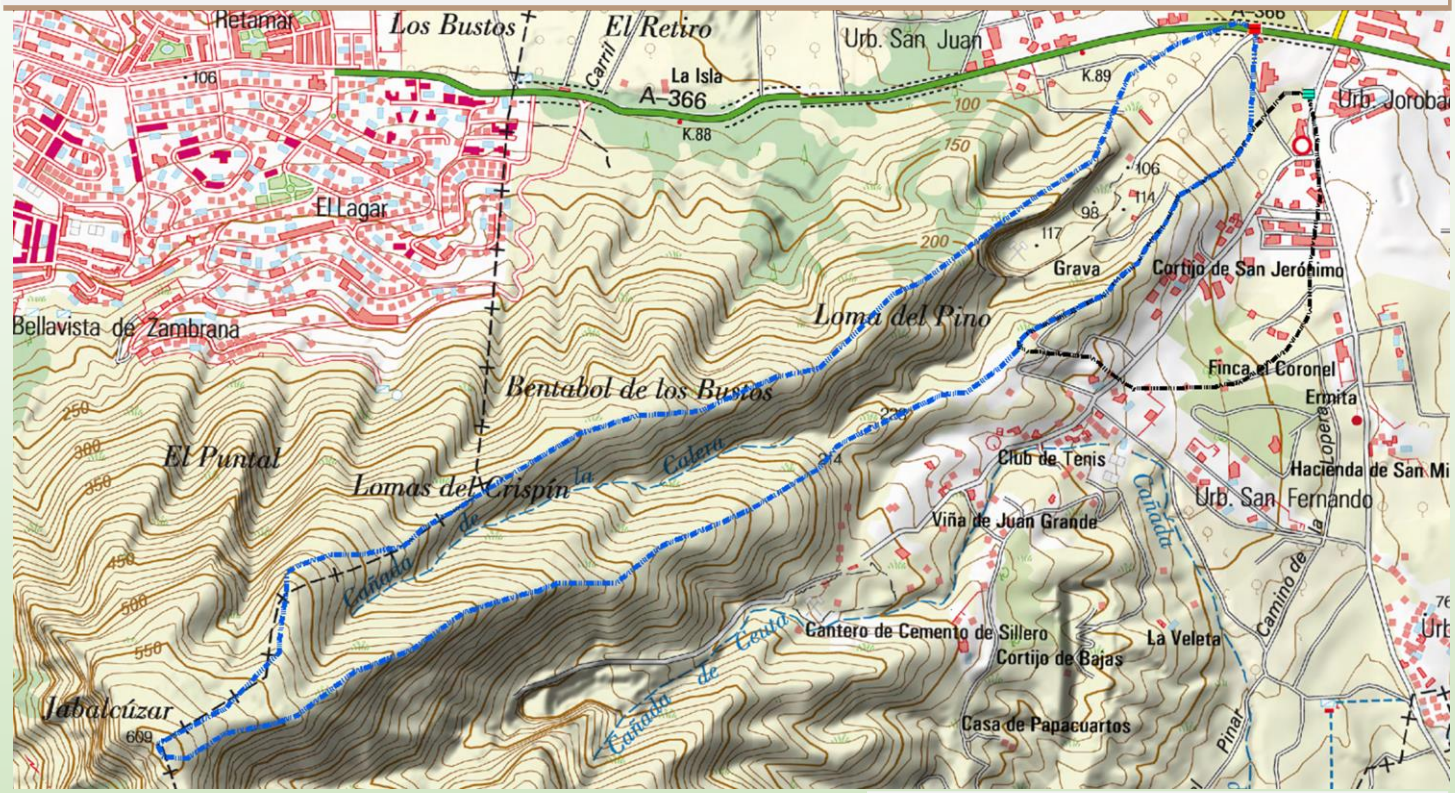
DICIEMBRE DE 2017

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA



SFERA PROYECTO AMBIENTAL S.L.
CALLE IVAN PAULOV 6
29590 PARQUE TECNOLÓGICO MÁLAGA
e-mail:
sfera@sferaproyectoambiental.com

CÓDIGO DOCUMENTO	REV	REALIZ	FECHA	VERIF.	FECHA
	1	JEN	26/12/2017		
18-05					

La composición del equipo redactor, consta de los siguientes profesionales:

- **Rafael González Gil**
  - Licenciado en Biología
  - Master en Evaluación y Corrección de Impactos Ambientales
  - Técnico superior en Prevención de Riesgo Laborales; especialidad en Higiene

- **José Enrique Navarro García**
  - Licenciado en Ciencias Ambientales
  - Especialista en Sistemas de Información Geográfica
  - Técnico Superior en Prevención de Riesgos Laborales, especialidad en Seguridad e Higiene Industrial, Ergonomía y Psicosociología.
  - Master en sistemas de gestión de la calidad y medio ambiente. Nuevas tecnologías.

En Málaga, diciembre de 2017

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1 INTRODUCCIÓN Y OBJETO DEL ESTUDIO

1.1. INTRODUCCIÓN

Se redacta el presente estudio hidrológico-hidráulico como con el objetivo de proponer la delimitación cautelar de dominio público hidráulico y una determinación cautelar de zonas inundables de acuerdo con el análisis de las avenidas laminares de agua en régimen permanente para los periodos de retorno de **5, 10, 100 y 500** años respectivamente, cumplimentando los requisitos exigidos en el documento base “Directrices para la redacción de Estudios de Inundabilidad marcados por la CMA (Consejería de Medio Ambiente). Donde se ha seleccionado el periodo de retorno de 5 años como periodo estadístico de máximas crecidas ordinarias para la propuesta del dominio público hidráulico.

Determinada la MCO, a partir de las regiones con homogeneidad estadística del CEDEX, la zona de estudio se enmarca dentro del área 61 al que le corresponde un tiempo de retorno para máxima crecida ordinaria de 5.5 extraído de la memoria técnica de mapa de caudales máximos de la publicación del CEDEX.

GOBIERNO DE ESPAÑA MINISTERIO DE FOMENTO
MINISTERIO DE MEDIO AMBIENTE Y MEDIO RURAL Y MARINO
CEDEX CENTRO DE ESTUDIOS Y EXPERIMENTACIÓN DE OBRAS PÚBLICAS
SECRETARIA DE ESTADO DE MEDIO RURAL Y MARINO
DIRECCIÓN GENERAL DEL AGUA

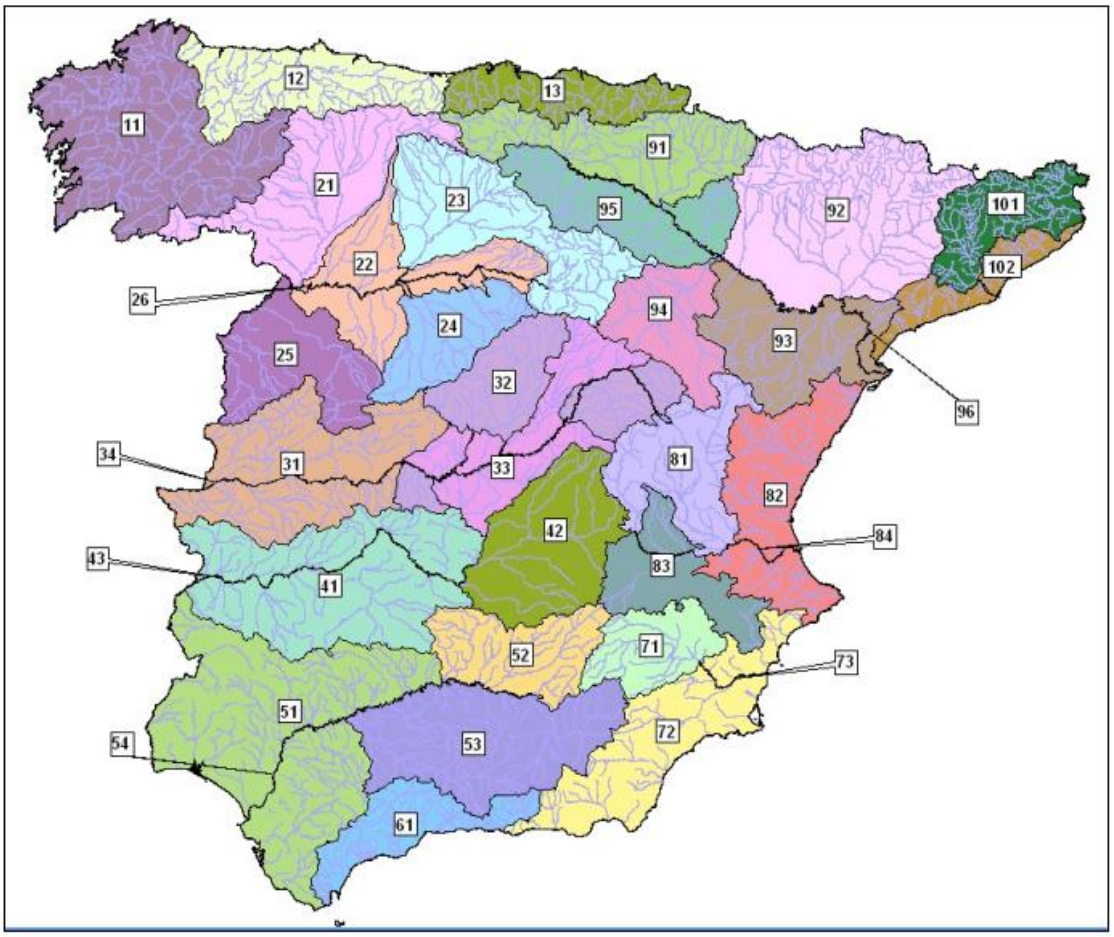
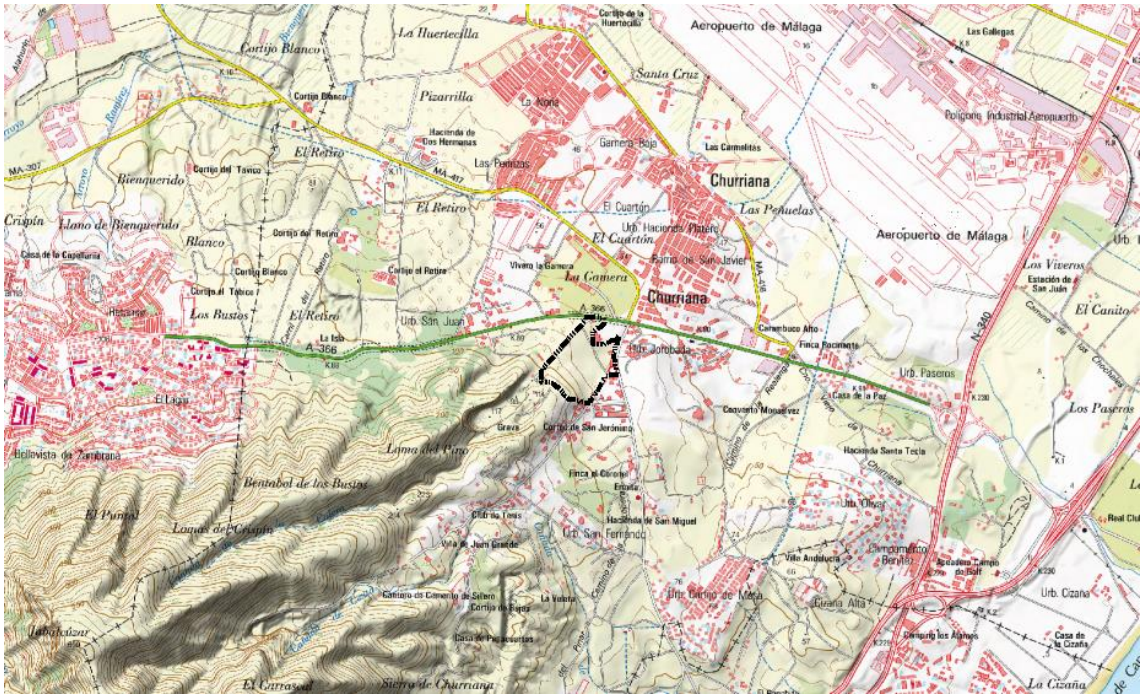


Figura 8. Regiones con homogeneidad estadística identificadas.

El estudio se realiza de forma específica para los suelos de la finca el Higueral ubicados en Churriana dentro del T.M de Málaga sobre el ámbito de estudio se han identificado dos arroyos con cuenca de aporte superior a 0.3 Km^2 que ha sido recogida su ubicación en los planos de localización adjuntos (Plano nº1).

Son dos arroyos altamente antropizados, hasta el punto de verse afectados por construcciones, explotaciones mineras y otros factores que hace de su cauce complejo y único.

Se recoge esquema a continuación del ámbito de estudio para el alcance del presente estudio, que abarca los arroyos interceptados por la parcela SUS-CH.3, Finca El Higueral.



Sobre dicha parcela se han identificado dos cauces, antropizados, distinguibles sobre el terreno y recogidos sobre topográficos actualizados proporcionados por la propiedad.

Imagen: Plano topográfico levantado de la zona de estudio con curvas equidistantes de 1m.

Sobre ambos arroyos se han determinado sus cuencas de aporte sobre modelo digital de elevaciones MDT 5x5. Y se han recogido en planimetría en el anexo planos.

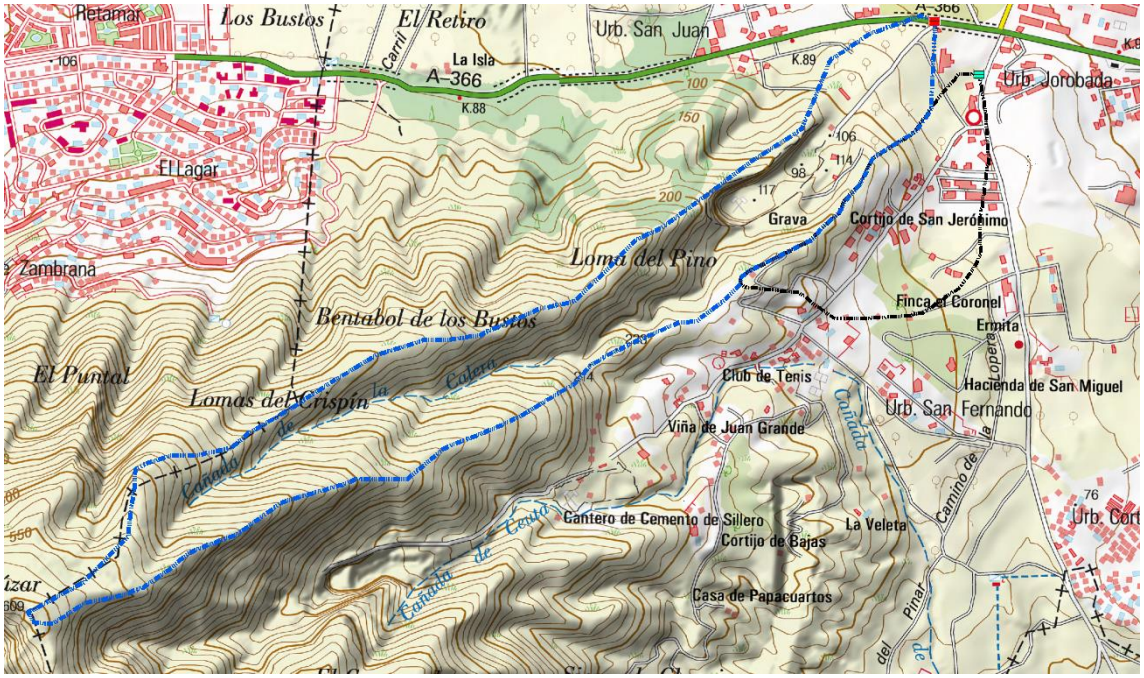


Imagen: cuencas de aporte sobre la red superficial del sector SUS-CH3. Mapa topográfico nacional.

El arroyo de la Calera está parcialmente recogido sobre mapa topográfico nacional y el Arroyo Innominado 1 con cuenca mayor a 0.3 Km^2 no se refleja sobre el mismo.

1.2. OBJETO DEL PRESENTE ESTUDIO

El objeto del presente estudio es desarrollar estudio sectorial de aguas en los siguientes apartados

- Propuesta de delimitación de Dominio público Hidráulico
- Riesgos por avenidas e inundaciones

Componiendo un estudio hidrológico hidráulico en los cauces afectados por la propuesta de innovación de la máxima crecida ordinaria y de las zonas inundables para un periodo de retorno de TR = 500 años. De acuerdo al requerimiento emitido por la Consejería de Medio Ambiente y Ordenación del Territorio de la Delegación Territorial de Málaga con referencia MA-63193 que se aporta como anexo 1 dentro del presente estudio.

Para la máxima crecida ordinaria, han sido estimados dos tiempos de retorno para la propuesta cautelar de DPH. TR = 5 años como recomendaciones del CEDEX, descrito en el punto anterior. TR = 10 años como alternativa en base a los posibles estudios comparativos que pudiera realizar la Junta de Andalucía y en aplicación a la normativa anterior a la actual modificación del reglamento de aguas con entrada en vigor en diciembre de 2016 donde según este en el artículo 4.2:

DE LOS CAUCES, RIBERAS Y MARGENES

Artículo 4

1. Álveo o cauce natural de una corriente continua o discontinua es el terreno cubierto por las aguas en las máximas crecidas ordinarias (artículo 4 del texto refundido de la Ley de Aguas). La determinación de ese terreno se realizará atendiendo a sus características geomorfológicas, ecológicas y teniendo en cuenta las informaciones hidrológicas, hidráulicas, fotográficas y cartográficas que existan, así como las referencias históricas disponibles.

2. En los tramos de cauce donde exista información hidrológica suficiente, se considerará caudal de la máxima crecida ordinaria la media de los máximos caudales instantáneos anuales en su régimen natural, calculada a partir de las series de datos existentes y seleccionando un período que incluirá el máximo número de años posible y será superior a diez años consecutivos. Dicho periodo será representativo del comportamiento hidráulico de la corriente y en su definición se tendrá en cuenta las características geomorfológicas, ecológicas y referencias históricas disponibles.

En los tramos de cauce en los que no haya información hidrológica suficiente para aplicar el párrafo anterior, el caudal de la máxima crecida ordinaria se establecerá a partir de métodos hidrológicos e hidráulicos alternativos, y, en especial, a partir de la simulación hidrológica e hidráulica de la determinación del álveo o cauce natural y teniendo en cuenta el comportamiento hidráulico de la corriente, las características geomorfológicas, ecológicas y referencias históricas disponibles.

Número 2 del artículo 4 redactado por el apartado uno del artículo primero del R.D. 638/2016, de 9 de diciembre, por el que se modifica el Reglamento del Dominio Público Hidráulico aprobado por el R.D. 849/1986, de 11 de abril, el Reglamento de Planificación Hidrológica, aprobado por el R.D. 907/2007, de 6 de julio, y otros reglamentos en materia de gestión de riesgos de inundación, caudales ecológicos, reservas hidrológicas y vertidos de aguas residuales («B.O.E.» 29 diciembre). Vigencia: 30 diciembre 2016

1.3. METODOLOGÍA PARA LA CONSECUCIÓN DE LOS ESTUDIOS:

La definición de cauce natural establecida en el vigente Reglamento, basada en el concepto de máxima crecida ordinaria, se ha mostrado claramente insuficiente en numerosas situaciones, por lo que resulta imprescindible que los cauces naturales se definan no sólo a partir de criterios hidrológicos, sino atendiendo también a otras características, como las geomorfológicas, las ecológicas y teniendo en cuenta las referencias históricas disponibles, lo cual ha sido considerado en el presente estudio a tenor de la situación reglamentaria recogida en la legislación vigente de aplicación:

Real Decreto 638/2016, de 9 de diciembre, por el que se modifica el Reglamento del Dominio Público Hidráulico, aprobado por el Real Decreto 849/1986, de 11 de abril, el Reglamento de Planificación Hidrológica, aprobado por el Real Decreto 907/2007, de 6 de julio, y otros reglamentos en materia de gestión de riesgos de inundación, caudales ecológicos, reservas hidrológicas y vertidos de aguas residuales, ha supuesto un importante avance en la relación entre los usos del suelo y la gestión del riesgo de inundación, todo ello en consonancia con los objetivos que marca la Comisión Europea en materia de gestión del riesgo de inundación derivados de la implantación de la Directiva 2007/60/CE, de 23 de octubre de 2007, relativa a la evaluación y gestión de los riesgos de inundación.

Las directrices que guían el presente estudio son:

- Delimitar el espacio ocupado por el dominio público hidráulico.
- Asegurar (en su caso) que las determinaciones cumplen con los requisitos establecidos en el Decreto 189/2002, por el que se aprueba el “Plan de Prevención de Avenidas e Inundaciones en Cauces Urbanos Andaluces”.

El trabajo se estructura en las siguientes fases:

A.- Recopilación de datos previos necesarios para la elaboración del estudio

B.- Estudio hidrológico

C.- Estudio hidráulico

Cada fase se compone de los siguientes trabajos:

1. Análisis de antecedentes y recopilación de datos.

- Reconocimiento técnico in situ de la zona para un mejor análisis e interpretación de los resultados.
- Análisis topográfico general de la cuenca de aportación.
- Cartografía detallada de la cuenca de aportación en formato digital, con la que poder realizar el modelo del terreno y el plano de pendientes.
- Estudio de la geología y edafología general de la cuenca.
- Planos de usos del suelo y vegetación natural.
- Reportaje fotográfico.

2. Estudio hidrológico

- Determinación de la precipitación de cálculo correspondiente para diferentes períodos de retorno, en función de las prescripciones técnicas de La Consejería de Medio Ambiente (CMA), utilizadas para el cálculo del caudal de la cuenca. En cuyo caso se ha optado de las diferentes técnicas propuestas la obtención de las lluvias máximas mediante el uso del programa MAXPLUWIN de la publicación del Ministerio de Fomento "Máximas lluvias diarias en la España Peninsular" y su confrontación de las estaciones de aforo, además de las correlaciones estadísticas dadas en la misma publicación y aplicación informática.
- Determinación del umbral de escorrentía y del coeficiente de escorrentía.
- Calculo de los distintos caudales de avenida para los periodos de retorno de 5, 10, 100 y 500 años, siguiendo las prescripciones técnicas dadas y en concreto dentro de las diferentes opciones, se ha utilizado el método racional modificado por Témez, según la instrucción de carreteras en su

revisión Orden FOM/298/2016 del 15 de febrero. Norma 5.2-IC de Drenaje Superficial. Instrucción de Carreteras.

3. Estudio hidráulico

- Obtención de las secciones del modelo digital del terreno e inserción de datos obtenidos en campo.

- Cálculo hidráulico en régimen permanente no uniforme, para la obtención de la altura de la lámina de agua para los distintos periodos de retorno (5, 10, 100 y 500 años). Mediante la aplicación informática HECRAS.

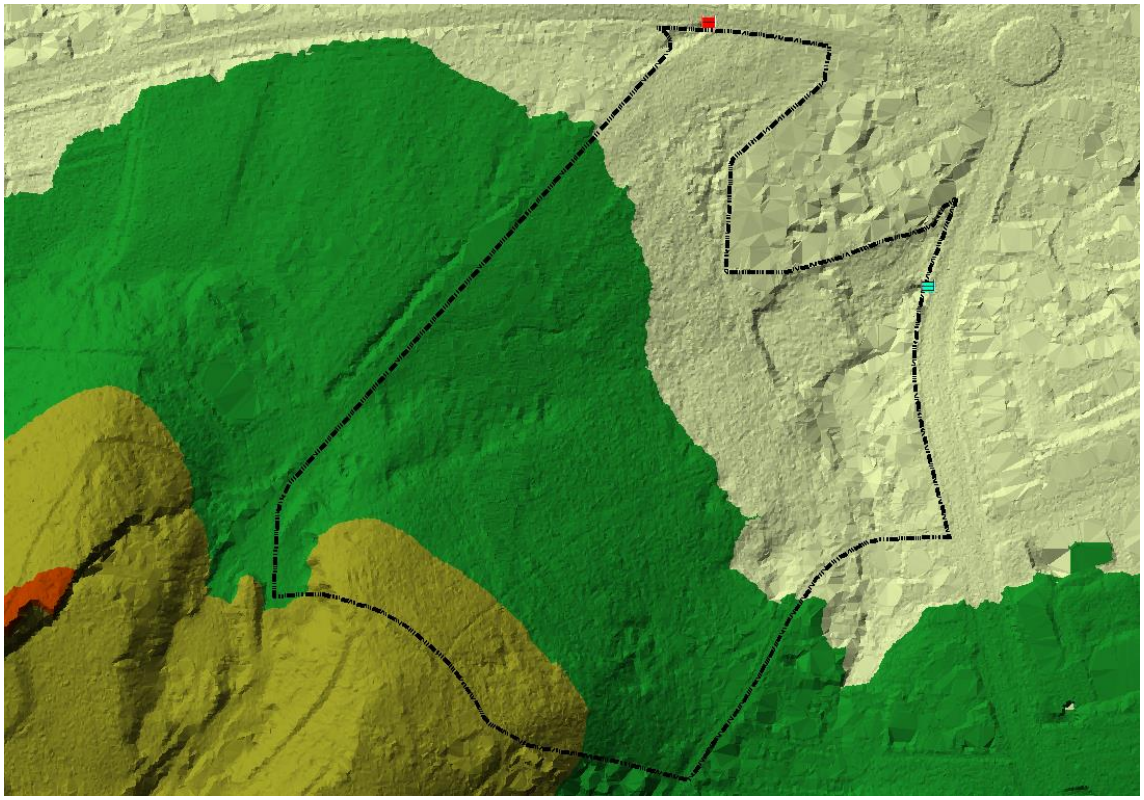
- Delimitación cartográfica del dominio público hidráulico, zona de servidumbre y zona de riesgo de inundación para el periodo de retorno de 5, 10, 100 y 500 años.

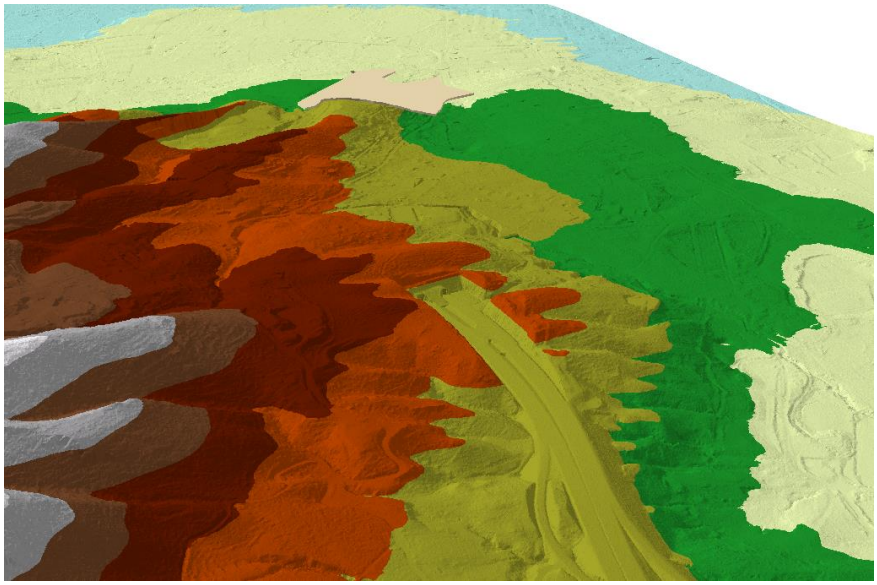
A lo largo de la memoria, se realiza un desarrollo de cada uno de los apartados anteriores.

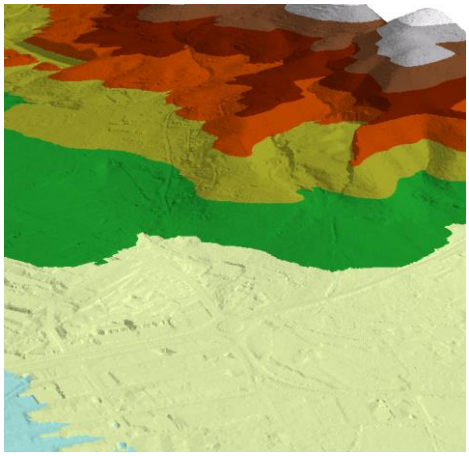
2 ANTECEDENTES

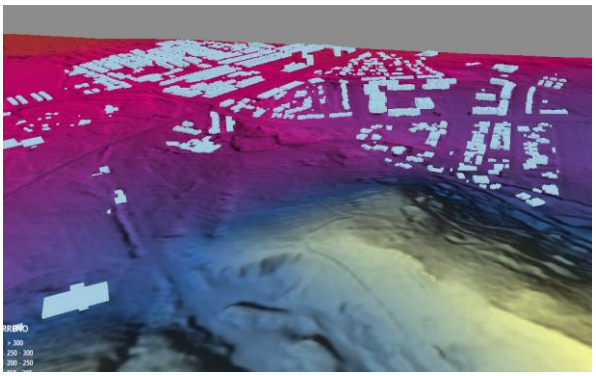
La zona de estudio está inserta en una mezcla de tramas urbanas, edificaciones aisladas, cultivos en estado de abandono (olivar). Son terrenos urbanos sectorizados.

Entorno al mismo se ha levantado modelo digital del terreno TIN, a partir de las hojas de puntos LIDARs para caracterizar el entorno en un modelo informático en el cual se han insertado las edificaciones:










TERRENO
> 300
250 - 300
200 - 250
150 - 200
100 - 150
50 - 100
< 50

Identificado cauce principal y arroyos afluentes se han inventariado los puntos críticos de la zona de estudio y que vienen a ser obras de drenaje transversal y vados a nivel y puntos de control de investigación de campo para la ejecución de trabajos de campo y medición que se describen en el siguiente apartado.

3 LOCALIZACIÓN Y SITUACIÓN DE LAS OBRAS DE DRENAJE

Para el caso del ámbito de estudio se han inventariado diversas obras de drenaje (ODTs en adelante) que han sido medidas en lo posible dada la peculiaridad para cada una de ellas e integrado en el modelo desarrollado en GeoHecras para poder evaluar su comportamiento con respecto a cada uno de los puntos estudiados.

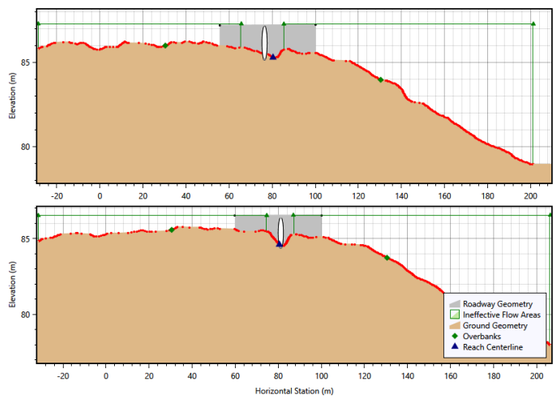
Las mediciones y datos recogidos en campo han sido sintetizados en las siguientes fichas donde se recogen los datos de incorporación en la modelización del modelo hidráulico.

ESTUDIO HIDROLÓGICO
HIDRÁULICO DE LA FINCA EL HIGUERAL, SUS-CH3. CHURRIANA.
T.M. MÁLAGA

FECHA:15/12/2017

NUMERO DE CONTROL	CAÑADA DE LA CALERA - SECCIÓN 995. ODT1		
CAUCE DE ESTUDIO:	CAÑADA DE LA CALERA		
LOCALIZACIÓN:	SECCIÓN 995		
COORDENADAS:	HUSO	ETRS 89 HUSO 30	
	X, m	Y, m	
	365032.48	4058286.77	
DESCRIPCION DEL CAUCE			
TIPO DE SECCIÓN	TUBO CIRCULAR DIAMETRO 2m	LECHO	NATURAL
ESTADO DE CONSERVACIÓN	BUENO	MARGEN DERECHA	TIERRAS Y RELLENOS
Nº DE MANNING	0.045	MARGEN IZQUIERDA	TIERRAS Y RELLENOS

CROQUIS DE LA SECCIÓN



FOTOS DE LA OBRA DE DRENAJE

AGUAS ARRIBA

AGUAS ABAJO

OBSERVACIONES	SE RECOMIENDA DEMOLICIÓN Y RETIRADA DE LA ODT

ESTUDIO HIDROLÓGICO
HIDRÁULICO DE LA FINCA EL HIGUERAL, SUS-CH3. CHURRIANA.
T.M. MÁLAGA

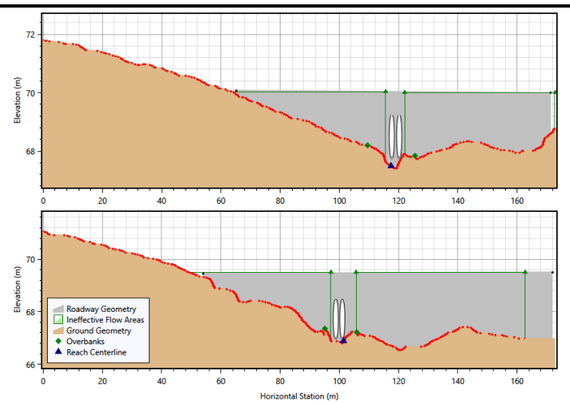
FECHA:15/12/2017

NUMERO DE CONTROL	CAÑADA DE LA CALERA - SECCIÓN 980. ODT2		
CAUCE DE ESTUDIO:	CAÑADA DE LA CALERA		
LOCALIZACIÓN:	SECCIÓN 980		
COORDENADAS:	HUSO	ETRS 89 HUSO 30	
	X, m	Y, m	
	365197.64	4058443.01	

DESCRIPCION DEL CAUCE

TIPO DE SECCIÓN	BICELULAR 1.5 M DE HORMIGON	LECHO	HORMIGÓN
ESTADO DE CONSERVACIÓN	BUENO	MARGEN DERECHA	
Nº DE MANNING	0.045	MARGEN IZQUIERDA	HORMIGÓN

CROQUIS DE LA SECCIÓN



FOTOS DE LA OBRA DE DRENAJE

AGUAS ARRIBA

AGUAS ABAJO

OBSERVACIONES	PASO INFERIOR DE LA CARRETERA DE COÍN. SE RECOMIENA LIMPIEZA DE CAUCE Y MÁRGENES AL ENCONTRARSE DETERIORADAS Y CON RESIDUOS DE DIVERSA INDOLE INCLUYENDO RCDs

ESTUDIO HIDROLÓGICO
HIDRÁULICO DE LA FINCA EL HIGUERAL, SUS-CH3. CHURRIANA.
T.M. MÁLAGA

FECHA:15/12/2017

NUMERO DE CONTROL	INNOMINADO – ODT3		
CAUCE DE ESTUDIO:	INNOMINADO 1		
LOCALIZACIÓN:			
COORDENADAS:	HUSO	ETRS 89 HUSO 30	
	X, m	Y, m	
	365296.16	4058127.94	

DESCRIPCION DEL CAUCE			
TIPO DE SECCIÓN	CUADRANGULAR DE HORMIGÓN, FABRICADO INSITU	LECHO	TIERRAS
ESTADO DE CONSERVACIÓN	MUY MALO	MARGEN DERECHA	TIERRAS
Nº DE MANNING	0.1	MARGEN IZQUIERDA	TIERRAS

CROQUIS DE LA SECCIÓN

NO SE PUEDE LEVANTAR SECCIÓN POR IMPOSIBILIDAD DE APOYO DE PERFIL AGUAS ARRIBA

FOTOS DE LA OBRA DE DRENAJE

AGUAS ARRIBA

INACCESIBLE

AGUAS ABAJO

OBSERVACIONES	PASO INFERIOR DE LA CARRETERA CAMINO DE LA SIERRA. PROCEDE DE LA ZONA DE URBANIZACIONES. SE ENCUENTRA DESTRUIDA POR ARRASTRES QUE SE DETECTAN NO SOLO VIENEN DE LA MISMA OBRA DE DRENAJE SI NO DE LA CARRETERA. SE RECOMIENDA SU ESTUDIO Y MEJORA PARA LA EVACUCACIÓN DE PLUVIALES DE FORMA ADECUADA.

ESTUDIO HIDROLÓGICO HIDRÁULICO
DE LA FINCA EL HIGUERAL, SUS-CH3. CHURRIANA. T.M. MÁLAGA

FECHA:15/12/2017

NUMERO DE CONTROL	INNOMINADO – ODT4		
CAUCE DE ESTUDIO:	INNOMINADO 1		
LOCALIZACIÓN:			
COORDENADAS:	HUSO	ETRS 89 HUSO 30	
	X, m	Y, m	
	365296.16	4058127.94	

DESCRIPCION DEL CAUCE			
TIPO DE SECCIÓN	DESCONOCIDO	LECHO	-
ESTADO DE CONSERVACIÓN	DESCONOCIDO	MARGEN DERECHA	-
Nº DE MANNING	0.045	MARGEN IZQUIERDA	-

CROQUIS DE LA SECCIÓN

NO SE PUEDE LEVANTAR SECCIÓN POR IMPOSIBILIDAD DE APOYO DE PERFIL AGUAS ABAJO. SE DESCONOCE DONDE DESAGÜA.

FOTOS DE LA OBRA DE DRENAJE

AGUAS ARRIBA

INACCESIBLE:

INACCESIBLE

BSERVACIONES	PASO INFERIOR DE LA CARRETERA CAMINO DEL PILAR. LA SITUACIÓN DEL MISMO, UNIDO CON LA VEGETACIÓN HACEN IMPOSIBLE SU ACCESO Y MEDICIÓN.

No se han podido medir, ni apoyar perfil suficiente para la modelización de la ODT 3 y ODT 4 del Arroyo Innominado 1, por inaccesibilidad y medición. Unido a esto la entrada y salida de dichas OBRAS DE DRENAJE TRANSVERSAL son difusas dentro del tramado urbano en el que los accesos están cerrados y no depende del promotor actual su posible estudio.

No obstante las obras de drenaje se han recogido y contemplado para el presente estudio y su inclusión y comparación de los efectos medidos en modelo de cálculo bidimensional.

3.1. TABLA DE LOCALIZACIÓN, LONGITUD E IDENTIFICACIÓN DE LOS DIFERENTES TRAMOS DE ESTUDIO CON AFECCIÓN A LA ZONIFICACIÓN DE ESTUDIO, Sistema de coordenadas ETRS89_UTM_Zone_30N.

	Longitud del tramo estudiado (m)		X	Y
ARROYO CAÑADA DE LA CALERA	340	**INICIO**	364,963.099	4,058,214.378
		FIN	365,196.462	4,058,440.994
INNOMINADO_1	180	**INICIO**	365,300.443	4,058,127.859
		FIN	365,332.193	4,058,279.465

3.2. TABLA DE LOCALIZACIÓN, SUPERFICIE Y ASIGNACIÓN DE NUMERACIÓN A LAS CUENCAS DE ESTUDIO. Sistema de coordenadas ETRS89 UTM_Zone_30N.

NUMERO DE CUENCA		Área (km^2)		X	Y
1	CAÑADA DE LA CALERA	0.83	CENTROIDE DE LA CUENCA	363972	4057502
2	INNOMIADO 1	0.31	CENTROIDE DE LA CUENCA	365092	4057834

4 DOCUMENTACION UTILIZADA

Para la realización del presente estudio hidrológico-hidráulico se ha utilizado la siguiente documentación:

4.1. CARTOGRAFÍA

Para el estudio de la cuenca y cálculo de caudales:

- Modelo digital del terreno con paso de malla de 5 m proporcionado por el Instituto Geográfico Nacional. Utilizado para el cálculo hidrológico.

- Puntos LIDARs[1] de 2014_del Instituto de Estadística y Cartografía Nacional. Utilizados para el levantamiento del terreno y del modelo topográfico.

- Mapa de Usos y Coberturas Vegetales del Suelo a partir del Corine Land Cover desde el cual han sido utilizados para la obtención de los coeficientes de rugosidad por correlación de tablas con la *GUÍA METODOLÓGICA PARA EL DESARROLLO DEL SISTEMA NACIONAL DE CARTOGRAFÍA DE ZONAS INUNDABLES DEL MINISTERIO DE MEDIO AMBIENTE.*

- Mapa de usos del suelo SIOSE. Sistema de Información sobre Ocupación del Suelo de España, integrado dentro del Plan Nacional de Observación del Territorio (PNOT) cuyo objetivo es generar una base de datos de Ocupación del Suelo para toda España a escala de referencia 1:25.000.

