



FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

2015 EDITION

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

ELEVATION CERTIFICATE AND INSTRUCTIONS

Paperwork Reduction Act Notice

Public reporting burden for this data collection is estimated to average 3.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

Privacy Act Statement

Authority: Title 44 CFR § 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or the applicant may be subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

Purpose of the Elevation Certificate

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate Post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. The Elevation Certificate is not required for Pre-FIRM buildings unless the building is being rated under the optional Post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management regulations that specify minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in FEMA Publication 467-1, Floodplain Management Bulletin: Elevation Certificate, available on FEMA's website at <https://www.fema.gov/media-library/assets/documents/3539?id=1727>.

ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1–9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION				FOR INSURANCE COMPANY USE	
A1. Building Owner's Name Ron Maclellan				Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 54A Road 2896				Company NAIC Number:	
City Aztec		State New Mexico		ZIP Code 87410	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) Parcel #2-063-180-010-429 Account R0012858					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) <u>Residential</u>					
A5. Latitude/Longitude: Lat. <u>36°51'35.17"N</u> Long. <u>107°58'11.12"W</u> Horizontal Datum: <input type="checkbox"/> NAD 1927 <input checked="" type="checkbox"/> NAD 1983					
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.					
A7. Building Diagram Number <u>9</u>					
A8. For a building with a crawlspace or enclosure(s):					
a) Square footage of crawlspace or enclosure(s) <u>2400.00</u> sq ft					
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade <u>0</u>					
c) Total net area of flood openings in A8.b <u>N/A</u> sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
A9. For a building with an attached garage:					
a) Square footage of attached garage <u>N/A</u> sq ft					
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade <u>N/A</u>					
c) Total net area of flood openings in A9.b <u>N/A</u> sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number San Juan County/ 350064			B2. County Name San Juan		B3. State New Mexico
B4. Map/Panel Number 35045C0730	B5. Suffix F	B6. FIRM Index Date 08-05-2010	B7. FIRM Panel Effective/ Revised Date 08-05-2010	B8. Flood Zone(s) A	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 5666.68
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input checked="" type="checkbox"/> Other/Source: <u>HEC-RAS</u>					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expiration Date: November 30, 2018

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 54A Road 2896			Policy Number:
City Aztec	State New Mexico	ZIP Code 87410	Company NAIC Number

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

- C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☒ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.
- C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO.
Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.
Benchmark Utilized: OPUS Vertical Datum: NAVD 1988
- Indicate elevation datum used for the elevations in items a) through h) below.
☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: _____
- Datum used for building elevations must be the same as that used for the BFE.
- Check the measurement used.
- | | | | |
|-------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------|---------------------------------|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor) | <u>5668.57</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor | <u>5671.61</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only) | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| d) Attached garage (top of slab) | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building
(Describe type of equipment and location in Comments) | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG) | <u>5668.16</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG) | <u>5669.98</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support | <u>N/A</u> | <input type="checkbox"/> feet | <input type="checkbox"/> meters |

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Were latitude and longitude in Section A provided by a licensed land surveyor? ☒ Yes ☐ No ☒ Check here if attachments.

Certifier's Name Paul F. Martin	License Number 8548		
Title Engineer			
Company Name Sakura Engineering and Surveying			
Address 125 West Main St.			
City Farmington	State New Mexico		ZIP Code 87401
Signature 	Date 03-14-2017	Telephone (505) 564-2139	Ext. 2

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including type of equipment and location, per C2(e), if applicable)

ELEVATION CERTIFICATEOMB No. 1660-0008
Expiration Date: November 30, 2018**IMPORTANT: In these spaces, copy the corresponding information from Section A.****FOR INSURANCE COMPANY USE**Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
54A Road 2896

Policy Number:

City
AztecState
New MexicoZIP Code
87410

Company NAIC Number

**SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED)
FOR ZONE AO AND ZONE A (WITHOUT BFE)**

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name

Address

City

State

ZIP Code

Signature

Date

Telephone

Comments

☐ Check here if attachments.

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expiration Date: November 30, 2018

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 54A Road 2896			Policy Number:	
City Aztec	State New Mexico	ZIP Code 87410	Company NAIC Number	
SECTION G – COMMUNITY INFORMATION (OPTIONAL)				
The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.				
G1. <input type="checkbox"/> The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)				
G2. <input type="checkbox"/> A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.				
G3. <input type="checkbox"/> The following information (Items G4–G10) is provided for community floodplain management purposes.				
G4. Permit Number		G5. Date Permit Issued		G6. Date Certificate of Compliance/Occupancy Issued
G7. This permit has been issued for: <input type="checkbox"/> New Construction <input type="checkbox"/> Substantial Improvement				
G8. Elevation of as-built lowest floor (including basement) of the building: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
G9. BFE or (in Zone AO) depth of flooding at the building site: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
G10. Community's design flood elevation: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
Local Official's Name		Title		
Community Name		Telephone		
Signature		Date		
Comments (including type of equipment and location, per C2(e), if applicable)				
<div><input type="checkbox"/> Check here if attachments.</div>				

BUILDING PHOTOGRAPHS**ELEVATION CERTIFICATE**

See Instructions for Item A6.

