



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 Harry J. and Theresa Dalton				Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 23 Rd 1634				Company NAIC Number:	
City Farmington		State New Mexico		ZIP Code 87401	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) Account R6001367, Tract 3 Bees Farm Subdivision					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) <u>Residential</u>					
A5. Latitude/Longitude: Lat. <u>36° 51' 32.73" N</u> Long. <u>107° 12' 27.85" 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>2700.00</u> sq ft					
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade <u>13</u>					
c) Total net area of flood openings in A8.b <u>546.00</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>800.00</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 County350064			B2. County Name San Juan		B3. State New Mexico
B4. Map/Panel Number 35045C0700	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) 5463.50
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 checked="" 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. 23 Rd 1634			Policy Number:
City Farmington	State New Mexico	ZIP Code 87401	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>5470.10</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor | <u>5474.10</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>5470.90</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>5469.50</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG) | <u>5470.90</u> | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG) | <u>5471.70</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 Scott A. Martin	License Number 24570		
Title Professional Surveyor			
Company Name Sakura Engineering and Surveying			
Address 125 West Main St.			
City Farmington	State New Mexico		ZIP Code 87401
Signature 	Date 12-23-2019	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)

Equipment is propane tank. HVAC equipment is at 5470.95.

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. 23 Rd 1634			Policy Number:
City Farmington	State New Mexico	ZIP Code 87401	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 _____ 5470.10 feet meters above or below the HAG.
 - b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ 5470.10 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 _____ 5474.10 feet meters above or below the HAG.
- E3. Attached garage (top of slab) is _____ 5474.90 feet meters above or below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is _____ 5469.50 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. 23 Rd 1634			Policy Number:
City Farmington	State New Mexico	ZIP Code 87401	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. 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. 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. 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
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- G7. This permit has been issued for: New Construction Substantial Improvement
- G8. Elevation of as-built lowest floor (including basement) of the building: _____ feet meters Datum _____
- G9. BFE or (in Zone AO) depth of flooding at the building site: _____ feet meters Datum _____
- G10. Community's design flood elevation: _____ feet meters Datum _____

Local Official's Name	Title
Community Name	Telephone
Signature	Date

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

Check here if attachments.

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

OMB No. 1660-0008

Expiration Date: November 30, 2018

ELEVATION CERTIFICATE

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. 23 Rd 1634			Policy Number:
City Farmington	State New Mexico	ZIP Code 87401	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 (Taken 12-23-2019)

Clear Photo One



Photo Two

Photo Two Caption South Side (Taken 12-23-2019)

Clear Photo Two

BUILDING PHOTOGRAPHS

Continuation Page

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

ELEVATION CERTIFICATE

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. 23 Rd 1634			Policy Number:
City Farmington	State New Mexico	ZIP Code 87401	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 West Side (Taken 12-23-2019)

Clear Photo Three



Photo Four

Photo Four Caption East Side (Taken 12-23-2019)

