | | | | | |
|--------|----|----------------|---------------|-------------|--------------|
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.7 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 3 | VDOP max | 1.4 |
| | | Monitor status | Not monitored | RMS | 7.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246734.0 | End wk 1609 | sec 246736.0 |
| GPSVEC | TP | Point ID 3245 | DX 50.978 | DY | 70.064 |
| | | Class Normal | DZ 122.433 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.038 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 3 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 7.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246755.0 | End wk 1609 | sec 246757.0 |
| GPSVEC | TP | Point ID 3246 | DX 90.265 | DY | 46.172 |
| | | Class Normal | DZ 110.830 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.039 |
| GPSQC1 | NM | Min SVs | 7 | PDOP max | 2.0 |
| | | Relative DOPs | Yes | HDOP max | 1.1 |
| | | Total GPS pos | 3 | VDOP max | 1.6 |
| | | Monitor status | Not monitored | RMS | 10.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246777.0 | End wk 1609 | sec 246779.0 |
| GPSVEC | TP | Point ID 3247 | DX 124.048 | DY | 12.832 |
| | | Class Normal | DZ 83.009 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.042 | V.pr | 0.061 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.8 |
| | | Relative DOPs | Yes | HDOP max | 1.6 |
| | | Total GPS pos | 5 | VDOP max | 2.3 |
| | | Monitor status | Not monitored | RMS | 25.7 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246801.0 | End wk 1609 | sec 246805.0 |
| GPSVEC | TP | Point ID 3248 | DX 143.392 | DY | -18.266 |
| | | Class Normal | DZ 50.038 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.041 | V.pr | 0.060 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 6 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 26.1 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246824.0 | End wk 1609 | sec 246830.0 |
| GPSVEC | TP | Point ID 3249 | DX 139.705 | DY | -48.425 |
| | | Class Normal | DZ 5.888 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.040 | V.pr | 0.059 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.5 |
| | | Relative DOPs | Yes | HDOP max | 1.4 |
| | | Total GPS pos | 5 | VDOP max | 2.1 |
| | | Monitor status | Not monitored | RMS | 25.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246853.0 | End wk 1609 | sec 246857.0 |
| GPSVEC | TP | Point ID 3250 | DX 122.595 | DY | -30.148 |
| | | Class Normal | DZ 32.198 | Code | TOP NJ |
| | | Obs L1 Fixed | H.pr 0.033 | V.pr | 0.051 |
| GPSQC1 | NM | Min SVs | 6 | PDOP max | 3.8 |
| | | Relative DOPs | Yes | HDOP max | 1.8 |
| | | Total GPS pos | 7 | VDOP max | 3.3 |
| | | Monitor status | Not monitored | RMS | 8.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246879.0 | End wk 1609 | sec 246885.0 |
| GPSVEC | TP | Point ID 3251 | DX 118.704 | DY | -6.881 |
| | | Class Normal | DZ 61.707 | Code | TOP NJ |
| | | Obs L1 Fixed | H.pr 0.026 | V.pr | 0.039 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 2.7 |
| | | Relative DOPs | Yes | HDOP max | 1.5 |
| | | Total GPS pos | 5 | VDOP max | 2.2 |
| | | Monitor status | Not monitored | RMS | 8.3 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246903.0 | End wk 1609 | sec 246907.0 |
| GPSVEC | TP | Point ID 3252 | DX 111.009 | DY | -5.001 |
| | | Class Normal | DZ 60.684 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.034 | V.pr | 0.050 |
| GPSQC1 | NM | Min SVs | 8 | PDOP max | 1.8 |
| | | Relative DOPs | Yes | HDOP max | 1.0 |
| | | Total GPS pos | 4 | VDOP max | 1.5 |
| | | Monitor status | Not monitored | RMS | 17.5 |
| | | Horz SD | | Vert SD | |
| | | Start wk 1609 | sec 246922.0 | End wk 1609 | sec 246925.0 |
| GPSVEC | TP | Point ID 3253 | DX 86.882 | DY | 18.431 |
| | | Class Normal | DZ 79.793 | Code | TOE NJ |
| | | Obs L1 Fixed | H.pr 0.037 | V.pr | 0.057 |