OMB No. 1660-0008

Expiration Date: November 30, 2018

IMPORTANT: In these spaces, copy the corresponding information from Section A.**FOR INSURANCE COMPANY USE**Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
54A Road 2896

Policy Number:

City
AztecState
New MexicoZIP Code
87410

Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.



Photo One

Photo One Caption East side of House (Date Taken 5/25/2017)

Clear Photo One



Photo Two

Photo Two Caption West Side of House (Date Taken 5/25/2017)

Clear Photo Two

ELEVATION CERTIFICATE

BUILDING PHOTOGRAPHS

Continuation Page

OMB No. 1660-0008

Expiration Date: November 30, 2018

IMPORTANT: In these spaces, copy the corresponding information from Section A.

FOR INSURANCE COMPANY USE

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
54A Road 2896

Policy Number:

City
Aztec

State
New Mexico

ZIP Code
87410

Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.



Photo Three

Photo Three Caption South Side of House (Date Taken 5/25/2017)

Clear Photo Three

Photo Four

Photo Four Caption

Clear Photo Four

2017-252Ron.rep

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X        X      X      X      X
XXXXXXXX XXXX      X        XXX XXXX      XXXXXX   XXXX
X      X  X        X        X      X      X      X
X      X  X        X      X      X      X      X
X      X  XXXXXX   XXXX      X      X      X      XXXXX
```

PROJECT DATA

Project Title: 2017-252Ron
Project File : 2017-252Ron.prj
Run Date and Time: 6/5/2017 11:13:12 AM

Project in English units

PLAN DATA

Plan Title: Plan 03
Plan File : C:\Users\Scott\Documents\2017-252Ron.p03

Geometry Title: Geom 01
Geometry File : C:\Users\Scott\Documents\2017-252Ron.g01

Flow Title : Flow 01
Flow File : C:\Users\Scott\Documents\2017-252Ron.f01

Plan Summary Information:

Number of:	Cross Sections =	2	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

2017-252Ron.rep
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Flow 01
Flow File : C:\Users\Scott\Documents\2017-252Ron.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Animas River	1	80	20123.74

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Animas River	1	PF 1	Critical
Critical			

GEOMETRY DATA

Geometry Title: Geom 01
Geometry File : C:\Users\Scott\Documents\2017-252Ron.g01

CROSS SECTION

RIVER: Animas River
REACH: 1 RS: 80

INPUT

Description:

Station Elevation Data				num=	10				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	5671.27	509.59	5669.25	669.16	5669.85	845	5669.32	1647.92	5666.16
1895.96	5662.54	2183.6	5660.45	2189	5657.79	2350.48	5658.19	2362.66	5662.16