- Mapa Geológico en formato digital a escala 1:50.000

Con el objetivo de optimizar la modelización 3D de los arroyos y evitar los escalonamientos provocados por datos anómalos de la cartografía digital, se realiza una corrección digital mediante polilíneas 3D por el eje del cauce y curva

[1] DADO QUE ESTE HA SIDO LA BASE SOBRE LA CUAL SE HAN LEVANTADO LOS MODELOS, SE HA VERIFICADO SOBRE CAMPO LA POSIBLE MODIFICACIÓN DESDE 20104. NO DETECTANDOSE CAMBIOS EN EL TERRENO DESDE LA FECHA DEL LEVANTAMIENTO.

de nivel. Los puntos anómalos que pueden provocar una mala triangulación en el modelo digital del terreno (MDT), han sido eliminados o depurados.

Tras el proceso de análisis y tratamiento de la cartografía digital y su correlación real comprobada mediante la visita de campo, se realiza el estudio mediante el programa informático ARCGIS/GEORAS.

4.2. DATOS DE PRECIPITACIÓN

El estudio de las precipitaciones máximas diarias se ha llevado a cabo a partir de los registros existentes en las estaciones meteorológicas ubicadas en el término municipal.

Los registros de precipitaciones máximas han sido obtenidos de los datos de precipitaciones de la publicación del CEDEX, organismo público perteneciente al Ministerio de Fomento, denominada “Máximas lluvias diarias en la España peninsular”, mediante su aplicación informática Maxpluwin.

NÚMERO DE CUENCA	CUENCA	CENTROX	CENTRO Y	PRECIPITACIÓN 5 AÑOS	PRECIPITACIÓN 10 AÑOS	PRECIPITACIÓN 100 AÑOS	PRECIPITACIÓN 500 AÑOS
1	CAÑADA DE LA CALERA	363972	4057502	106.08	130.26	219.67	293.26
2	INNOMINADO 1	365092	4057834	106.08	130.26	219.67	293.26

5 ESTUDIO HIDROLÓGICO

5.1. OBJETIVO DE LA SIMULACIÓN HIDROLÓGICA

El principal objetivo de la presente simulación hidrológica, es obtener los diferentes caudales de avenidas, según diferentes períodos de retorno, para los cauces identificados y su ámbito concreto.

Los periodos de retorno considerados en el presente estudio para el cálculo de caudales son:

PERIODOS DE RETORNO DEL ESTUDIO
5 años
10 años
100 años
500 años

De las diferentes técnicas hidrometeorológicas que existen para la determinación de caudales, se ha elegido el Método Racional, modificado según Témez y normalizado en España por la Dirección General de Carreteras para el diseño de los elementos de drenaje superficial Orden FOM/298/2016, de 15 de febrero, por la que se aprueba la norma 5.2 -IC drenaje superficial de la Instrucción de Carreteras). Por este motivo, la modelación hidrológica se realizará siguiendo las directrices de dicha Instrucción.

5.2. DELIMITACIÓN Y CARACTERÍSTICAS DE LAS CUENCAS ESTUDIADAS

La delimitación de las cuencas y los cauces a estudiar, serán todos aquellos que cumplan alguno de los requisitos establecidos según la siguiente directriz común de la Consejería de Medio Ambiente:

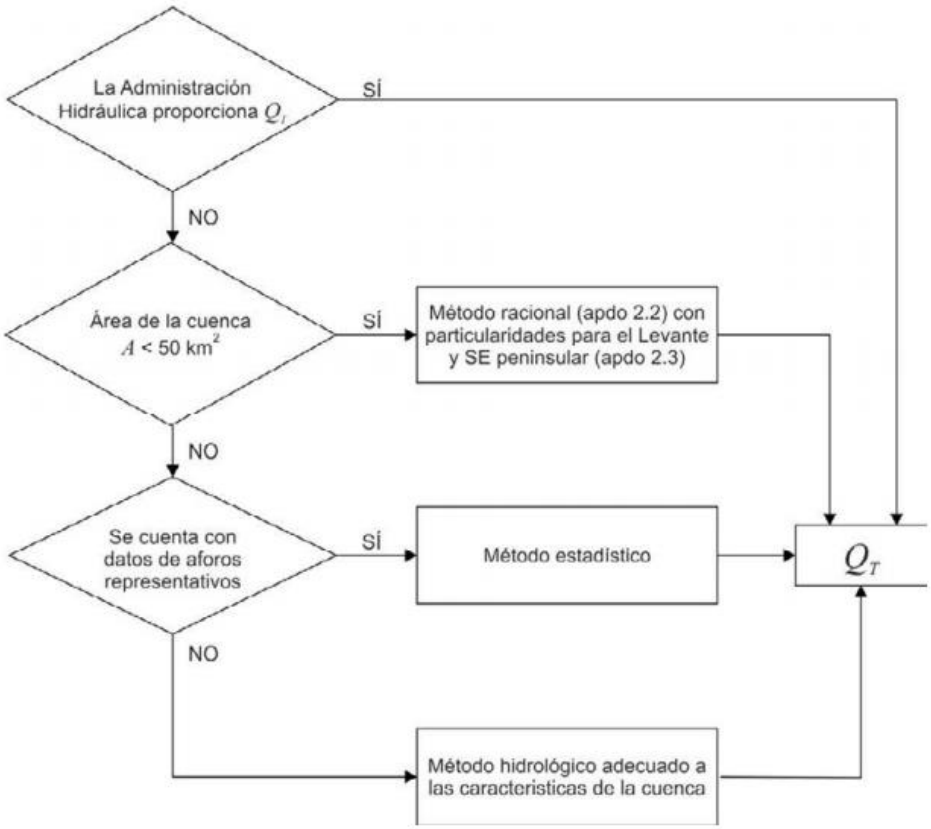
- *Ríos y arroyos que aparezcan en línea azul continua o discontinua, en el mapa topográfico nacional a escala 1:25.000 (se adjunta plano de localización en M.T.N.)*
- *Todas las cuencas cuya superficie en su punto de cierre sea superior o igual a 0.3 Km^2, y no estén incluidas en el apartado anterior.*
- *Aquellas zonas recogidas dentro de: PLAN DE GESTIÓN DEL RIESGO DE INUNDACIÓN, DEMARCACIÓN HIDROGRÁFICA DE LAS CUENCAS MEDITERRÁNEAS ANDALUZAS, y las contempladas dentro del sistema ARPSI.*
- *Aquellos tramos que por sus características hidrológicas, geomorfológicas y bióticas puedan considerarse un verdadero cauce, incluyendo razones históricas o de concurrencia.*

Siguiendo la cartografía trabajada sobre modelo digital TIN a partir de los puntos LIDARs Instituto Nacional de Cartografía, así como cartografía complementaria y herramientas sobre sistemas de información geográfica (ArcHidroTools de ArcGis), se han delimitado las cuencas, partiendo de los puntos de caudal considerados (ver plano de "Cuencas y puntos de caudal"). La superficie de cada cuenca, así como otras características morfológicas necesarias para los cálculos posteriores, se muestran en la siguiente tabla:

CUENCA	N.º DE CUENCA	AREA (Km^2)	LONGITUD DEL CAUCE (Km)	COTA A. ARRIBA (m)	COTA A. ABAJO (m)	PEND. MEDIA (%)
1 CAÑADA DE LA CALERA	**1**	0.83	3.34	609	68	16
2 INNOMINADO 1	**2**	0.31	1.11	205	62	14

5.3. APLICACIÓN DE LA INSTRUCCIÓN 5.2-IC PARA EL CÁLCULO DE CAUDALES DE DISEÑO

El cálculo de caudales se replantea atendiendo a las indicaciones de la norma que sigue el siguiente esquema básico:



La aplicación para el presente estudio aplica el Método Racional:

$$Q_T = \frac{I(T,t_c) \cdot C \cdot A \cdot K_t}{3{,}6}$$

Donde:

Q_T (m3/s) - Caudal máximo anual correspondiente al período de retorno T, en el punto de desagüe de la cuenca.

I (T, t_c) (mm/h) - Intensidad de precipitación correspondiente al período de retorno considerado T, para una duración del aguacero igual al tiempo de concentración t_c, de la cuenca.

C - (adimensional) Coeficiente medio de escorrentía de la cuenca o superficie considerada.

A (km2) - Área de la cuenca o superficie considerada.

K_t (adimensional) - Coeficiente de uniformidad en la distribución temporal de la precipitación.

Esto es válido para cuencas homogéneas, como es nuestro caso, debido su escaso tamaño.

Al no poseer datos de caudales obtenidos con métodos empíricos utilizaremos únicamente el método descrito en la Instrucción.

A continuación, se desglosa cada uno de los determinantes de la ecuación formulada para dicho método.

5.3.1. INTENSIDAD DE LA PRECIPITACIÓN:

La intensidad de precipitación I (T, t) correspondiente a un período de retorno T, y a una duración del aguacero t, a emplear en la estimación de caudales por el método racional, se obtendrá por medio de la siguiente fórmula:

$$I(T,t) = I_d \cdot F_{\text{int}}$$

Donde:

I (T, t) (mm/h) Intensidad de precipitación correspondiente a un período de retorno T y a una duración del aguacero t. En el presente estudio hemos considerado la duración del aguacero igual que el tiempo de concentración de la cuenca.

I_d (mm/h) – Intensidad media diaria de precipitación corregida correspondiente al período de retorno T.

F_{int} (adimensional) - Factor de intensidad.

Por otro lado, la valoración de la Intensidad Media Diaria es la que se obtiene relacionando Precipitación Máxima Diaria con una duración de 24h a través del factor reductor de precipitación.

5.3.1.2. FACTOR REDUCTOR DE LA PRECIPITACIÓN POR ÁREA DE LA CUENCA

El factor reductor de la precipitación por área de la cuenca K_A, tiene en cuenta la no simultaneidad de la lluvia en toda su superficie. Se obtiene a partir de la siguiente formula:

Si $A < 1$ km^2	$K_A = 1$
Si $A \geq 1$ km^2	$K_A = 1 - \frac{\log_{10} A}{15}$

donde:

K_A (adimensional) - Factor reductor de la precipitación por área de la cuenca.

A (km2) - Área de la cuenca.

5.3.1.3. FACTOR DE INTENSIDAD

El factor de intensidad introduce la torrencialidad de la lluvia en el área de estudio y depende de:

- La duración del aguacero t

- El período de retorno T, si se dispone de curvas intensidad - duración - frecuencia (IDF) aceptadas por la Dirección General de Carreteras, en un pluviógrafo situado en el entorno de la zona de estudio que pueda considerarse representativo de su comportamiento.

Se tomará el mayor valor de los obtenidos de entre los que se indican a continuación:

$$F_{int} = máx\ (F_a, F_b)$$

donde:

F_{int} (adimensional) - Factor de intensidad

Fa (adimensional) - Factor obtenido a partir del índice de torrencialidad (I1/Id)

F_b (adimensional) - Factor obtenido a partir de las curvas IDF de un pluviógrafo próximo.

A. Obtención de F_a:

$$F_a = \left(\frac{I_1}{I_d} \right)^{3,5287 - 2,5287\, t^{0,1}}$$

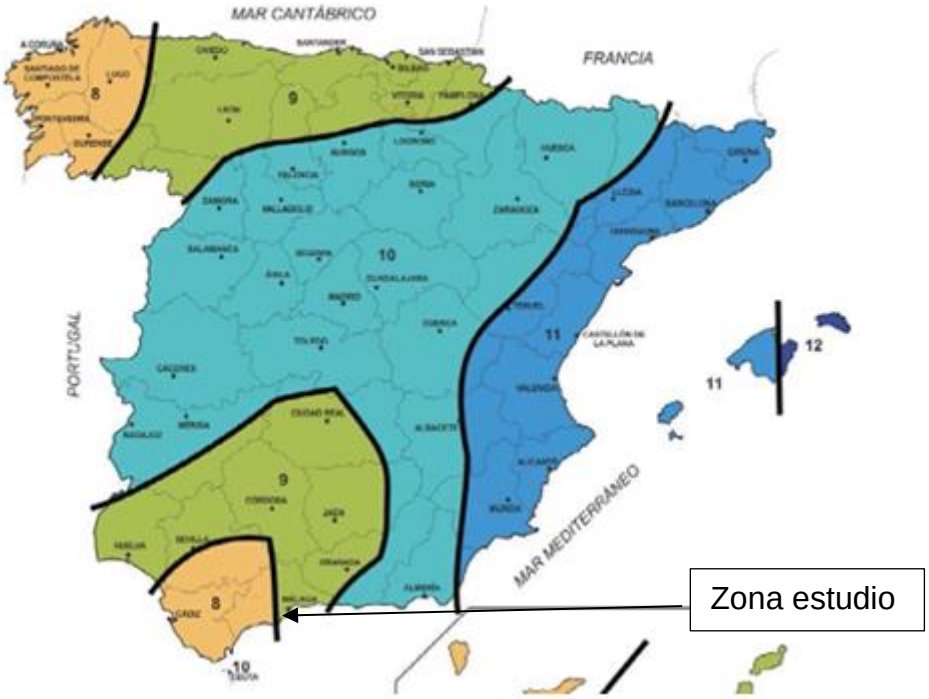
Donde:

Fa (adimensional) - Factor obtenido a partir del índice de torrencialidad (I1/Id).

I1/Id (adimensional) - Índice de torrencialidad que expresa la relación entre la intensidad de precipitación horaria y la media diaria corregida. Su valor se determina en función de la zona geográfica, a partir del mapa siguiente. En la zona de estudio tiene un valor de 8.

T (horas) - Duración del aguacero.

Para la obtención del F_a, se debe particularizar la expresión para un tiempo de duración del aguacero igual al tiempo de concentración ($t = t_c$).



B. Obtención de F_b:

$$F_b = k_b \frac{I_{IDF}(T,t_c)}{I_{IDF}(T,24)}$$

Fb (adimensional) - Factor obtenido a partir de las curvas IDF de un pluviógrafo próximo.

I_{IDF} (T, t_c) (mm/h) - Intensidad de precipitación correspondiente al período de retorno T y al tiempo de concentración tc, obtenido a través de las curvas IDF del pluviógrafo.

I_{IDF} (T,24) (mm/h) - Intensidad de precipitación correspondiente al período de retorno T y a un tiempo de aguacero igual a veinticuatro horas (t 24 K), obtenido a través de curvas IDF.

k_b (adimensional) - Factor que tiene en cuenta la relación entre la intensidad máxima anual en un período de veinticuatro horas y la intensidad máxima anual diaria. En defecto de un cálculo específico se puede tomar kb - 1,13.

Punto de control	**Cuenca**	**Periodo de retorno (años)**	**Precipitación (mm)**	**F_{int}**	**Intensidad(mm/h)**
1	CAÑADA DE LA CALERA	5	106.08	8.51	37.61
		10	130.26		48.18
		100	219.67		77.88
		500	293.26		103.97
2	INNOMINADO 1	5	106.08	13.12	57.99
		10	130.26		71.21
		100	219.67		120.08
		500	293.26		160.26

5.3.1.4. TIEMPO DE CONCENTRACIÓN

Tiempo de concentración t_c, es el tiempo mínimo necesario desde el comienzo del aguacero para que toda la superficie de la cuenca esté aportando escorrentía en el punto de desagüe. Se obtiene calculando el tiempo de recorrido más largo desde cualquier punto de la cuenca hasta el punto de desagüe, mediante la siguiente formula:

$$t_c = 0{,}3 \cdot L_c^{0{,}76} \cdot J_c^{-0{,}19}$$

Donde:

t_c (horas) - Tiempo de concentración.

L_c (km) - Longitud del cauce

J_c (adimensional) - Pendiente media del cauce

Dado que el tiempo de concentración depende de la longitud y pendiente del cauce escogido, deben tantearse diferentes cauces o recorridos del agua, incluyendo siempre en los tanteos los de mayor longitud y menor pendiente. El cauce (o recorrido) que debe escogerse es aquél que da lugar a un valor mayor del tiempo de concentración t_c.

En aquellas cuencas principales de pequeño tamaño en las que el tiempo de recorrido en flujo difuso sobre el terreno sea apreciable respecto al tiempo de recorrido total no será de aplicación la fórmula anterior, debiendo aplicarse las indicaciones que se proporcionan a continuación para cuencas secundarias. Se considera que se produce esta circunstancia cuando el tiempo de concentración calculado mediante la fórmula anterior sea inferior a cero coma veinticinco horas (tc = 0,25h). En el estudio no se ha calculado ninguna cuenca con tiempo de concentración inferior a 0.25 h.

Punto de control	Cuenca	Tiempo de concentración (h)
1	CAÑADA DE LA CALERA	1.12
2	INNOMINADO	0.48

5.3.2. COEFICIENTE DE ESCORRENTÍA

El coeficiente de escorrentía C, define la parte de la precipitación de intensidad I (T, tc) que genera el caudal de avenida en el punto de desagüe de la cuenca. El coeficiente de escorrentía C, se obtendrá mediante la siguiente formula:

Si $P_d \cdot K_A > P_0$

$$C = \frac{\left(\frac{P_d \cdot K_A}{P_0} - 1\right)\left(\frac{P_d \cdot K_A}{P_0} + 23\right)}{\left(\frac{P_d \cdot K_A}{P_0} + 11\right)^2}$$

Si $P_d \cdot K_A \leq P_0$

$$C = 0$$

donde:

C (adimensional) - Coeficiente de escorrentía

Pd (mm) - Precipitación diaria correspondiente al período de retorno T considerado.

KA (adimensional) - Factor reductor de la precipitación por área de la cuenca.

P0 (mm) - Umbral de escorrentía.

5.3.2.1. UMBRAL DE ESCORRENTÍA

El umbral de escorrentía P0, representa la precipitación mínima que debe caer sobre la cuenca para que se inicie la generación de escorrentía. Se determinará mediante la siguiente fórmula:

$$P_0 = P_0^i \cdot \beta$$

donde:

P0 (mm) - Umbral de escorrentía.

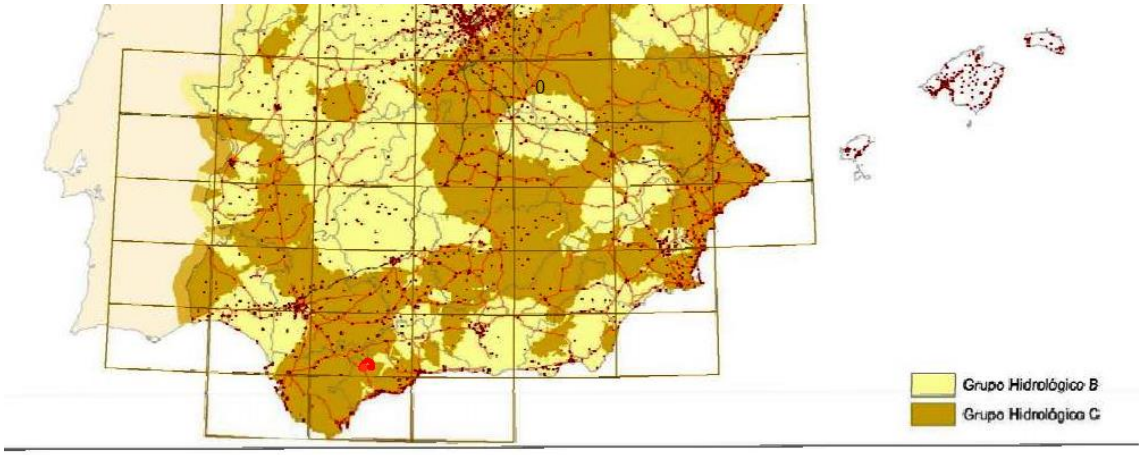
P0i (mm) - Valor inicial del umbral de escorrentía.

β (adimensional) - Coeficiente corrector del umbral de escorrentía.

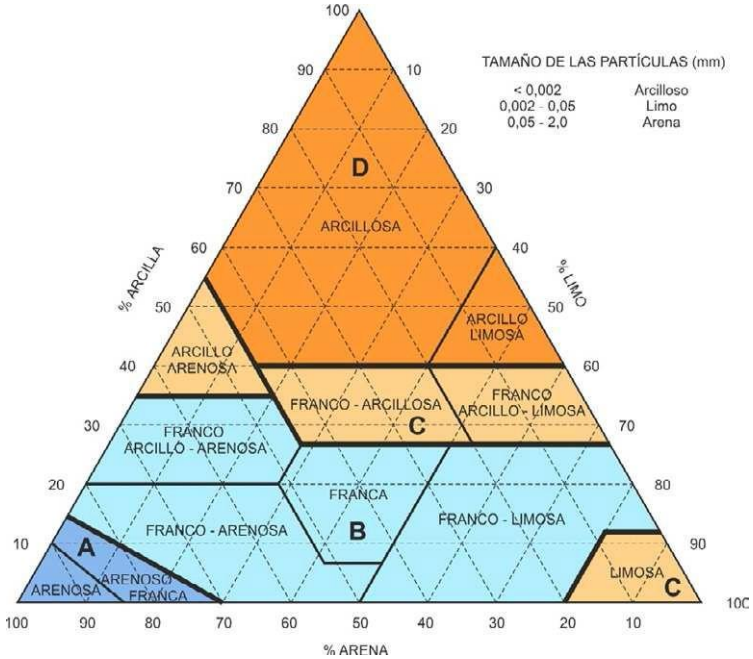
5.3.2.2. VALOR INICIAL DEL UMBRAL DE ESCORRENTÍA

Para la determinación del valor inicial del umbral de escorrentía se ha relacionado la tabla incluida en la norma (5.2. – IC drenaje superficial de la Instrucción de Carreteras utilizada como guion de la memoria) con los usos del suelo descritos en el proyecto CORINE Land Cover. La tabla se denomina *Tabla 2.3. – VALOR INICIAL DEL UMBRAL DE ESCORRENTÍA* P_0^i.

A partir de la figura siguiente incluida en la norma se determina que el grupo hidrológico del suelo es el “C”.



Grupo	Infiltración (cuando están muy húmedos)	Potencia	Textura	Drenaje
A	Rápida	Grande	Arenosa Areno-limosa	Perfecto
B	Moderada	Media a grande	Franco-arenosa Franca Franco-arcillosa-arenosa Franco-limosa	Bueno a moderado
C	Lenta	Media a pequeña	Franco-arcillosa Franco-arcillo-limosa Arcillo-arenosa	Imperfecto
D	Muy lenta	Pequeño (litosuelo) u horizontes de arcilla	Arcillosa	Pobre o muy pobre



5.3.2.3. Coeficiente corrector del umbral de escorrentía

La formulación del método racional efectuada en los epígrafes precedentes requiere una calibración con datos reales de las cuencas, que se introduce en el método a través de un coeficiente corrector del umbral de escorrentía B.

Al no disponer de información suficiente en las propias cuencas de cálculo para llevar a cabo una calibración específica se toma el valor del coeficiente corrector a partir de los datos de la tabla 2.5. de la norma de referencia, teniendo en cuenta que nos encontramos en la región 61.

Punto de control	**Cuenca**	**Periodo de retorno (años)**	**Precipitación (mm)**	**K_a**	**Umbral de escorrentía corregido**	**Coeficiente de escorrentía**
1	CAÑADA DE LA CALERA	5	106.08	1	30.9	0.31
		10	130.26		34.0	0.35
		100	219.67		40.1	0.47
		500	293.26		39.8	0.57
2	INNOMINADO 1	5	106.08	1	27.3	0.35
		10	130.26		30.0	0.39
		100	219.67		35.4	0.51
		500	293.26		35.1	0.62

5.3.3. ÁREA DE LA CUENCA

A los efectos de esta norma se considera como área de la cuenca la superficie medida en proyección horizontal (planta) que drena al punto de desagüe.

Se han supuesto, debido a la escasa entidad de las cuencas de estudio y a su homogeneidad, unos valores únicos de la intensidad de precipitación y del coeficiente de escorrentía para toda la cuenca, correspondientes a sus valores medios.

5.3.4. COEFICIENTE DE UNIFORMIDAD EN LA DISTRIBUCIÓN TEMPORAL DE LA PRECIPITACIÓN

El coeficiente Kt tiene en cuenta la falta de uniformidad en la distribución temporal de la precipitación. Se obtendrá a través de la siguiente expresión:

$$K_t = 1 + \frac{t_c^{1,25}}{t_c^{1,25} + 14}$$

Donde:

Kt (adimensional) Coeficiente de uniformidad en la distribución temporal de la precipitación.

tc (horas) Tiempo de concentración de la cuenca.

En el anexo “HOJAS DE CÁLCULO DE CAUDAL” se muestran los resultados obtenidos.

Punto de control	**Cuenca**	**Área, km²**	**Kt**	**Periodo de retorno (años)**	**Intensidad(mm/h)**	**Coeficiente de escorrentía**	**Caudal, m³/seg**
1	CAÑADA DE LA CALERA	0.83	1.08	5	37.61	0.31	2.88
				10	48.18	0.35	3.96
				100	77.88	0.47	9.07
				500	103.97	0.57	14.79
2	INNOMINADO 1	0.31	1.03	5	57.99	0.35	1.08
				10	71.21	0.39	2.45
				100	120.08	0.51	5.46
				500	160.26	0.62	8.73

6. ESTUDIO HIDRÁULICO

6.1. OBJETO DE ESTUDIO

El objeto del estudio es analizar las condiciones hidráulicas de flujo de los principales cauces que atraviesan el sector. Se realiza para los caudales correspondientes a los periodos de retorno de **5, 10, 100 y 500** años.

6.2. LEGISLACIÓN DE AGUAS

Dominio Público Hidráulico (DPH)

El artículo 2 del Texto Refundido de la Ley de Aguas y el mismo artículo del Reglamento del Dominio Público Hidráulico, hacen la enumeración de los bienes que constituyen el Dominio Público Hidráulico con las salvedades expresamente establecidas en la Ley, no se admiten pues otras excepciones que las que la propia Ley de Aguas determine, por lo que quedan derogadas cuantas disposiciones contenidas en otras Leyes sean contrarias a la clasificación del artículo 2 con sus salvedades. Así, los referidos cuerpos legales determinan que el **Dominio Público Hidráulico está constituido por los siguientes bienes**:

1. Las aguas continentales, tanto las superficiales como las subterráneas renovables con independencia del tiempo de renovación.
2. Los cauces de corrientes naturales, continuas o discontinuas.
3. Los lechos de los lagos y lagunas y de los embalses superficiales en cauce público.
4. Los acuíferos, a los efectos de los actos de disposición o de la afección de los recursos hidráulicos.
5. Las aguas procedentes de la desalación de agua del mar una vez que fuera de la planta de producción, se incorporen a cualquiera de los elementos señalados en los apartados anteriores.

Según Artículo Único, apartado Dos del Real Decreto 9/2008, de 11 de enero, por el que se modifica el Reglamento del Dominio Público Hidráulico (RDPH), aprobado por el Real Decreto 849/1986, de 11 de abril, el artículo 4 del RDPH queda redactado del siguiente modo:

«1. Álveo o cauce natural de una corriente continua o discontinua es el terreno cubierto por las aguas en las máximas crecidas ordinarias (artículo 4 del TRLA).

La determinación de ese terreno se realizará atendiendo a sus características geomorfológicas, ecológicas y teniendo en cuenta las informaciones hidrológicas, hidráulicas, fotográficas y cartográficas que existan, así como las referencias históricas disponibles.

2. Se considerará como caudal de la máxima crecida ordinaria la media de los máximos caudales anuales, en su régimen natural producidos durante diez años consecutivos, que sean representativos del comportamiento hidráulico de la corriente y que tengan en cuenta lo establecido en el apartado 1.»

Las riberas, las márgenes, zona de servidumbre y zona de policía

Según Artículo Único, apartado Tres del Real Decreto 9/2008, de 11 de enero, por el que se modifica el Reglamento del Dominio Público Hidráulico (RDPH), aprobado por el Real Decreto 849/1986, de 11 de abril, el artículo 6 del RDPH queda redactado del siguiente modo:

«1. Se entiende por riberas, las fajas laterales de los cauces públicos situadas por encima del nivel de aguas bajas y por márgenes los terrenos que lindan con los cauces.»

Las márgenes son aquellos terrenos que lindan con los cauces sujetas, en toda su extensión longitudinal:

a) A una zona de servidumbre de 5 metros de anchura para uso público.

b) A una zona de policía de 100 metros de anchura, en la que se condicionará el uso del suelo y las actividades que en él se desarrollen.»

Estos terrenos, que **con carácter general son de titularidad privada**, están sujetos a limitaciones y afecciones que condicionan su uso normal por parte de sus titulares. El art. 7 Reglamento del Dominio Público Hidráulico (RDPH) dispone que los propietarios de estas zonas de servidumbre puedan plantar y sembrar especies no arbóreas, siempre que no impidan las servidumbres de paso antes mencionadas. Para la plantación de especies arbóreas requerirán la autorización del organismo de cuenca. Queda prohibida la edificación de esta zona, salvo que sea autorizada por el organismo de cuenca, autorización que se otorgará sólo en casos muy justificados.

La zona afectada por la servidumbre de uso público podrá ser modificada por causas justificadas, que habrán de fundamentarse en razones topográficas, hidrográficas o en las exigencias de las características de la concesión del aprovechamiento hidráulico; y siempre que se justifique que ésta modificación viene exigida por el uso público.

En ésta zona también el uso del suelo que puedan hacer sus titulares se encuentra condicionado o limitado. En concreto, la legislación en materia de Aguas prohíbe las siguientes actividades:

a) Las alteraciones sustanciales del relieve natural del terreno.
b) Las extracciones de áridos.
c) Las construcciones de todo tipo, definitivas o provisionales.
d) Cualquier otro uso o actividad que suponga un obstáculo para la corriente en régimen de avenidas o que pueda ser causa de degradación o deterioro del dominio público hidráulico.

La Zona de Policía podrá ser modificada a instancia de la Administración (estatal, autonómica o local) cuando las condiciones topográficas o hidrográficas lo hagan necesario.

La competencia para acordar la modificación corresponderá al Organismo de cuenca, debiendo instruir al efecto el oportuno expediente.

La ejecución de cualquier obra o trabajo que se realice en esta zona de policía requiere la autorización administrativa previa del Organismo de Cuenca, además de cualquier otra que deba ser otorgada por otras administraciones competentes (art. 9 del RDPH). Esta autorización previa no será necesaria cuando las obras de construcción ya hubieren sido contempladas en el instrumento de planeamiento urbanístico o en los planes de obras de la Administración, y éstos hayan sido informados por el organismo de cuenca (art. 78.1 RDPH).

Zonas inundables

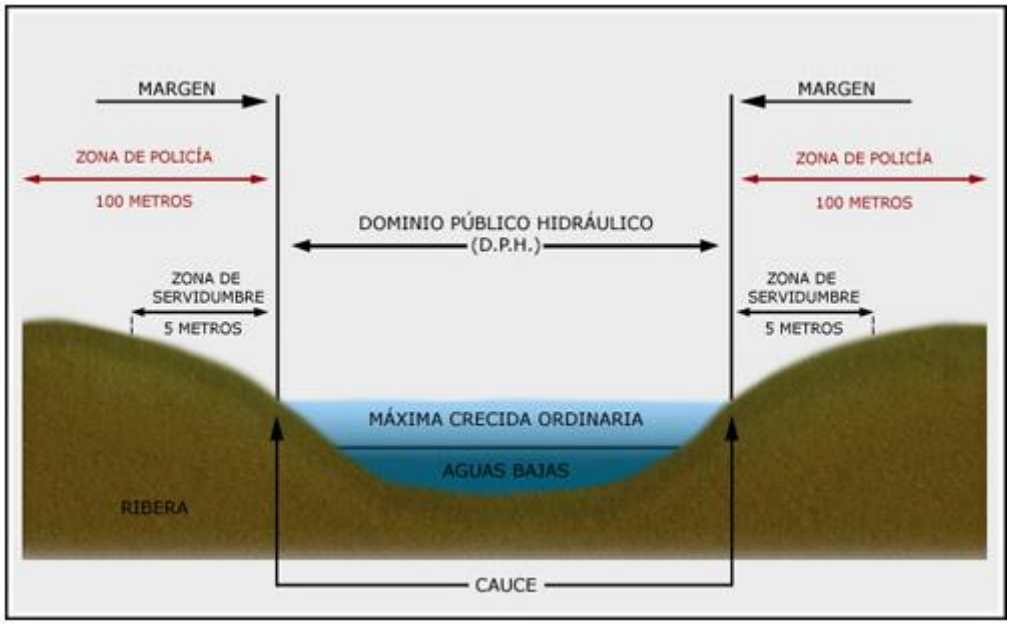
Según Artículo Único, apartado Seis del Real Decreto 9/2008, de 11 de enero, por el que se modifica el Reglamento del Dominio Público Hidráulico (RDPH), aprobado por el Real Decreto 849/1986, de 11 de abril, el artículo 14 del RDPH queda redactado del siguiente modo:

*"1.Se consideran **zonas inundables** las delimitadas por los niveles teóricos que alcanzarían las aguas en las avenidas cuyo **período estadístico de retorno sea de quinientos años**, atendiendo a estudios geomorfológicos, hidrológicos e*

hidráulicos, así como a serie de avenidas históricas y documentos o evidencias históricas de las mismas....”

La calificación como zonas inundables no alterará la calificación jurídica y la titularidad dominical que dichos terrenos tuviesen».

El Dominio Público Hidráulico y sus zonas de servidumbre y protección. Aplicación de la regulación en materia de aguas e inundaciones



El DPH y zonas de servidumbre y protección

6.3. MODELO MATEMÁTICO DE CÁLCULO

Datos hidráulicos

La simulación matemática del flujo requiere de un trabajo intenso preliminar que determine de la forma más real posible las condiciones geométricas del cauce, las condiciones de contorno y afinen al máximo las variables hidráulicas que determinan la cota absoluta de la lámina de agua.

Geometría

Cálculo con HEC-RAS

El cálculo hidráulico de la cuenca se ha realizado mediante el software HEC-RAS 5.0, proporcionado por “US Army Corps of Engineers”, consistente en:

- Trazado de secciones de control, puentes y alcantarillados.
- Generar la geometría del cauce y afluentes (si los hubiera).
- Introducción de variables hidráulicas (coeficiente de rugosidad de Manning, coeficientes de contracción y expansión, etc.)
- Generar la geometría de puentes y alcantarillados.
- Introducción de datos de caudal y condiciones límites.
- Cálculo de la lámina de agua en cada sección de control, junto a otras variables como velocidad de flujo o área de inundación.

Para realizar el modelado hidráulico resultó necesario crear un esquema hidráulico del cauce y afluentes, así como de aquellas infraestructuras que actúen sobre él, canalizándolo o alterando su normal funcionamiento.

Este esquema está constituido por secciones transversales y apoyándonos en la cartografía existente para la zona de estudio, mediante un sistema SIG o CAD.

Seguidamente en HEC-RAS se ha calculado la altura de la lámina del agua para cada sección de control, junto con otras variables tales como la velocidad de flujo, sección mojada, etc.

Antes de iniciar esta parte, fue necesario disponer de la siguiente información georreferenciada:

- Trazado del cauce y afluentes si los hubiere. Estos han sido digitalizados siguiendo la cartografía proporcionada por el peticionario para tenerlos mejor adaptados al modelo digital de elevaciones.
- Secciones transversales de control. Se han realizado secciones cada 40 m por norma general, además, con posterioridad se realiza una interpolación entre las secciones para refinar la simulación. También se trazaron en aquellos puntos donde pueda estimarse un cambio en el comportamiento del flujo. Es recomendable trazar al menos dos secciones por cada tramo recto (una al principio y otra al final), y al menos tres en las curvas (al inicio de ésta, en su interior y al final). Habrán de recoger como mínimo la superficie máxima que se estime pueda ser inundada, y como máximo llegar hasta la divisoria de aguas.
- Geometrías de puentes y entubamientos, y secciones de control de éstos. Estas secciones representan la existencia de una infraestructura que modifica la normal trayectoria del flujo. Datos como la geometría de las infraestructuras, diámetros de tubos, altura de plataformas deberán obtenerse en el campo, resultando este uno de los aspectos más complejos e importantes del proceso.
- Datos de caudal para la cuenca (para los distintos puntos de caudal considerados), calculados en el estudio hidrológico.
- Modelo digital del terreno a partir de la cartografía proporcionada, con curvas de nivel por cada metro de desnivel.

Todo el proceso se ha realizado en la aplicación informática GEOHECRAS 2D ha sido analizado los flujos unidimensionalmente y bidimensionalmente recogiendo los resultados que se adaptan a la realidad del entorno.

GeoHEC-RAS es una interfaz gráfica e interactiva de visualización de datos en 2D/3D compatible con AutoCAD, MicroStation y ESRI ArcGIS para modelos HEC-RAS del Cuerpo de Ingenieros del Ejército de EE.UU.

Coeficiente de Manning:

Mapas de rugosidad o coeficiente de Manning para la cuenca. Este valor dependerá del uso del suelo, la existencia de vegetación, la localización transversal en el cauce, etc.

En nuestro caso, se ha elegido la metodología descrita en la publicación del Ministerio de Medio Ambiente denominada “Guía metodológica para el desarrollo del sistema nacional de cartografía de zonas inundables”. En su anexo V “Valores del coeficiente de rugosidad de Manning asignados a los usos del suelo del SIOSE y CLC2000” se relaciona el coeficiente con los usos del suelo delimitados en Corine Land Cover.

Relacionando las tablas con el mapa de usos se ha elaborado mapa del número de Manning. Recogido en el anexo planos.

Dado que en los usos del suelo no se detallan los cauces estudiados se ha introducido manualmente, tras realizar la visita de campo y mediante estudio de la ortofoto, los valores indicados en la siguiente tabla:

Descripción de la corriente	Mínimo	Normal	Máximo
A *Cauces naturales*			
A.1 Cursos secundarios (ancho de la superficie libre en crecida < 30 m)			
A.1.1 Cursos en planicies			
- Limpios, rectos, sin fallas ni pozos	0,025	0,030	0,033
- Rectos con algunas piedras y pastos	0,030	0,035	0,040
- Limpios con meandros, con algunos pozos y bancos	0,033	0,040	0,045
- Meandros con algunas piedras y pastos	0,035	0,045	0,050
- Meandros con muchas piedras	0,045	0,050	0,060
- Tramos sucios, con pastos y pozos profundos	0,050	0,070	0,080
- Tramo con mucho pasto, pozos profundos y cauce en crecida con muchos arbustos y matorral	0,075	0,100	0,150
A.1.2 Cursos montañosos, carentes de vegetación en el fondo, laderas con pendientes pronunciadas y árboles y arbustos en las laderas que se sumergen en niveles de crecida			
- Cauce de grava, cantos rodados y algunas rocas	0,030	0,040	0,050
- Cauce de cantos rodados, con grandes rocas	0,040	0,050	0,070
A.2 Cursos en planicies inundadas			
A..2.1 Zonas de pastos, sin arbustos			
- Pasto corto	0,025	0,030	0,035
- Pasto alto	0,030	0,035	0,050
A.2.2 Zonas cultivadas			
- Sin cultivo	0,020	0,030	0,030
- Cultivos sembrados en línea en fase de madurez fisiológica	0,025	0,035	0,045
- Cultivos sembrados a voleo en fase de madurez fisiológica	0,030	0,040	0,050
A.2.3 Zonas arbustivas			
- Escasos arbustos y pasto abundante	0,035	0,050	0,070
- Pequeños árboles y arbustos sin follaje (parada invernal)	0,035	0,050	0,060
- Pequeños árboles y arbustos con follaje (fase vegetativa)	0,040	0,060	0,080
- Arbustos medianos a densos durante la parada invernal	0,045	0,070	0,110
- Arbustos medianos a densos durante la fase vegetativa	0,070	0,100	0,160
A.2.4 Zonas arbóreas			
- Sauces densos, temporada invernal	0,110	0,150	0,200
- Terreno claro con ramas sin brotes	0,030	0,040	0,050
- Terreno claro con ramas con gran crecimiento de brotes	0,050	0,060	0,080
-Zonas de explotación maderera con árboles caídos, poco crecimiento en las zonas bajas y nivel de inundación por debajo de las ramas	0,080	0,100	0,120
-Zonas de explotación maderera con árboles caídos, poco crecimiento en las zonas bajas y nivel de inundación que alcanza a las ramas	0,100	0,120	0,160
A.3 Cursos importantes (ancho de la superficie libre en crecida > 30 m)			
En este caso, los valores del coeficiente *n* son inferiores a los correspondientes de cauces secundarios análogos, ya que los bancos ofrecen una resistencia efectiva menor,			
- Sección regular sin rocas ni arbustos	0,025		0,060
- Sección irregular y rugosa	0,035		0,100

En *todas* las obras de drenaje de hormigón, se ha utilizado el coeficiente de 0.017.