Clear Photo Four

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X X XXXXXX XXXX XXXX XX XXXX
X X 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
X X XXXXXX XXXX X X X X XXXXX
```

PROJECT DATA

Project Title: HEC-RAS Model
Project File : fecballard.prj
Run Date and Time: 8/4/2019 2:25:23 PM

Project in English units

Project Description:

CRS Info=<SpatialReference> <CoordinateSystem Code="2259"
Unit="US_survey_Foot" AcadCode="" /> <Registration OffsetX="0" OffsetY="0"
OffsetZ="0" ScaleX="1" ScaleY="1" ScaleZ="1" /></SpatialReference>

PLAN DATA

Plan Title: Default Scenario
Plan File : C:\Users\Scott\Documents\fecballard.p01

Geometry Title: Default Geometry
Geometry File : C:\Users\Scott\Documents\fecballard.g01

Flow Title : Default Steady Flow
Flow File : C:\Users\Scott\Documents\fecballard.f01

Plan Description:
Default Scenario

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
Maximum difference tolerance = 0.33
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: Default Steady Flow
Flow File : C:\Users\Scott\Documents\fecballard.f01

Flow Data (cfs)

River	Reach	RS	100 YR
La Plata	1634	1006	6000

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
La Plata	1634	100 YR	Critical	Critical

GEOMETRY DATA

Geometry Title: Default Geometry
Geometry File : C:\Users\Scott\Documents\fecballard.g01

CROSS SECTION

RIVER: La Plata
REACH: 1634 RS: 1006

INPUT

Description:

Station Elevation Data num= 491

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
640.57	5485.22	656.33	5485.11	660.6	5484.94	669.6	5484.81	680.9	5484.5
688.87	5484.56	694.79	5484.43	708.62	5483.91	714.3	5483.99	722.49	5483.91

726.9 5484 740.64 5484.02 745.18 5484.07 754 5483.88 772.86 5483.68
784.88 5483.45 800.02 5483.21 822.25 5483.07 830.24 5482.88 840.04 5482.89
842.51 5482.8 850.41 5482.79 856.08 5482.87 864.27 5482.82 867.7 5482.7
877.58 5482.66 881.53 5483.15 887.95 5483.09 891.9 5482.58 896.41 5482.6
908.2 5482.21 914.68 5482.11 923.5 5481.83 951.22 5481.27 958.15 5481.35
972.65 5481.1 978.85 5480.92 990.3 5480.7 993.17 5480.7 1001.58 5480.28
1012.35 5479.99 1015.5 5480.02 1019.28 5480.59 1022.43 5480.38 1024.22 5480.04
1027.47 5479.97 1031.25 5480.47 1034.68 5480.38 1038.18 5479.64 1042.51 5479.34
1058.88 5479.03 1066.77 5478.8 1076.66 5478.71 1082.58 5478.07 1086.06 5478.16
1090.98 5477.57 1096.78 5477.6 1101.85 5477.9 1107.49 5477.15 1114.42 5477.55
1117.57 5477.93 1124.08 5478.16 1128.28 5477.87 1135.44 5477.88 1139.89 5478.02
1144.04 5478.44 1148.78 5477.91 1155.21 5477.77 1159.16 5477.28 1164.83 5476.05
1167.05 5475.81 1169.88 5475.02 1171.13 5474.97 1173.97 5475.82 1176.94 5476.32
1178.91 5476.41 1187.32 5476.37 1189.29 5476.14 1194.45 5474.57 1198.68 5474.09
1203.9 5473.31 1211.46 5472.98 1216.5 5473.15 1223.43 5472.69 1230.99 5472.48