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
0	.045	2189	.04	2350.48	.045

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	2189	2350.48		170	151	130	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	5666.68	Element	Left OB	Channel
Right OB				
Vel Head (ft)	1.12	Wt. n-Val.	0.045	0.040
0.045				
W.S. Elev (ft)	5665.56	Reach Len. (ft)	170.00	151.00
130.00				
Crit W.S. (ft)	5664.63	Flow Area (sq ft)	1518.18	1222.97
65.63				
E.G. Slope (ft/ft)	0.004961	Area (sq ft)	1518.18	1222.97
65.63				
Q Total (cfs)	20123.74	Flow (cfs)	7395.56	12340.49
387.69				
Top Width (ft)	673.86	Top Width (ft)	500.20	161.48
12.18				
Vel Total (ft/s)	7.17	Avg. Vel. (ft/s)	4.87	10.09
5.91				
Max Chl Dpth (ft)	7.77	Hydr. Depth (ft)	3.04	7.57
5.39				
Conv. Total (cfs)	285708.1	Conv. (cfs)	104999.0	175204.8
5504.3				
Length Wtd. (ft)	156.70	Wetted Per. (ft)	500.85	161.48
16.21				
Min Ch El (ft)	5657.79	Shear (lb/sq ft)	0.94	2.35
1.25				
Alpha	1.40	Stream Power (lb/ft s)	2362.66	0.00
0.00				
Frctn Loss (ft)	1.02	Cum Volume (acre-ft)	4.81	4.26
0.12				
C & E Loss (ft)	0.07	Cum SA (acres)	1.77	0.61
0.02				

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Animas River

REACH: 1

RS: 0

INPUT

Description:

Station Elevation Data	num=	10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 5671.12 511.41 5669.25 673.77 5669.18 842.38 5668.57 1649.73 5666.17		
1923.89 5661.33 2187.75 5660.57 2192.67 5657.13 2385.24 5657.65 2388.02 5660.86		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .045 2192.67 .04 2385.24 .045		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
2192.67 2385.24	80 80 80	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	5665.59	Element	Left OB	Channel
Right OB				
Vel Head (ft)	1.80	Wt. n-Val.	0.045	0.040
0.045				
W.S. Elev (ft)	5663.80	Reach Len. (ft)		
Crit W.S. (ft)	5663.80	Flow Area (sq ft)	947.68	1233.70
12.63				
E.G. Slope (ft/ft)	0.008890	Area (sq ft)	947.68	1233.70
12.63				
Q Total (cfs)	20123.74	Flow (cfs)	5161.33	14905.16
57.25				
Top Width (ft)	603.84	Top Width (ft)	408.49	192.57
2.78				
Vel Total (ft/s)	9.17	Avg. Vel. (ft/s)	5.45	12.08

4.53				
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)	2.32	6.41
4.54				
Conv. Total (cfs)	213433.4	Conv. (cfs)	54741.3	158084.9
607.2				
Length Wtd. (ft)		Wetted Per. (ft)	409.59	192.57
7.18				
Min Ch El (ft)	5657.13	Shear (lb/sq ft)	1.28	3.56
0.98				
Alpha	1.38	Stream Power (lb/ft s)	2388.02	0.00
0.00				
Frctn Loss (ft)		Cum Volume (acre-ft)		
C & E Loss (ft)		Cum SA (acres)		

SUMMARY OF MANNING'S N VALUES