Condiciones de contorno:

Las condiciones de contorno utilizadas en la modelización son aguas arriba el calado crítico y aguas abajo el calado normal introduciendo el valor de la pendiente en el punto de salida.

Régimen de cálculo:

Se ha utilizado el régimen mixto.

Coeficientes de expansión y contracción:

Para el coeficiente de expansión se ha escogido 0.3 y para contracción 0.1.

La totalidad de tablas resultantes tras el estudio se recogen en el Anexo, incluyéndose:

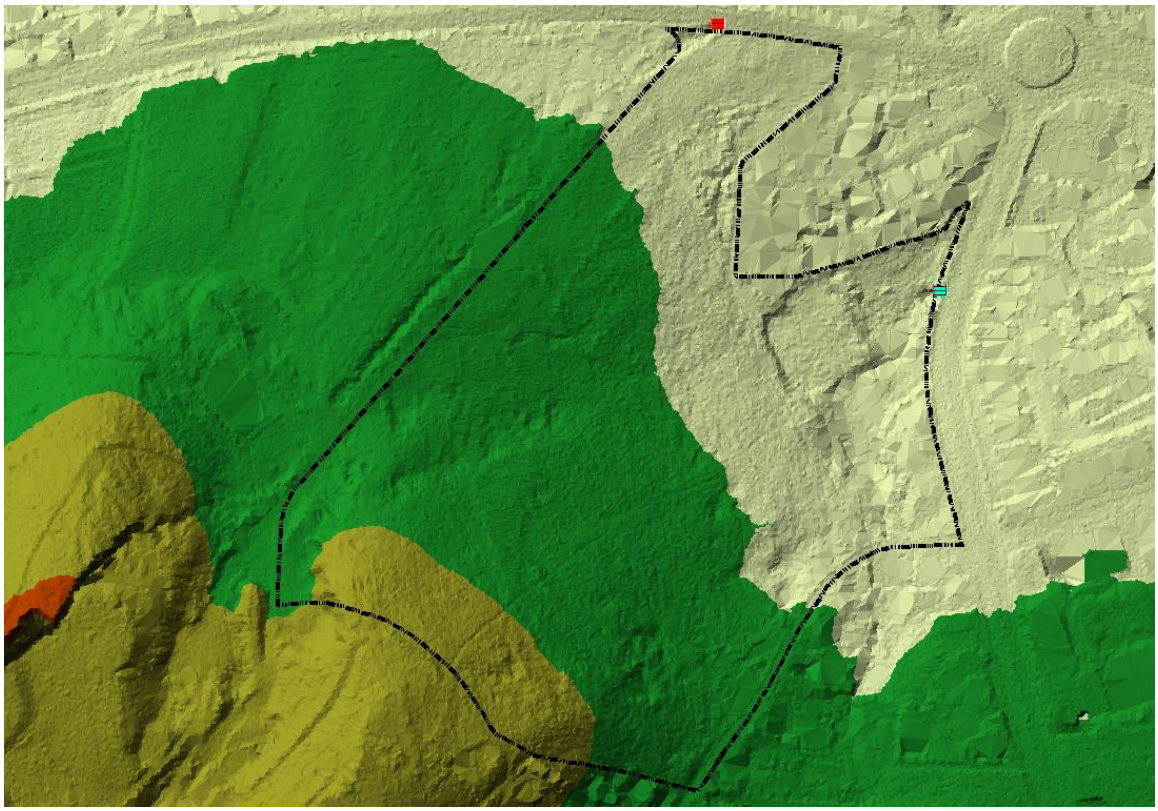
- Datos de caudal en los puntos calculados.
- Tablas de resultados hidráulicos, con la siguiente información para cada sección de control:
  - Período de retorno.
  - Caudal.
  - Altura mínima del canal.
  - Elevación de la lámina de inundación.
  - Velocidad media del flujo en la sección.
  - Área mojada de la sección.
  - Anchura máxima de lámina.
  - Número de Froude.
  - Coeficiente de Manning.

7. RESUMEN, CONCLUSIONES Y PROPUESTAS

1. ESTUDIO HIDROLÓGICO

La zona de estudio está inserta en una mezcla de tramas urbanas, edificaciones aisladas, cultivos en estado de abandono (olivar). Son terrenos urbanos sectorizados.

Entorno al mismo se ha levantado modelo digital del terreno TIN, a partir de las hojas de puntos LIDARs para caracterizar el entorno en un modelo informático en el cual se han insertado las edificaciones:



Los tramos de estudio son los siguientes:

	Longitud del tramo estudiado (m)		X	Y
ARROYO CAÑADA DE LA CALERA	340	**INICIO**	364,963.099	4,058,214.378
		FIN	365,196.462	4,058,440.994
INNOMINADO_1	180	**INICIO**	365,300.443	4,058,127.859
		FIN	365,332.193	4,058,279.465

Las cuencas de estudio son las siguientes:

NUMERO DE CUENCA		Área (km^2)		X	Y
1	CAÑADA DE LA CALERA	0.83	CENTROIDE DE LA CUENCA	363972	4057502
2	INNOMIADO 1	0.31	CENTROIDE DE LA CUENCA	365092	4057834

Los registros de precipitaciones máximas han sido obtenidos de los datos de precipitaciones de la publicación del CEDEX, organismo público perteneciente al Ministerio de Fomento, denominada “Máximas lluvias diarias en la España peninsular”, mediante su aplicación informática Maxpluwin.

PERIODOS DE RETORNO DEL ESTUDIO
5 años
10 años
10 años
500 años

De las diferentes técnicas hidrometeorológicas que existen para la determinación de caudales, se ha elegido el Método Racional, modificado según Témez y normalizado en España por la Dirección General de Carreteras para el diseño de los elementos de drenaje superficial Orden FOM/298/2016, de 15 de febrero, por la que se aprueba la norma 5.2 -IC drenaje superficial de la Instrucción de

Carreteras). Por este motivo, la modelación hidrológica se realizará siguiendo las directrices de dicha Instrucción.

De las cuales han sido recogidas en anexo las fichas de cálculo de caudal con los parámetros necesarios según la instrucción:

Punto de control	**Cuenca**	**Periodo de retorno (años)**	**Precipitación (mm)**	**K_a**	**Umbral de escorrentía corregido**	**Coeficiente de escorrentía**
1	CAÑADA DE LA CALERA	5	106.08	1	30.9	0.31
		10	130.26		34.0	0.35
		100	219.67		40.1	0.47
		500	293.26		39.8	0.57
2	INNOMINADO 1	5	106.08	1	27.3	0.35
		10	130.26		30.0	0.39
		100	219.67		35.4	0.51
		500	293.26		35.1	0.62

Punto de control	**Cuenca**	**Área, km^2**	**Kt**	**Periodo de retorno (años)**	**Intensidad(mm/h)**	**Coeficiente de escorrentía**	**Caudal, m^3/seg**
1	CAÑADA DE LA CALERA	0.83	1.08	5	37.61	0.31	2.88
				10	48.18	0.35	3.96
				100	77.88	0.47	9.07
				500	103.97	0.57	14.79
2	INNOMINADO 1	0.31	1.03	5	57.99	0.35	1.08
				10	71.21	0.39	2.45
				100	120.08	0.51	5.46
				500	160.26	0.62	8.73

2. ESTUDIO HIDRAÚLICO

Con los caudales obtenidos, se ha determinado la zona ocupada por la lámina de agua para los períodos de retorno de 5, 10, 100 y 500 años. Se han seguido los siguientes pasos:

Se han realizado perfiles transversales con una equidistancia ordinaria de 40 m, disminuyendo dicha distancia en puntos singulares como curvas cerradas, cambios de rasante, bruscos de sección y aumentándola en ciertos zonas puntuales, obteniendo los perfiles recogidos en el apartado de perfiles longitudinales y transversales dentro del presente estudio.

Los datos hidráulicos (incluyendo cota máxima de inundación) se recogen en las tablas de datos hidráulicos de las secciones de control. (ver perfiles a escala en el Anexo).

El cálculo hidráulico ha sido realizado en régimen permanente no uniforme, obteniéndose la altura alcanzada por la lámina de agua de cada sección, para las avenidas de período de retorno de 10, 100 y 500 años.

Coeficiente de Manning:

Mapas de rugosidad o coeficiente de Manning para la cuenca. Este valor dependerá del uso del suelo, la existencia de vegetación, la localización transversal en el cauce, etc.

En nuestro caso, se ha elegido la metodología descrita en la publicación del Ministerio de Medio Ambiente denominada “Guía metodológica para el desarrollo del sistema nacional de cartografía de zonas inundables”. En su anexo V “Valores del coeficiente de rugosidad de Manning asignados a los usos del suelo del SIOSE y CLC2000” se relaciona el coeficiente con los usos del suelo delimitados en Corine Land Cover.

Relacionando las tablas con el mapa de usos hemos elaborado mapa con el número de Manning:

Dado que en los usos del suelo no se detallan los cauces estudiados se ha introducido manualmente, tras realizar la visita de campo y mediante estudio de la ortofoto, los valores indicados en la siguiente tabla (extraída de la guía metodológica para el desarrollo del sistema nacional de cartografía de zonas inundables del Ministerio de Medio Ambiente y Medio Rural y Marino del Gobierno de España):

Descripción de la corriente	Mínimo	Normal	Máximo
A *Cauces naturales*			
A.1 Cursos secundarios (ancho de la superficie libre en crecida < 30 m)			
A.1.1 Cursos en planicies			
- Limpios, rectos, sin fallas ni pozos	0,025	0,030	0,033
- Rectos con algunas piedras y pastos	0,030	0,035	0,040
- Limpios con meandros, con algunos pozos y bancos	0,033	0,040	0,045
- Meandros con algunas piedras y pastos	0,035	0,045	0,050
- Meandros con muchas piedras	0,045	0,050	0,060
- Tramos sucios, con pastos y pozos profundos	0,050	0,070	0,080
- Tramo con mucho pasto, pozos profundos y cauce en crecida con muchos arbustos y matorral	0,075	0,100	0,150
A.1.2 Cursos montañosos, carentes de vegetación en el fondo, laderas con pendientes pronunciadas y árboles y arbustos en las laderas que se sumergen en niveles de crecida			
- Cauce de grava, cantos rodados y algunas rocas	0,030	0,040	0,050
- Cauce de cantos rodados, con grandes rocas	0,040	0,050	0,070
A.2 Cursos en planicies inundadas			
A..2.1 Zonas de pastos, sin arbustos			
- Pasto corto	0,025	0,030	0,035
- Pasto alto	0,030	0,035	0,050
A.2.2 Zonas cultivadas			
- Sin cultivo	0,020	0,030	0,030
- Cultivos sembrados en línea en fase de madurez fisiológica	0,025	0,035	0,045
- Cultivos sembrados a voleo en fase de madurez fisiológica	0,030	0,040	0,050
A.2.3 Zonas arbustivas			
- Escasos arbustos y pasto abundante	0,035	0,050	0,070
- Pequeños árboles y arbustos sin follaje (parada invernal)	0,035	0,050	0,060
- Pequeños árboles y arbustos con follaje (fase vegetativa)	0,040	0,060	0,080
- Arbustos medianos a densos durante la parada invernal	0,045	0,070	0,110
- Arbustos medianos a densos durante la fase vegetativa	0,070	0,100	0,160
A.2.4 Zonas arbóreas			
- Sauces densos, temporada invernal	0,110	0,150	0,200
- Terreno claro con ramas sin brotes	0,030	0,040	0,050
- Terreno claro con ramas con gran crecimiento de brotes	0,050	0,060	0,080
-Zonas de explotación maderera con árboles caídos, poco crecimiento en las zonas bajas y nivel de inundación por debajo de las ramas	0,080	0,100	0,120
-Zonas de explotación maderera con árboles caídos, poco crecimiento en las zonas bajas y nivel de inundación que alcanza a las ramas	0,100	0,120	0,160
A.3 Cursos importantes (ancho de la superficie libre en crecida > 30 m)			
En este caso, los valores del coeficiente *n* son inferiores a los correspondientes de cauces secundarios análogos, ya que los bancos ofrecen una resistencia efectiva menor,			
- Sección regular sin rocas ni arbustos	0,025		0,060
- Sección irregular y rugosa	0,035		0,100

En *todas* las obras de drenaje de hormigón, se ha utilizado el coeficiente de 0.017.

Condiciones de contorno:

Las condiciones de contorno utilizadas en la modelización son aguas arriba el calado crítico y aguas abajo el calado normal introduciendo el valor de la pendiente en el punto de salida.

Régimen de cálculo:

Se ha utilizado el régimen mixto.

Coeficientes de expansión y contracción:

Para el coeficiente de expansión se ha escogido 0.3 y para contracción 0.1.

Con los resultados del estudio se han realizado:

Plano en planta para cada arroyo, con la avenida de período de retorno de 5, 10, 100 Y 500 años (ver Anexo de Planos).

Sobre cada perfil transversal se indica la zona ocupada por la avenida de 5, 10, 100 y 500 años y dibujado las obras de paso, muros, …

(ver Anexo de Planos).

3. PROPUESTA Y CONCLUSIÓN A LA ORDENACIÓN

Se ha levantado sobre plano en planta las diferentes afecciones sobre el sector y recogido en el anexo de planos las diferentes afecciones, según propuesta de delimitación cautelar:

- *DPH para lámina calculada a partir del periodo de retorno de 5 años.*
- *Zona de servidumbre: 5 metros en planta a partir del límite de la propuesta cautelar de DPH*
- *Zonas inundables para el periodo de retorno de 500 años.*

LIMITACIONES PARA USO DE ZONAS INUNDABLES. CONSIDERACIONES PARA EL PLANEAMIENTO.

<table>
<tr><td>Zona afectada por avenida de 10 – 50 años de periodo de retorno</td><td colspan="2">No se permitirá edificación o instalación alguna, temporal o permanente. Excepcionalmente, y por razones justificadas de interés público, se podrán autorizar instalaciones temporales.
En cualquier caso, se prohibirán usos que conlleven un riesgo potencial de pérdida de vidas humanas</td></tr>
<tr><td>Zona afectada por avenida de 100 años de periodo de retorno</td><td>No se permitirá la instalación de industria pesada, contaminante según la legislación vigente o con riesgo inherente de accidentes graves.</td><td rowspan="2">Se prohibirán instalaciones destinadas a servicios públicos esenciales o que conlleven un alto nivel de riesgo en situación de avenida</td></tr>
<tr><td>Zona afectada por avenida de 500 años de periodo de retorno</td><td>No se permitirá las industrias contaminantes según la legislación vigente o con riesgo inherente de accidentes graves.</td></tr>
</table>

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ANEXOS:

1.- HOJAS DE CÁLCULO DE CAUDAL

2.- DATOS HIDRÁULICOS DE LAS SECCIONES DE CONTROL

3.- REPORTAJE FOTOGRÁFICO

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2.- PLANO DE SITUACIÓN SOBRE ORTOFOTO

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4.- PLANO DE USOS DEL SUELO

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8.- SITUACIÓN DE LOS PERFILES TRANSVERSALES

9.- DELIMITACIÓN DE LÁMINA PARA TIEMPO DE RETORNO 5 Y 10 AÑOS. ZONA DE SERVIDUMBRE

10.- DELIMITACIÓN DE LÁMINAS SEGÚN AVENIDAS PARA TIEMPOS DE RETORNO 10, 500 AÑOS. ZONAS INUNDABLES

ANEXOS:

1.- HOJAS DE CÁLCULO DE CAUDAL

Nombre del Caudal	Periodo de Retorno
CAÑADA DE LA CALERA (cuenca 1)	**5 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	5		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.83	Cota Máxima del cauce (m):	609
Longitud del Cauce (km):	3.34	Cota Mínima del Cauce (m):	205
T_c- Tiempo de Concentración (h):	1.12	Pendiente del Cauce (%):	12.1

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	106.08	F_a- Relación (I_1/I_d) según fórmula:	7.53
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	8.51
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	245.02
P'_d- Máxima Lluvia Corregida (mm/h):	106.08	$I_{24}(T,24)$:	32.54
I'_d- Intensidad Media Diaria (mm/h):	4.42	F_{int}- Factor de Intensidad:	8.51
(I_1/I_d)- Factor Torrencialidad:	8	I(5,1.12)- Intensidad(mm/h):	37.61

PERDIDAS

P_o- Umbral de Escorrentía (mm):	17	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	1.82
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	30.94
F_T - Factor Periodo de Retorno:	0.91	Relación P'_d/P'_o:	3.43
β^{DT} - Coef. Drenaje Transversal:	1.59	C - Coeficiente de Escorrentía:	0.31
β^{PM} - Coef. Drenajes Auxiliares:	1.82	K_t - Coeficiente de Uniformidad:	1.08

RESULTADOS

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http://lab-hidrologia.uca.es/
olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 2.88

Anexo hojas de cálculo de caudal.

Nombre del Caudal	Periodo de Retorno
CAÑADA DE LA CALERA (cuenca 1)	**10 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	10		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.83	Cota Máxima del cauce (m):	609
Longitud del Cauce (km):	3.34	Cota Mínima del Cauce (m):	205
T_c- Tiempo de Concentración (h):	1.12	Pendiente del Cauce (%):	12.1

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	130.26	F_a- Relación (I_1/I_d) según fórmula:	7.53
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	8.51
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	300.22
P'_d- Máxima Lluvia Corregida (mm/h):	130.26	$I_{24}(T,24)$:	39.87
I'_d- Intensidad Media Diaria (mm/h):	5.43	F_{int}- Factor de Intensidad:	8.51
(I_1/I_d)- Factor Torrencialidad:	8	I(10,1.12)- Intensidad(mm/h):	46.18

PERDIDAS

P_o- Umbral de Escorrentía (mm):	17	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	34
F_T - Factor Periodo de Retorno:	1	Relación P'_d/P'_o:	3.83
β^{DT} - Coef. Drenaje Transversal:	1.75	C - Coeficiente de Escorrentía:	0.35
β^{PM} - Coef. Drenajes Auxiliares:	2	K_t - Coeficiente de Uniformidad:	1.08

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Olegario Castillo (2016)
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olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 3.96

Nombre del Caudal	Periodo de Retorno
CAÑADA DE LA CALERA (cuenca 1)	**100 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	100		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.83	Cota Máxima del cauce (m):	609
Longitud del Cauce (km):	3.34	Cota Mínima del Cauce (m):	205
T_c- Tiempo de Concentración (h):	1.12	Pendiente del Cauce (%):	12.1

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	219.67	F_a- Relación (I_1/I_d) según fórmula:	7.53
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	8.51
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	505.79
P'_d- Máxima Lluvia Corregida (mm/h):	219.67	$I_{24}(T,24)$:	67.17
I'_d- Intensidad Media Diaria (mm/h):	9.15	F_{int}- Factor de Intensidad:	8.51
(I_1/I_d)- Factor Torrencialidad:	8	I(100,1.12)- Intensidad(mm/h):	77.88

PERDIDAS

P_o- Umbral de Escorrentía (mm):	17	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2.36
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	40.12
F_T - Factor Periodo de Retorno:	1.18	Relación P'_d/P'_o:	5.48
β^{DT} - Coef. Drenaje Transversal:	2.07	C - Coeficiente de Escorrentía:	0.47
β^{PM} - Coef. Drenajes Auxiliares:	2.36	K_t - Coeficiente de Uniformidad:	1.08

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olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 9.07

Nombre del Caudal	Periodo de Retorno
CAÑADA DE LA CALERA (cuenca 1)	**500 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	500		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.83	Cota Máxima del cauce (m):	609
Longitud del Cauce (km):	3.34	Cota Mínima del Cauce (m):	205
T_c- Tiempo de Concentración (h):	1.12	Pendiente del Cauce (%):	12.1

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	293.26	F_a- Relación (I_1/I_d) según fórmula:	7.53
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	8.51
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	677.32
P'_d- Máxima Lluvia Corregida (mm/h):	293.26	$I_{24}(T,24)$:	89.95
I'_d- Intensidad Media Diaria (mm/h):	12.22	F_{int}- Factor de Intensidad:	8.51
(I_1/I_d)- Factor Torrencialidad:	8	I(500,1.12)- Intensidad(mm/h):	103.97

PERDIDAS

P_o- Umbral de Escorrentía (mm):	17	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2.34
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	39.78
F_T - Factor Periodo de Retorno:	1.17	Relación P'_d/P'_o:	7.37
β^{DT} - Coef. Drenaje Transversal:	2.05	C - Coeficiente de Escorrentía:	0.57
β^{PM} - Coef. Drenajes Auxiliares:	2.34	K_t - Coeficiente de Uniformidad:	1.08

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olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 14.79

Nombre del Caudal	Periodo de Retorno
INNOMINADO (cuenca 2)	**5 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	5		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.31	Cota Máxima del cauce (m):	205
Longitud del Cauce (km):	1.11	Cota Mínima del Cauce (m):	62
T_c- Tiempo de Concentración (h):	0.48	Pendiente del Cauce (%):	12.88

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	106.08	F_a- Relación (I_1/I_d) según fórmula:	11.61
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	13.12
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	377.79
P'_d- Máxima Lluvia Corregida (mm/h):	106.08	$I_{24}(T,24)$:	32.54
I'_d- Intensidad Media Diaria (mm/h):	4.42	F_{int}- Factor de Intensidad:	13.12
(I_1/I_d)- Factor Torrencialidad:	8	I(5,0.48)- Intensidad(mm/h):	57.99

PERDIDAS

P_o- Umbral de Escorrentía (mm):	15	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	1.82
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	27.3
F_T - Factor Periodo de Retorno:	0.91	Relación P'_d/P'_o:	3.89
β^{DT} - Coef. Drenaje Transversal:	1.59	C - Coeficiente de Escorrentía:	0.35
β^{PM} - Coef. Drenajes Auxiliares:	1.82	K_t - Coeficiente de Uniformidad:	1.03

RESULTADOS

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olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 1.8

Nombre del Caudal	Periodo de Retorno
INNOMINADO (cuenca 2)	**10 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	10		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.31	Cota Máxima del cauce (m):	205
Longitud del Cauce (km):	1.11	Cota Mínima del Cauce (m):	62
T_c- Tiempo de Concentración (h):	0.48	Pendiente del Cauce (%):	12.88

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	130.26	F_a- Relación (I_1/I_d) según fórmula:	11.61
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	13.12
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	463.82
P'_d- Máxima Lluvia Corregida (mm/h):	130.26	$I_{24}(T,24)$:	39.95
I'_d- Intensidad Media Diaria (mm/h):	5.43	F_{int}- Factor de Intensidad:	13.12
(I_1/I_d)- Factor Torrencialidad:	8	I(10,0.48)- Intensidad(mm/h):	71.21

PERDIDAS

P_o- Umbral de Escorrentía (mm):	15	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	30
F_T - Factor Periodo de Retorno:	1	Relación P'_d/P'_o:	4.34
β^{DT} - Coef. Drenaje Transversal:	1.75	C - Coeficiente de Escorrentía:	0.39
β^{PM} - Coef. Drenajes Auxiliares:	2	K_t - Coeficiente de Uniformidad:	1.03

RESULTADOS

CAUDAL TOTAL (m^3/s): 2.45

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Nombre del Caudal	Periodo de Retorno
INNOMINADO (cuenca 2)	**100 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	100		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.31	Cota Máxima del cauce (m):	205
Longitud del Cauce (km):	1.11	Cota Mínima del Cauce (m):	62
T_c- Tiempo de Concentración (h):	0.48	Pendiente del Cauce (%):	12.88

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	219.67	F_a- Relación (I_1/I_d) según fórmula:	11.61
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	13.12
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	782.28
P'_d- Máxima Lluvia Corregida (mm/h):	219.67	$I_{24}(T,24)$:	67.38
I'_d- Intensidad Media Diaria (mm/h):	9.15	F_{int}- Factor de Intensidad:	13.12
(I_1/I_d)- Factor Torrencialidad:	8	I(100,0.48)- Intensidad(mm/h):	120.08

PERDIDAS

P_o- Umbral de Escorrentía (mm):	15	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2.36
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	35.4
F_T - Factor Periodo de Retorno:	1.18	Relación P'_d/P'_o:	6.21
β^{DT} - Coef. Drenaje Transversal:	2.07	C - Coeficiente de Escorrentía:	0.51
β^{PM} - Coef. Drenajes Auxiliares:	2.36	K_t - Coeficiente de Uniformidad:	1.03

RESULTADOS

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CAUDAL TOTAL (m^3/s): 5.46

Nombre del Caudal	Periodo de Retorno
INNOMINADO (cuenca 2)	**500 años**

DATOS INICIALES

Región nº:	61	Tipo de obra: Drenaje auxilar	
Periodo de Retorno (años):	500		

GEOMETRÍA DE LA CUENCA

Área de la Cuenca (km^2):	0.31	Cota Máxima del cauce (m):	205
Longitud del Cauce (km):	1.11	Cota Mínima del Cauce (m):	62
T_c- Tiempo de Concentración (h):	0.48	Pendiente del Cauce (%):	12.88

PRECIPITACIONES

P_d - Máxima Lluvia diaria (mm):	293.26	F_a- Relación (I_1/I_d) según fórmula:	11.61
K_a- Factor Reductor de Precipitación:	1	F_b- Relación (I_1/I_d) según pluviómetro:	13.12
☐ Forzar valor de Ka = 1		$I_{IDF}(T,t_c)$:	1044
P'_d- Máxima Lluvia Corregida (mm/h):	293.26	$I_{24}(T,24)$:	89.95
I'_d- Intensidad Media Diaria (mm/h):	12.22	F_{int}- Factor de Intensidad:	13.12
(I_1/I_d)- Factor Torrencialidad:	8	I(500,0.48)- Intensidad(mm/h):	160.26

PERDIDAS

P_o- Umbral de Escorrentía (mm):	15	Forzar valor del Coef. corrector β:	
β_m - Coef. corrector Umbral de Escorrentía:	2	β- Coef. corrector utilizado:	2.34
Δ50% - Intervalo de confianza:	0.25	P'_o- Umbral Escorrentía Corregido (mm):	35.1
F_T - Factor Periodo de Retorno:	1.17	Relación P'_d/P'_o:	8.35
β^{DT} - Coef. Drenaje Transversal:	2.05	C - Coeficiente de Escorrentía:	0.62
β^{PM} - Coef. Drenajes Auxiliares:	2.34	K_t - Coeficiente de Uniformidad:	1.03

RESULTADOS

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olegario.castillo@uca.es

CAUDAL TOTAL (m^3/s): 8.73

2.- DATOS HIDRÁULICOS DE LAS SECCIONES DE CONTROL

HEC-RAS Plan: INNOMINADO1 River: INNOMINADO1 Reach: INNOMINADO1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
INNOMINADO1	1000	TR 5	1.08	69.30	69.79	69.66	69.82	0.030650	0.74	1.46	5.38	0.45
INNOMINADO1	1000	TR10	2.45	69.30	69.97	69.80	70.02	0.035144	0.99	2.52	6.98	0.51
INNOMINADO1	1000	TR 100	5.46	69.30	70.17	70.01	70.26	0.041264	1.37	4.29	12.91	0.58
INNOMINADO1	1000	TR 500	8.73	69.30	70.29	70.21	70.40	0.042956	1.59	5.98	15.04	0.61
INNOMINADO1	999	TR 5	1.08	69.06	69.27	69.26	69.33	0.072125	1.08	1.02	6.69	0.87
INNOMINADO1	999	TR10	2.45	69.06	69.37	69.37	69.48	0.076296	1.51	1.66	7.35	0.99
INNOMINADO1	999	TR 100	5.46	69.06	69.53	69.53	69.71	0.061127	1.91	2.99	8.60	1.00
INNOMINADO1	999	TR 500	8.73	69.06	69.67	69.67	69.91	0.047573	2.17	4.30	9.82	0.97
INNOMINADO1	998	TR 5	1.08	67.86	68.14	68.14	68.22	0.107653	1.41	0.87	5.06	1.00
INNOMINADO1	998	TR10	2.45	67.86	68.26	68.27	68.40	0.096507	1.85	1.56	6.35	1.11
INNOMINADO1	998	TR 100	5.46	67.86	68.40	68.47	68.67	0.115510	2.55	2.58	8.33	1.40
INNOMINADO1	998	TR 500	8.73	67.86	68.48	68.61	68.91	0.143943	3.23	3.31	9.43	1.68
INNOMINADO1	997	TR 5	1.08	65.31	65.39	65.44	65.54	0.263878	2.08	0.67	9.15	2.87
INNOMINADO1	997	TR10	2.45	65.31	65.43	65.52	65.76	0.298731	3.02	1.06	10.02	3.31
INNOMINADO1	997	TR 100	5.46	65.31	65.51	65.65	66.03	0.223555	3.70	1.92	11.63	3.12
INNOMINADO1	997	TR 500	8.73	65.31	65.58	65.75	66.22	0.179614	4.03	2.80	12.94	2.94
INNOMINADO1	996	TR 5	1.08	64.89	65.10	65.05	65.12	0.010152	0.61	1.86	15.42	0.52
INNOMINADO1	996	TR10	2.45	64.89	65.19	65.12	65.22	0.010833	0.82	3.23	16.74	0.55
INNOMINADO1	996	TR 100	5.46	64.89	65.30	65.22	65.36	0.013766	1.17	5.14	18.27	0.65
INNOMINADO1	996	TR 500	8.73	64.89	65.38	65.32	65.48	0.015926	1.45	6.70	19.05	0.72
INNOMINADO1	995	TR 5	1.08	64.59	64.75	64.75	64.80	0.100654	0.96	1.16	12.78	0.98
INNOMINADO1	995	TR10	2.45	64.59	64.82	64.82	64.89	0.087980	1.23	2.06	14.12	0.99
INNOMINADO1	995	TR 100	5.46	64.59	64.96	64.93	65.05	0.048014	1.35	4.30	17.49	0.81
INNOMINADO1	995	TR 500	8.73	64.59	65.10	65.02	65.19	0.029716	1.38	6.96	21.01	0.68
INNOMINADO1	994	TR 5	1.08	64.17	64.50	64.35	64.51	0.006306	0.41	2.62	12.16	0.28
INNOMINADO1	994	TR10	2.45	64.17	64.64	64.44	64.66	0.006247	0.55	4.58	15.60	0.30
INNOMINADO1	994	TR 100	5.46	64.17	64.85		64.87	0.005749	0.70	8.42	21.19	0.31
INNOMINADO1	994	TR 500	8.73	64.17	65.01		65.04	0.005492	0.82	12.52	31.07	0.32

HEC-RAS Plan: INNOMINADO1 River: INNOMINADO1 Reach: INNOMINADO1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
INNOMINADO1	993	TR 5	1.08	63.84	64.14	64.14	64.23	0.084686	1.27	0.85	5.21	0.98
INNOMINADO1	993	TR10	2.45	63.84	64.27	64.27	64.39	0.071455	1.57	1.60	6.54	0.97
INNOMINADO1	993	TR 100	5.46	63.84	64.46	64.46	64.63	0.063241	1.87	3.07	9.47	0.97
INNOMINADO1	993	TR 500	8.73	63.84	64.59	64.59	64.80	0.052571	2.09	4.51	11.29	0.93
INNOMINADO1	992	TR 5	1.08	62.82	63.23	63.04	63.24	0.004133	0.43	2.74	10.08	0.24
INNOMINADO1	992	TR10	2.45	62.82	63.43	63.14	63.45	0.003827	0.53	4.91	11.64	0.25
INNOMINADO1	992	TR 100	5.46	62.82	63.74	63.28	63.76	0.003593	0.64	8.90	15.11	0.25
INNOMINADO1	992	TR 500	8.73	62.82	63.99	63.40	64.01	0.002982	0.73	13.26	20.09	0.24
INNOMINADO1	988	TR 5	1.08	62.76	63.02	63.02	63.12	0.022374	1.40	0.77	3.88	1.03
INNOMINADO1	988	TR10	2.45	62.76	63.16	63.16	63.33	0.020287	1.81	1.39	4.61	1.06
INNOMINADO1	988	TR 100	5.46	62.76	63.40	63.40	63.64	0.014559	2.27	2.64	5.94	0.99
INNOMINADO1	988	TR 500	8.73	62.76	63.59	63.59	63.90	0.013162	2.63	3.86	7.18	0.99
INNOMINADO1	987.8	TR 5	1.08	62.43	62.55	62.64	62.83	0.147347	2.39	0.46	4.57	2.39
INNOMINADO1	987.8	TR10	2.45	62.43	62.63	62.76	63.06	0.126172	2.91	0.85	5.33	2.37
INNOMINADO1	987.8	TR 100	5.46	62.43	62.75	62.93	63.42	0.113485	3.62	1.51	6.22	2.40
INNOMINADO1	987.8	TR 500	8.73	62.43	62.84	63.09	63.68	0.101121	4.06	2.15	6.86	2.37
INNOMINADO1	987.6	TR 5	1.08	61.91	62.11	62.17	62.28	0.049614	1.75	0.59	3.68	1.47
INNOMINADO1	987.6	TR10	2.45	61.91	62.22	62.31	62.52	0.052497	2.37	1.02	4.23	1.62
INNOMINADO1	987.6	TR 100	5.46	61.91	62.38	62.53	62.88	0.054342	3.15	1.75	4.91	1.75
INNOMINADO1	987.6	TR 500	8.73	61.91	62.51	62.71	63.16	0.052999	3.62	2.45	5.50	1.80
INNOMINADO1	987.5	TR 5	1.08	61.86	62.02	62.11	62.31	0.130059	2.36	0.46	4.11	2.27
INNOMINADO1	987.5	TR10	2.45	61.86	62.22	62.25	62.35	0.031167	1.93	1.62	10.45	1.26
INNOMINADO1	987.5	TR 100	5.46	61.86	62.29	62.38	62.57	0.050145	2.75	2.45	12.20	1.64
INNOMINADO1	987.5	TR 500	8.73	61.86	62.33	62.48	62.80	0.075687	3.58	2.95	13.06	2.04
INNOMINADO1	987	TR 5	1.08	59.07	59.50	59.60	59.82	0.415931	2.50	0.43	1.42	1.45
INNOMINADO1	987	TR10	2.45	59.07	59.56	59.87	60.70	1.311603	4.72	0.52	1.55	2.61
INNOMINADO1	987	TR 100	5.46	59.07	60.02	60.23	60.69	0.423125	3.63	1.50	2.88	1.60
INNOMINADO1	987	TR 500	8.73	59.07	60.39	60.49	60.87	0.204496	3.06	2.85	4.20	1.18

HEC-RAS Plan: CHURRIANA River: DE LA CALERA Reach: CALERA

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
CALERA	1000	TR 5	2.88	93.03	93.47	93.39	93.54	0.067275	1.13	2.56	8.86	0.67
CALERA	1000	TR 10	3.96	93.03	93.54	93.46	93.62	0.069919	1.24	3.19	9.85	0.70
CALERA	1000	TR 100	9.07	93.03	93.77	93.67	93.88	0.065223	1.53	6.07	14.68	0.71
CALERA	1000	TR 500	14.79	93.03	93.91	93.83	94.08	0.068920	1.86	8.32	17.04	0.78
CALERA	999	TR 5	2.88	90.21	90.77	90.73	90.90	0.110391	1.60	1.80	5.23	0.87
CALERA	999	TR 10	3.96	90.21	90.86	90.82	91.01	0.102413	1.70	2.33	5.82	0.86
CALERA	999	TR 100	9.07	90.21	91.16	91.11	91.38	0.101253	2.12	4.29	7.64	0.90
CALERA	999	TR 500	14.79	90.21	91.47	91.36	91.67	0.087292	2.01	7.44	16.01	0.87
CALERA	998	TR 5	2.88	88.50	89.19	89.09	89.29	0.075387	1.44	2.00	5.06	0.73
CALERA	998	TR 10	3.96	88.50	89.28	89.19	89.41	0.080201	1.57	2.52	5.83	0.77
CALERA	998	TR 100	9.07	88.50	89.59	89.51	89.78	0.081109	1.93	4.71	8.56	0.83
CALERA	998	TR 500	14.79	88.50	89.75	89.75	90.04	0.097919	2.37	6.25	10.89	1.00
CALERA	997	TR 5	2.88	87.00	87.65	87.59	87.77	0.094831	1.55	1.86	5.03	0.81
CALERA	997	TR 10	3.96	87.00	87.75	87.68	87.89	0.087311	1.62	2.44	5.79	0.80
CALERA	997	TR 100	9.07	87.00	88.03	87.99	88.26	0.086832	2.11	4.30	7.74	0.90
CALERA	997	TR 500	14.79	87.00	88.28	88.22	88.54	0.069231	2.26	6.55	10.04	0.89
CALERA	996	TR 5	2.88	85.31	85.91	85.76	85.96	0.047418	0.99	2.90	9.22	0.56
CALERA	996	TR 10	3.96	85.31	85.97	85.84	86.03	0.052757	1.13	3.50	10.53	0.63
CALERA	996	TR 100	9.07	85.31	86.17	86.07	86.29	0.058434	1.51	6.02	14.97	0.76
CALERA	996	TR 500	14.79	85.31	86.27	86.27	86.45	0.081509	1.92	7.75	23.01	0.96
CALERA	995.48		Culvert									
CALERA	995	TR 5	2.88	84.72	85.17	85.17	85.30	0.019236	1.62	1.78	6.70	1.01
CALERA	995	TR 10	3.96	84.72	85.24	85.24	85.39	0.018510	1.75	2.26	7.38	1.01
CALERA	995	TR 100	9.07	84.72	85.48	85.48	85.70	0.015877	2.07	4.38	9.87	0.99
CALERA	995	TR 500	14.79	84.72	85.70	85.70	85.93	0.011615	2.15	7.81	22.84	0.88
CALERA	994	TR 5	2.88	82.95	83.19	83.19	83.24	0.025027	1.01	2.89	28.27	0.99
CALERA	994	TR 10	3.96	82.95	83.21	83.21	83.28	0.024668	1.14	3.53	28.70	1.02
CALERA	994	TR 100	9.07	82.95	83.31	83.31	83.41	0.019621	1.47	6.34	30.22	0.99