1241.71 5472.3 1251.53 5472.2 1256.97 5472.05 1269.31 5472.1 1274.75 5471.9
1281.17 5471.78 1295.49 5471.81 1298.46 5471.68 1306.36 5471.58 1314.64 5471.59
1323.16 5471.52 1331.17 5471.54 1336.99 5471.65 1343.78 5471.4 1353.86 5471.36
1364.16 5471.45 1371.5 5471.29 1384.42 5471.42 1389.15 5471.3 1408.06 5471.25
1424.43 5471.15 1429.37 5471.07 1435.86 5471.1 1447.65 5470.9 1453.09 5470.89
1463.46 5471.02 1470.87 5470.95 1484.7 5470.99 1494.38 5471.1 1497.53 5471.28
1502.57 5471.22 1507.42 5471.34 1514.34 5471.23 1539.12 5471.17 1543 5471.25
1551.89 5471.15 1557.32 5471.23 1562.43 5471.17 1568.19 5471.25 1575.59 5471.03
1589.43 5470.94 1602.27 5470.97 1611.66 5470.89 1633.4 5470.92 1636.36 5470.89
1641.3 5471.07 1648.75 5470.95 1661.06 5470.99 1671.43 5470.85 1682.15 5471
1690.21 5470.99 1697.61 5471.09 1703.55 5470.97 1716.38 5470.98 1719.33 5470.86
1730.71 5470.82 1735.65 5471 1741.09 5470.81 1748.32 5470.72 1765.29 5470.63
1773.52 5470.54 1790.32 5470.49 1792.6 5470.42 1801.36 5470.46 1809.44 5470.38
1817.62 5470.58 1820.13 5471.46 1824.08 5473.67 1827.53 5474.66 1831.49 5474.98
1833.46 5474.77 1835.9 5474.11 1841.36 5473.45 1844.09 5473.46 1846.61 5474.08
1849.78 5474.28 1853.71 5473.6 1854.8 5473.62 1859.64 5474.63 1861.61 5474.58
1863.6 5474.16 1866.46 5473.03 1868.77 5471.83 1872.75 5470.03 1875.4 5469.74
1881.66 5469.53 1892.17 5469.3 1895.82 5469.33 1900.06 5469.17 1906.85 5468.65
1913.5 5468.04 1918.37 5467.48 1922 5466.89 1924.57 5466.71 1929.78 5468.2
1931.66 5468.31 1935.21 5467.53 1938.97 5465.73 1942.29 5465.24 1948.49 5463.91
1955.59 5463.04 1960.88 5462.15 1963.56 5461.56 1965.33 5460.92 1968.87 5459.01
1971.97 5459.02 1975.52 5458.44 1983.94 5456.75 1986.59 5457.07 1988.81 5457.93
1991.47 5458.64 1995.59 5458.52 2002.1 5458.82 2011.4 5458.98 2014.07 5458.83
2015.85 5458.45 2019.83 5456.86 2022.05 5455.55 2023.82 5453.99 2026.92 5452.95
2029.13 5453.09 2034.89 5456.17 2038.76 5457.9 2041.99 5459.03 2045.09 5459.45
2052.2 5460.18 2057.49 5461.12 2059.99 5461.22 2070.78 5461.22 2080.97 5460.95
2085.85 5460.35 2090.43 5460.1 2099.58 5459.91 2111.09 5459.82 2122.62 5460.01
2139 5459.87 2144.32 5460 2150.57 5459.93 2154.95 5460.13 2156.23 5459.98
2159.38 5460.14 2163.3 5459.76 2181.98 5459.68 2193.1 5459.7 2205.45 5459.92
2208.11 5460.02 2220.07 5459.92 2225.39 5460.12 2234.77 5460.03 2238.3 5460.1
2255.29 5460.13 2260.82 5460.31 2263.92 5460.1 2268.36 5460.13 2273.65 5459.83
2281.64 5459.23 2295.82 5459.36 2301.28 5459.33 2306.82 5459.42 2311.78 5460.16
2314.72 5460.23 2319.3 5459.71 2326.39 5459.83 2330.38 5460.09 2336.58 5460.01
2340.9 5459.73 2346.32 5459.56 2353.86 5459.75 2359.17 5460.16 2362.72 5460.22
2366.7 5459.71 2370.24 5459.76 2374.68 5459.44 2379.11 5459.55 2385.31 5459.55
2389.73 5459.42 2393.73 5459.54 2396.39 5459.91 2403.17 5459.7 2410.96 5459.74