GPSQC1 NM Min SVs 7 PDOP max 2.7
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 4 VDOP max 2.3
 Monitor status Not monitored RMS 8.6
 Horz SD Vert SD
 Start wk 1609 sec 246943.0 End wk 1609 sec 246946.0

GPSVEC TP Point ID 3254 DX 96.315 DY 21.625
 Class Normal DZ 88.496 Code TOP NJ
 Obs L1 Fixed H.pr 0.030 V.pr 0.043

GPSQC1 NM Min SVs 8 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 4 VDOP max 1.5
 Monitor status Not monitored RMS 15.0
 Horz SD Vert SD
 Start wk 1609 sec 246957.0 End wk 1609 sec 246960.0

GPSVEC TP Point ID 3255 DX 64.240 DY 46.646
 Class Normal DZ 105.619 Code TOP NJ
 Obs L1 Fixed H.pr 0.026 V.pr 0.038

GPSQC1 NM Min SVs 8 PDOP max 1.9
 Relative DOPs Yes HDOP max 1.1
 Total GPS pos 3 VDOP max 1.6
 Monitor status Not monitored RMS 10.3
 Horz SD Vert SD
 Start wk 1609 sec 246981.0 End wk 1609 sec 246983.0

GPSVEC TP Point ID 3256 DX 56.787 DY 39.305
 Class Normal DZ 92.111 Code TOE NJ
 Obs L1 Fixed H.pr 0.029 V.pr 0.042

GPSQC1 NM Min SVs 8 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 4 VDOP max 1.5
 Monitor status Not monitored RMS 9.1
 Horz SD Vert SD
 Start wk 1609 sec 246995.0 End wk 1609 sec 246998.0

GPSVEC TP Point ID 3257 DX 12.962 DY 63.074
 Class Normal DZ 99.871 Code TOE NJ
 Obs L1 Fixed H.pr 0.026 V.pr 0.038

GPSQC1 NM Min SVs 8 PDOP max 1.8
 Relative DOPs Yes HDOP max 1.0
 Total GPS pos 4 VDOP max 1.5
 Monitor status Not monitored RMS 7.4
 Horz SD Vert SD
 Start wk 1609 sec 247017.0 End wk 1609 sec 247020.0

GPSVEC TP Point ID 3258 DX 16.502 DY 71.704
 Class Normal DZ 113.626 Code TOP NJ
 Obs L1 Fixed H.pr 0.037 V.pr 0.055

GPSQC1 NM Min SVs 8 PDOP max 2.6
 Relative DOPs Yes HDOP max 1.5
 Total GPS pos 5 VDOP max 2.2
 Monitor status Not monitored RMS 16.5
 Horz SD Vert SD
 Start wk 1609 sec 247033.0 End wk 1609 sec 247037.0

GPSVEC TP Point ID 2343 DX -103.550 DY 243.214
 Class Check DZ 294.890 Code BC
 Obs L1 Fixed H.pr 0.024 V.pr 0.037

GPSQC1 NM Min SVs 7 PDOP max 3.5
 Relative DOPs Yes HDOP max 1.9
 Total GPS pos 4 VDOP max 3.0
 Monitor status Not monitored RMS 14.6
 Horz SD Vert SD
 Start wk 1609 sec 247207.0 End wk 1609 sec 247210.0

POLAR D TP Azmth 152°35'15.225" H.Dist 0.059
 V.Dist -0.083

FEATURE FC Name BC

ATTRIB FC Name MATERIAL TYPE Value BRASS

ATTRIB FC Name CAP SIZE Value 2"