HEC-RAS Plan: CHURRIANA River: DE LA CALERA Reach: CALERA (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
CALERA	994	TR 500	14.79	82.95	83.39	83.39	83.54	0.018931	1.76	8.71	31.31	1.02
CALERA	993	TR 5	2.88	81.63	81.89	81.89	81.93	0.023860	0.97	3.02	32.11	0.97
CALERA	993	TR 10	3.96	81.63	81.91	81.91	81.97	0.023008	1.08	3.76	32.92	0.98
CALERA	993	TR 100	9.07	81.63	82.00	82.00	82.09	0.019721	1.40	6.70	35.39	0.98
CALERA	993	TR 500	14.79	81.63	82.07	82.07	82.20	0.017334	1.61	9.60	38.01	0.97
CALERA	992	TR 5	2.88	80.22	80.49	80.62	81.09	0.200117	3.43	0.84	6.03	2.93
CALERA	992	TR 10	3.96	80.22	80.53	80.66	81.09	0.287592	3.30	1.20	11.96	3.33
CALERA	992	TR 100	9.07	80.22	80.61	80.76	81.32	0.243786	3.77	2.50	20.41	3.24
CALERA	992	TR 500	14.79	80.22	80.66	80.83	81.48	0.259847	4.08	3.75	27.22	3.38
CALERA	991	TR 5	2.88	78.33	78.67	78.79	78.98	0.067132	2.47	1.17	5.99	1.79
CALERA	991	TR 10	3.96	78.33	78.77	78.84	78.99	0.055233	2.07	1.92	11.14	1.59
CALERA	991	TR 100	9.07	78.33	78.89	79.00	79.22	0.058733	2.56	3.55	15.73	1.72
CALERA	991	TR 500	14.79	78.33	78.98	79.14	79.39	0.056367	2.83	5.23	19.97	1.74
CALERA	990	TR 5	2.88	77.40	77.61	77.68	77.82	0.086337	2.05	1.40	11.61	1.88
CALERA	990	TR 10	3.96	77.40	77.63	77.72	77.90	0.098719	2.31	1.72	13.18	2.04
CALERA	990	TR 100	9.07	77.40	77.72	77.87	78.14	0.089087	2.90	3.25	19.52	2.08
CALERA	990	TR 500	14.79	77.40	77.79	77.96	78.34	0.088197	3.34	4.69	26.45	2.14
CALERA	989	TR 5	2.88	76.44	76.61	76.67	76.84	0.125878	2.13	1.36	14.11	2.19
CALERA	989	TR 10	3.96	76.44	76.63	76.71	76.90	0.112554	2.28	1.74	14.93	2.14
CALERA	989	TR 100	9.07	76.44	76.71	76.85	77.17	0.116974	3.02	3.01	17.53	2.32
CALERA	989	TR 500	14.79	76.44	76.78	76.96	77.39	0.111779	3.47	4.26	19.47	2.37
CALERA	988.4	TR 5	2.88	75.00	75.39	75.45	75.59	0.043420	2.01	1.44	7.29	1.44
CALERA	988.4	TR 10	3.96	75.00	75.43	75.51	75.68	0.044692	2.21	1.79	8.05	1.50
CALERA	988.4	TR 100	9.07	75.00	75.61	75.72	75.97	0.041523	2.67	3.40	10.88	1.52
CALERA	988.4	TR 500	14.79	75.00	75.74	75.89	76.18	0.042149	2.95	5.01	13.97	1.57
CALERA	988	TR 5	2.88	74.13	74.33	74.41	74.64	0.191312	2.46	1.17	13.35	2.66
CALERA	988	TR 10	3.96	74.13	74.35	74.45	74.72	0.178099	2.69	1.47	13.89	2.64
CALERA	988	TR 100	9.07	74.13	74.42	74.58	75.05	0.178029	3.51	2.59	16.47	2.82

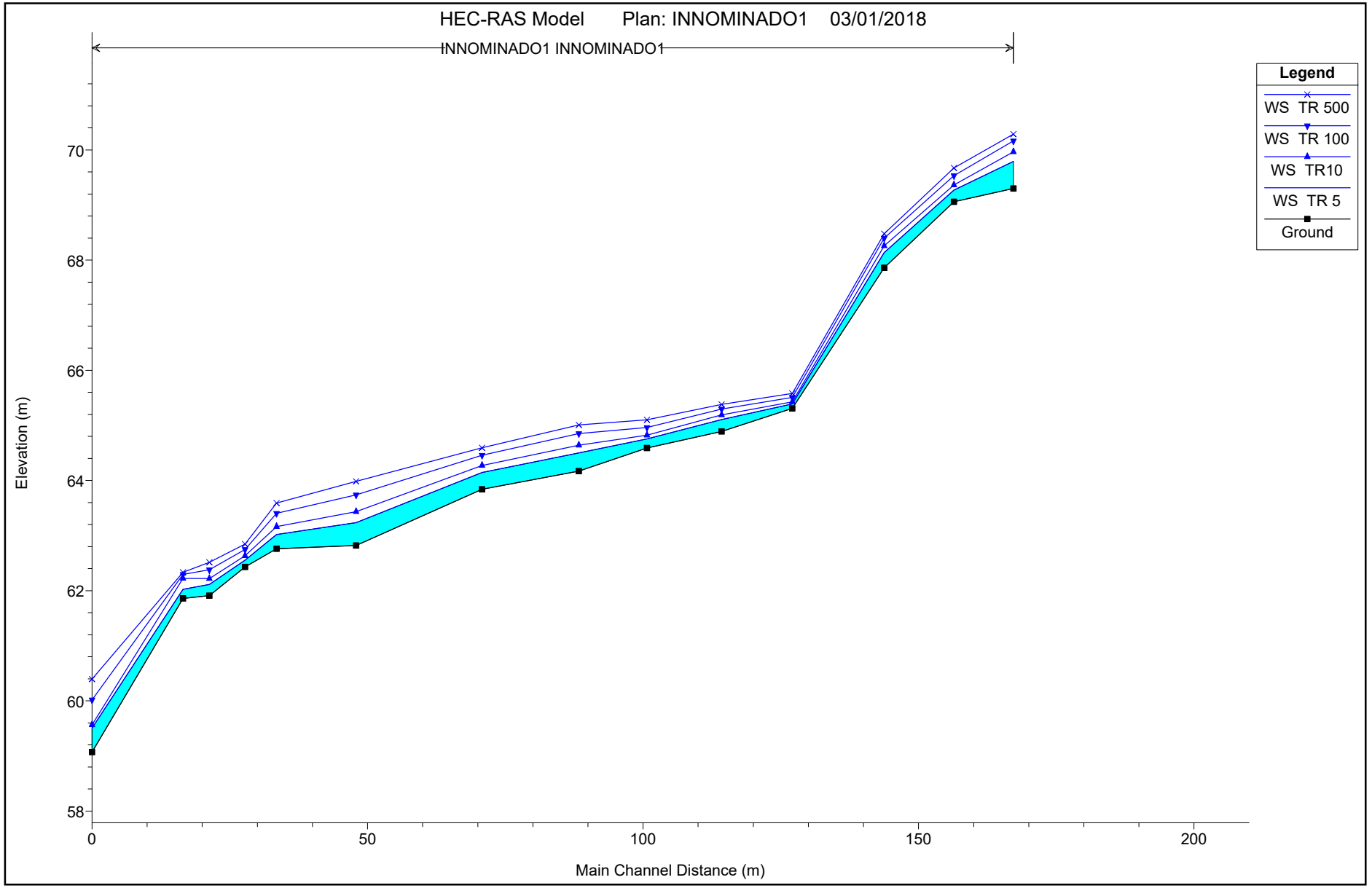
HEC-RAS Plan: CHURRIANA River: DE LA CALERA Reach: CALERA (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
CALERA	988	TR 500	14.79	74.13	74.49	74.70	75.28	0.153237	3.94	3.76	18.21	2.75
CALERA	985	TR 5	2.88	72.78	73.00	73.02	73.08	0.035334	1.26	2.29	20.26	1.19
CALERA	985	TR 10	3.96	72.78	73.03	73.05	73.13	0.037357	1.42	2.80	21.51	1.25
CALERA	985	TR 100	9.07	72.78	73.11	73.16	73.30	0.041480	1.91	4.75	25.29	1.41
CALERA	985	TR 500	14.79	72.78	73.17	73.25	73.44	0.047485	2.30	6.44	28.77	1.55
CALERA	984	TR 5	2.88	72.30	72.42	72.49	72.67	0.150065	2.24	1.29	14.17	2.37
CALERA	984	TR 10	3.96	72.30	72.44	72.53	72.73	0.128146	2.38	1.66	14.83	2.27
CALERA	984	TR 100	9.07	72.30	72.54	72.68	72.91	0.097958	2.68	3.38	20.61	2.11
CALERA	984	TR 500	14.79	72.30	72.62	72.74	73.03	0.094991	2.85	5.19	28.18	2.12
CALERA	983.9	TR 5	2.88	72.18	72.37	72.38	72.45	0.030817	1.28	2.24	17.34	1.14
CALERA	983.9	TR 10	3.96	72.18	72.42	72.42	72.49	0.023419	1.14	3.47	25.95	1.00
CALERA	983.9	TR 100	9.07	72.18	72.49	72.52	72.63	0.036515	1.67	5.45	32.31	1.30
CALERA	983.9	TR 500	14.79	72.18	72.54	72.61	72.76	0.041025	2.05	7.20	34.05	1.43
CALERA	983	TR 5	2.88	70.89	71.19	71.21	71.30	0.028497	1.46	1.97	11.80	1.14
CALERA	983	TR 10	3.96	70.89	71.21	71.27	71.37	0.036143	1.73	2.29	12.71	1.30
CALERA	983	TR 100	9.07	70.89	71.38	71.39	71.50	0.023463	1.55	5.85	27.73	1.08
CALERA	983	TR 500	14.79	70.89	71.46	71.48	71.63	0.021394	1.78	8.30	30.08	1.08
CALERA	982	TR 5	2.88	68.25	68.54	68.66	68.92	0.085335	2.76	1.04	5.45	2.01
CALERA	982	TR 10	3.96	68.25	68.61	68.73	68.98	0.061311	2.68	1.48	6.25	1.77
CALERA	982	TR 100	9.07	68.25	68.75	68.97	69.45	0.076293	3.73	2.43	7.83	2.13
CALERA	982	TR 500	14.79	68.25	68.88	69.19	69.74	0.069644	4.09	3.61	9.27	2.09
CALERA	981	TR 5	2.88	67.35	68.77	67.73	68.77	0.000039	0.11	25.44	47.33	0.05
CALERA	981	TR 10	3.96	67.35	68.82	67.80	68.82	0.000065	0.14	27.73	51.48	0.06
CALERA	981	TR 100	9.07	67.35	68.94	68.04	68.94	0.000200	0.26	34.57	58.22	0.11
CALERA	981	TR 500	14.79	67.35	69.03	68.23	69.03	0.000375	0.37	39.83	65.16	0.15
CALERA	980.6		Culvert									
CALERA	980.2	TR 5	2.88	64.11	64.99	64.99	65.06	0.020407	1.14	2.53	19.54	1.01

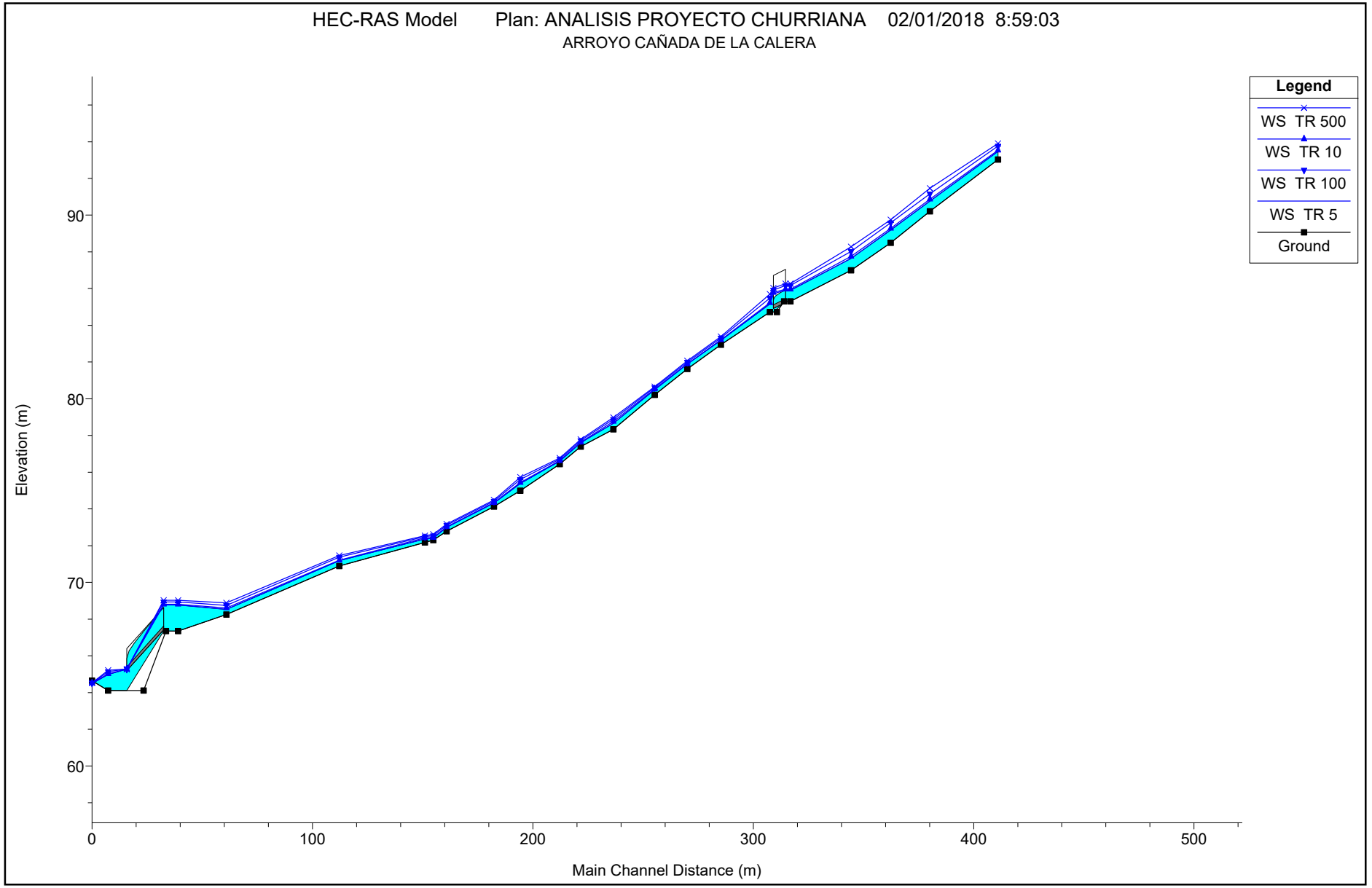
HEC-RAS Plan: CHURRIANA River: DE LA CALERA Reach: CALERA (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
CALERA	980.2	TR 10	3.96	64.11	65.03	65.03	65.10	0.020024	1.15	3.45	25.99	1.01
CALERA	980.2	TR 100	9.07	64.11	65.13	65.13	65.24	0.016171	1.41	6.43	30.17	0.98
CALERA	980.2	TR 500	14.79	64.11	65.22	65.22	65.34	0.016962	1.55	9.56	40.48	1.02
CALERA	980	TR 5	2.88	64.64	64.49	64.49	64.55	0.042042		2.55	20.67	0.00
CALERA	980	TR 10	3.96	64.64	64.52	64.52	64.60	0.036671		3.27	21.46	0.00
CALERA	980	TR 100	9.07	64.64	64.52	64.59	64.92	0.197338		3.25	21.43	0.00
CALERA	980	TR 500	14.79	64.64	64.53	64.59	65.54	0.489581		3.32	21.51	0.00

3.- PERFIL LONGITUDINAL

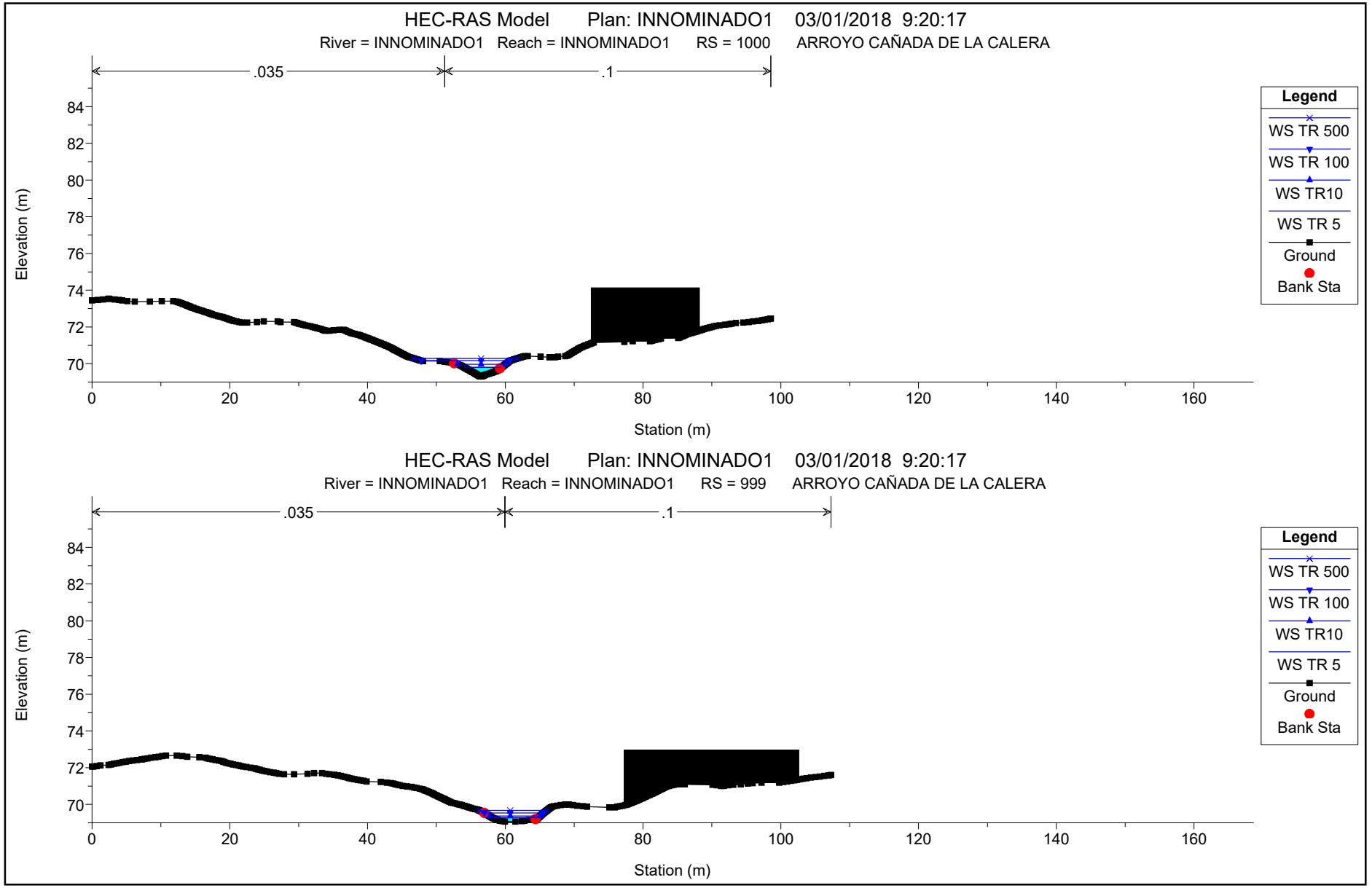


1 cm Horiz. = 10 m 1 cm Vert. = 1 m

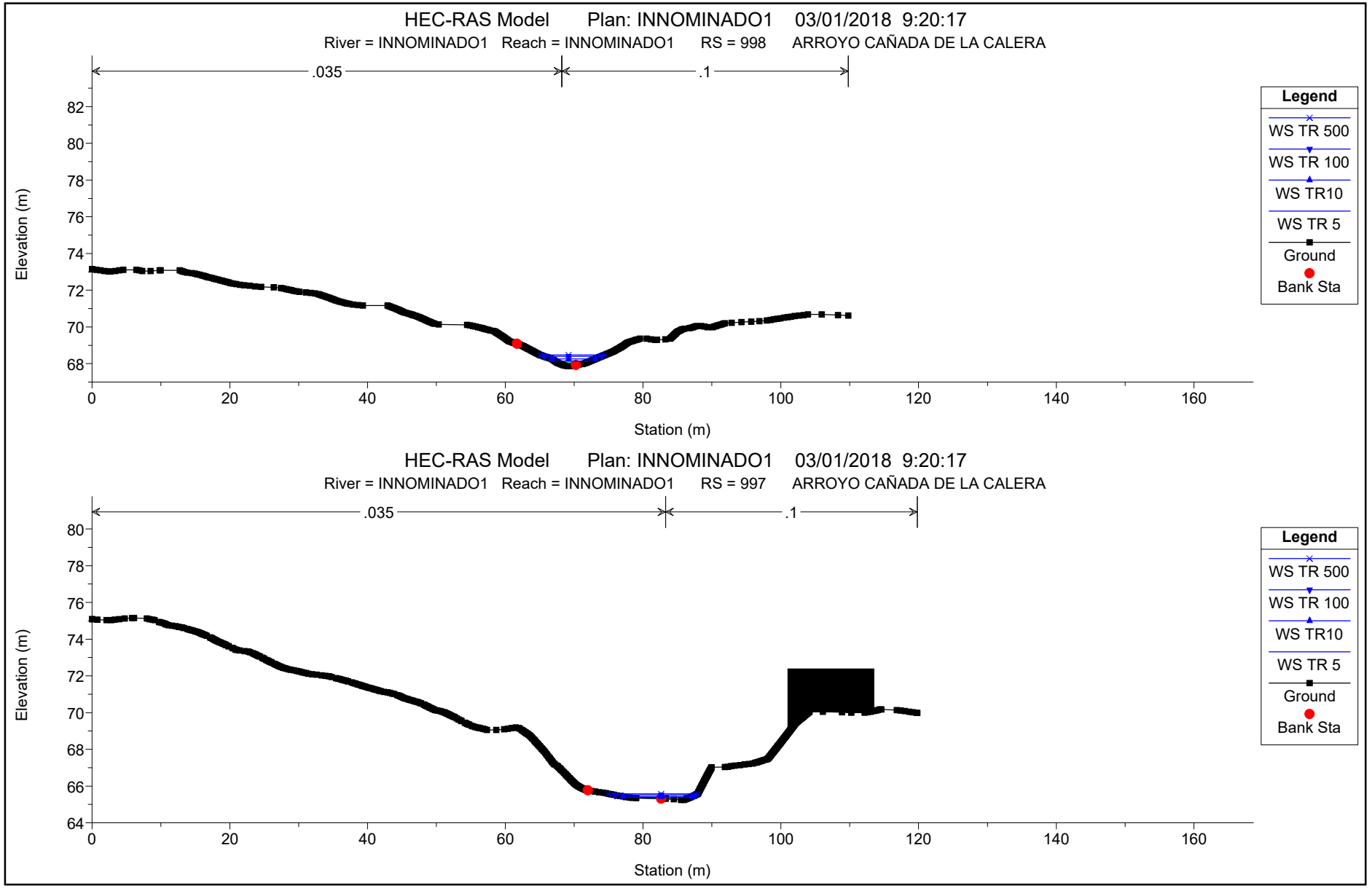


1 cm Horiz. = 25 m 1 cm Vert. = 3 m

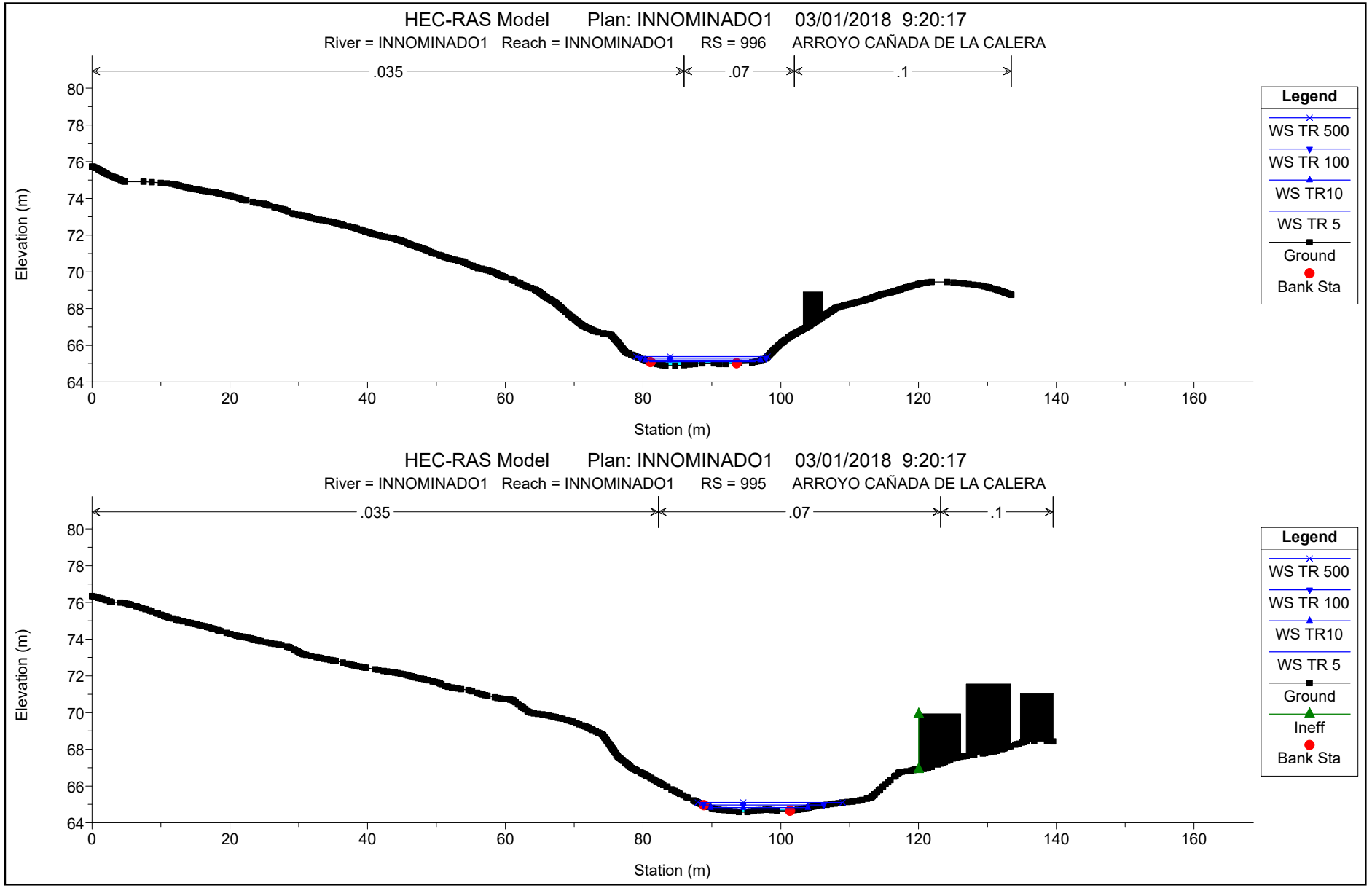
4.-PERFILES TRANSVERSALES



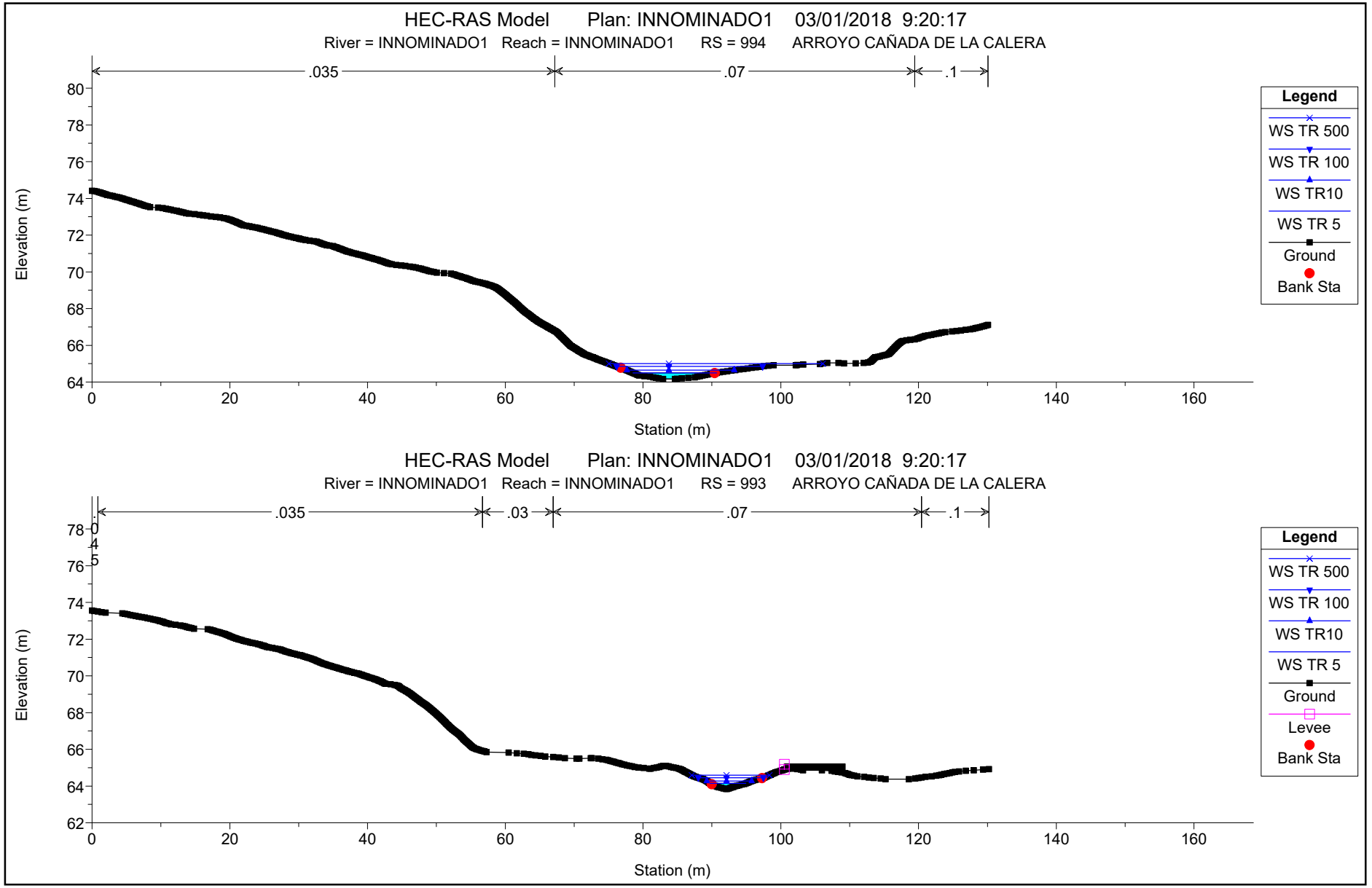
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



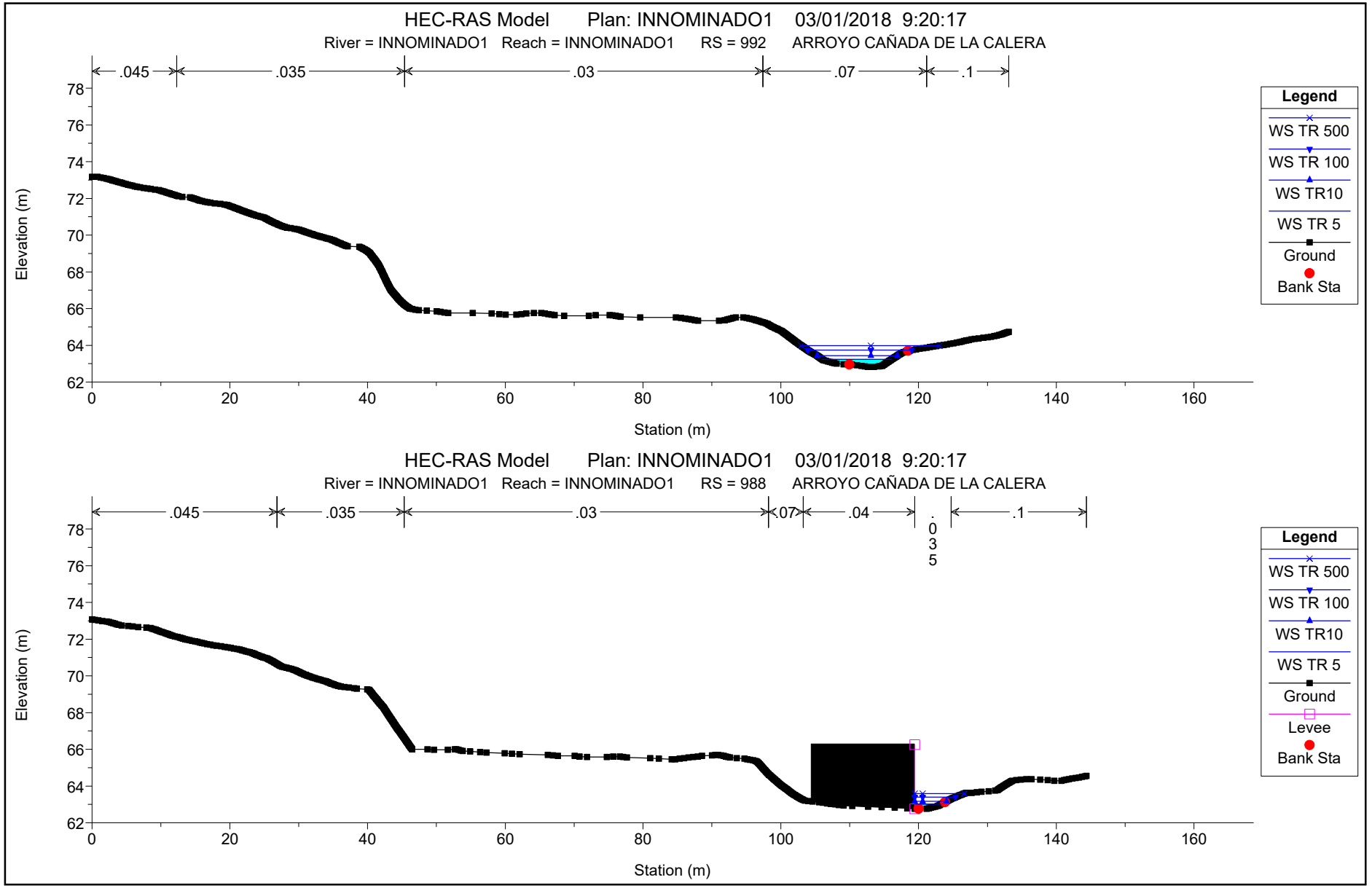
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



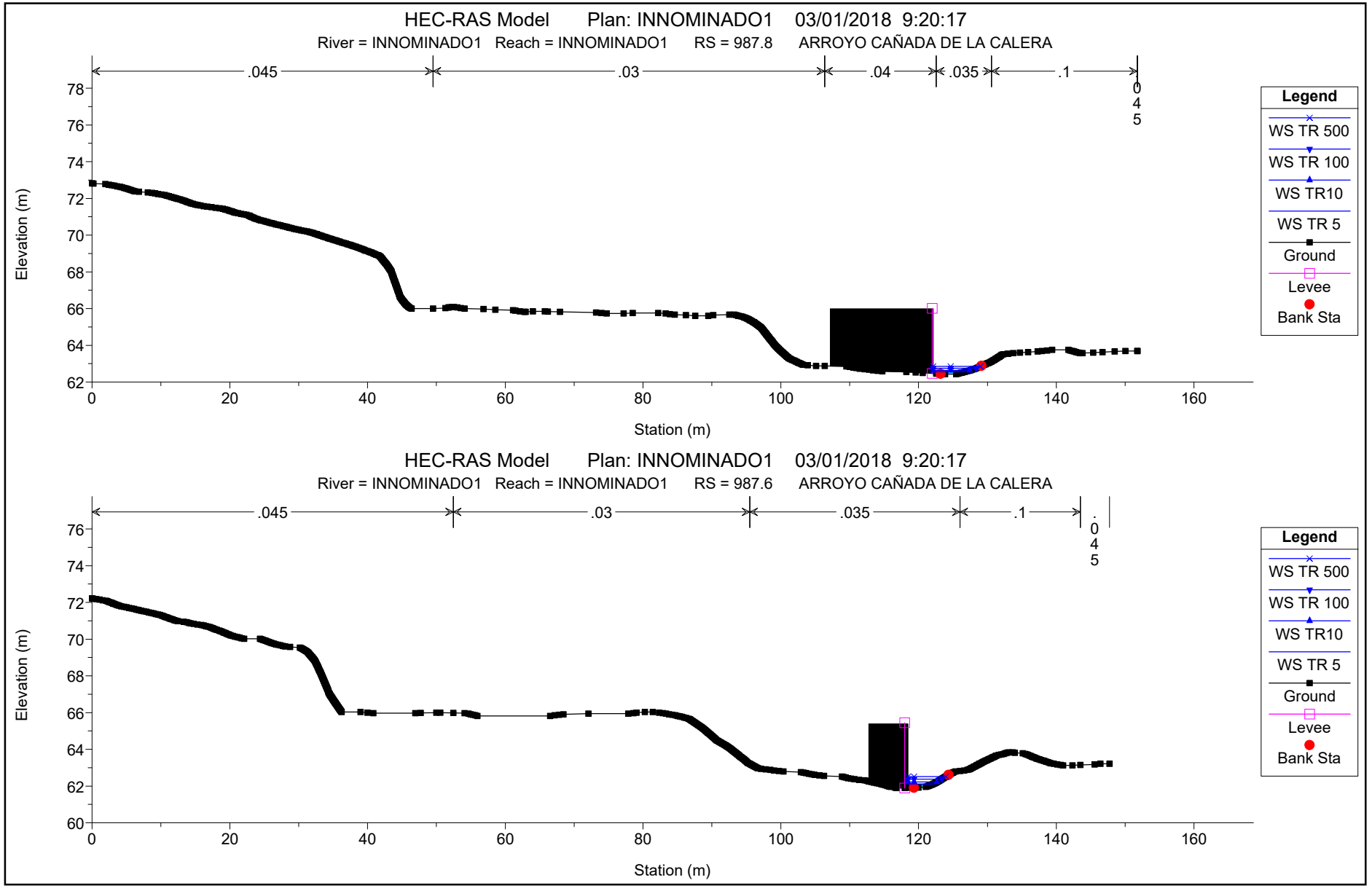
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



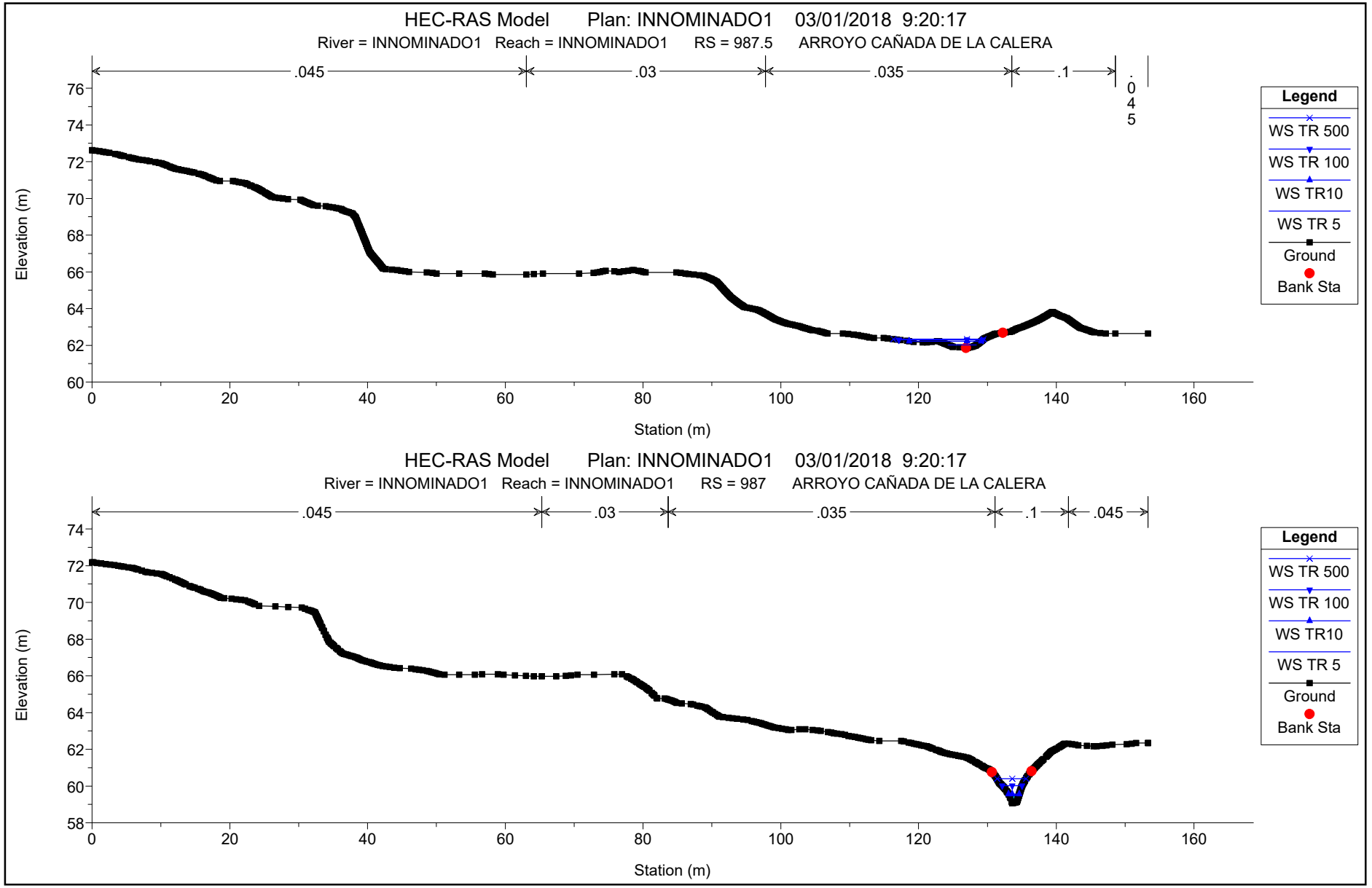
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