2424.12 5459.45 2439.97 5459.03 2454.83 5458.86 2462.5 5458.87 2463.73 5458.87
2465.45 5458.44 2470.81 5458.57 2475.68 5458.98 2483.66 5459.22 2486.32 5459.02
2490.92 5457.16 2494.73 5456.02 2496.95 5455.76 2500.94 5455.73 2507.05 5456.17

2513.78 5456.92 2526.63 5458.52 2537.5 5458.65 2541.35 5458.69 2552.06 5459.11
 2560.21 5459.63 2569.8 5459.82 2577.74 5460.21 2588.44 5460.23 2590.46 5460.72
 2594.86 5460.83 2602.07 5460.35 2613.95 5460.04 2641.36 5459.58 2647.26 5459.78
 2651.98 5459.38 2654.77 5459.28 2657.59 5459.53 2662.76 5459.37 2670.14 5459.34
 2677.25 5459.15 2680.46 5459.26 2687.94 5459.31 2690.79 5459.17 2706.28 5459.22
 2711.48 5459.51 2715.88 5459.17 2721.78 5459.32 2727.53 5459.06 2729.9 5459.28
 2735.02 5459.47 2740.23 5459.26 2746.13 5459.57 2749.08 5459.51 2753.5 5459.18
 2754.98 5459.61 2757.94 5459.87 2762.36 5459.61 2771.94 5459.91 2774.61 5459.78
 2779.96 5459.78 2788.18 5459.94 2799.24 5460.24 2819.55 5460.71 2825.07 5460.79
 2833.92 5460.76 2846.83 5460.56 2862.69 5460.43 2878.19 5460.53 2911.56 5460.6
 2920.98 5460.99 2928.68 5460.88 2932.78 5460.96 2936.18 5460.73 2940.9 5460.9
 2949.01 5460.55 2961.85 5460.63 2971.15 5460.96 2977.53 5461.05 2988.59 5461
 2991.78 5461.41 2996.96 5461.25 3000.66 5461.72 3004.34 5461.35 3009.5 5462.37
 3012.46 5462.3 3014.67 5461.48 3016.89 5461.28 3022.84 5462.94 3027.12 5462.93
 3030.33 5464.11 3036.07 5464.72 3039.75 5464.41 3041.23 5464.08 3045.66 5463.87
 3053.77 5461.67 3056 5462.36 3059.22 5462.34 3063.37 5461.49 3066.32 5461.73
 3068.53 5461.49 3078.12 5461.83 3082.08 5461.72 3087.04 5461.84 3093.97 5462.4
 3099.87 5463.35 3102.46 5463.48 3106.9 5464.03 3109.84 5464.09 3112.71 5463.53
 3119.43 5463.92 3124.86 5464.49 3132.71 5464.99 3140.09 5465.08 3150.17 5465.45
 3183.62 5466.97 3186.54 5466.95 3191.74 5467.63 3195.1 5467.83 3199.11 5467.71
 3202.8 5468.14 3210.18 5468.08 3217.53 5468.54 3221.85 5468.46 3224.2 5468.6
 3229.36 5470.91 3231.79 5471.79 3236.83 5473.05 3241.17 5474.39 3243.25 5474.53
 3247.07 5474.13 3249.29 5473.36 3250.74 5473.2 3252.88 5473.61 3261.44 5474.55
 3273.21 5476.68 3276.58 5477.51 3281.77 5479.73 3288.18 5483.2 3291.39 5484.72
 3297.24 5486.15 3303.16 5487.84 3307.45 5488.74 3311.25 5489.2 3319.71 5489.6
 3323.5 5489.88 3326.84 5490.35 3334.12 5491.85 3339.55 5492.83 3344.9 5493.96
 3352.57 5495.78 3360.11 5497.06 3364.86 5497.78 3368.8 5498.16 3372.49 5498.21
 3375.44 5498.45 3376.99 5498.96 3381.27 5499.61 3384.29 5500.46 3393.37 5502.11
 3397.32 5502.22 3402.67 5501.45 3410.01 5501.97 3416.02 5501.57 3419.79 5500.85
 3423.39 5500.35 3431.51 5500.04 3435.2 5499.25 3436.67 5499.21 3442.26 5499.6
 3444.79 5499.45 3446.27 5499.09 3450.69 5497.58 3452.16 5497.52 3455.1 5498.22
 3457.24 5499.1 3460.28 5499.74 3466.18 5500.37 3469.13 5500.41 3471.34 5500.01
 3475.77 5499.73 3478.92 5499.39 3482.41 5498.49 3483.99 5498.49 3485.37 5498.93