ATTRIB FC Name AGENCY Value OTHER

ATTRIB FC Name STAMPING Value US DEPT OF AGRICULTURE 105+00

ATTRIB FC Name ORIENTATION Value RAISED

ATTRIB FC Name DEPTH/HEIGHT IN FEET Value 0.300

ATTRIB FC Name LOCATION Value 200' +/- NORTH OF LEVEE AT CURVE

ATTRIB FC Name NOTE Value

SURVEY EVENTKISurvey event Survey ended

NOTE TS Time Date 11/09/2010 Time 14:37:38

HGTADJ TM Geoid + Inclined Plane
Orig Nrth 891879.086 Slope N 24.470
Orig East 791925.872 Slope E -22.238
Hgt Const 0.142
Geoid GE01D03 (Conus)



Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots from top of diversion looking East

AMEC Job No.
0911505010

Reviewed By:
R. Davies

Prepared By:
D. Smith



Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots from top of diversion looking West

AMEC Job No.
0911505010

Reviewed By:
R. Davies

Prepared By:
D. Smith



Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots of Diversion Channel looking upstream

AMEC Job No.
0911505010

Reviewed By:
R. Davies

Prepared By:
D. Smith



Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots of Outlet Channel looking downstream

AMEC Job No.
0911505010

Reviewed By:
R. Davies

Prepared By:
D. Smith



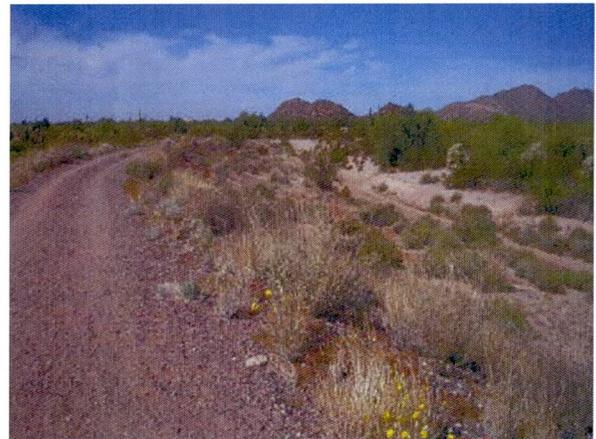
Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots of nuisance water pipes



Typical shots of levee tie-in to natural ground

AMEC Job No.
0911505010

Reviewed By:
R. Davies

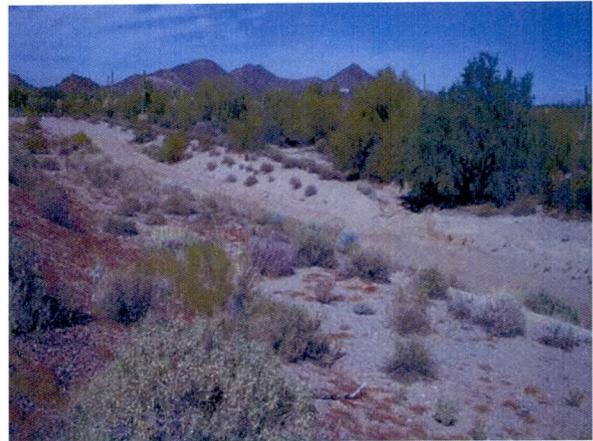
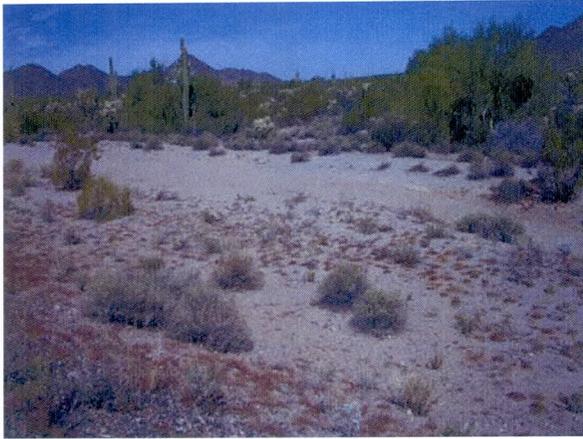
Prepared By:
D. Smith



Pass Mountain Diversion Field Reconnaissance

Site Visit – September 3, 2009

PHOTOGRAPHIC LOG



Typical shots of levee tie-in to natural ground

AMEC Job No.
0911505010

Reviewed By:
R. Davies

Prepared By:
D. Smith