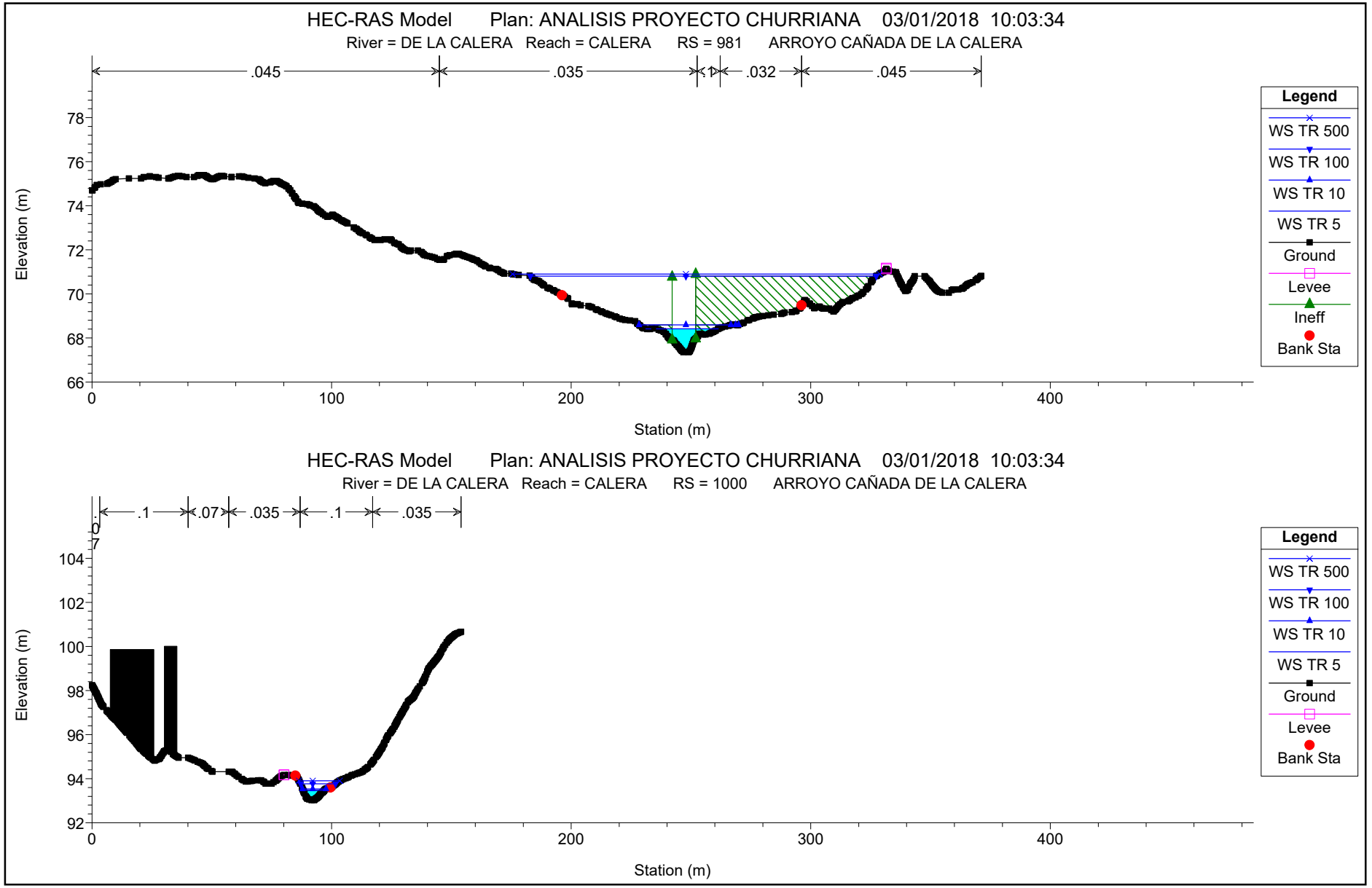
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



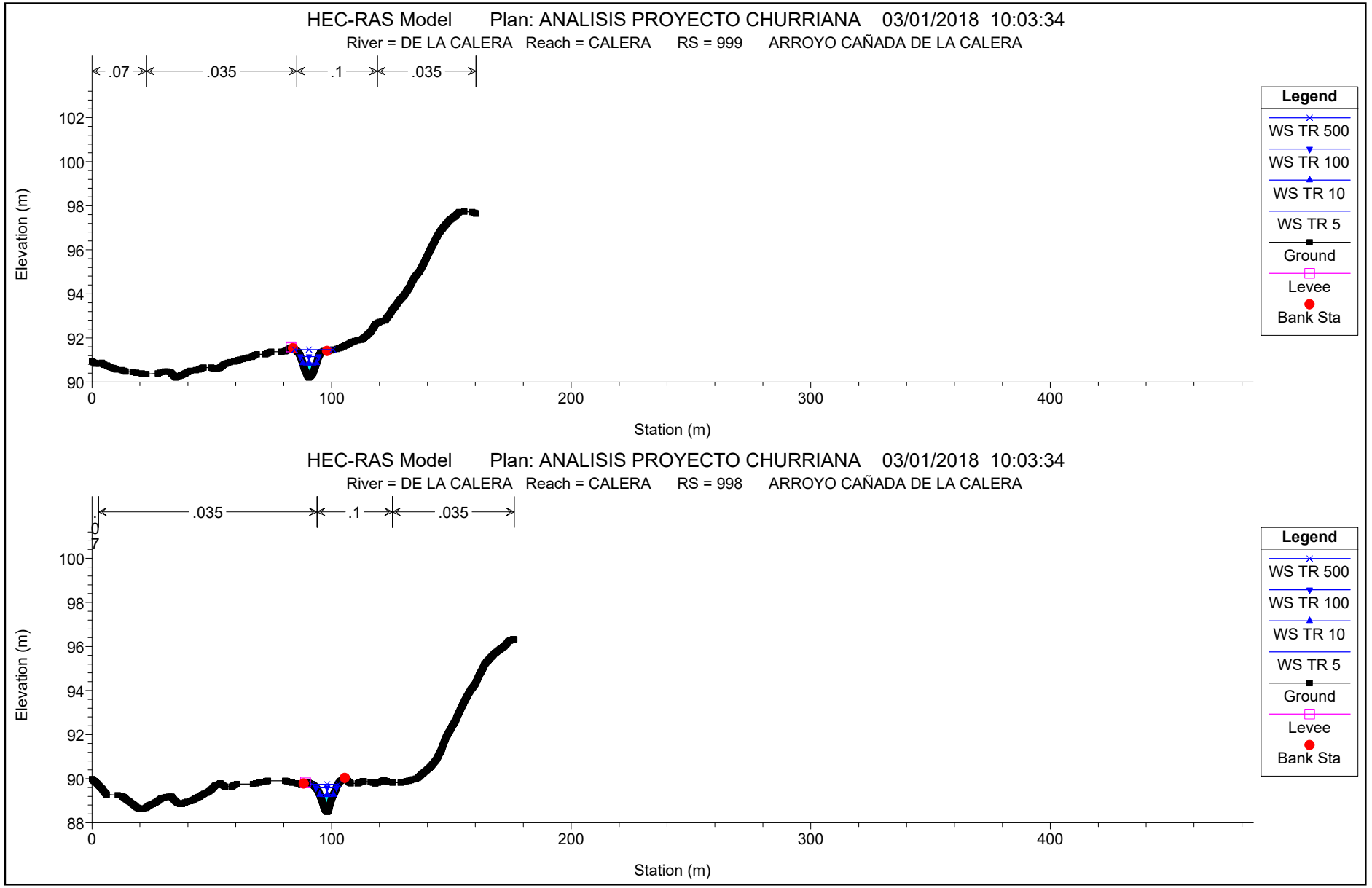
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



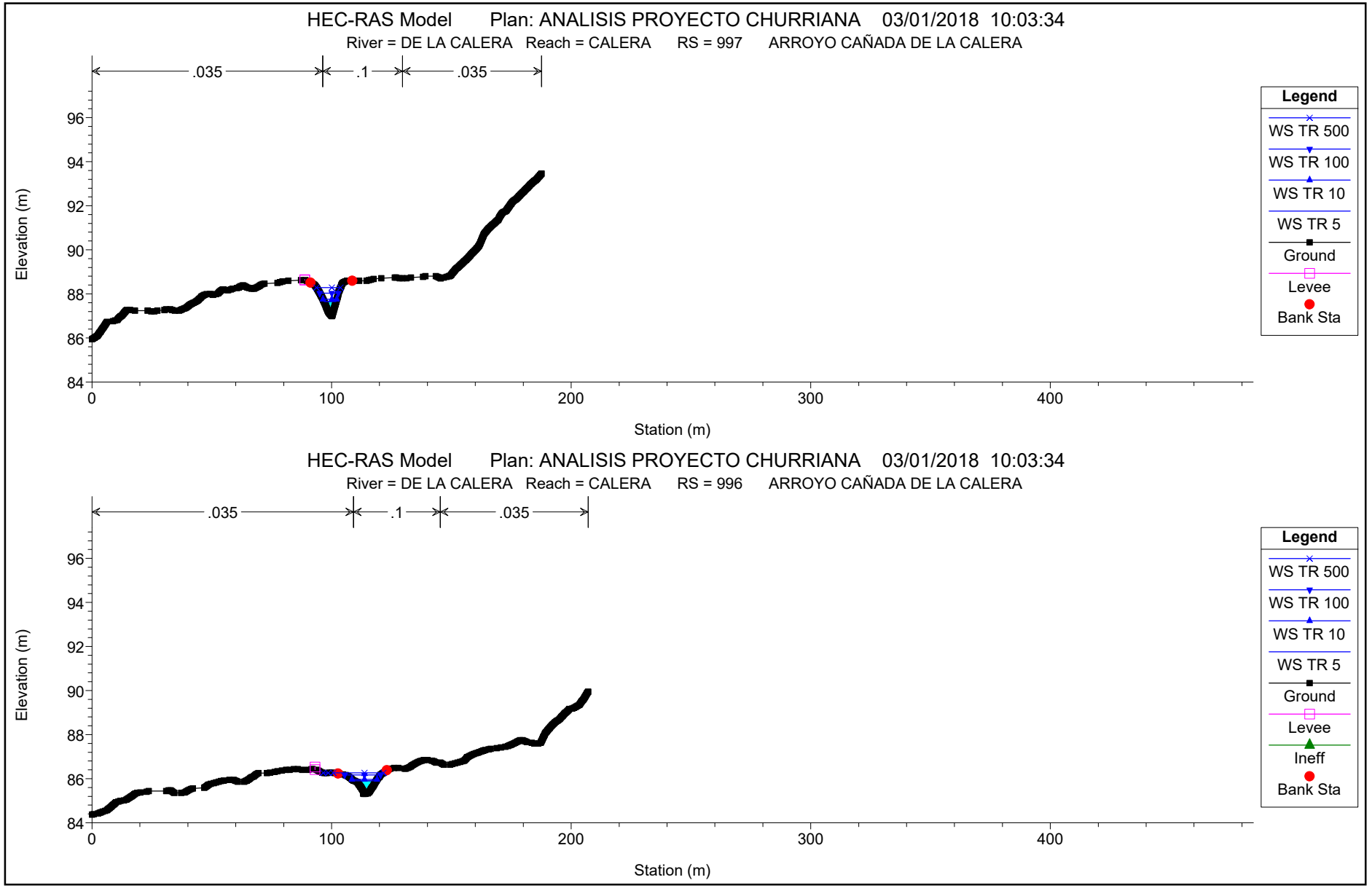
1 cm Horiz. = 8 m 1 cm Vert. = 3 m



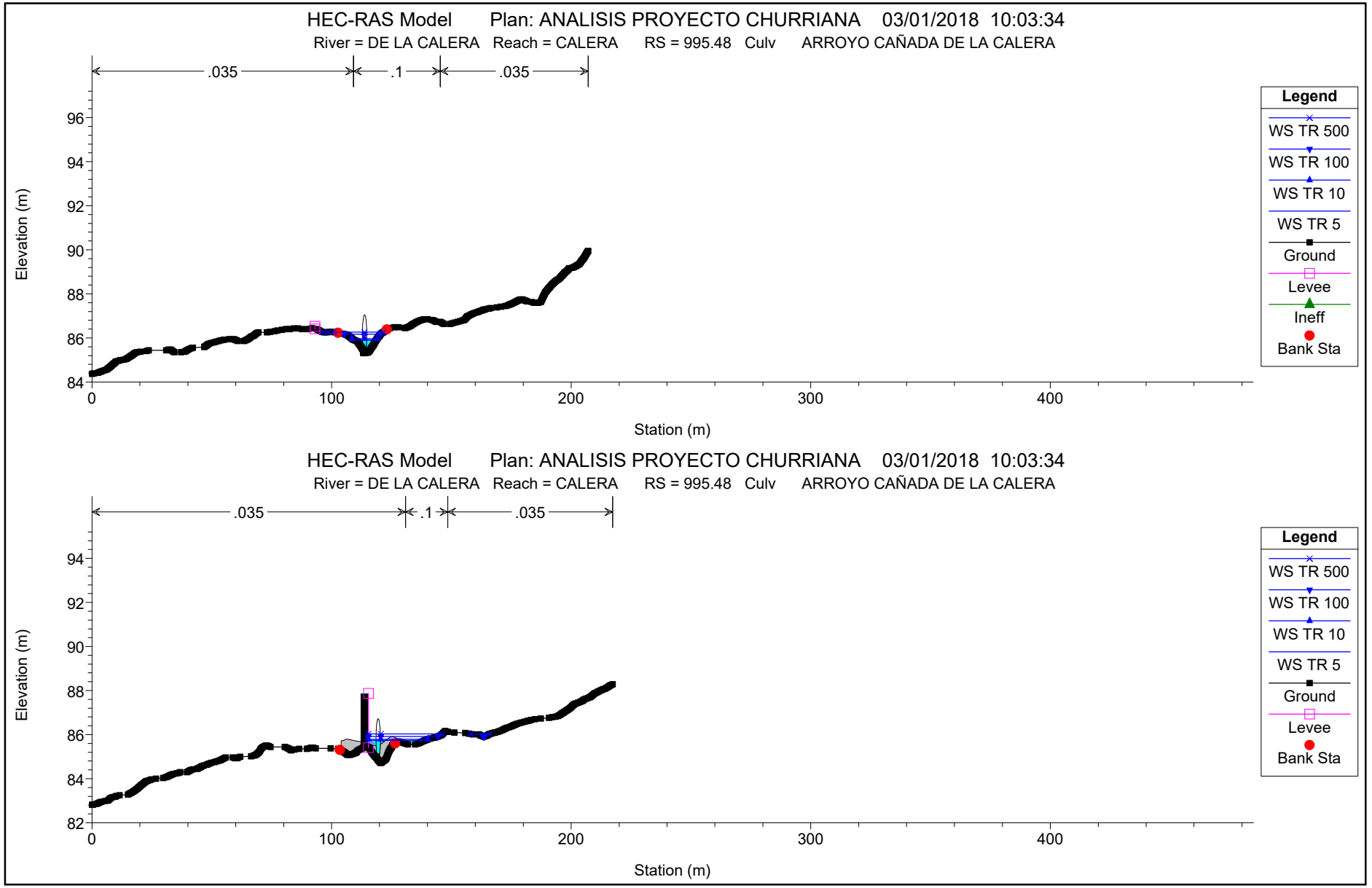
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



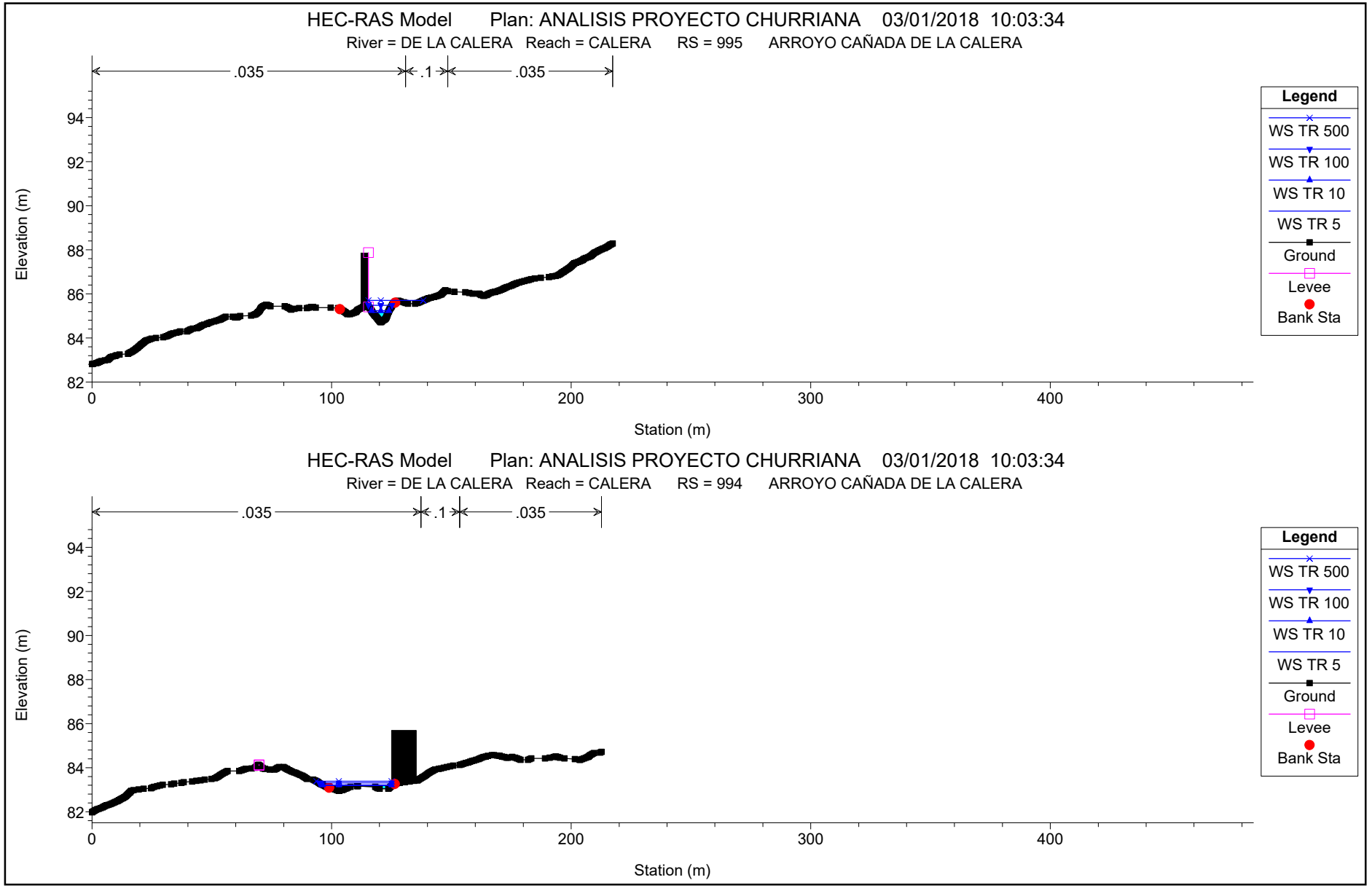
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



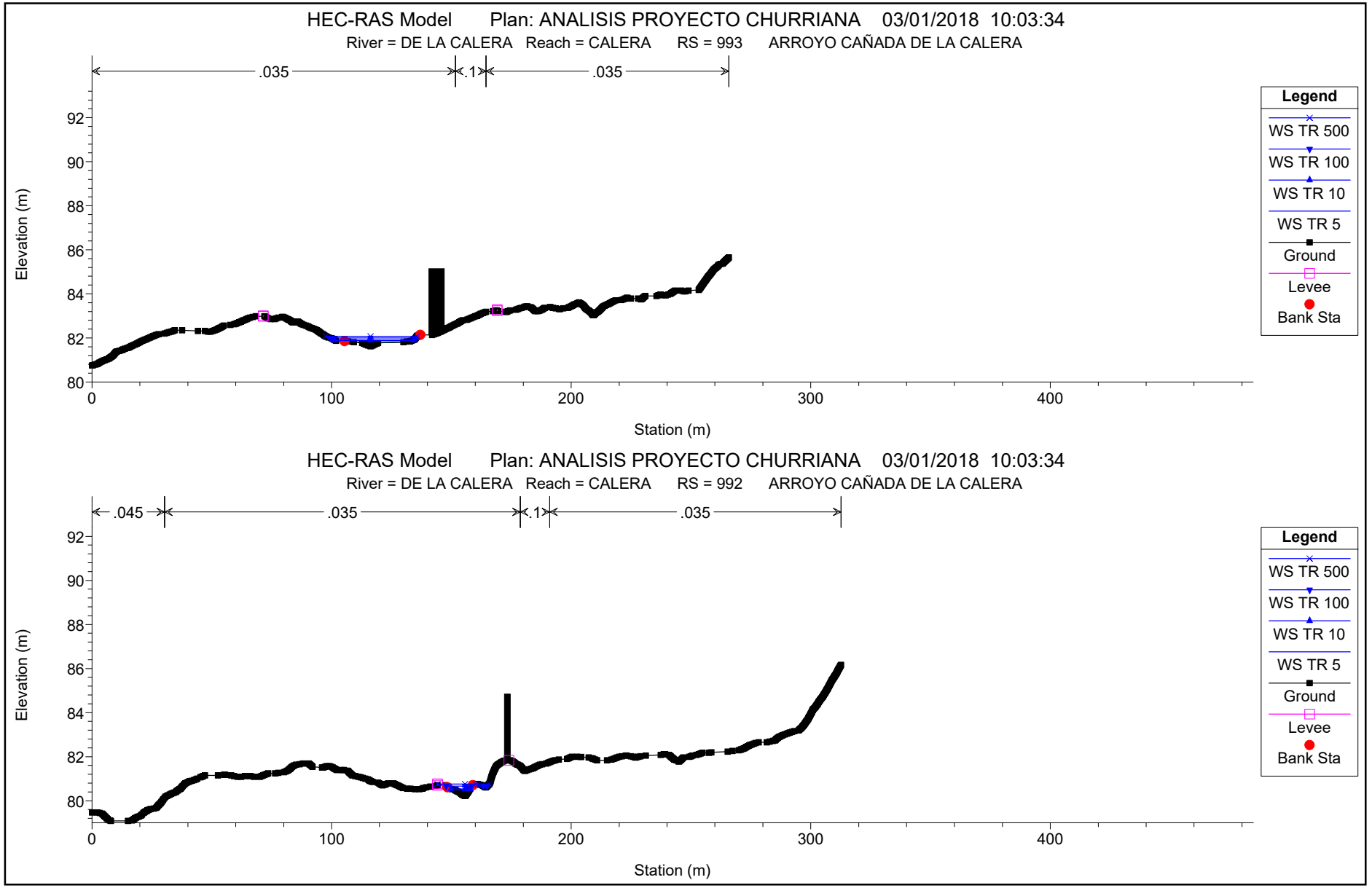
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



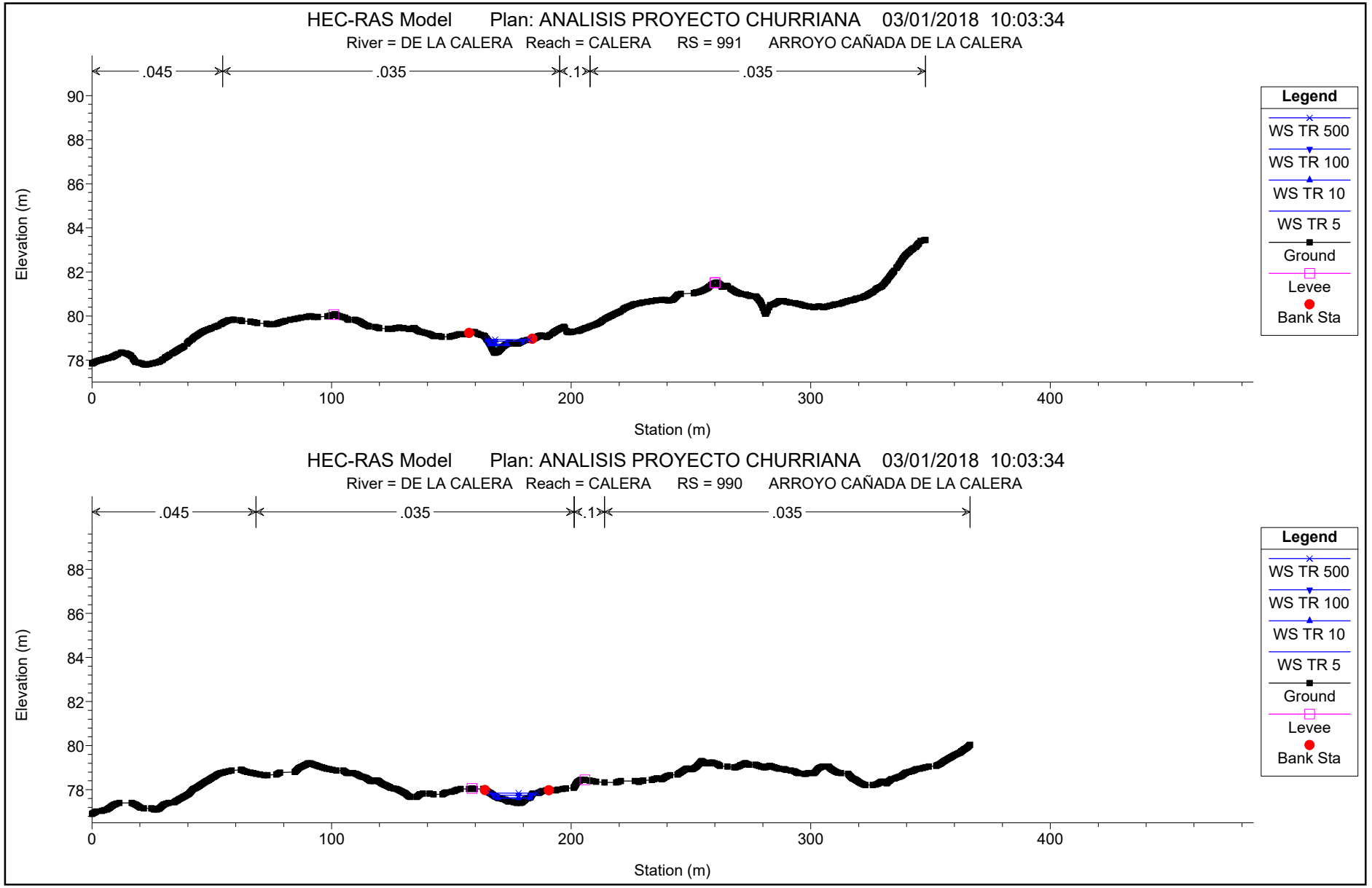
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



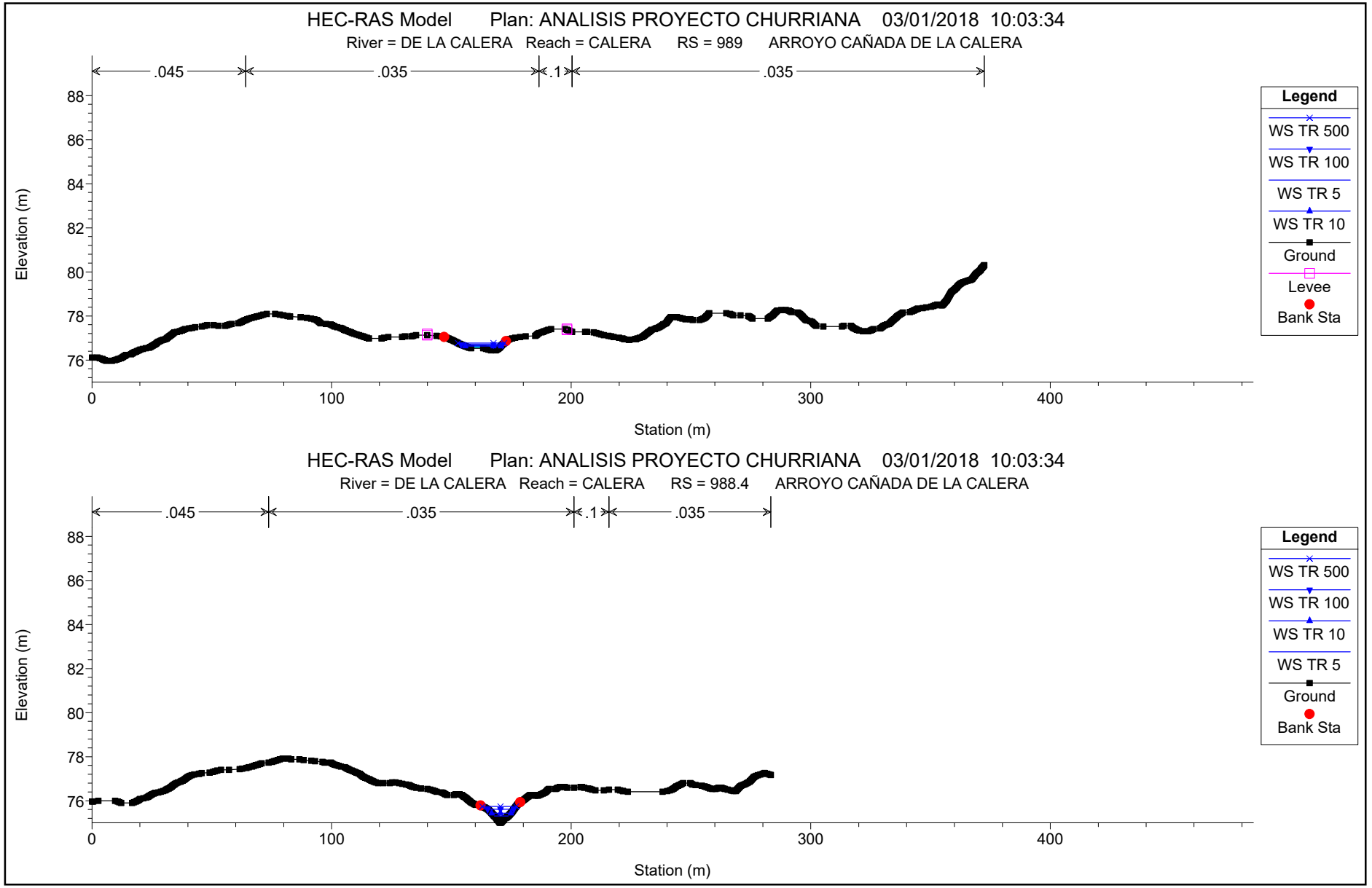
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



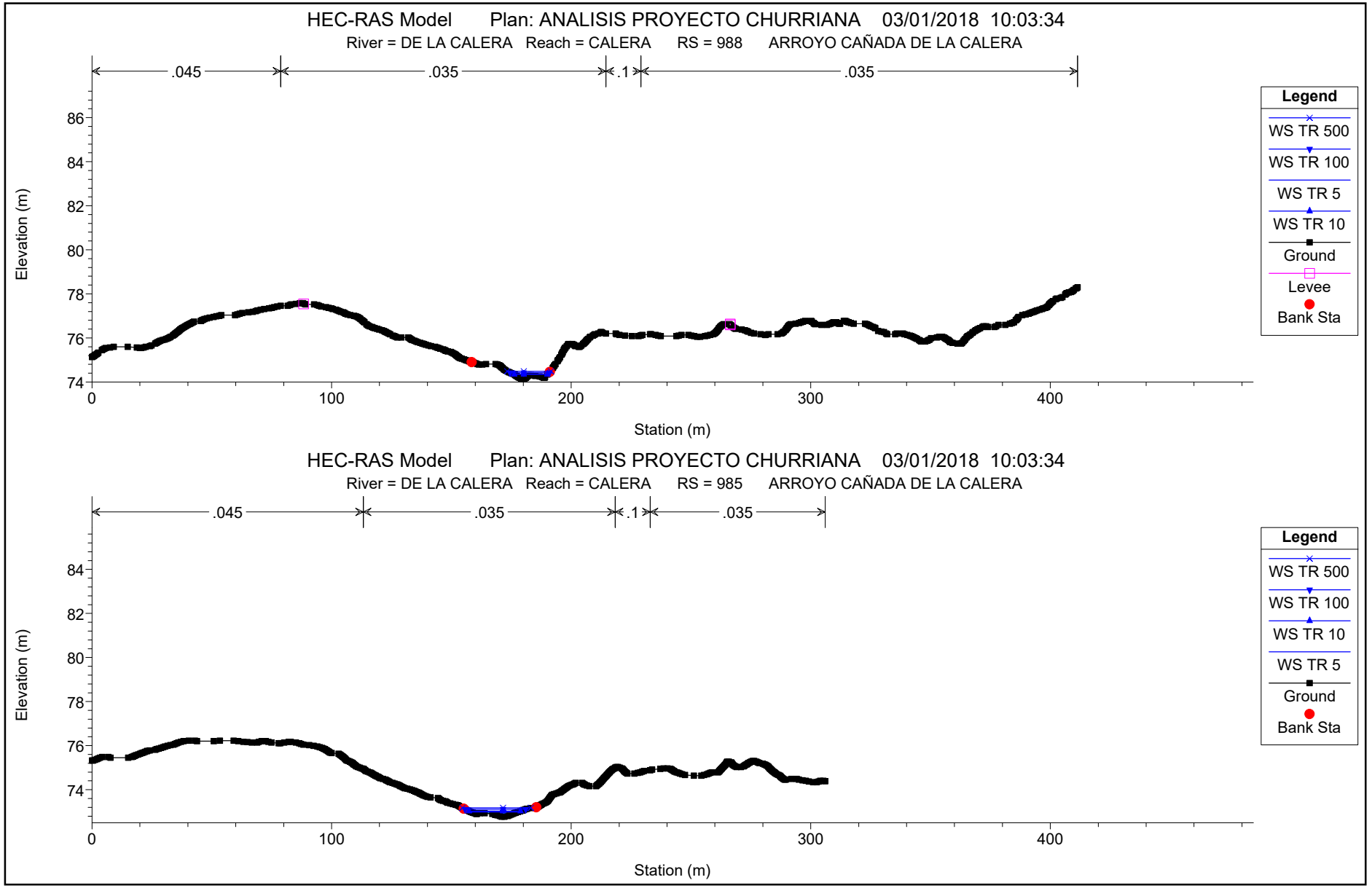
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



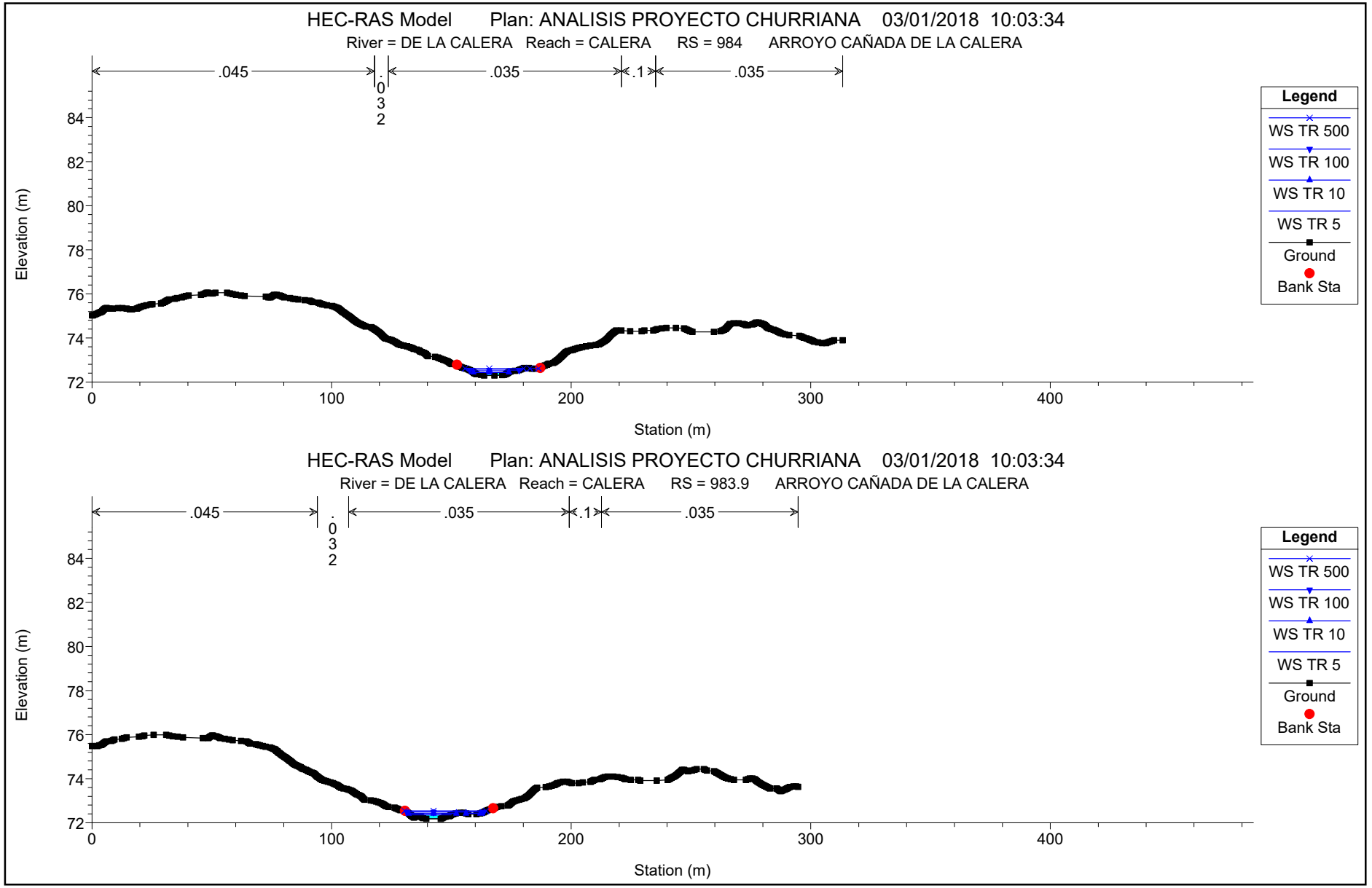
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