 3489.06 5500.71 3493.48 5503.32 3498.64 5505.36 3505.07 5506.55 3511.19 5506.9
 3516.95 5507.49 3519.32 5507.42 3522.99 5506.85 3530.37 5507.56 3533.33 5508.56
 3536.27 5510.32 3540.71 5512.31 3544.39 5513.48 3547.34 5514.17 3550.32 5514.62
 3554.61 5515.03 3557.82 5515.77 3559.95 5516.07 3565.04 5517.41 3569.47 5519.17
 3572.42 5519.81 3574.64 5519.97 3577.59 5520.54 3580.53 5521.71 3583.48 5522.65
 3595.26 5524.74 3602.75 5525.68 3610.05 5525.86 3617.43 5525.57 3626.28 5524.82
 3631.45 5524.55 3638.07 5524.38 3642.89 5524.36 3653.05 5524.61 3659.46 5525.06
 3664.81 5525.1 3673.5 5525.67 3677.93 5525.51 3683 5524.4 3686.78 5523.74
 3694.15 5522.68 3699.92 5522.01 3708.18 5521.25 3716.29 5520.72 3722.93 5520.43
 3723.46 5520.43

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 640.57 .045 2462.5 .032 2537.5 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2462.5 2537.5 944.44 944.44 944.44 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft) 5463.56 Element Left OB Channel Right OB

Vel Head (ft)	0.04	Wt. n-Val.	0.045	0.032	0.045
W.S. Elev (ft)	5463.52	Reach Len. (ft)	944.44	944.44	944.44
Crit W.S. (ft)		Flow Area (sq ft)	2017.44	432.06	1703.13
E.G. Slope (ft/ft)	0.000291	Area (sq ft)	2017.44	432.06	1703.13
Q Total (cfs)	6000.00	Flow (cfs)	2822.72	1092.34	2084.94
Top Width (ft)	1132.97	Top Width (ft)	510.86	75.00	547.11
Vel Total (ft/s)	1.44	Avg. Vel. (ft/s)	1.40	2.53	1.22
Max Chl Dpth (ft)	10.57	Hydr. Depth (ft)	3.95	5.76	3.11
Conv. Total (cfs)	351684.8	Conv. (cfs)	165451.1	64026.7	122207.0
Length Wtd. (ft)	944.44	Wetted Per. (ft)	515.43	75.78	548.72
Min Ch El (ft)	5455.73	Shear (lb/sq ft)	0.07	0.10	0.06
Alpha	1.25	Stream Power (lb/ft s)	0.10	0.26	0.07
Frctn Loss (ft)	0.90	Cum Volume (acre-ft)	31.55	4.68	18.46
C & E Loss (ft)	0.07	Cum SA (acres)	12.60	0.81	5.93

Warning: Divided flow computed for this cross-section.

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 conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than

1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: La Plata

REACH: 1634 RS: 1004

INPUT

Description:

Station Elevation Data num= 489

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
404.17	5485.07	415.8	5485	420.21	5484.86	427.34	5484.75	437.24	5484.53
440.68	5484.54	446.38	5484.36	452.96	5484.35	458.46	5484.27	462.9	5484.07
470.8	5483.92	476.73	5483.97	479.42	5483.86	484.63	5483.92	486.98	5483.8
489.82	5483.91	497.47	5484.03	506.85	5484.02	510.29	5483.9	520.19	5483.75
524.78	5483.72	532.96	5483.5	544.93	5483.4	552.78	5483.28	558.71	5483.12
570.76	5482.94	583.56	5482.96	593.77	5482.83	598.71	5482.99	601.84	5482.84
606.67	5482.74	611.08	5482.84	621.92	5482.83	628.71	5482.74	634.76	5482.58
640.19	5482.55	643.2	5482.65	646.61	5483.18	649.08	5483	653.53	5482.98
656	5482.58	664.89	5482.39	670.92	5482.19	674.07	5482.02	677.73	5482.03