River: Animas River

Reach	River Sta.	n1	n2	n3
1	80	.045	.04	.045
1	0	.045	.04	.045

SUMMARY OF REACH LENGTHS

River: Animas River

Reach	River Sta.	Left	Channel	Right
1	80	170	151	130
1	0	80	80	80

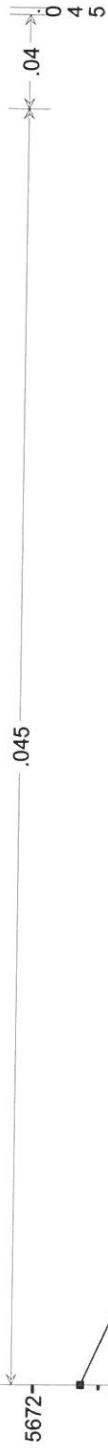
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Animas River

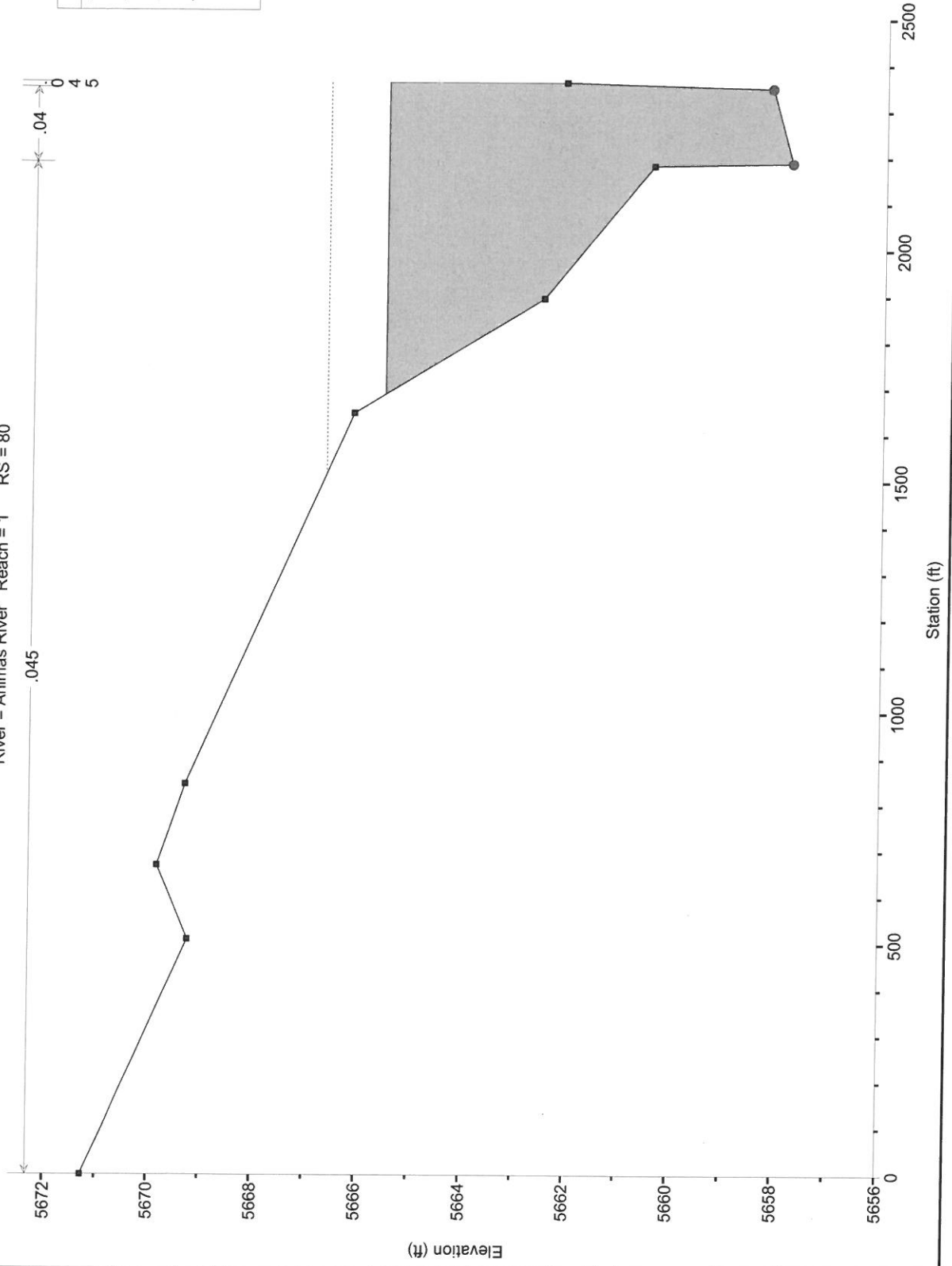
	Reach	River Sta.	2017-252 Contr.	Ron.rep Expan.
1		80	.1	.3
1		0	.1	.3

2017-252Ron Plan: Plan 03 6/5/2017

River = Animas River Reach = 1 RS = 80



Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta



Subject: OPUS solution : 7388_0113_112936.m00 OP1452811024422**From:** opus <opus@ngs.noaa.gov>**Date:** 1/14/2016 3:37 PM**To:** tojoe@sakuraeng.com

FILE: 7388_0113_112936.m00 OP1452811024422

NGS OPUS SOLUTION REPORT

=====

All computed coordinate accuracies are listed as peak-to-peak values.

For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>USER: tojoe@sakuraeng.com

DATE: January 14, 2016

RINEX FILE: 7388013s.16o

TIME: 22:37:24 UTC

SOFTWARE:	page5 1209.04 master91.pl 022814	START:	2016/01/13 18:30:00
EPHEMERIS:	igr18793.eph [rapid]	STOP:	2016/01/13 23:15:00
NAV FILE:	brdc0130.16n	OBS USED:	12059 / 14144 : 85%
ANT NAME:	LEIGS15 NONE	# FIXED AMB:	76 / 81 : 94%
ARP HEIGHT:	1.45	OVERALL RMS:	0.015(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000)

IGS08 (EPOCH:2016.0352)

X:	-1578770.557(m)	0.012(m)	-1578771.396(m)	0.012(m)
Y:	-4861472.108(m)	0.020(m)	-4861470.768(m)	0.020(m)
Z:	3805147.726(m)	0.012(m)	3805147.604(m)	0.012(m)
LAT:	36 51 0.17926	0.005(m)	36 51 0.19584	0.005(m)
E LON:	252 0 31.37404	0.010(m)	252 0 31.32514	0.010(m)
W LON:	107 59 28.62596	0.010(m)	107 59 28.67486	0.010(m)
EL HGT:	1763.609(m)	0.025(m)	1762.724(m)	0.025(m)
ORTH0 HGT:	1784.385(m)	0.045(m)	[NAVD88 (Computed using GEOID12B)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 12)	SPC (3003 NM W)
Northing (Y) [meters]	4082464.510	648853.311
Easting (X) [meters]	768263.304	815914.068
Convergence [degrees]	1.80547145	-0.09472737
Point Scale	1.00048667	0.99991911
Combined Factor	1.00020984	0.99964244

US NATIONAL GRID DESIGNATOR: 12SYF6826382464(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DL3585	MC10 MONTROSE CORS ARP	N382720.137	W1075242.393	178521.5
DL3642	MC09 NUCLA CORS ARP	N381435.614	W1083329.283	162577.3
DI2245	P011 SPIDERROCKAZ2005 CORS ARP	N360859.363	W1093109.175	157441.0

NEAREST NGS PUBLISHED CONTROL POINT

GN0356	E 18	N365035.	W1075833.	1581.4
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This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.