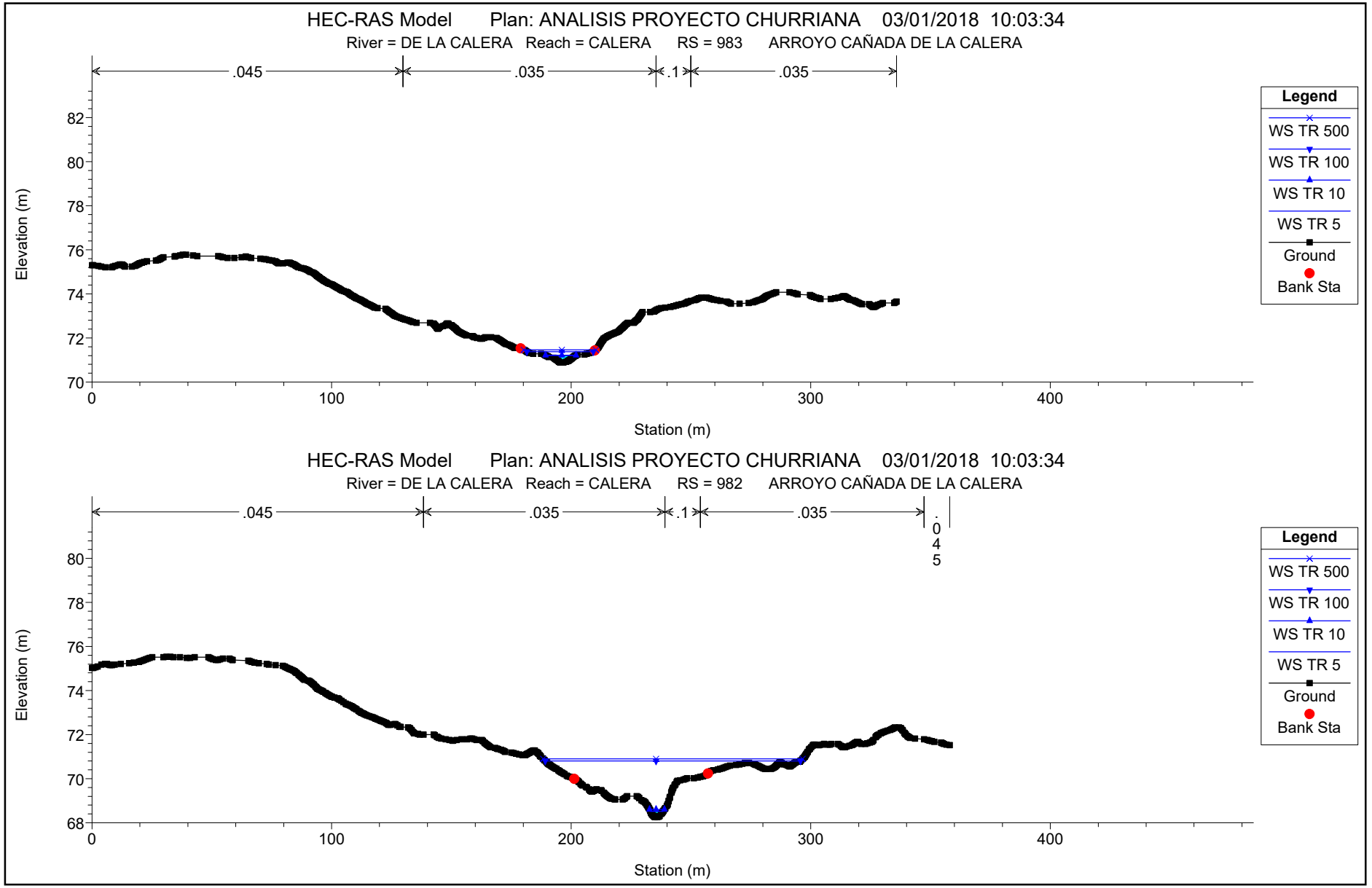
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



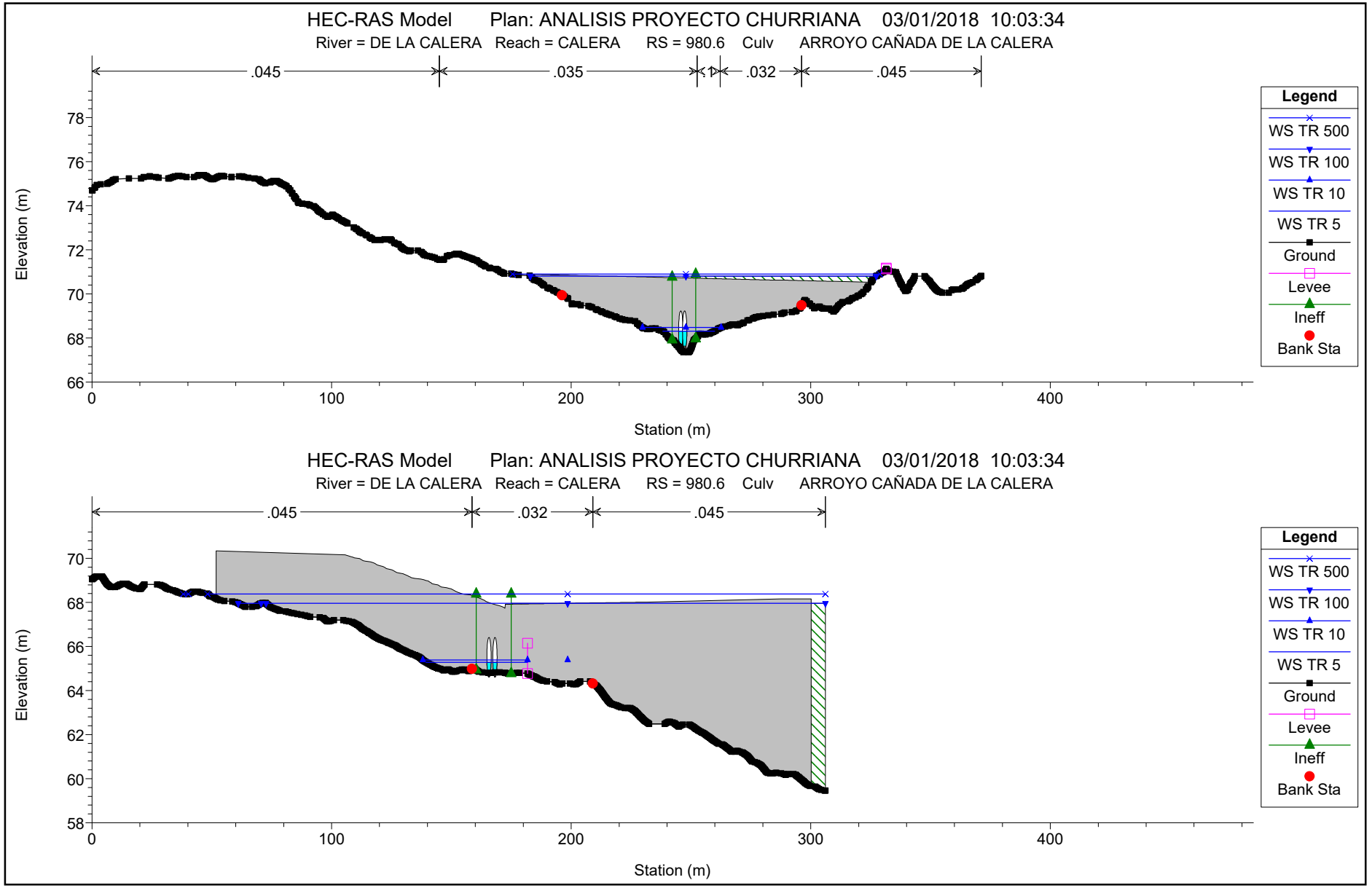
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



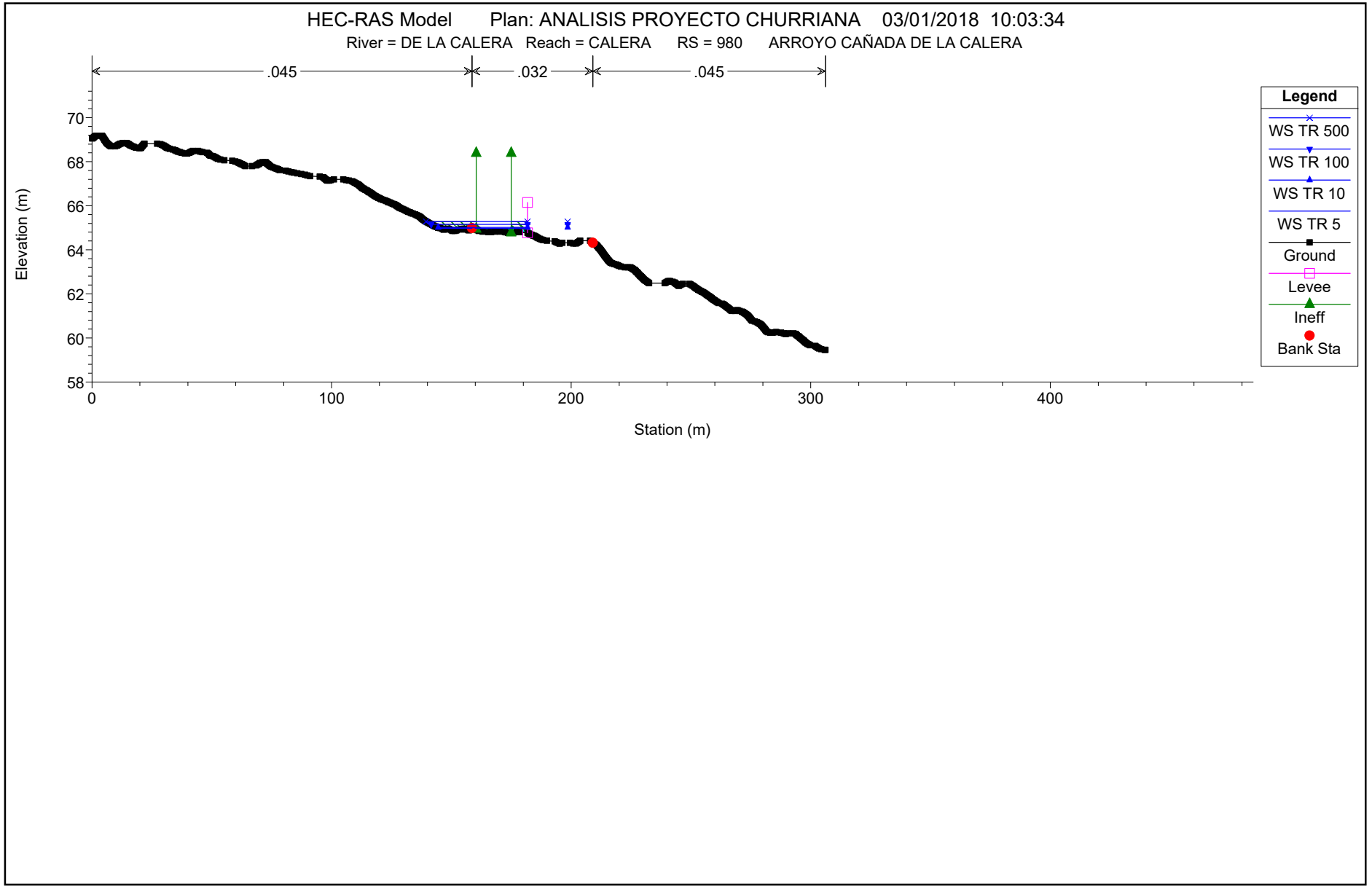
1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m



1 cm Horiz. = 23 m 1 cm Vert. = 2.5 m

5.-INFORME DE RESULTADOS GEOHECRAS

HIDROLOGICO HIDRAULICO.rep

HEC-RAS HEC-RAS 5.0.3 September 2016
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    X    X   X
XXXXXXX  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     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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PROJECT DATA
Project Title: HEC-RAS Model
Project File : HIDROLOGICO HIDRAULICO.prj
Run Date and Time: 02/01/2018 13:55:37

Project in SI units

Project Description:
CRS Info=<SpatialReference> <CoordinateSystem Code="3042" Unit="Meter" AcadCode="" /> <Registration OffsetX="0" OffsetY="0" OffsetZ="0" ScaleX="1" ScaleY="1" ScaleZ="1" /></SpatialReference>

PLAN DATA

Plan Title: PRUEBA2
Plan File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.p02

Geometry Title: Default Geometry
Geometry File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.g01

Flow Title   : Default Steady Flow
Flow File   : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.f01

Plan Description:
Default Scenario

Plan Summary Information:
Number of: Cross Sections = 14 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: Mixed Flow

FLOW DATA

Flow Title: Default Steady Flow
Flow File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.f01

Flow Data (m3/s)

River	Reach	RS	TR 5	TR10	TR 100	TR 500
INNOMINADO1	INNOMINADO1	1000	1.08	2.45	5.46	8.73

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
INNOMINADO1	INNOMINADO1	TR 5	Critical	Normal S = 0.110149
INNOMINADO1	INNOMINADO1	TR10	Critical	Normal S = 0.110149
INNOMINADO1	INNOMINADO1	TR 100	Critical	Normal S = 0.110149
INNOMINADO1	INNOMINADO1	TR 500	Critical	Normal S = 0.110149

Observed Water Surface Marks

River	Reach	RS	TR 5	TR10	TR 100	TR 500
INNOMINADO1	INNOMINADO1	987	.5			
INNOMINADO1	INNOMINADO1	987.5	.5			
INNOMINADO1	INNOMINADO1	987.6	.5			
INNOMINADO1	INNOMINADO1	987.8	.5			
INNOMINADO1	INNOMINADO1	988	.5			
INNOMINADO1	INNOMINADO1	992	.5			
INNOMINADO1	INNOMINADO1	993	.5			
INNOMINADO1	INNOMINADO1	994	.5			
INNOMINADO1	INNOMINADO1	995	.5			
INNOMINADO1	INNOMINADO1	996	.5			
INNOMINADO1	INNOMINADO1	997	.5			
INNOMINADO1	INNOMINADO1	998	.5			
INNOMINADO1	INNOMINADO1	999	.5			
INNOMINADO1	INNOMINADO1	1000	.5			

GEOMETRY DATA

Geometry Title: Default Geometry
Geometry File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.g01

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 1000

INPUT
Description:
Station Elevation Data num= 283

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.45	.83	73.47	1.6	73.5	2.36	73.53	2.5	73.53
3.3	73.5	3.92	73.47	4.38	73.44	5.12	73.41	6.21	73.38
8.41	73.38	10.12	73.41	11.8	73.41	12.25	73.38	12.49	73.35
12.73	73.32	12.97	73.29	13.19	73.26	13.4	73.23	13.61	73.2
13.8	73.17	13.99	73.14	14.18	73.11	14.37	73.08	14.56	73.05
14.64	73.04	14.78	73.02	15.02	72.99	15.27	72.96	15.52	72.93
15.77	72.9	16.02	72.87	16.27	72.84	16.53	72.81	16.78	72.78
17.01	72.75	17.21	72.72	17.42	72.69	17.65	72.66	17.94	72.63
18.25	72.6	18.57	72.57	18.93	72.54	19.18	72.51	19.4	72.48
19.62	72.45	19.84	72.42	20.07	72.39	20.29	72.36	20.56	72.33
20.96	72.3	21.36	72.27	21.77	72.24	22.51	72.24	23.96	72.27
24.94	72.3	26.97	72.3	27.38	72.27	29.32	72.27	29.56	72.24
29.8	72.21	30.04	72.18	30.31	72.15	30.61	72.12	30.94	72.09
31.33	72.06	31.7	72.03	32.04	72	32.37	71.97	32.68	71.94
32.97	71.91	33.25	71.88	33.5	71.85	33.69	71.82	33.88	71.79
34.44	71.79	35.1	71.82	35.91	71.85	36.55	71.85	36.72	71.82
36.89	71.79	37.07	71.76	37.24	71.73	37.41	71.7	37.61	71.67
37.87	71.64	38.18	71.61	38.54	71.58	38.88	71.55	39.08	71.52
39.31	71.49	39.53	71.46	39.73	71.43	39.94	71.4	40.14	71.37
40.34	71.34	40.55	71.31	40.75	71.28	40.95	71.25	41.16	71.22
41.36	71.19	41.56	71.16	41.76	71.13	41.97	71.1	42.16	71.07
42.35	71.04	42.53	71.01	42.72	70.98	42.91	70.95	43.09	70.92
43.27	70.89	43.44	70.86	43.58	70.83	43.71	70.8	43.85	70.77
43.86	70.77	44	70.74	44.15	70.71	44.3	70.68	44.45	70.65
44.61	70.62	44.76	70.59	44.91	70.56	45.07	70.53	45.23	70.5
45.39	70.47	45.55	70.44	45.71	70.41	45.87	70.38	46.14	70.35
46.4	70.32	46.67	70.29	46.94	70.26	47.2	70.23	47.47	70.2
47.74	70.17	48.07	70.14	50.5	70.14	51.2	70.11	51.72	70.08
52.12	70.05	52.49	70.02	52.6	70.01	52.83	69.99	53.11	69.96
53.36	69.93	53.52	69.9	53.67	69.87	53.82	69.84	53.97	69.81
54.12	69.78	54.27	69.75	54.39	69.72	54.53	69.69	54.68	69.66
54.82	69.63	54.96	69.6	55.11	69.57	55.25	69.54	55.39	69.51
55.53	69.48	55.68	69.45	55.82	69.42	55.96	69.39	56.1	69.36
56.24	69.33	56.3	69.32	56.38	69.3	56.58	69.3	56.74	69.33
56.9	69.36	57.06	69.39	57.29	69.42	57.57	69.45	57.83	69.48
58.07	69.51	58.3	69.54	58.56	69.57	58.69	69.6	58.81	69.63
58.92	69.66	59.04	69.69	59.15	69.72	59.24	69.74	59.27	69.75
59.38	69.78	59.49	69.81	59.59	69.84	59.7	69.87	59.81	69.9
59.91	69.93	60.01	69.96	60.11	69.99	60.21	70.02	60.31	70.05
60.41	70.08	60.5	70.11	60.61	70.14	60.72	70.17	60.98	70.2
61.25	70.23	61.51	70.26	61.77	70.29	62.03	70.32	62.29	70.35
62.55	70.38	62.81	70.41	63.27	70.41	65.11	70.38	66.4	70.35
67.19	70.35	67.67	70.38	68.72	70.41	68.98	70.44	69.11	70.47
69.25	70.5	69.38	70.53	69.52	70.56	69.65	70.59	69.78	70.62
69.92	70.65	70.05	70.68	70.19	70.71	70.32	70.74	70.46	70.77
70.59	70.8	70.73	70.83	70.86	70.86	71.03	70.89	71.23	70.92
71.43	70.95	71.63	70.98	71.83	71.01	72.03	71.04	72.23	71.07

72.44	71.1	72.64	71.13	72.84	71.16	77.29	71.19	78.5	71.22
81	71.22	81.32	71.25	81.64	71.28	81.96	71.31	82.28	71.34
82.61	71.37	85.11	71.4	85.3	71.43	85.49	71.46	85.67	71.49
85.86	71.52	86.05	71.55	86.23	71.58	86.46	71.61	86.71	71.64
87.05	71.67	87.31	71.7	87.56	71.73	87.81	71.76	88.06	71.79
88.31	71.82	88.56	71.85	88.79	71.88	89.04	71.91	89.35	71.94
89.67	71.97	89.98	72	90.31	72.03	90.64	72.06	91.09	72.09
91.91	72.12	92.48	72.15	92.82	72.18	93.48	72.21	94.56	72.24
95.35	72.27	95.95	72.3	96.71	72.33	97.26	72.36	97.68	72.39
98.1	72.42	98.45	72.45	98.54	72.46				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	51.2	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
52.6	59.24	10.78	10.78	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
72.49	88.18	74.13

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 999

INPUT
Description:
Station Elevation Data num= 260

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.06	.2	72.06	.67	72.09	1.23	72.12	2.39	72.15
2.79	72.18	3.19	72.21	3.58	72.24	3.99	72.27	4.44	72.3
4.91	72.33	5.4	72.36	5.94	72.39	6.53	72.42	7.18	72.45
7.28	72.46	7.62	72.48	8.06	72.51	8.57	72.54	9.2	72.57
9.67	72.6	10.18	72.63	10.75	72.66	12.28	72.66	13.1	72.63
13.82	72.6	15.57	72.57	16.48	72.54	16.78	72.51	17.11	72.48
17.48	72.45	17.9	72.42	18.38	72.39	18.8	72.36	19.02	72.33
19.24	72.3	19.49	72.27	19.77	72.24	20.1	72.21	20.47	72.18
20.89	72.15	21.26	72.12	21.57	72.09	21.93	72.06	22.42	72.03
23.04	72	23.56	71.97	23.81	71.94	24.07	71.91	24.35	71.88
24.68	71.85	25.03	71.82	25.41	71.79	25.84	71.76	26.37	71.73
26.75	71.7	27.13	71.67	27.88	71.64	29.32	71.64	31.3	71.67
32.25	71.7	33.4	71.7	33.98	71.67	34.44	71.64	35.2	71.61
35.7	71.58	36.13	71.55	36.49	71.52	36.78	71.49	37.08	71.46
37.37	71.43	37.68	71.4	38.09	71.37	38.53	71.34	38.98	71.31
39.43	71.28	39.87	71.25	41.91	71.22	42.8	71.19	43.42	71.16
43.75	71.13	44.05	71.1	44.36	71.07	44.67	71.04	45.1	71.01
45.73	70.98	46.41	70.95	46.76	70.92	47.15	70.89	47.6	70.86
47.92	70.83	48.11	70.8	48.31	70.77	48.5	70.74	48.69	70.71
48.89	70.68	49.08	70.65	49.27	70.62	49.44	70.59	49.6	70.56

49.76	70.53	49.93	70.5	50.09	70.47	50.25	70.44	50.42	70.41
50.58	70.38	50.75	70.35	50.92	70.32	51.09	70.29	51.16	70.28
51.27	70.26	51.44	70.23	51.62	70.2	51.79	70.17	51.96	70.14
52.17	70.11	52.44	70.08	52.72	70.05	53.02	70.02	53.34	69.99
53.67	69.96	53.95	69.93	54.2	69.9	54.46	69.87	54.71	69.84
54.97	69.81	55.25	69.78	55.58	69.75	55.95	69.72	56.13	69.69
56.31	69.66	56.47	69.63	56.63	69.6	56.78	69.57	56.93	69.54
56.98	69.53	57.08	69.51	57.22	69.48	57.37	69.45	57.49	69.42
57.62	69.39	57.74	69.36	57.87	69.33	57.99	69.3	58.13	69.27
58.29	69.24	58.49	69.21	58.69	69.18	58.9	69.15	59.19	69.12
59.57	69.09	59.95	69.06	61.47	69.06	62.4	69.09	62.8	69.12
63.39	69.15	64.25	69.18	64.42	69.19	64.62	69.21	64.71	69.24
64.8	69.27	64.88	69.3	64.97	69.33	65.05	69.36	65.14	69.39
65.22	69.42	65.31	69.45	65.4	69.48	65.5	69.51	65.59	69.54
65.69	69.57	65.79	69.6	65.89	69.63	65.99	69.66	66.1	69.69
66.2	69.72	66.31	69.75	66.42	69.78	66.52	69.81	66.65	69.84
66.82	69.87	67.07	69.9	67.5	69.93	68.04	69.96	68.68	69.99
69.23	69.99	69.82	69.96	70.44	69.93	71.3	69.9	71.87	69.87
75.1	69.84	75.88	69.84	76.27	69.87	76.65	69.9	77.04	69.93
77.42	69.96	77.64	69.99	77.85	70.02	78.05	70.05	78.25	70.08
78.45	70.11	78.64	70.14	78.84	70.17	79.03	70.2	79.22	70.23
79.41	70.26	79.58	70.29	79.75	70.32	79.91	70.35	80.09	70.38
80.26	70.41	80.44	70.44	80.61	70.47	80.79	70.5	80.97	70.53
81.16	70.56	81.34	70.59	81.51	70.62	81.67	70.65	81.82	70.68
81.98	70.71	82.14	70.74	82.3	70.77	82.46	70.8	82.63	70.83
82.79	70.86	82.95	70.89	83.11	70.92	83.28	70.95	83.45	70.98
83.8	71.01	84.15	71.04	84.5	71.07	85.28	71.1	86.07	71.1
90.09	71.07	90.7	71.04	91.3	71.01	91.76	71.01	92.42	71.04
93.11	71.07	94.19	71.1	95.21	71.13	95.91	71.16	97.21	71.19
99.77	71.19	100.33	71.22	100.92	71.25	101.51	71.28	101.95	71.31
102.39	71.34	102.83	71.37	103.26	71.4	103.75	71.43	104.39	71.46
105.03	71.49	105.65	71.52	106.3	71.55	106.94	71.58	107.28	71.6

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	59.95	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
56.98	64.42	12.65	12.65	12.65	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
77.25	102.62	72.96

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 998

INPUT
Description:

Station Elevation Data num= 307

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.15	.09	73.14	.64	73.11	1.23	73.08	1.8	73.05
2.39	73.02	2.69	73.02	3.36	73.05	3.97	73.08	4.54	73.11
6.45	73.11	6.86	73.08	7.27	73.05	8.51	73.05	9.81	73.08
9.95	73.08	12.75	73.08	13	73.05	13.19	73.02	13.4	72.99
13.81	72.96	14.51	72.93	14.93	72.9	15.29	72.87	15.63	72.84
15.98	72.81	16.26	72.78	16.48	72.75	16.74	72.72	17.06	72.69
17.41	72.66	17.7	72.63	18	72.6	18.31	72.57	18.62	72.54
18.94	72.51	19.27	72.48	19.57	72.45	19.83	72.42	20.1	72.39
20.48	72.36	20.94	72.33	21.47	72.3	22.09	72.27	22.88	72.24
23.66	72.21	24.54	72.18	26.39	72.15	27.43	72.12	27.8	72.09
28.21	72.06	28.57	72.03	28.92	72	29.26	71.97	29.7	71.94
30.12	71.91	31.07	71.88	31.77	71.85	32.39	71.82	32.81	71.79
33.06	71.76	33.3	71.73	33.54	71.7	33.78	71.67	34.01	71.64
34.24	71.61	34.46	71.58	34.67	71.55	34.88	71.52	35.09	71.49
35.3	71.46	35.53	71.43	35.8	71.4	36.08	71.37	36.37	71.34
36.69	71.31	37.03	71.28	37.39	71.25	37.88	71.22	38.63	71.19
39.33	71.16	42.92	71.16	43.14	71.13	43.36	71.1	43.58	71.07
43.8	71.04	44	71.01	44.19	70.98	44.38	70.95	44.56	70.92
44.73	70.89	44.91	70.86	45.08	70.83	45.26	70.8	45.52	70.77
45.86	70.74	46.11	70.71	46.35	70.68	46.54	70.66	46.59	70.65
46.85	70.62	47.09	70.59	47.31	70.56	47.52	70.53	47.7	70.5
47.87	70.47	48.05	70.44	48.22	70.41	48.4	70.38	48.58	70.35
48.76	70.32	48.94	70.29	49.13	70.26	49.33	70.23	49.52	70.2
49.71	70.17	50.32	70.14	54.46	70.11	54.91	70.08	55.29	70.05
55.67	70.02	56.06	69.99	56.37	69.96	56.65	69.93	56.93	69.9
57.21	69.87	57.49	69.84	57.82	69.81	58.24	69.78	58.48	69.75
58.61	69.72	58.74	69.69	58.87	69.66	58.99	69.63	59.11	69.6
59.23	69.57	59.35	69.54	59.47	69.51	59.59	69.48	59.71	69.45
59.83	69.42	59.94	69.39	60.05	69.36	60.17	69.33	60.28	69.3
60.39	69.27	60.5	69.24	60.66	69.21	60.87	69.18	61.1	69.15
61.34	69.12	61.6	69.09	61.69	69.08	61.86	69.06	62.1	69.03
62.34	69	62.52	68.97	62.66	68.94	62.81	68.91	62.96	68.88
63.12	68.85	63.27	68.82	63.43	68.79	63.58	68.76	63.74	68.73
63.89	68.7	64.04	68.67	64.19	68.64	64.34	68.61	64.49	68.58
64.64	68.55	64.79	68.52	64.97	68.49	65.17	68.46	65.37	68.43
65.6	68.4	65.84	68.37	66.08	68.34	66.32	68.31	66.56	68.28
66.78	68.25	66.92	68.22	67.02	68.19	67.14	68.16	67.26	68.13
67.38	68.1	67.5	68.07	67.64	68.04	67.65	68.04	67.81	68.01
67.99	67.98	68.2	67.95	68.44	67.92	68.72	67.89	69.04	67.86
69.36	67.86	69.79	67.89	70.21	67.92	70.29	67.93	70.67	67.95
71.24	67.98	71.5	68.01	71.69	68.04	71.87	68.07	72.06	68.1
72.25	68.13	72.44	68.16	72.64	68.19	72.83	68.22	73.02	68.25
73.21	68.28	73.4	68.31	73.59	68.34	73.78	68.37	73.97	68.4
74.17	68.43	74.36	68.46	74.55	68.49	74.74	68.52	74.93	68.55
75.12	68.58	75.31	68.61	75.5	68.64	75.69	68.67	75.83	68.7
75.98	68.73	76.13	68.76	76.27	68.79	76.42	68.82	76.56	68.85
76.71	68.88	76.79	68.9	76.84	68.91	76.96	68.94	77.08	68.97
77.2	69	77.32	69.03	77.43	69.06	77.55	69.09	77.67	69.12
77.8	69.15	77.99	69.18	78.24	69.21	78.5	69.24	78.76	69.27
79.02	69.3	79.28	69.33	79.54	69.36	80.52	69.36	81.16	69.33

81.72	69.3	82.04	69.3	83.25	69.33	83.92	69.36	84.01	69.39
84.09	69.42	84.18	69.45	84.26	69.48	84.35	69.51	84.43	69.54
84.51	69.57	84.6	69.6	84.68	69.63	84.77	69.66	84.85	69.69
84.94	69.72	85.04	69.75	85.21	69.78	85.38	69.81	85.53	69.84
85.68	69.87	85.96	69.9	86.74	69.93	87	69.96	87.26	69.99
87.52	70.02	87.78	70.05	88.42	70.05	88.93	70.02	89.36	69.99
90.11	69.99	90.33	70.02	90.58	70.05	90.84	70.08	91.12	70.11
91.41	70.14	91.65	70.17	91.88	70.2	92.85	70.23	94.3	70.26
95.71	70.29	96.89	70.32	97.98	70.35	98.53	70.38	98.99	70.41
99.46	70.44	99.95	70.47	100.48	70.5	100.98	70.53	101.49	70.56
101.99	70.59	102.65	70.62	103.34	70.65	103.92	70.68	105.93	70.68
108.31	70.65	109.81	70.62						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	68.2	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
61.69	70.29	16.7	16.7	.1	.3

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 997

INPUT
Description:
Station Elevation Data num= 493

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.09	.02	75.09	.77	75.06	2.09	75.03	2.82	75.03
3.3	75.06	3.92	75.09	4.74	75.12	5.84	75.15	6.11	75.15
7.97	75.12	8.34	75.09	8.76	75.06	9.08	75.03	9.71	74.94
9.97	74.91	10.27	74.88	10.55	74.85	10.68	74.82	10.82	74.79
11.12	74.76	11.6	74.73	12.15	74.7	12.55	74.67	13.03	74.64
13.34	74.61	13.86	74.55	14.13	74.52	14.4	74.49	14.68	74.46
14.96	74.43	15.21	74.4	15.43	74.37	15.64	74.34	15.84	74.31
16.03	74.28	16.23	74.25	16.42	74.22	16.62	74.19	17.13	74.1
17.28	74.07	17.43	74.04	17.58	74.01	17.73	73.98	17.88	73.95
18.03	73.92	18.18	73.89	18.35	73.86	18.55	73.83	18.74	73.8
18.93	73.77	19.11	73.74	19.3	73.71	19.47	73.68	19.82	73.62
19.83	73.62	20.34	73.53	20.51	73.5	20.83	73.44	21	73.41
21.41	73.38	22.16	73.35	22.68	73.32	22.97	73.29	23.35	73.23
23.54	73.2	23.71	73.17	23.85	73.14	24.02	73.11	24.19	73.08
24.36	73.05	24.68	72.99	24.84	72.96	24.99	72.93	25.31	72.87
25.46	72.84	25.62	72.81	25.77	72.78	25.93	72.75	26.08	72.72
26.4	72.66	26.59	72.63	26.76	72.6	26.94	72.57	27.11	72.54
27.28	72.51	27.46	72.48	27.69	72.45	27.94	72.42	28.22	72.39
28.52	72.36	28.84	72.33	29.29	72.3	29.72	72.27	30.09	72.24
30.4	72.21	30.7	72.18	31.04	72.15	31.4	72.12	31.95	72.09
32.63	72.06	33.36	72.03	33.91	72	34.4	71.97	34.77	71.94

35.43	71.88	35.74	71.85	36.03	71.82	36.31	71.79	36.59	71.76
36.89	71.73	37.16	71.7	37.7	71.64	37.97	71.61	38.23	71.58
38.49	71.55	38.74	71.52	39	71.49	39.24	71.46	39.52	71.43
39.73	71.4	40.02	71.37	40.31	71.34	40.59	71.31	40.88	71.28
41.15	71.25	41.43	71.22	41.69	71.19	41.96	71.16	42.41	71.13
42.92	71.1	43.26	71.07	43.6	71.04	43.9	71.01	44.32	70.95
44.53	70.92	44.73	70.89	44.9	70.86	45.06	70.83	45.24	70.8
45.48	70.77	45.74	70.74	46	70.71	46.26	70.68	46.52	70.65
46.79	70.62	47.08	70.59	47.36	70.56	47.58	70.53	47.79	70.5
48.15	70.44	48.32	70.41	48.48	70.38	48.64	70.35	48.79	70.32
48.94	70.29	49.1	70.26	49.27	70.23	49.44	70.2	49.62	70.17
49.83	70.14	50.15	70.11	50.55	70.08	50.85	70.05	51.1	70.02
51.28	69.99	51.44	69.96	51.61	69.93	51.78	69.9	51.94	69.87
52.11	69.84	52.3	69.81	52.48	69.78	52.64	69.75	52.92	69.69
53.2	69.63	53.5	69.57	53.65	69.54	54.13	69.45	54.29	69.42
54.45	69.39	54.63	69.36	54.8	69.33	55.14	69.27	55.36	69.24
55.68	69.21	55.99	69.18	56.14	69.17	56.34	69.15	56.72	69.12
57.04	69.09	57.33	69.06	58.69	69.06	59.85	69.09	60.37	69.12
60.92	69.15	61.51	69.18	61.55	69.18	61.91	69.15	62.15	69.12
62.37	69.06	62.49	69.03	62.6	69	62.72	68.97	62.83	68.94
62.95	68.91	63.06	68.88	63.18	68.85	63.29	68.82	63.41	68.79
63.52	68.76	63.61	68.73	63.69	68.7	63.76	68.67	63.84	68.64
63.91	68.61	63.99	68.58	64.13	68.52	64.2	68.49	64.28	68.46
64.35	68.43	64.42	68.4	64.49	68.37	64.57	68.34	64.64	68.31
64.71	68.28	64.79	68.25	64.86	68.22	65	68.16	65.08	68.13
65.22	68.07	65.29	68.04	65.37	68.01	65.44	67.98	65.6	67.92
65.72	67.86	65.84	67.8	65.96	67.74	66.03	67.71	66.09	67.68
66.21	67.62	66.33	67.56	66.4	67.53	66.46	67.5	66.58	67.44
66.7	67.38	66.77	67.35	66.83	67.32	66.89	67.29	67.01	67.23
67.08	67.2	67.2	67.17	67.46	67.11	67.59	67.08	67.68	67.05
67.84	66.99	67.92	66.96	68	66.93	68.07	66.9	68.15	66.87
68.31	66.81	68.47	66.75	68.54	66.72	68.7	66.66	68.78	66.63
68.85	66.6	68.93	66.57	69.01	66.54	69.09	66.51	69.16	66.48
69.32	66.42	69.39	66.39	69.47	66.36	69.54	66.33	69.62	66.3
69.7	66.27	69.79	66.24	69.87	66.21	69.95	66.18	70.04	66.15
70.12	66.12	70.2	66.09	70.3	66.06	70.44	66.03	70.57	66
70.71	65.97	70.86	65.94	71	65.91	71.15	65.88	71.3	65.85
71.49	65.82	71.67	65.79	71.99	65.76	72.04	65.76	72.52	65.73
73.05	65.7	73.61	65.67	74.21	65.64	74.6	65.61	74.98	65.58
75.37	65.55	75.76	65.52	76.2	65.49	76.63	65.46	77.07	65.43
77.5	65.4	78.07	65.37	78.45	65.36	79.01	65.34	82.65	65.31
83.29	65.31	84.47	65.28	85.53	65.25	85.97	65.25	86.16	65.28
86.36	65.31	86.56	65.34	86.78	65.37	86.95	65.4	87.12	65.43
87.3	65.46	87.47	65.49	87.64	65.52	87.81	65.55	87.94	65.58
87.98	65.61	88.02	65.64	88.06	65.67	88.1	65.7	88.14	65.73
88.18	65.76	88.22	65.79	88.26	65.82	88.3	65.85	88.35	65.88
88.39	65.91	88.43	65.94	88.47	65.97	88.51	66	88.55	66.03
88.59	66.06	88.63	66.09	88.68	66.12	88.72	66.15	88.76	66.18
88.8	66.21	88.84	66.24	88.88	66.27	88.93	66.3	88.97	66.33
89.01	66.36	89.05	66.39	89.09	66.42	89.14	66.45	89.18	66.48
89.22	66.51	89.26	66.54	89.31	66.57	89.35	66.6	89.39	66.63
89.43	66.66	89.48	66.69	89.52	66.72	89.56	66.75	89.61	66.78

89.65	66.81	89.69	66.84	89.74	66.87	89.78	66.9	89.82	66.93
89.86	66.96	89.9	66.99	89.94	67.02	91.87	67.04	92.37	67.05
92.78	67.08	93.29	67.11	94.08	67.14	94.71	67.17	95.32	67.2
95.91	67.23	96.25	67.26	96.51	67.29	96.76	67.32	97.02	67.35
97.27	67.38	97.53	67.41	97.79	67.44	98.05	67.47	98.16	67.5
98.22	67.53	98.28	67.56	98.35	67.59	98.41	67.62	98.47	67.65
98.54	67.68	98.6	67.71	98.66	67.74	98.73	67.77	98.79	67.8
98.86	67.83	98.92	67.86	98.98	67.89	99.05	67.92	99.11	67.95
99.17	67.98	99.24	68.01	99.3	68.04	99.36	68.07	99.42	68.1
99.49	68.13	99.55	68.16	99.61	68.19	99.68	68.22	99.74	68.25
99.8	68.28	99.87	68.31	99.93	68.34	99.99	68.37	100.05	68.4
100.12	68.43	100.18	68.46	100.24	68.49	100.3	68.52	100.36	68.55
100.43	68.58	100.49	68.61	100.55	68.64	100.61	68.67	100.67	68.7
100.73	68.73	100.79	68.76	100.85	68.79	100.92	68.82	100.98	68.85
101.04	68.88	101.1	68.91	101.16	68.94	101.22	68.97	101.28	69
101.34	69.03	101.41	69.06	101.47	69.09	101.53	69.12	101.59	69.15
101.65	69.18	101.71	69.21	101.77	69.24	101.83	69.27	101.89	69.3
101.96	69.33	102.02	69.36	102.08	69.39	102.14	69.42	102.21	69.45
102.31	69.48	102.4	69.51	102.5	69.54	102.59	69.57	102.69	69.6
102.79	69.63	102.88	69.66	102.98	69.69	103.08	69.72	103.18	69.75
103.28	69.78	103.37	69.81	103.47	69.84	103.57	69.87	103.67	69.9
103.77	69.93	103.87	69.96	103.97	69.99	104.07	70.02	104.17	70.05
106.12	70.05	108.89	70.02	110.22	69.99	112.18	69.99	112.57	70.02
113.03	70.05	113.46	70.08	113.79	70.11	114.07	70.14	114.36	70.17
114.59	70.17	116.84	70.14	117.4	70.11	118.01	70.08	118.62	70.05
119.14	70.02	119.65	69.99	119.82	69.98				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	83.29	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
71.99	82.65	12.81	12.81	12.81	.1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
101.02	113.52	72.38

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 996

INPUT
Description:
Station Elevation Data num= 492

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.74	.2	75.72	.48	75.69	.65	75.66	.89	75.6
1.02	75.57	1.14	75.54	1.26	75.51	1.41	75.48	1.57	75.45
1.73	75.42	2.03	75.36	2.17	75.33	2.41	75.27	2.61	75.24
2.83	75.21	3.06	75.18	3.27	75.15	3.47	75.12	3.67	75.09