689.09	5481.66	697.87	5481.44	715.64	5481.09	725.14	5481.11	737.06	5480.97
743.9	5480.71	753.44	5480.64	758.23	5480.55	762.18	5480.33	770.45	5480.04
772.34	5480.32	775.02	5480.32	776.99	5480.03	778.97	5479.97	780.45	5480.11
784.31	5479.95	789.34	5480.17	801.94	5479.17	806.35	5479.03	817.98	5478.97
825.25	5478.67	834.28	5478.75	838.73	5478.67	847.12	5478.22	852.55	5478.21
855.02	5477.88	858.97	5477.72	863.91	5478.07	867.46	5477.75	871.24	5477.62
872.5	5477.96	875.27	5478.11	880.06	5478.06	882.58	5477.76	885.1	5477.85
888.88	5477.79	902.93	5478.14	905.88	5478.43	907.87	5478.43	914.29	5477.9
917.22	5477.36	921	5476.37	927.13	5475.65	929.19	5475.1	931.57	5475.96
935.03	5476.43	938.01	5476.36	942.93	5476.43	944.9	5476.33	951.24	5475.1
954.29	5474.39	957.54	5474.06	961.7	5473.79	963.84	5473.26	969.51	5473.02
972.21	5472.84	975.18	5472.86	976.51	5473.05	982.73	5472.62	986.39	5472.49

1000.22 5472.33 1006.64 5472.31 1012.56 5472.19 1026.83 5472 1031.24 5472.02
1035.28 5471.89 1048.25 5471.75 1056.44 5471.88 1059.48 5471.84 1064.63 5471.57
1071.83 5471.52 1076.59 5471.57 1088.56 5471.54 1091.71 5471.48 1099.48 5471.63
1106.2 5471.49 1116.25 5471.35 1120.69 5471.38 1138 5471.31 1147.39 5471.56
1155.11 5471.27 1162.27 5471.25 1167.14 5471.29 1167.63 5471.37 1176.52 5471.18
1180.97 5471.15 1185.91 5471.25 1189.71 5471.12 1203.92 5471.02 1212.26 5471.01
1218.56 5470.89 1227.73 5470.8 1237.07 5470.81 1247.86 5470.77 1260.2 5470.84
1269.2 5470.75 1276.63 5470.79 1285.3 5470.76 1297.68 5470.78 1306.34 5470.72
1309.54 5470.76 1324.29 5470.72 1336.67 5470.78 1345.34 5470.69 1360.42 5470.68
1367.36 5470.74 1372.58 5470.6 1382.78 5470.66 1389.29 5470.53 1394.35 5470.53
1400.43 5470.45 1409.51 5470.45 1423.33 5470.34 1433.67 5470.38 1445.62 5470.25
1451.4 5470.14 1468.52 5470.14 1472.22 5470.3 1479.04 5469.97 1484.55 5469.99
1488 5469.93 1501.51 5470.03 1505.66 5469.88 1514.32 5469.86 1517.42 5469.79
1522.54 5469.8 1539.7 5469.72 1543.92 5469.84 1550.86 5469.8 1557.02 5469.67
1565.08 5469.66 1571.67 5469.87 1573.98 5469.7 1578.7 5469.65 1582.41 5469.53
1591.62 5469.38 1599.13 5469.38 1606.37 5469.67 1607.14 5469.5 1611.51 5469.25
1614.08 5469.24 1620.79 5469.04 1628.72 5468.92 1633.17 5468.94 1639.36 5468.79
1643.37 5468.77 1648.64 5468.54 1651.85 5468.48 1657.93 5468.14 1661.88 5468.06
1670.36 5467.54 1674.21 5467.5 1676.52 5467.23 1697.34 5465.98 1704.97 5465.31
1707.8 5465.14 1714.88 5464.57 1721.69 5464.09 1726.64 5463.82 1730.97 5463.35
1735.12 5463.11 1738.2 5462.64 1741.29 5462.49 1748.3 5461.79 1750.54 5461.62
1755.11 5461.11 1758.82 5460.84 1763.78 5460.58 1770.58 5460.42 1775.54 5460.39
1778.01 5460.24 1787.55 5460.04 1791.01 5460.11 1792.94 5460.02 1802.15 5459.81
1809.13 5459.94 1819.49 5460.07 1824.55 5460.17 1832.48 5460.23 1839.2 5460.12
1844.6 5460.13 1847.96 5460.03 1854.15 5460.13 1857.7 5460.43 1858.47 5460.32
1863.43 5460.17 1864.64 5460 1867.77 5459.9 1872.35 5460.15 1878.29 5460.37
1881.6 5460.31 1885.72 5460.36 1893.17 5460.36 1898.57 5460.21 1909.24 5460.13
1915.53 5460.32 1916.3 5460.41 1921.31 5460.39 1927.86 5460.55 1936.47 5460.33
1938.66 5460.37 1941.74 5460.74 1944.82 5460.65 1947 5460.39 1950.09 5460.23
1956.28 5460.44 1986.61 5460.39 1992.8 5460.2 1994.66 5460.04 2003.94 5460.1
2039.85 5460.18 2054.7 5460.26 2072.81 5460.41 2075.16 5460.19 2078.2 5460.15
2081.94 5460.55 2084.37 5460.93 2087.46 5460.74 2089.36 5460.49 2093.7 5460.38
2107.32 5460.91 2113.67 5460.73 2116.6 5460.46 2119.69 5460.36 2125.4 5460.34
2136.8 5460.39 2149.13 5460.26 2153.12 5460.12 2155.6 5460.15 2165.5 5460.1
2169.83 5459.97 2174.78 5459.97 2179.2 5460.27 2186.55 5460.22 2190.88 5460.26
2194.62 5460.42 2196.93 5460.8 2198.48 5460.79 2200.76 5460.45 2205.12 5460.33
2212.35 5460.55 2222.45 5460.58 2227 5460.71 2229.87 5460.57 2236.25 5460.76
2240.4 5460.72 2247.21 5460.98 2257.27 5460.73 2259.38 5460.79 2264.54 5460.5
2270.95 5460.83 2275.68 5460.88 2281.74 5460.85 2285.6 5461.13 2290.22 5460.89
2300.44 5460.91 2304.1 5461.1 2308.73 5461.2 2311.04 5461.36 2314.12 5460.86
2315.91 5460.76 2322.72 5460.71 2327.06 5461.18 2330.31 5461.41 2335.1 5461.48
2343.42 5461.43 2353.67 5461.47 2359.61 5461.61 2366.55 5461.49 2369.63 5461.18
2377.81 5460.91 2386.59 5461.37 2397 5461.82 2408.95 5462.48 2416.81 5463.04
2424.86 5463.7 2431.05 5464.28 2434.76 5464.7 2440.56 5465.47 2445.9 5465.91
2449.81 5465.66 2456.75 5465.46 2462.5 5465.44 2463.85 5465.44 2475.26 5465.55
2481.8 5465.75 2485.28 5465.93 2490.47 5466.32 2495.42 5466.84 2502.19 5467.79
2505.94 5468.44 2511.49 5469.57 2517.88 5471.16 2521.42 5472.2 2524.6 5473.24
2528.85 5474.78 2533.8 5476.8 2536.27 5477.96 2537.5 5478.64 2538.75 5479.33
2541.23 5480.42 2544.94 5482.22 2554.84 5487.44 2560.06 5490.04 2561.61 5490.66
2563.92 5491.02 2566.23 5490.93 2570.32 5491.04 2578.37 5491.6 2584.74 5491.88
2590.74 5491.93 2595.53 5492.3 2600.93 5491.91 2603.12 5491.98 2609.41 5491.9
2610.95 5491.7 2612.49 5491.22 2615.5 5489.91 2617.36 5489.27 2621.69 5488.07
2626.03 5487.14 2627.91 5486.88 2629.12 5486.91 2630.36 5487.37 2632.22 5488.61
2637.16 5492.19 2640.34 5493.7 2645.22 5495 2655.66 5497.44 2661.06 5498.12

2669.54 5498.89 2670.31 5499.05 2678.79 5499.17 2681.11 5499.36 2686.69 5499.46
 2689.16 5499.79 2693.72 5500.23 2698.45 5501.01 2703.4 5501.17 2707.73 5501.16
 2710.83 5501.06 2713.92 5500.83 2718.26 5500.27 2721.97 5499.6 2724.45 5499.61
 2726.3 5500.06 2729.4 5501.07 2735.08 5502.3 2741.16 5503.05 2745.49 5503.86
 2750.49 5504.28 2754.35 5505.2 2757.25 5505.68 2760.52 5505.93 2763.6 5505.86
 2770.25 5505.31 2773.35 5504.96 2777.06 5505.23 2779.54 5505.63 2782.88 5505.46