3.84	75.06	4.02	75.03	4.19	75	4.55	74.94	4.72	74.91
7.47	74.91	8.66	74.88	10	74.85	10.89	74.82	11.54	74.79
12.02	74.76	12.34	74.73	12.63	74.7	12.92	74.67	13.24	74.64
13.57	74.61	13.91	74.58	14.27	74.55	14.68	74.52	15.16	74.49
15.55	74.46	15.98	74.43	16.41	74.4	16.85	74.37	17.53	74.34
18.01	74.31	18.31	74.28	18.62	74.25	18.94	74.22	19.34	74.19
19.78	74.16	20.16	74.13	20.49	74.1	20.8	74.07	21.08	74.04
21.32	74.01	21.56	73.98	21.8	73.95	22.11	73.92	22.38	73.89
23.34	73.8	23.76	73.77	24.31	73.74	24.93	73.71	25.21	73.68
25.46	73.65	25.72	73.62	26.47	73.53	26.74	73.5	27.07	73.47
27.42	73.44	27.71	73.41	27.97	73.38	28.15	73.35	28.31	73.32
28.48	73.29	28.99	73.2	29.16	73.17	29.44	73.14	29.98	73.11
30.51	73.08	30.87	73.05	31.13	73.02	31.38	72.99	31.64	72.96
31.89	72.93	32.16	72.9	32.55	72.87	32.99	72.84	33.47	72.81
33.95	72.78	34.4	72.75	34.78	72.72	35.12	72.69	35.42	72.66
35.7	72.63	36.22	72.57	36.51	72.54	37.23	72.48	37.56	72.45
37.87	72.42	38.17	72.39	38.43	72.36	38.93	72.3	39.16	72.27
39.4	72.24	39.65	72.21	39.9	72.18	40.13	72.15	40.36	72.12
40.6	72.09	40.86	72.06	41.14	72.03	41.45	72	41.78	71.97
42.14	71.94	42.56	71.91	43.01	71.88	43.47	71.85	43.83	71.82
44.08	71.79	44.32	71.76	44.57	71.73	44.8	71.7	45.02	71.67
45.23	71.64	45.45	71.61	45.83	71.55	46.02	71.52	46.22	71.49
46.46	71.46	46.7	71.43	46.94	71.4	47.18	71.37	47.43	71.34
47.67	71.31	47.92	71.28	48.13	71.25	48.33	71.22	48.53	71.19
48.74	71.16	48.9	71.13	49.22	71.07	49.42	71.04	49.64	71.01
49.87	70.98	50.35	70.92	50.58	70.89	50.81	70.86	51.06	70.83
51.3	70.8	51.55	70.77	51.79	70.74	52.05	70.71	52.37	70.68
52.72	70.65	53.11	70.62	53.51	70.59	53.77	70.56	53.95	70.53
54.14	70.5	54.5	70.44	54.88	70.38	55.26	70.32	55.45	70.29
55.64	70.26	55.84	70.23	56.04	70.2	56.57	70.17	56.89	70.14
57.19	70.11	57.5	70.08	57.82	70.05	58.08	70.02	58.28	69.99
58.48	69.96	58.64	69.93	58.79	69.9	58.95	69.87	59.1	69.84
59.26	69.81	59.46	69.78	59.67	69.75	59.9	69.72	60.14	69.69
60.89	69.6	61.05	69.57	61.2	69.54	61.21	69.54	61.37	69.51
61.85	69.42	62.01	69.39	62.18	69.36	62.5	69.3	62.67	69.27
62.83	69.24	63	69.21	63.22	69.18	63.7	69.12	63.93	69.09
64.31	69.03	64.44	69	64.58	68.97	64.71	68.94	64.84	68.91
64.98	68.88	65.1	68.85	65.2	68.82	65.3	68.79	65.39	68.76
65.49	68.73	65.59	68.7	65.72	68.67	65.84	68.64	65.97	68.61
66.09	68.58	66.35	68.52	66.48	68.49	66.62	68.46	66.77	68.43
66.92	68.4	67.06	68.37	67.18	68.34	67.29	68.31	67.38	68.28
67.47	68.25	67.57	68.22	67.75	68.16	67.85	68.13	68.03	68.07
68.12	68.04	68.22	68.01	68.4	67.95	68.49	67.92	68.76	67.83
68.85	67.8	69.12	67.71	69.21	67.68	69.31	67.65	69.4	67.62
69.6	67.56	69.7	67.53	69.8	67.5	69.9	67.47	70.1	67.41
70.2	67.38	70.3	67.35	70.4	67.32	70.5	67.29	70.6	67.26
70.7	67.23	70.81	67.2	70.91	67.17	71.01	67.14	71.11	67.11
71.22	67.08	71.38	67.05	71.54	67.02	71.71	66.99	71.88	66.96
72.06	66.93	72.24	66.9	72.41	66.87	72.59	66.84	72.78	66.81
72.96	66.78	73.14	66.75	73.44	66.72	74.28	66.66	74.69	66.63
75.09	66.6	75.35	66.57	75.42	66.54	75.5	66.51	75.64	66.45
75.71	66.42	75.85	66.36	75.92	66.33	75.99	66.3	76.06	66.27

76.12	66.24	76.19	66.21	76.26	66.18	76.33	66.15	76.39	66.12
76.46	66.09	76.53	66.06	76.59	66.03	76.73	65.97	76.79	65.94
76.86	65.91	76.98	65.85	77.04	65.82	77.1	65.79	77.22	65.73
77.34	65.67	77.42	65.64	77.52	65.61	77.7	65.58	77.89	65.55
78.29	65.49	78.49	65.46	78.7	65.43	78.91	65.4	79.29	65.34
79.52	65.31	79.92	65.25	80.12	65.22	80.33	65.19	80.54	65.16
80.75	65.13	81.12	65.08	81.19	65.07	81.43	65.04	81.75	65.01
82.09	64.98	82.46	64.95	82.84	64.92	83.23	64.89	84.68	64.89
85.96	64.92	86.76	64.95	87.55	64.98	88.6	65.01	90.3	65.01
91.09	64.98	92.06	64.98	93.47	65.01	93.61	65.02	93.98	65.04
95.83	65.07	96.32	65.1	96.59	65.13	96.84	65.16	97.08	65.19
97.33	65.22	97.57	65.25	97.82	65.28	97.9	65.31	97.97	65.34
98.05	65.37	98.12	65.4	98.2	65.43	98.28	65.46	98.35	65.49
98.43	65.52	98.5	65.55	98.58	65.58	98.65	65.61	98.81	65.67
98.88	65.7	98.96	65.73	99.04	65.76	99.12	65.79	99.2	65.82
99.25	65.84	99.28	65.85	99.37	65.88	99.53	65.94	99.62	65.97
99.7	66	99.81	66.03	99.91	66.06	100.09	66.12	100.19	66.15
100.28	66.18	100.37	66.21	100.48	66.24	100.58	66.27	100.8	66.33
101.02	66.39	101.14	66.42	101.25	66.45	101.37	66.48	101.48	66.51
101.6	66.54	101.72	66.57	101.84	66.6	101.97	66.63	102.12	66.66
102.28	66.69	102.43	66.72	102.58	66.75	102.74	66.78	102.89	66.81
103.05	66.84	103.2	66.87	103.35	66.9	103.51	66.93	103.66	66.96
103.81	66.99	103.97	67.02	104.21	67.08	104.32	67.11	104.56	67.17
104.68	67.2	104.79	67.23	105.03	67.29	105.15	67.32	105.27	67.35
105.51	67.41	105.62	67.44	105.74	67.47	105.98	67.53	106.22	67.59
106.34	67.62	106.45	67.65	106.57	67.68	106.69	67.71	106.81	67.74
106.93	67.77	107.05	67.8	107.18	67.83	107.3	67.86	107.42	67.89
107.54	67.92	107.66	67.95	107.78	67.98	107.91	68.01	108.03	68.04
108.26	68.07	108.55	68.1	108.85	68.13	109.15	68.16	109.45	68.19
109.74	68.22	110.04	68.25	110.36	68.28	110.69	68.31	111.01	68.34
111.33	68.37	111.65	68.4	111.95	68.43	112.24	68.46	112.48	68.49
112.72	68.52	112.95	68.55	113.17	68.58	113.39	68.61	113.61	68.64
113.84	68.67	114.05	68.7	114.21	68.73	114.53	68.76	114.89	68.79
115.26	68.82	115.62	68.85	115.95	68.88	116.27	68.91	116.5	68.94
116.75	68.97	117	69	117.24	69.03	117.48	69.06	117.73	69.09
117.98	69.12	118.22	69.15	118.5	69.18	118.79	69.21	119.09	69.24
119.38	69.27	119.67	69.3	119.96	69.33	120.25	69.36	120.68	69.39
121.28	69.42	121.9	69.45	124.17	69.45	125.08	69.42	125.74	69.39
126.57	69.36	127.26	69.33	127.97	69.3	128.68	69.27	129.11	69.24
129.5	69.21	129.87	69.18	130.15	69.15	130.4	69.12	130.66	69.09
131.08	69.06	131.36	69.03	131.58	69	131.8	68.97	132.03	68.94
132.25	68.91	132.47	68.88	132.7	68.85	132.93	68.82	133.15	68.79
133.37	68.76	133.47	68.75						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	85.96	.07	101.97	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
81.12	93.61	13.55	13.55	13.55	.1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
103.27	106.12	68.9

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 995

INPUT
Description:
Station Elevation Data num= 400

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	76.35	.27	76.32	.57	76.29	.88	76.26	1.17	76.23
1.44	76.2	1.7	76.17	1.93	76.14	2.15	76.11	2.61	76.05
2.87	76.02	4.12	75.99	4.79	75.96	5.13	75.93	5.38	75.9
5.64	75.87	6.48	75.78	6.75	75.75	7.27	75.69	7.77	75.63
8.23	75.57	8.44	75.54	8.67	75.51	9.33	75.42	9.56	75.39
10	75.33	10.23	75.3	10.45	75.27	10.68	75.24	10.9	75.21
11.13	75.18	11.71	75.12	12.25	75.06	12.54	75.03	13.18	74.97
13.92	74.91	14.31	74.88	14.64	74.85	14.95	74.82	15.26	74.79
15.58	74.76	15.94	74.73	16.32	74.7	16.69	74.67	16.97	74.64
17.23	74.61	17.48	74.58	17.74	74.55	18.24	74.49	18.5	74.46
18.76	74.43	19.54	74.34	20.1	74.28	20.68	74.22	21.01	74.19
21.38	74.16	21.41	74.16	21.86	74.13	22.32	74.1	22.66	74.07
22.98	74.04	23.29	74.01	23.58	73.98	23.85	73.95	24.13	73.92
24.47	73.89	25.23	73.83	25.63	73.8	26.02	73.77	26.48	73.74
27.12	73.71	27.51	73.68	28.35	73.59	28.64	73.56	28.89	73.53
29.28	73.44	29.42	73.41	29.55	73.38	29.87	73.32	30.03	73.29
30.19	73.26	30.36	73.23	30.52	73.2	30.71	73.17	31.08	73.14
31.84	73.08	32.62	73.02	32.98	72.99	33.3	72.96	33.71	72.93
34.15	72.9	34.61	72.87	35.02	72.84	35.37	72.81	36.39	72.72
37.09	72.66	37.4	72.63	37.69	72.6	38.03	72.57	38.41	72.54
38.83	72.51	39.26	72.48	39.53	72.46	39.75	72.45	41.13	72.36
41.56	72.33	42.32	72.27	42.83	72.24	43.46	72.21	43.97	72.18
44.38	72.15	44.81	72.12	45.19	72.09	45.55	72.06	45.85	72.03
46.12	72	46.41	71.97	46.69	71.94	46.98	71.91	47.35	71.88
47.79	71.85	48.19	71.82	48.47	71.79	48.79	71.76	49.45	71.7
49.8	71.67	50.13	71.64	50.35	71.61	50.54	71.58	50.74	71.55
51.31	71.46	51.51	71.43	51.7	71.4	52.27	71.37	52.7	71.34
53.1	71.31	53.59	71.28	54.67	71.22	54.92	71.19	55.16	71.16
55.91	71.07	56.17	71.04	56.44	71.01	56.7	70.98	57.05	70.95
57.42	70.92	58.5	70.83	58.85	70.8	59.33	70.77	60.04	70.74
60.72	70.71	61.06	70.68	61.19	70.65	61.41	70.59	61.51	70.56
61.84	70.47	61.94	70.44	62.27	70.35	62.37	70.32	62.59	70.26
62.81	70.2	62.91	70.17	63.24	70.08	63.37	70.05	63.53	70.02
63.7	69.99	64.16	69.96	64.72	69.93	65.39	69.9	65.84	69.87
66.25	69.84	66.63	69.81	66.99	69.78	67.33	69.75	67.63	69.72
67.97	69.69	68.3	69.66	68.92	69.6	69.22	69.57	69.5	69.54
69.78	69.51	70.35	69.42	70.75	69.36	71.17	69.3	71.4	69.27
71.64	69.24	71.87	69.21	72.06	69.18	72.36	69.12	72.52	69.09
72.67	69.06	73.15	68.97	73.49	68.91	73.65	68.88	73.99	68.82

74.14	68.79	74.2	68.76	74.25	68.73	74.37	68.67	74.42	68.64
74.54	68.58	74.59	68.55	74.71	68.49	74.76	68.46	74.88	68.4
74.93	68.37	75.05	68.31	75.1	68.28	75.16	68.25	75.21	68.22
75.27	68.19	75.32	68.16	75.38	68.13	75.43	68.1	75.49	68.07
75.54	68.04	75.6	68.01	75.65	67.98	75.71	67.95	75.76	67.92
75.82	67.89	75.92	67.83	75.98	67.8	76.13	67.71	76.19	67.68
76.29	67.62	76.38	67.59	76.49	67.56	76.69	67.5	76.8	67.47
77	67.41	77.11	67.38	77.41	67.29	77.46	67.27	77.51	67.26
77.6	67.23	77.7	67.2	77.79	67.17	77.89	67.14	78.07	67.08
78.17	67.05	78.35	66.99	78.45	66.96	78.62	66.93	78.8	66.9
78.97	66.87	79.13	66.84	79.61	66.75	79.76	66.72	79.92	66.69
80.06	66.66	80.21	66.63	80.35	66.6	80.5	66.57	80.64	66.54
80.79	66.51	81.07	66.45	81.22	66.42	81.5	66.36	81.65	66.33
81.93	66.27	82.08	66.24	82.22	66.21	82.36	66.18	82.51	66.15
82.65	66.12	82.8	66.09	82.95	66.06	83.4	65.97	83.54	65.94
84.14	65.82	84.29	65.79	84.59	65.73	84.91	65.67	85.06	65.64
85.22	65.61	85.37	65.58	85.85	65.49	86.33	65.4	86.5	65.37
87.3	65.22	87.47	65.19	87.63	65.16	87.8	65.13	87.96	65.1
88.13	65.07	88.29	65.04	88.47	65.01	88.64	64.98	88.85	64.95
88.86	64.95	89.05	64.92	89.51	64.86	89.99	64.8	90.22	64.77
90.47	64.74	90.96	64.71	91.82	64.68	92.57	64.65	93.31	64.62
93.94	64.59	95.17	64.59	95.64	64.62	96.1	64.65	96.71	64.68
97.18	64.69	97.77	64.71	98.2	64.71	98.77	64.68	99.48	64.65
101.37	64.65	101.87	64.68	102.46	64.71	102.98	64.74	103.34	64.77
103.71	64.8	104.07	64.83	104.41	64.86	104.76	64.89	105.26	64.92
105.95	64.95	106.63	64.98	107.27	65.01	107.83	65.04	108.39	65.07
108.95	65.1	109.69	65.13	110.37	65.16	110.44	65.16	111.12	65.19
111.48	65.22	111.81	65.25	112.49	65.31	112.84	65.34	113.08	65.37
113.19	65.4	113.27	65.43	113.36	65.46	113.54	65.52	113.62	65.55
113.89	65.64	113.97	65.67	114.24	65.76	114.32	65.79	114.41	65.82
114.77	65.94	114.85	65.97	115.21	66.09	115.57	66.21	115.93	66.33
116.47	66.51	116.57	66.54	116.66	66.57	117.02	66.69	117.11	66.72
117.25	66.75	117.58	66.78	118.3	66.81	118.95	66.84	119.24	66.87
119.54	66.9	120.74	66.93	121.1	66.96	121.39	66.99	121.89	67.05
122.81	67.17	123.19	67.23	123.59	67.29	123.8	67.32	124.2	67.38
124.4	67.41	124.61	67.44	125.01	67.5	125.23	67.53	125.63	67.56
126.08	67.59	126.52	67.62	126.97	67.65	127.46	67.68	128.08	67.71
129.32	67.77	129.69	67.8	130.09	67.83	130.52	67.86	130.97	67.89
131.39	67.92	132.11	68.01	132.36	68.04	132.6	68.07	133.08	68.13
133.33	68.16	134.05	68.25	134.3	68.28	134.54	68.31	135.02	68.37
135.27	68.4	135.71	68.43	136.78	68.46	138.66	68.46	139.53	68.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	82.22	.07	123.19	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
88.86	101.37	12.34	12.34	12.34	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
120.03	139.53	69.9	F

Blocked Obstructions num= 3

Sta L	Sta R	Elev	Sta L	Sta R	Elev	Sta L	Sta R	Elev
120.05	126.11	69.93	126.92	133.4	71.56	134.78	139.53	71.04

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 994

INPUT
Description:
Station Elevation Data num= 453

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.42	.35	74.4	.68	74.37	.99	74.34	1.27	74.31
1.52	74.28	1.76	74.25	1.99	74.22	2.25	74.19	2.61	74.16
2.97	74.13	3.32	74.1	3.67	74.07	3.98	74.04	4.29	74.01
4.55	73.98	4.81	73.95	5.06	73.92	5.31	73.89	5.56	73.86
5.82	73.83	6.07	73.8	6.32	73.77	6.58	73.74	6.83	73.71
7.06	73.68	7.3	73.65	7.55	73.62	7.8	73.59	8.09	73.56
8.44	73.53	9.6	73.5	10.25	73.47	10.72	73.44	11.08	73.41
11.45	73.38	11.85	73.35	12.28	73.32	12.68	73.29	12.97	73.26
13.26	73.23	13.64	73.2	14.04	73.17	14.9	73.14	15.6	73.11
16.13	73.08	16.67	73.05	17.28	73.02	17.97	72.99	18.59	72.96
19.15	72.93	19.53	72.9	19.82	72.87	20.05	72.84	20.26	72.81
20.47	72.78	20.67	72.75	20.86	72.72	21.04	72.69	21.22	72.66
21.39	72.63	21.56	72.6	21.73	72.57	21.99	72.54	22.43	72.51
22.86	72.48	23.28	72.45	23.69	72.42	24.06	72.39	24.37	72.36
24.69	72.33	25.01	72.3	25.33	72.27	25.66	72.24	25.99	72.21
26.32	72.18	26.61	72.15	26.9	72.12	27.16	72.09	27.4	72.06
27.64	72.03	27.9	72	28.17	71.97	28.52	71.94	28.89	71.91
29.26	71.88	29.62	71.85	29.96	71.82	30.07	71.81	30.29	71.79
30.62	71.76	31	71.73	31.59	71.7	32.2	71.67	32.62	71.64
32.86	71.61	33.08	71.58	33.3	71.55	33.51	71.52	33.73	71.49
34.06	71.46	34.47	71.43	34.97	71.4	35.19	71.37	35.41	71.34
35.63	71.31	35.85	71.28	36.07	71.25	36.28	71.22	36.49	71.19
36.71	71.16	36.92	71.13	37.14	71.1	37.44	71.07	37.73	71.04
38.03	71.01	38.33	70.98	38.63	70.95	38.99	70.92	39.33	70.89
39.59	70.86	39.86	70.83	40.14	70.8	40.41	70.77	40.68	70.74
40.96	70.71	41.24	70.68	41.53	70.65	41.78	70.62	42.01	70.59
42.23	70.56	42.46	70.53	42.69	70.5	42.94	70.47	43.2	70.44
43.51	70.41	44.17	70.38	44.87	70.35	45.48	70.32	46.15	70.29
46.63	70.26	47.01	70.23	47.44	70.2	47.79	70.17	48.04	70.14
48.32	70.11	48.6	70.08	48.88	70.05	49.22	70.02	49.61	69.99
50.06	69.96	51.1	69.93	52.13	69.9	52.5	69.87	52.74	69.84
52.98	69.81	53.22	69.78	53.47	69.75	53.72	69.72	53.97	69.69
54.24	69.66	54.5	69.63	54.7	69.6	54.9	69.57	55.1	69.54
55.33	69.51	55.64	69.48	56	69.45	56.35	69.42	56.71	69.39
57.02	69.36	57.28	69.33	57.53	69.3	57.78	69.27	58.03	69.24
58.24	69.21	58.42	69.18	58.59	69.15	58.74	69.12	58.89	69.09
58.99	69.06	59.09	69.03	59.2	69	59.3	68.97	59.4	68.94
59.5	68.91	59.61	68.88	59.71	68.85	59.81	68.82	59.91	68.79

60.01	68.76	60.1	68.73	60.2	68.7	60.29	68.67	60.39	68.64
60.48	68.61	60.58	68.58	60.67	68.55	60.77	68.52	60.86	68.49
60.96	68.46	61.06	68.43	61.16	68.4	61.26	68.37	61.36	68.34
61.45	68.31	61.53	68.28	61.62	68.25	61.7	68.22	61.79	68.19
61.87	68.16	61.95	68.13	62.04	68.1	62.12	68.07	62.21	68.04
62.3	68.01	62.38	67.98	62.47	67.95	62.56	67.92	62.65	67.89
62.75	67.86	62.84	67.83	62.94	67.8	63.06	67.77	63.2	67.74
63.31	67.71	63.4	67.68	63.5	67.65	63.6	67.62	63.69	67.59
63.79	67.56	63.89	67.53	64	67.5	64.11	67.47	64.22	67.44
64.34	67.41	64.46	67.38	64.58	67.35	64.7	67.32	64.83	67.29
64.95	67.26	65.08	67.23	65.21	67.2	65.36	67.17	65.51	67.14
65.65	67.11	65.79	67.08	65.93	67.05	66.08	67.02	66.14	67.01
66.22	66.99	66.36	66.96	66.5	66.93	66.63	66.9	66.77	66.87
66.91	66.84	67.05	66.81	67.19	66.78	67.33	66.75	67.47	66.72
67.56	66.69	67.64	66.66	67.72	66.63	67.8	66.6	67.88	66.57
67.96	66.54	68.04	66.51	68.12	66.48	68.2	66.45	68.28	66.42
68.36	66.39	68.44	66.36	68.52	66.33	68.61	66.3	68.69	66.27
68.77	66.24	68.85	66.21	68.93	66.18	69.01	66.15	69.09	66.12
69.17	66.09	69.25	66.06	69.34	66.03	69.42	66	69.5	65.97
69.63	65.94	69.76	65.91	69.89	65.88	70.02	65.85	70.16	65.82
70.29	65.79	70.42	65.76	70.55	65.73	70.68	65.7	70.81	65.67
70.95	65.64	71.08	65.61	71.21	65.58	71.34	65.55	71.47	65.52
71.66	65.49	71.87	65.46	72.07	65.43	72.28	65.4	72.49	65.37
72.7	65.34	72.91	65.31	73.12	65.28	73.33	65.25	73.53	65.22
73.74	65.19	73.96	65.16	74.18	65.13	74.39	65.1	74.61	65.07
74.82	65.04	75.04	65.01	75.25	64.98	75.47	64.95	75.68	64.92
75.9	64.89	76.11	64.86	76.33	64.83	76.54	64.8	76.75	64.77
76.76	64.77	76.97	64.74	77.18	64.71	77.39	64.68	77.6	64.65
77.79	64.62	77.98	64.59	78.17	64.56	78.35	64.53	78.54	64.5
78.73	64.47	78.91	64.44	79.1	64.41	79.28	64.38	79.46	64.35
80.21	64.32	81.01	64.29	81.5	64.26	81.89	64.23	82.27	64.2
82.89	64.17	84.62	64.17	84.92	64.18	85.63	64.2	86.57	64.23
87.51	64.26	87.9	64.29	88.25	64.32	88.62	64.35	89	64.38
89.37	64.41	89.79	64.44	90.25	64.47	90.43	64.48	90.71	64.5
91.17	64.53	91.63	64.56	92.23	64.59	92.82	64.62	93.41	64.65
94	64.68	94.59	64.71	95.18	64.74	95.77	64.77	96.37	64.8
96.96	64.83	97.55	64.86	98.23	64.89	98.96	64.92	102.18	64.92
102.38	64.93	103.27	64.95	105.69	64.98	106.14	65.01	106.76	65.04
108.38	65.04	109.18	65.01	110.89	65.01	112.04	65.04	112.69	65.07
112.99	65.1	113.11	65.13	113.19	65.16	113.27	65.19	113.35	65.22
113.43	65.25	113.51	65.28	113.59	65.31	113.72	65.34	114.08	65.37
114.41	65.4	114.74	65.43	115.05	65.46	115.34	65.49	115.63	65.52
115.72	65.55	115.8	65.58	115.88	65.61	115.96	65.64	116.03	65.67
116.11	65.7	116.19	65.73	116.27	65.76	116.34	65.79	116.42	65.82
116.5	65.85	116.58	65.88	116.65	65.91	116.73	65.94	116.81	65.97
116.89	66	116.96	66.03	117.04	66.06	117.14	66.09	117.24	66.12
117.34	66.15	117.45	66.18	117.56	66.21	117.73	66.24	118.23	66.27
118.8	66.3	119.44	66.33	119.81	66.36	120.04	66.39	120.26	66.42
120.49	66.45	120.71	66.48	120.94	66.51	121.39	66.54	121.86	66.57
122.23	66.6	122.6	66.63	122.97	66.66	123.35	66.69	123.89	66.72
124.87	66.75	125.51	66.78	126.15	66.81	126.84	66.84	127.51	66.87
127.91	66.9	128.24	66.93	128.56	66.96	128.89	66.99	129.22	67.02

129.54	67.05	129.84	67.08	130.07	67.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	67.19	.07	119.44	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76.76	90.43	17.59	17.59	.1	.3

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 993

INPUT
Description:
Station Elevation Data num= 425

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.56	.32	73.53	.84	73.5	1.39	73.47	1.96	73.44
4.4	73.41	4.77	73.38	5.16	73.35	5.54	73.32	5.93	73.29
6.33	73.26	6.78	73.23	7.22	73.2	7.65	73.17	8.06	73.14
8.47	73.11	8.86	73.08	9.22	73.05	9.55	73.02	9.87	72.99
10.16	72.96	10.37	72.93	10.56	72.9	10.82	72.87	11.13	72.84
11.44	72.81	12.11	72.78	12.84	72.75	13.2	72.72	13.51	72.69
13.8	72.66	14.1	72.63	14.43	72.6	14.8	72.57	16.79	72.54
17.2	72.51	17.48	72.48	17.76	72.45	18.04	72.42	18.31	72.39
18.58	72.36	18.85	72.33	19.12	72.3	19.35	72.27	19.54	72.24
19.73	72.21	19.93	72.18	20.12	72.15	20.32	72.12	20.54	72.09
20.75	72.06	20.98	72.03	21.23	72	21.49	71.97	21.74	71.94
22.02	71.91	22.32	71.88	22.63	71.85	22.95	71.82	23.29	71.79
23.72	71.76	24.09	71.73	24.4	71.7	24.64	71.67	24.88	71.64
25.11	71.61	25.36	71.58	25.68	71.55	26.18	71.52	26.62	71.49
27.03	71.46	27.35	71.43	27.58	71.4	27.81	71.37	28.05	71.34
28.28	71.31	28.54	71.28	28.82	71.25	29.12	71.22	29.44	71.19
29.77	71.16	30.16	71.13	30.22	71.12	30.44	71.1	30.69	71.07
30.95	71.04	31.21	71.01	31.47	70.98	31.73	70.95	31.97	70.92
32.16	70.89	32.34	70.86	32.53	70.83	32.71	70.8	32.9	70.77
33.1	70.74	33.3	70.71	33.51	70.68	33.73	70.65	33.96	70.62
34.2	70.59	34.46	70.56	34.72	70.53	34.99	70.5	35.26	70.47
35.54	70.44	35.81	70.41	36.08	70.38	36.33	70.35	36.61	70.32
36.9	70.29	37.16	70.26	37.43	70.23	37.74	70.2	38.08	70.17
38.48	70.14	38.73	70.11	38.97	70.08	39.22	70.05	39.46	70.02
39.7	69.99	39.94	69.96	40.17	69.93	40.4	69.9	40.69	69.87
40.93	69.84	41.15	69.81	41.36	69.78	41.56	69.75	41.74	69.72
41.91	69.69	42.08	69.66	42.25	69.63	42.42	69.6	42.59	69.57
43.36	69.54	43.91	69.51	44.22	69.48	44.42	69.45	44.56	69.42
44.65	69.39	44.74	69.36	44.85	69.33	45.01	69.3	45.16	69.27
45.3	69.24	45.44	69.21	45.58	69.18	45.71	69.15	45.84	69.12
45.97	69.09	46.09	69.06	46.21	69.03	46.32	69	46.43	68.97
46.54	68.94	46.65	68.91	46.75	68.88	46.85	68.85	46.95	68.82

47.05	68.79	47.16	68.76	47.26	68.73	47.37	68.7	47.47	68.67
47.58	68.64	47.69	68.61	47.8	68.58	47.92	68.55	48.03	68.52
48.15	68.49	48.26	68.46	48.38	68.43	48.49	68.4	48.6	68.37
48.71	68.34	48.81	68.31	48.91	68.28	49	68.25	49.1	68.22
49.19	68.19	49.28	68.16	49.38	68.13	49.47	68.1	49.56	68.07
49.66	68.04	49.75	68.01	49.84	67.98	49.93	67.95	50.01	67.92
50.1	67.89	50.19	67.86	50.28	67.83	50.36	67.8	50.45	67.77
50.53	67.74	50.62	67.71	50.7	67.68	50.78	67.65	50.87	67.62
50.95	67.59	51.03	67.56	51.11	67.53	51.19	67.5	51.26	67.47
51.34	67.44	51.42	67.41	51.49	67.38	51.57	67.35	51.66	67.32
51.74	67.29	51.82	67.26	51.91	67.23	52	67.2	52.09	67.17
52.18	67.14	52.27	67.11	52.37	67.08	52.47	67.05	52.56	67.02
52.67	66.99	52.77	66.96	52.88	66.93	52.99	66.9	53.1	66.87
53.21	66.84	53.32	66.81	53.39	66.78	53.47	66.75	53.54	66.72
53.62	66.69	53.69	66.66	53.77	66.63	53.85	66.6	53.92	66.57
54	66.54	54.07	66.51	54.15	66.48	54.24	66.45	54.33	66.42
54.42	66.39	54.51	66.36	54.6	66.33	54.69	66.3	54.78	66.27
54.86	66.24	54.95	66.21	55.04	66.18	55.14	66.15	55.25	66.12
55.36	66.09	55.49	66.06	55.7	66.03	55.92	66	56.16	65.97
56.41	65.94	56.68	65.91	56.97	65.88	57.28	65.85	60.5	65.82
61.67	65.79	62.69	65.76	63.35	65.73	63.78	65.7	64.39	65.67
65.11	65.64	65.8	65.61	66.94	65.58	67.77	65.55	68.64	65.52
70.33	65.49	70.76	65.49	72.41	65.52	72.59	65.52	73.54	65.49
74.11	65.46	74.66	65.43	74.95	65.4	75.25	65.37	75.55	65.34
75.83	65.31	76.1	65.28	76.39	65.25	76.66	65.22	76.93	65.19
77.3	65.16	77.67	65.13	78.04	65.1	78.4	65.07	78.77	65.04
79.34	65.01	80.09	64.98	80.91	64.95	81.11	64.95	81.57	64.98
81.98	65.01	82.35	65.04	82.65	65.07	82.94	65.1	83.35	65.1
83.71	65.07	84.07	65.04	84.43	65.01	84.79	64.98	85.16	64.95
85.39	64.92	85.54	64.89	85.7	64.86	85.85	64.83	86.01	64.8
86.16	64.77	86.32	64.74	86.48	64.71	86.63	64.68	86.78	64.65
86.94	64.62	87.09	64.59	87.25	64.56	87.41	64.53	87.64	64.5
87.9	64.47	88.15	64.44	88.4	64.41	88.65	64.38	88.69	64.38
88.83	64.35	88.98	64.32	89.13	64.29	89.28	64.26	89.41	64.23
89.52	64.2	89.62	64.17	89.74	64.14	89.9	64.11	89.99	64.09
90.06	64.08	90.23	64.05	90.39	64.02	90.58	63.99	90.8	63.96
91.04	63.93	91.36	63.9	91.68	63.87	92	63.84	92.23	63.84
92.46	63.87	92.68	63.9	92.91	63.93	93.03	63.95	93.14	63.96
93.39	63.99	93.67	64.02	93.97	64.05	94.33	64.08	94.68	64.11
94.92	64.14	95.11	64.17	95.29	64.2	95.47	64.23	95.68	64.26
95.91	64.29	96.17	64.32	96.46	64.35	96.79	64.38	97.09	64.41
97.3	64.43	97.35	64.44	97.6	64.47	97.61	64.47	97.79	64.5
97.97	64.53	98.15	64.56	98.33	64.59	98.51	64.62	98.69	64.65
98.87	64.68	99.05	64.71	99.23	64.74	99.47	64.77	99.72	64.8
99.98	64.83	100.24	64.86	100.5	64.89	100.76	64.92	101.02	64.95
101.72	64.95	102.37	64.92	102.93	64.89	103.23	64.86	105.96	64.86
107.38	64.83	107.84	64.8	108.32	64.77	108.83	64.74	109.31	64.71
109.53	64.68	109.75	64.65	109.97	64.62	110.28	64.59	110.64	64.56
111.12	64.53	112.1	64.5	112.79	64.47	113.49	64.44	114.49	64.41
115.22	64.38	118.6	64.38	119.53	64.41	119.98	64.44	120.43	64.47
121.01	64.5	121.87	64.53	122.55	64.56	122.99	64.59	123.31	64.62
123.72	64.65	124.13	64.68	124.52	64.71	124.91	64.74	125.28	64.77

125.88	64.8	126.85	64.83	128	64.86	129.36	64.89	130.22	64.92

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	.84	.035	56.68	.03	66.94	.07	120.43	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
89.99	97.3	22.86	22.86	.1	.3

Right Levee Station= 100.5 Elevation= 65.19

Blocked Obstructions num= 1

Sta L	Sta R	Elev
100.49	109.34	65.21

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 992

INPUT
Description:
Station Elevation Data num= 447

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.17	.8	73.17	1.26	73.14	1.7	73.11	2.11	73.08
2.41	73.05	2.68	73.02	2.95	72.99	3.22	72.96	3.49	72.93
3.77	72.9	4.05	72.87	4.33	72.84	4.62	72.81	4.91	72.78
5.22	72.75	5.55	72.72	5.87	72.69	6.19	72.66	6.52	72.63
6.99	72.6	7.53	72.57	8.05	72.54	8.5	72.51	9.14	72.48
9.73	72.45	9.99	72.42	10.25	72.39	10.51	72.36	10.76	72.33
11.01	72.3	11.25	72.27	11.5	72.24	11.76	72.21	12.02	72.18
12.28	72.15	12.54	72.12	13.12	72.09	14.22	72.06	14.47	72.03
14.72	72	14.96	71.97	15.21	71.94	15.44	71.91	15.66	71.88
16	71.85	16.38	71.82	16.77	71.79	17.16	71.76	17.83	71.73
18.63	71.7	19.22	71.67	19.61	71.64	19.83	71.61	20.05	71.58
20.27	71.55	20.49	71.52	20.7	71.49	20.91	71.46	21.12	71.43
21.34	71.4	21.55	71.37	21.76	71.34	21.98	71.31	22.19	71.28
22.42	71.25	22.64	71.22	22.87	71.19	23.09	71.16	23.32	71.13
23.55	71.1	23.8	71.07	24.1	71.04	24.44	71.01	24.77	70.98
25	70.95	25.15	70.92	25.3	70.89	25.45	70.86	25.6	70.83
25.75	70.8	25.9	70.77	26.06	70.74	26.24	70.71	26.42	70.68
26.6	70.65	26.78	70.62	26.95	70.59	27.13	70.56	27.31	70.53
27.52	70.5	27.74	70.47	27.97	70.44	28.28	70.41	28.86	70.38
29.4	70.35	29.77	70.32	30.08	70.29	30.39	70.26	30.59	70.23
30.8	70.2	31.02	70.17	31.26	70.14	31.49	70.11	31.74	70.08
31.99	70.05	32.23	70.02	32.48	69.99	32.75	69.96	33.04	69.93
33.09	69.92	33.33	69.9	33.63	69.87	33.92	69.84	34.21	69.81
34.51	69.78	34.78	69.75	34.96	69.72	35.15	69.69	35.33	69.66
35.52	69.63	35.71	69.6	35.9	69.57	36.09	69.54	36.28	69.51
36.47	69.48	36.66	69.45	36.86	69.42	37.11	69.39	38.82	69.36
39.02	69.33	39.18	69.3	39.32	69.27	39.46	69.24	39.61	69.21
39.75	69.18	39.88	69.15	39.99	69.12	40.09	69.09	40.19	69.06

40.29	69.03	40.36	69	40.42	68.97	40.48	68.94	40.54	68.91
40.6	68.88	40.67	68.85	40.73	68.82	40.79	68.79	40.85	68.76
40.91	68.73	40.97	68.7	41.04	68.67	41.1	68.64	41.16	68.61
41.22	68.58	41.28	68.55	41.33	68.52	41.39	68.49	41.44	68.46
41.5	68.43	41.55	68.4	41.6	68.37	41.65	68.34	41.69	68.31
41.73	68.28	41.77	68.25	41.81	68.22	41.85	68.19	41.89	68.16
41.93	68.13	41.97	68.1	42.01	68.07	42.05	68.04	42.09	68.01
42.12	67.98	42.16	67.95	42.2	67.92	42.24	67.89	42.27	67.86
42.31	67.83	42.35	67.8	42.39	67.77	42.42	67.74	42.46	67.71
42.5	67.68	42.54	67.65	42.57	67.62	42.61	67.59	42.65	67.56
42.69	67.53	42.72	67.5	42.76	67.47	42.8	67.44	42.84	67.41
42.88	67.38	42.92	67.35	42.97	67.32	43.01	67.29	43.05	67.26
43.09	67.23	43.14	67.2	43.18	67.17	43.22	67.14	43.26	67.11
43.3	67.08	43.35	67.05	43.4	67.02	43.46	66.99	43.53	66.96
43.6	66.93	43.66	66.9	43.73	66.87	43.8	66.84	43.86	66.81
43.93	66.78	44	66.75	44.06	66.72	44.13	66.69	44.2	66.66
44.26	66.63	44.33	66.6	44.4	66.57	44.46	66.54	44.54	66.51
44.61	66.48	44.69	66.45	44.77	66.42	44.85	66.39	44.92	66.36
45.01	66.33	45.1	66.3	45.19	66.27	45.29	66.24	45.38	66.21
45.48	66.18	45.57	66.15	45.69	66.12	45.81	66.09	45.93	66.06
46.05	66.03	46.17	66	46.5	65.97	46.93	65.94	47.46	65.91
48.6	65.88	50.07	65.85	50.6	65.82	51.16	65.79	51.73	65.76
55.28	65.76	58	65.73	59.13	65.7	60.03	65.67	61.61	65.67
62.34	65.7	63.06	65.73	64.15	65.76	65.24	65.76	65.75	65.73
66.24	65.7	66.72	65.67	67.17	65.64	68.54	65.61	72.14	65.61
73.13	65.64	75.14	65.64	75.54	65.63	76.03	65.61	76.39	65.58
76.75	65.55	79.57	65.52	84.78	65.52	85.52	65.49	86.13	65.46
86.59	65.43	87.05	65.4	87.51	65.37	87.97	65.34	91.03	65.34
91.85	65.37	92.21	65.4	92.49	65.43	92.78	65.46	93.06	65.49
93.46	65.52	94.56	65.52	95.03	65.49	95.42	65.46	95.8	65.43
96.13	65.4	96.39	65.37	96.65	65.34	96.9	65.31	97.15	65.28
97.41	65.25	97.66	65.22	97.91	65.19	98.1	65.16	98.22	65.13
98.35	65.1	98.48	65.07	98.62	65.04	98.79	65.01	98.96	64.98
99.12	64.95	99.28	64.92	99.45	64.89	99.61	64.86	99.81	64.83
100	64.8	100.13	64.77	100.24	64.74	100.35	64.71	100.45	64.68
100.56	64.65	100.67	64.62	100.77	64.59	100.88	64.56	100.99	64.53
101.09	64.5	101.2	64.47	101.31	64.44	101.42	64.41	101.52	64.38
101.63	64.35	101.74	64.32	101.84	64.29	101.95	64.26	102.05	64.23
102.15	64.2	102.26	64.17	102.37	64.14	102.48	64.11	102.59	64.08
102.71	64.05	102.82	64.02	102.94	63.99	103.05	63.96	103.17	63.93
103.28	63.9	103.4	63.87	103.51	63.84	103.63	63.81	103.74	63.78
103.85	63.75	103.97	63.72	104.09	63.69	104.2	63.66	104.34	63.63
104.49	63.6	104.64	63.57	104.78	63.54	104.93	63.51	105.07	63.48
105.21	63.45	105.34	63.42	105.46	63.39	105.57	63.36	105.68	63.33
105.78	63.3	105.89	63.27	105.99	63.24	106.12	63.21	106.29	63.18
106.56	63.15	106.85	63.12	107.14	63.09	107.45	63.06	107.77	63.03
108.09	63	109.13	62.97	109.98	62.95	110.32	62.94	110.33	62.94
111.07	62.91	111.73	62.88	112.19	62.85	112.64	62.82	113.52	62.82
114.21	62.85	114.39	62.86	114.7	62.88	114.81	62.91	114.93	62.94
115.05	62.97	115.16	63	115.28	63.03	115.4	63.06	115.52	63.09
115.64	63.12	115.76	63.15	115.88	63.18	116	63.21	116.12	63.24
116.24	63.27	116.36	63.3	116.49	63.33	116.61	63.36	116.73	63.39