 2784.49 5505.21 2787.58 5504.45 2788.82 5504.46 2791.92 5505.19 2793.15 5505.89
 2795.63 5506.93 2800.61 5508.35 2802.15 5508.63 2806.77 5509.12 2809.25 5509.74
 2811.1 5510.39 2813.72 5510.92 2815.26 5511.02 2823.74 5510.36 2829.67 5510.07
 2832.99 5510.4 2833.76 5510.68 2836.07 5510.58 2840.82 5510.65 2842.05 5510.83
 2845.77 5511.06 2851.34 5510.95 2854.43 5510.58 2856.29 5510.07 2858.77 5510.07
 2862.48 5510.63 2869.91 5511.41 2874.62 5511.69 2879.25 5511.73 2881.05 5511.52
 2887.73 5511.48 2890.04 5511.3 2893.13 5511.24 2897.14 5511.51 2900.06 5512.2
 2901.61 5512.42 2904.69 5512.61 2907.67 5512.49 2910.37 5512.14 2916.25 5511.79
 2919.79 5511.43 2921.9 5511.09 2923.96 5510.94 2927.05 5510.5 2929.36 5509.88
 2932.35 5509.34 2934.76 5508.75 2941.09 5506.12 2944.81 5504.73 2947.9 5504.92
 2949.76 5505.48 2955.95 5508.21 2959.43 5509.95 2964.06 5511.5 2966.47 5512.83
 2971.42 5515.21 2973.31 5516 2976.39 5516.93 2979.47 5517.45 2983.33 5517.84
 2984.1 5518.05 2987.96 5517.94 3002.6 5518.35 3006.71 5517.9 3012.28 5517.7
 3014.75 5517.8 3016.61 5518.07 3019.7 5518.2 3022.8 5517.86 3030.23 5517.78
 3032.83 5518.07 3043.23 5519.06 3047.56 5519.23 3055.03 5522.28 3059.94 5524.12
 3064.22 5525.58 3069.84 5527.3 3078.16 5529.44 3082.01 5530.31 3087.41 5531.27
 3093.98 5532.06 3100.52 5532.54 3105.14 5532.76 3114.62 5533

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 404.17 .045 2462.5 .032 2537.5 .045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 2462.5 2537.5 1888.88 1888.88 1888.88 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	5462.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.045		
W.S. Elev (ft)	5461.89	Reach Len. (ft)			
Crit W.S. (ft)	5461.89	Flow Area (sq ft)	892.94		
E.G. Slope (ft/ft)	0.027205	Area (sq ft)	892.94		
Q Total (cfs)	6000.00	Flow (cfs)	6000.00		
Top Width (ft)	651.03	Top Width (ft)	651.03		
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	6.72		
Max Chl Dpth (ft)	2.08	Hydr. Depth (ft)	1.37		
Conv. Total (cfs)	36376.9	Conv. (cfs)	36376.9		
Length Wtd. (ft)		Wetted Per. (ft)	651.61		
Min Ch El (ft)	5465.44	Shear (lb/sq ft)	2.33		
Alpha	1.00	Stream Power (lb/ft s)	15.64		
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: There is no flow in the channel. Check that the channel stations are correctly coded. To force flow into the channel,
 a levee or ineffective flow may have to be added or the Manning's n of the overbank could be increased.

SUMMARY OF MANNING'S N VALUES

River:La Plata

Reach	River Sta.	n1	n2	n3
1634	1006	.045	.032	.045
1634	1004	.045	.032	.045

SUMMARY OF REACH LENGTHS

River: La Plata

Reach	River Sta.	Left	Channel	Right
1634	1006	944.44	944.44	944.44
1634	1004	1888.88	1888.88	1888.88

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: La Plata

Reach	River Sta.	Contr.	Expan.
1634	1006	.1	.3
1634	1004	.1	.3