116.86	63.42	116.98	63.45	117.11	63.48	117.24	63.51	117.37	63.54
117.52	63.57	117.7	63.6	117.85	63.63	117.88	63.63	118.15	63.66
118.41	63.69	118.5	63.7	118.76	63.72	119.17	63.75	119.66	63.78
120.17	63.81	120.68	63.84	121.18	63.87	121.66	63.9	122.08	63.93
122.56	63.96	123.12	63.99	123.66	64.02	124.13	64.05	124.61	64.08
125.08	64.11	125.56	64.14	125.95	64.17	126.27	64.2	126.59	64.23
126.94	64.26	127.31	64.29	127.69	64.32	128.14	64.35	128.72	64.38
129.4	64.41	130.05	64.44	130.52	64.47	130.99	64.5	131.37	64.53
131.71	64.56	132	64.59	132.23	64.62	132.44	64.65	132.65	64.68
132.86	64.71	133.09	64.73						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	12.28	.035	45.38	.03	97.41	.07	121.18	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
109.98	118.5	14.42	14.42	.1	.3

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 988

INPUT
Description:
Station Elevation Data num= 448

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.08	.03	73.08	.39	73.05	.91	73.02	1.49	72.99
2.14	72.96	2.46	72.93	2.77	72.9	3.06	72.87	3.31	72.84
3.56	72.81	3.85	72.78	4.29	72.75	5.25	72.72	5.9	72.69
6.69	72.66	7.88	72.63	8.49	72.6	8.73	72.57	9	72.54
9.24	72.51	9.46	72.48	9.68	72.45	9.9	72.42	10.11	72.39
10.37	72.36	10.62	72.33	10.84	72.3	11.05	72.27	11.27	72.24
11.49	72.21	11.7	72.18	12.03	72.15	12.41	72.12	12.75	72.09
12.96	72.06	13.2	72.03	13.51	72	13.83	71.97	14.16	71.94
14.52	71.91	14.96	71.88	15.3	71.85	15.63	71.82	15.96	71.79
16.29	71.76	16.7	71.73	17.18	71.7	17.61	71.67	18.08	71.64
18.73	71.61	19.26	71.58	19.7	71.55	20.14	71.52	20.59	71.49
21.05	71.46	21.44	71.43	21.74	71.4	22.03	71.37	22.33	71.34
22.63	71.31	22.93	71.28	23.22	71.25	23.42	71.22	23.6	71.19
23.78	71.16	23.97	71.13	24.19	71.1	24.41	71.07	24.64	71.04
24.87	71.01	25.13	70.98	25.39	70.95	25.57	70.92	25.72	70.89
25.87	70.86	26.02	70.83	26.17	70.8	26.31	70.77	26.46	70.74
26.6	70.71	26.74	70.68	26.87	70.65	27	70.62	27.14	70.59
27.27	70.56	27.4	70.53	27.59	70.5	27.92	70.47	28.26	70.44
28.59	70.41	28.92	70.38	29.19	70.35	29.4	70.32	29.61	70.29
29.77	70.26	29.93	70.23	30.1	70.2	30.26	70.17	30.42	70.14
30.6	70.11	30.79	70.08	31.01	70.05	31.23	70.02	31.45	69.99
31.67	69.96	31.89	69.93	32.1	69.9	32.36	69.87	32.64	69.84
32.92	69.81	33.2	69.78	33.49	69.75	33.77	69.72	33.99	69.69

34.2	69.66	34.41	69.63	34.62	69.6	34.83	69.57	35.04	69.54
35.26	69.51	35.49	69.48	35.76	69.45	36.1	69.42	36.63	69.39
37.28	69.36	38.07	69.33	38.43	69.3	39.97	69.27	40.22	69.24
40.28	69.21	40.34	69.18	40.41	69.15	40.47	69.12	40.53	69.09
40.59	69.06	40.66	69.03	40.72	69	40.78	68.97	40.85	68.94
40.91	68.91	40.98	68.88	41.04	68.85	41.11	68.82	41.17	68.79
41.24	68.76	41.3	68.73	41.37	68.7	41.44	68.67	41.5	68.64
41.57	68.61	41.64	68.58	41.7	68.55	41.77	68.52	41.84	68.49
41.91	68.46	41.98	68.43	42.04	68.4	42.11	68.37	42.19	68.34
42.26	68.31	42.33	68.28	42.38	68.25	42.43	68.22	42.48	68.19
42.53	68.16	42.58	68.13	42.63	68.1	42.68	68.07	42.73	68.04
42.79	68.01	42.84	67.98	42.89	67.95	42.94	67.92	42.99	67.89
43.05	67.86	43.1	67.83	43.15	67.8	43.2	67.77	43.26	67.74
43.31	67.71	43.36	67.68	43.42	67.65	43.47	67.62	43.52	67.59
43.58	67.56	43.63	67.53	43.68	67.5	43.74	67.47	43.79	67.44
43.84	67.41	43.9	67.38	43.95	67.35	44	67.32	44.06	67.29
44.11	67.26	44.17	67.23	44.22	67.2	44.27	67.17	44.33	67.14
44.37	67.12	44.39	67.11	44.44	67.08	44.5	67.05	44.56	67.02
44.62	66.99	44.67	66.96	44.73	66.93	44.79	66.9	44.85	66.87
44.9	66.84	44.96	66.81	45.02	66.78	45.07	66.75	45.13	66.72
45.19	66.69	45.24	66.66	45.3	66.63	45.35	66.6	45.41	66.57
45.47	66.54	45.52	66.51	45.58	66.48	45.63	66.45	45.69	66.42
45.74	66.39	45.8	66.36	45.86	66.33	45.91	66.3	45.97	66.27
46.02	66.24	46.07	66.21	46.13	66.18	46.18	66.15	46.24	66.12
46.3	66.09	46.36	66.06	46.42	66.03	46.48	66	48.7	66
49.66	65.97	51.64	65.97	52.67	66	52.9	66	53.2	65.97
53.5	65.94	53.81	65.91	54.89	65.88	56.35	65.85	57.27	65.82
59.9	65.79	60.96	65.76	62.07	65.73	66.17	65.7	66.92	65.67
67.64	65.64	70.07	65.64	70.77	65.61	71.87	65.58	74.74	65.58
75.65	65.61	76.63	65.61	77.12	65.58	77.66	65.55	81.05	65.52
82.28	65.49	84.17	65.46	84.67	65.46	85.32	65.49	85.96	65.52
86.6	65.55	87.27	65.58	87.96	65.61	88.56	65.64	90.02	65.67
90.5	65.7	90.89	65.7	91.35	65.67	91.7	65.64	92.01	65.61
92.32	65.58	92.64	65.55	93.61	65.52	94.71	65.49	95.13	65.46
95.55	65.43	95.97	65.4	96.33	65.37	96.48	65.34	96.6	65.31
96.69	65.28	96.76	65.25	96.84	65.22	96.91	65.19	96.98	65.16
97.05	65.13	97.12	65.1	97.19	65.07	97.27	65.04	97.34	65.01
97.41	64.98	97.48	64.95	97.55	64.92	97.62	64.89	97.7	64.86
97.77	64.83	97.84	64.8	97.91	64.77	97.98	64.74	98.05	64.71
98.13	64.68	98.2	64.65	98.29	64.62	98.38	64.59	98.48	64.56
98.57	64.53	98.67	64.5	98.76	64.47	98.85	64.44	98.94	64.41
99.03	64.38	99.12	64.35	99.21	64.32	99.3	64.29	99.39	64.26
99.48	64.23	99.57	64.2	99.66	64.17	99.75	64.14	99.84	64.11
99.94	64.08	100.04	64.05	100.14	64.02	100.26	63.99	100.37	63.96
100.48	63.93	100.59	63.9	100.7	63.87	100.81	63.84	100.91	63.81
101.01	63.78	101.12	63.75	101.22	63.72	101.32	63.69	101.42	63.66
101.53	63.63	101.64	63.6	101.76	63.57	101.88	63.54	102	63.51
102.14	63.48	102.27	63.45	102.4	63.42	102.54	63.39	102.67	63.36
102.81	63.33	102.96	63.3	103.11	63.27	103.27	63.24	103.48	63.21
103.99	63.18	104.62	63.15	105.55	63.12	106.12	63.09	106.7	63.06
107.27	63.03	107.85	63	108.42	62.97	109.13	62.94	110.36	62.91
112.69	62.88	114.65	62.85	116.52	62.82	118.38	62.79	119.44	62.76

120.02	62.76	121.18	62.76	121.49	62.79	121.65	62.81	121.8	62.82
122.11	62.85	122.43	62.88	122.75	62.91	122.95	62.94	123.07	62.97
123.22	63	123.37	63.03	123.53	63.06	123.68	63.09	123.83	63.12
123.85	63.12	123.98	63.15	124.13	63.18	124.28	63.21	124.44	63.24
124.59	63.27	124.74	63.3	124.89	63.33	125.09	63.36	125.29	63.39
125.49	63.42	125.69	63.45	125.89	63.48	126.09	63.51	126.29	63.54
126.49	63.57	126.69	63.6	126.89	63.63	127.72	63.63	128.44	63.66
129.13	63.69	130.18	63.72	131.12	63.75	131.47	63.78	131.56	63.81
131.67	63.84	131.78	63.87	131.9	63.9	132.01	63.93	132.14	63.96
132.27	63.99	132.4	64.02	132.53	64.05	132.66	64.08	132.8	64.11
132.93	64.14	133.06	64.17	133.2	64.2	133.34	64.23	133.48	64.26
133.62	64.29	134.18	64.32	134.87	64.35	135.63	64.38	136.39	64.38
137.66	64.35	138.74	64.32	139.7	64.29	140.75	64.29	141.12	64.32
141.47	64.35	141.85	64.38	142.32	64.41	142.82	64.44	143.28	64.47
143.72	64.5	144.12	64.53	144.37	64.55				

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	26.87	.035	45.3	.03	98.2	.07	103.27	.04
119.44	.035	124.74	.1						

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
120.02	123.85	5.73	5.73	.1	.3

Left Levee Station= 119.44 Elevation= 66.26

Blocked Obstructions num= 1

Sta L	Sta R	Elev
104.4	119.37	66.29

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 987.8

INPUT
Description:
Station Elevation Data num= 436

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.82	.22	72.81	1.94	72.78	2.43	72.75	2.85	72.72
3.26	72.69	3.66	72.66	4.05	72.63	4.37	72.6	4.66	72.57
4.93	72.54	5.19	72.51	5.45	72.48	5.7	72.45	5.95	72.42
6.2	72.39	6.81	72.36	8.1	72.33	8.69	72.3	9.14	72.27
9.6	72.24	10.08	72.21	10.53	72.18	10.84	72.15	11.14	72.12
11.43	72.09	11.7	72.06	11.96	72.03	12.22	72	12.48	71.97
12.79	71.94	13.08	71.91	13.29	71.88	13.5	71.85	13.71	71.82
13.93	71.79	14.14	71.76	14.37	71.73	14.66	71.7	15	71.67
15.34	71.64	15.75	71.61	16.23	71.58	16.73	71.55	17.35	71.52
17.96	71.49	18.52	71.46	19	71.43	19.33	71.4	19.64	71.37
19.89	71.34	20.13	71.31	20.36	71.28	20.6	71.25	20.83	71.22
21.2	71.19	21.65	71.16	22.05	71.13	22.43	71.1	22.76	71.07
22.9	71.04	23.05	71.01	23.24	70.98	23.42	70.95	23.61	70.92

23.8	70.89	24.03	70.86	24.29	70.83	24.56	70.8	24.9	70.77
25.21	70.74	25.47	70.71	25.77	70.68	26.07	70.65	26.38	70.62
26.7	70.59	27.02	70.56	27.36	70.53	27.69	70.5	28	70.47
28.31	70.44	28.63	70.41	28.95	70.38	29.28	70.35	29.61	70.32
29.98	70.29	30.38	70.26	30.8	70.23	31.24	70.2	31.56	70.17
31.82	70.14	32.09	70.11	32.34	70.08	32.6	70.05	32.85	70.02
33.1	69.99	33.34	69.96	33.57	69.93	33.81	69.9	34.04	69.87
34.28	69.84	34.52	69.81	34.77	69.78	35.02	69.75	35.28	69.72
35.53	69.69	35.79	69.66	36.05	69.63	36.31	69.6	36.57	69.57
36.83	69.54	37.08	69.51	37.34	69.48	37.59	69.45	37.83	69.42
38.08	69.39	38.32	69.36	38.55	69.33	38.78	69.3	39	69.27
39.21	69.24	39.41	69.21	39.59	69.18	39.77	69.15	40.06	69.12
40.28	69.09	40.48	69.06	40.68	69.03	40.87	69	41.06	68.97
41.26	68.94	41.47	68.91	41.66	68.88	41.8	68.85	41.86	68.82
41.93	68.79	41.99	68.76	42.05	68.73	42.12	68.7	42.18	68.67
42.25	68.64	42.31	68.61	42.38	68.58	42.44	68.55	42.51	68.52
42.57	68.49	42.63	68.46	42.7	68.43	42.76	68.4	42.83	68.37
42.89	68.34	42.94	68.31	43	68.28	43.05	68.25	43.1	68.22
43.16	68.19	43.21	68.16	43.26	68.13	43.31	68.1	43.37	68.07
43.41	68.04	43.44	68.01	43.47	67.98	43.5	67.95	43.53	67.92
43.56	67.89	43.59	67.86	43.61	67.83	43.64	67.8	43.67	67.77
43.7	67.74	43.73	67.71	43.76	67.68	43.79	67.65	43.82	67.62
43.84	67.59	43.87	67.56	43.9	67.53	43.93	67.5	43.96	67.47
43.99	67.44	44.02	67.41	44.04	67.38	44.07	67.35	44.1	67.32
44.13	67.29	44.16	67.26	44.18	67.23	44.21	67.2	44.24	67.17
44.27	67.14	44.29	67.11	44.32	67.08	44.35	67.05	44.38	67.02
44.41	66.99	44.43	66.96	44.46	66.93	44.49	66.9	44.52	66.87
44.55	66.84	44.57	66.81	44.6	66.78	44.63	66.75	44.66	66.72
44.68	66.69	44.71	66.66	44.74	66.63	44.79	66.6	44.84	66.57
44.9	66.54	44.96	66.51	45.02	66.48	45.08	66.45	45.14	66.42
45.2	66.39	45.27	66.36	45.33	66.33	45.4	66.3	45.46	66.27
45.53	66.24	45.61	66.21	45.7	66.18	45.79	66.15	45.88	66.12
45.97	66.09	46.06	66.06	46.23	66.03	46.4	66	49.51	66
51.32	66.03	51.77	66.06	51.79	66.06	52.24	66.09	52.48	66.09
53.02	66.06	53.56	66.03	54.09	66	56.82	65.97	58.57	65.94
61.12	65.91	61.48	65.88	62.11	65.85	62.74	65.82	62.95	65.82
64	65.85	65.74	65.85	66.18	65.84	67.92	65.82	73.18	65.79
73.96	65.76	74.72	65.73	77.18	65.73	78.5	65.76	82.18	65.76
83.27	65.73	83.9	65.7	84.61	65.67	86.23	65.64	87.59	65.61
89.46	65.61	90.18	65.64	92.54	65.67	93.24	65.67	93.55	65.64
93.86	65.61	94.17	65.58	94.45	65.55	94.7	65.52	94.91	65.49
95.11	65.46	95.27	65.43	95.4	65.4	95.54	65.37	95.68	65.34
95.82	65.31	95.94	65.28	96.07	65.25	96.19	65.22	96.31	65.19
96.44	65.16	96.56	65.13	96.67	65.1	96.77	65.07	96.87	65.04
96.98	65.01	97.08	64.98	97.18	64.95	97.24	64.92	97.3	64.89
97.36	64.86	97.42	64.83	97.49	64.8	97.55	64.77	97.61	64.74
97.67	64.71	97.74	64.68	97.8	64.65	97.86	64.62	97.92	64.59
97.99	64.56	98.05	64.53	98.11	64.5	98.18	64.47	98.24	64.44
98.3	64.41	98.36	64.38	98.43	64.35	98.49	64.32	98.55	64.29
98.62	64.26	98.68	64.23	98.74	64.2	98.81	64.17	98.87	64.14
98.93	64.11	99	64.08	99.06	64.05	99.12	64.02	99.19	63.99
99.27	63.96	99.34	63.93	99.42	63.9	99.49	63.87	99.57	63.84

99.66	63.81	99.75	63.78	99.83	63.75	99.92	63.72	100.01	63.69
100.09	63.66	100.18	63.63	100.27	63.6	100.35	63.57	100.44	63.54
100.53	63.51	100.62	63.48	100.71	63.45	100.79	63.42	100.89	63.39
100.98	63.36	101.08	63.33	101.17	63.3	101.32	63.27	101.48	63.24
101.65	63.21	101.83	63.18	102	63.15	102.17	63.12	102.34	63.09
102.52	63.06	102.69	63.03	102.87	63	103.04	62.97	103.24	62.94
103.91	62.91	105.12	62.88	106.37	62.87	109.51	62.85	110.04	62.82
110.54	62.79	110.99	62.76	111.44	62.73	112.18	62.7	112.81	62.67
113.38	62.64	114.06	62.61	114.73	62.58	118.24	62.55	119.57	62.52
120.59	62.49	122.55	62.46	123.21	62.44	123.85	62.43	125.49	62.43
125.78	62.46	126.07	62.49	126.23	62.51	126.37	62.52	126.66	62.55
126.95	62.58	127.26	62.61	127.53	62.64	127.76	62.67	127.99	62.7
128.23	62.73	128.45	62.76	128.66	62.79	128.86	62.82	129.02	62.85
129.13	62.87	129.18	62.88	129.33	62.91	129.51	62.94	129.7	62.97
129.88	63	130.07	63.03	130.26	63.06	130.45	63.09	130.6	63.12
130.73	63.15	130.86	63.18	130.99	63.21	131.12	63.24	131.25	63.27
131.38	63.3	131.5	63.33	131.62	63.36	131.74	63.39	131.86	63.42
131.97	63.45	132.09	63.48	132.31	63.51	132.91	63.54	132.98	63.54
133.73	63.57	134.73	63.6	135.89	63.63	137.3	63.66	137.89	63.69
138.65	63.72	139.4	63.75	141.76	63.75	142.04	63.72	142.33	63.69
142.62	63.66	142.9	63.63	143.18	63.6	143.46	63.57	143.79	63.57
145.34	63.6	146.7	63.63	148.48	63.66	150.02	63.69	151.77	63.69
151.78	63.69								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	49.51	.03	106.37	.04	122.55	.035	130.6	.1
151.77	.045								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
123.21	129.13	6.48	6.48	.1	.3

Left Levee Station= 121.99 Elevation= 66.01

Blocked Obstructions num= 1

Sta L	Sta R	Elev
107.2	122.13	65.99

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 987.6

INPUT
Description:
Station Elevation Data num= 472

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.22	.14	72.21	.6	72.18	1.07	72.15	1.56	72.12
2.02	72.09	2.23	72.06	2.44	72.03	2.66	72	2.87	71.97
3.08	71.94	3.29	71.91	3.51	71.88	3.72	71.85	3.94	71.82
4.25	71.79	4.64	71.76	5.02	71.73	5.4	71.7	5.77	71.67
6.1	71.64	6.43	71.61	6.78	71.58	7.15	71.55	7.51	71.52

7.89	71.49	8.24	71.46	8.58	71.43	8.91	71.4	9.24	71.37
9.57	71.34	9.9	71.31	10.15	71.28	10.35	71.25	10.57	71.22
10.79	71.19	11.01	71.16	11.24	71.13	11.46	71.1	11.69	71.07
11.91	71.04	12.11	71.01	12.43	70.98	13.3	70.95	13.76	70.92
14.04	70.89	14.32	70.86	14.75	70.83	15.3	70.8	15.88	70.77
16.22	70.74	16.52	70.71	16.83	70.68	17.12	70.65	17.34	70.62
17.54	70.59	17.74	70.56	17.94	70.53	18.15	70.5	18.45	70.47
18.64	70.44	18.83	70.41	19.02	70.38	19.21	70.35	19.4	70.32
19.58	70.29	19.77	70.26	19.96	70.23	20.15	70.2	20.46	70.17
20.77	70.14	21.09	70.11	21.41	70.08	21.72	70.05	22.08	70.02
24.38	70.02	24.6	69.99	24.83	69.96	25.05	69.93	25.27	69.9
25.49	69.87	25.72	69.84	25.94	69.81	26.15	69.78	26.41	69.75
26.7	69.72	27.02	69.69	27.36	69.66	27.7	69.63	28.04	69.6
28.76	69.57	30.17	69.54	30.38	69.51	30.52	69.48	30.65	69.45
30.78	69.42	30.91	69.39	31.04	69.36	31.16	69.33	31.28	69.3
31.35	69.27	31.42	69.24	31.49	69.21	31.56	69.18	31.63	69.15
31.7	69.12	31.77	69.09	31.84	69.06	31.91	69.03	31.98	69
32.05	68.97	32.12	68.94	32.19	68.91	32.25	68.88	32.3	68.85
32.35	68.82	32.39	68.79	32.44	68.76	32.48	68.73	32.52	68.7
32.56	68.67	32.59	68.64	32.63	68.61	32.67	68.58	32.71	68.55
32.74	68.52	32.78	68.49	32.82	68.46	32.85	68.43	32.89	68.4
32.93	68.37	32.96	68.34	33	68.31	33.04	68.28	33.07	68.25
33.11	68.22	33.14	68.19	33.18	68.16	33.22	68.13	33.25	68.1
33.29	68.07	33.32	68.04	33.36	68.01	33.39	67.98	33.42	67.95
33.46	67.92	33.49	67.89	33.52	67.86	33.56	67.83	33.59	67.8
33.62	67.77	33.66	67.74	33.69	67.71	33.72	67.68	33.76	67.65
33.79	67.62	33.83	67.59	33.86	67.56	33.89	67.53	33.93	67.5
33.96	67.47	33.99	67.44	34.03	67.41	34.06	67.38	34.09	67.35
34.13	67.32	34.16	67.29	34.19	67.26	34.23	67.23	34.26	67.2
34.29	67.17	34.32	67.14	34.35	67.11	34.38	67.08	34.41	67.05
34.46	67.02	34.51	66.99	34.56	66.96	34.61	66.93	34.66	66.9
34.71	66.87	34.77	66.84	34.82	66.81	34.87	66.78	34.92	66.75
34.98	66.72	35.03	66.69	35.08	66.66	35.13	66.63	35.19	66.6
35.24	66.57	35.3	66.54	35.35	66.51	35.4	66.48	35.46	66.45
35.51	66.42	35.57	66.39	35.62	66.36	35.68	66.33	35.73	66.3
35.79	66.27	35.84	66.24	35.9	66.21	35.95	66.18	36.01	66.15
36.07	66.12	36.12	66.09	36.18	66.06	36.24	66.03	38.97	66.03
39.98	66	40.84	65.97	46.94	65.97	47.72	65.98	50	66
50.57	66	52.45	65.98	54.09	65.97	54.65	65.94	54.98	65.91
55.3	65.88	55.63	65.85	55.96	65.82	66.53	65.82	67.16	65.85
67.8	65.88	68.46	65.91	72.08	65.94	77.86	65.94	78.62	65.97
79.06	66	80.25	66.03	81.42	66.03	82.33	66	82.91	65.97
83.35	65.94	83.79	65.91	84.25	65.88	84.69	65.85	85.01	65.82
85.35	65.79	85.67	65.76	85.99	65.73	86.3	65.7	86.61	65.67
86.75	65.64	86.87	65.61	86.99	65.58	87.11	65.55	87.23	65.52
87.35	65.49	87.47	65.46	87.59	65.43	87.71	65.4	87.83	65.37
87.95	65.34	88.07	65.31	88.19	65.28	88.3	65.25	88.42	65.22
88.54	65.19	88.64	65.16	88.74	65.13	88.84	65.1	88.93	65.07
89.03	65.04	89.12	65.01	89.21	64.98	89.31	64.95	89.4	64.92
89.49	64.89	89.58	64.86	89.68	64.83	89.77	64.8	89.86	64.77
89.95	64.74	90.04	64.71	90.13	64.68	90.22	64.65	90.31	64.62
90.41	64.59	90.49	64.56	90.57	64.53	90.65	64.5	90.78	64.47

90.92	64.44	91.06	64.41	91.21	64.38	91.35	64.35	91.49	64.32
91.64	64.29	91.77	64.26	91.9	64.23	92.04	64.2	92.16	64.17
92.28	64.14	92.4	64.11	92.51	64.08	92.63	64.05	92.74	64.02
92.83	63.99	92.93	63.96	93.03	63.93	93.13	63.9	93.23	63.87
93.33	63.84	93.43	63.81	93.53	63.78	93.63	63.75	93.73	63.72
93.83	63.69	93.93	63.66	94.03	63.63	94.13	63.6	94.23	63.57
94.34	63.54	94.44	63.51	94.54	63.48	94.65	63.45	94.75	63.42
94.84	63.39	94.93	63.36	95.02	63.33	95.11	63.3	95.21	63.27
95.35	63.24	95.49	63.21	95.63	63.18	95.77	63.15	95.92	63.12
96.07	63.09	96.21	63.06	96.36	63.03	96.52	63	96.69	62.97
97.14	62.94	97.79	62.91	98.48	62.88	99.01	62.85	99.74	62.82
100.38	62.79	102.93	62.76	103.3	62.73	103.68	62.7	104.08	62.67
104.49	62.64	104.9	62.61	105.61	62.58	106.29	62.55	108.89	62.52
109.15	62.49	109.41	62.46	109.75	62.43	110.21	62.4	110.69	62.37
111.35	62.34	112.17	62.31	112.5	62.28	112.79	62.25	113.15	62.22
113.53	62.19	113.9	62.16	114.28	62.13	114.61	62.1	114.91	62.07
115.18	62.04	115.44	62.01	115.71	61.98	115.97	61.95	116.58	61.92
116.81	61.89	117.99	61.89	118.88	61.9	119.35	61.91	119.98	61.92
121.03	61.95	121.24	61.98	121.46	62.01	121.5	62.02	121.67	62.04
121.87	62.07	122.05	62.1	122.23	62.13	122.39	62.16	122.54	62.19
122.68	62.22	122.83	62.25	122.98	62.28	123.11	62.31	123.22	62.34
123.33	62.37	123.44	62.4	123.57	62.43	123.7	62.46	123.84	62.49
123.97	62.52	124.11	62.55	124.24	62.58	124.36	62.6	124.38	62.61
124.52	62.64	124.67	62.67	124.82	62.7	124.96	62.73	125.11	62.76
125.38	62.79	126.02	62.82	126.63	62.85	127.11	62.88	127.34	62.91
127.5	62.94	127.66	62.97	127.82	63	127.97	63.03	128.12	63.06
128.27	63.09	128.42	63.12	128.57	63.15	128.72	63.18	128.85	63.21
128.86	63.21	129.02	63.24	129.16	63.27	129.3	63.3	129.47	63.33
129.64	63.36	129.81	63.39	129.98	63.42	130.15	63.45	130.32	63.48
130.48	63.51	130.65	63.54	130.82	63.57	130.98	63.6	131.15	63.63
131.31	63.66	131.65	63.69	132	63.72	132.35	63.75	132.59	63.78
132.84	63.81	133.08	63.84	133.66	63.84	133.99	63.81	135.14	63.78
135.51	63.75	135.71	63.72	135.9	63.69	136.1	63.66	136.3	63.63
136.49	63.6	136.69	63.57	136.89	63.54	137.08	63.51	137.27	63.48
137.52	63.45	137.78	63.42	138.03	63.39	138.28	63.36	138.53	63.33
138.78	63.3	139.02	63.27	139.24	63.24	139.64	63.21	140.14	63.18
140.6	63.15	141	63.12	142.34	63.12	143.51	63.15	145.56	63.18
146.42	63.21	147.72	63.21						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	52.45	.03	95.49	.035	126.02	.1	143.51	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
119.35	124.36	4.76	4.76	4.76	.1	.3

Left Levee Station= 117.99 Elevation= 65.45

Blocked Obstructions num= 1

Sta L	Sta R	Elev
112.76	118.45	65.39

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 987.5

INPUT
Description:
Station Elevation Data num= 487

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.63	.04	72.63	.5	72.6	1.08	72.57	1.64	72.54
2.01	72.51	2.49	72.48	3.35	72.42	3.74	72.39	4.08	72.36
4.28	72.33	4.62	72.3	5.34	72.24	5.72	72.21	5.98	72.18
6.35	72.15	6.79	72.12	7.34	72.09	7.91	72.06	8.36	72.03
9.22	71.97	9.67	71.94	10.09	71.91	10.29	71.88	10.49	71.85
10.69	71.82	10.89	71.79	11.29	71.73	11.49	71.7	11.7	71.67
11.9	71.64	12.11	71.61	12.53	71.58	12.97	71.55	13.39	71.52
13.8	71.49	14.19	71.46	14.52	71.43	14.85	71.4	15.49	71.34
15.8	71.31	16.1	71.28	16.3	71.25	16.49	71.22	16.87	71.16
17.06	71.13	17.25	71.1	17.45	71.07	17.64	71.04	18.02	70.98
18.57	70.95	20.44	70.95	20.84	70.92	21.31	70.89	21.77	70.86
22.21	70.83	22.41	70.8	22.59	70.77	22.97	70.71	23.16	70.68
23.54	70.62	23.73	70.59	23.93	70.56	24.1	70.53	24.25	70.5
24.38	70.47	24.51	70.44	24.65	70.41	24.78	70.38	25.06	70.32
25.2	70.29	25.34	70.26	25.47	70.23	25.61	70.2	25.74	70.17
25.88	70.14	26.01	70.11	26.14	70.08	26.56	70.05	27.13	70.02
27.71	69.99	28.45	69.96	30.24	69.93	30.42	69.9	30.6	69.87
30.79	69.84	30.97	69.81	31.16	69.78	31.36	69.75	31.55	69.72
31.74	69.69	31.94	69.66	32.13	69.63	32.78	69.6	33.93	69.57
34.45	69.54	34.99	69.51	35.45	69.48	35.81	69.45	36.16	69.42
36.32	69.39	36.38	69.36	36.57	69.33	36.8	69.3	37.04	69.27
37.29	69.24	37.55	69.21	37.79	69.18	37.93	69.12	38.07	69.06
38.21	69	38.28	68.97	38.32	68.94	38.38	68.88	38.44	68.82
38.47	68.79	38.53	68.73	38.59	68.67	38.62	68.64	38.68	68.58
38.74	68.52	38.78	68.49	38.81	68.46	38.84	68.43	38.88	68.4
38.94	68.34	38.97	68.31	39.01	68.28	39.07	68.22	39.1	68.19
39.14	68.16	39.2	68.1	39.24	68.07	39.27	68.04	39.33	67.98
39.36	67.95	39.4	67.92	39.43	67.89	39.46	67.86	39.49	67.83
39.53	67.8	39.56	67.77	39.59	67.74	39.62	67.71	39.65	67.68
39.69	67.65	39.72	67.62	39.75	67.59	39.78	67.56	39.81	67.53
39.85	67.5	39.88	67.47	39.91	67.44	39.94	67.41	39.97	67.38
40	67.35	40.04	67.32	40.07	67.29	40.1	67.26	40.13	67.23
40.16	67.2	40.19	67.17	40.22	67.14	40.26	67.11	40.29	67.08
40.35	67.05	40.42	67.02	40.48	66.99	40.55	66.96	40.61	66.93
40.68	66.9	40.75	66.87	40.81	66.84	40.88	66.81	40.95	66.78
41.01	66.75	41.08	66.72	41.15	66.69	41.21	66.66	41.28	66.63
41.35	66.6	41.41	66.57	41.48	66.54	41.55	66.51	41.61	66.48
41.68	66.45	41.75	66.42	41.81	66.39	41.88	66.36	41.94	66.33
42.01	66.3	42.08	66.27	42.14	66.24	42.21	66.21	42.28	66.18
42.63	66.15	43.56	66.12	44.33	66.09	44.88	66.06	45.45	66.03
46.01	66	48.59	65.97	49.43	65.94	50.03	65.91	53.32	65.91
57.04	65.91	57.62	65.88	58.19	65.85	63.06	65.85	64.15	65.88
65.46	65.91	70.73	65.91	72.83	65.94	73.36	65.97	73.76	66

74.17	66.03	74.57	66.06	75.84	66.03	76.52	66	76.58	66
77.19	66.03	77.82	66.06	78.45	66.09	78.67	66.09	79.35	66.06
79.69	66.03	80.02	66	80.36	65.97	84.83	65.97	85.48	65.94
86.14	65.91	86.6	65.88	87.36	65.85	88.18	65.82	88.77	65.79
88.94	65.76	89.16	65.73	89.37	65.7	89.58	65.67	89.78	65.64
89.95	65.61	90.1	65.58	90.25	65.55	90.4	65.52	90.55	65.49
90.7	65.46	90.77	65.43	90.84	65.4	90.91	65.37	90.99	65.34
91.06	65.31	91.13	65.28	91.21	65.25	91.28	65.22	91.35	65.19
91.42	65.16	91.5	65.13	91.57	65.1	91.64	65.07	91.72	65.04
91.79	65.01	91.86	64.98	91.93	64.95	92.01	64.92	92.08	64.89
92.15	64.86	92.23	64.83	92.3	64.8	92.37	64.77	92.45	64.74
92.52	64.71	92.59	64.68	92.66	64.65	92.75	64.62	92.85	64.59
92.95	64.56	93.05	64.53	93.16	64.5	93.26	64.47	93.36	64.44
93.46	64.41	93.57	64.38	93.68	64.35	93.79	64.32	93.9	64.29
94.02	64.26	94.13	64.23	94.25	64.2	94.37	64.17	94.49	64.14
94.6	64.11	94.71	64.08	95.06	64.05	95.49	64.02	95.92	63.99
96.33	63.96	96.67	63.93	96.85	63.9	97.01	63.87	97.16	63.84
97.32	63.81	97.47	63.78	97.62	63.75	97.77	63.72	97.92	63.69
98.06	63.66	98.21	63.63	98.36	63.6	98.5	63.57	98.63	63.54
98.76	63.51	98.9	63.48	99.04	63.45	99.19	63.42	99.37	63.39
99.59	63.36	99.8	63.33	100.02	63.3	100.25	63.27	100.48	63.24
100.69	63.21	100.97	63.18	101.34	63.15	101.71	63.12	102.08	63.09
102.44	63.06	102.74	63.03	102.99	63	103.23	62.97	103.49	62.94
103.77	62.91	104.04	62.88	104.31	62.85	104.58	62.82	105.37	62.79
105.65	62.76	105.93	62.73	106.21	62.7	106.49	62.67	106.77	62.64
109.03	62.64	109.8	62.61	110.58	62.58	111.21	62.55	111.67	62.52
112.1	62.49	112.52	62.46	112.85	62.43	113.53	62.4	114.94	62.4
115.51	62.37	116.27	62.34	116.85	62.31	117.39	62.28	118.33	62.25
118.65	62.22	119.27	62.19	120.6	62.16	121.2	62.16	121.93	62.19
122.68	62.22	123	62.22	123.19	62.19	123.39	62.16	123.58	62.13
123.78	62.1	123.97	62.07	124.16	62.04	124.36	62.01	124.56	61.98
124.75	61.95	124.94	61.92	124.99	61.92	125.93	61.89	126.89	61.86
127	61.86	127.16	61.86	127.52	61.89	127.81	61.92	128.05	61.95
128.24	61.98	128.34	62.01	128.45	62.04	128.55	62.07	128.66	62.1
128.77	62.13	128.82	62.14	128.87	62.16	128.98	62.19	129.09	62.22
129.19	62.25	129.3	62.28	129.38	62.31	129.46	62.34	129.56	62.37
129.73	62.4	129.92	62.43	130.11	62.46	130.3	62.49	130.49	62.52
130.69	62.55	130.88	62.58	131.08	62.61	131.15	62.62	131.33	62.64
131.92	62.67	132.26	62.68	132.69	62.7	133.25	62.73	133.53	62.76
133.68	62.79	133.84	62.82	134	62.85	134.15	62.88	134.31	62.91
134.51	62.94	134.78	62.97	135.05	63	135.27	63.03	135.43	63.06
135.64	63.09	135.83	63.12	136.02	63.15	136.21	63.18	136.41	63.21
136.6	63.24	136.77	63.27	136.94	63.3	137.11	63.33	137.28	63.36
137.45	63.39	137.61	63.42	137.76	63.45	137.9	63.48	138.04	63.51
138.18	63.54	138.32	63.57	138.46	63.6	138.6	63.63	138.73	63.66
138.86	63.69	139	63.72	139.13	63.75	139.26	63.78	139.4	63.81
139.47	63.81	139.63	63.78	139.79	63.75	139.95	63.72	140.11	63.69
140.27	63.66	140.43	63.63	140.63	63.6	140.84	63.57	141.05	63.54
141.26	63.51	141.49	63.48	141.59	63.45	141.7	63.42	141.82	63.39
141.93	63.36	142.04	63.33	142.16	63.3	142.27	63.27	142.38	63.24
142.49	63.21	142.61	63.18	142.72	63.15	142.83	63.12	142.95	63.09
143.06	63.06	143.17	63.03	143.28	63	143.39	62.97	143.61	62.94

143.85	62.91	144.09	62.88	144.33	62.85	144.57	62.82	144.81	62.79
145.02	62.76	145.23	62.73	145.49	62.7	146.36	62.67	147.17	62.64
148.58	62.64	153.32	62.64						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	63.06	.03	97.77	.035	133.53	.1	148.58	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
126.89	132.26	16.53	16.53	16.53	.1	.3

CROSS SECTION

RIVER: INNOMINADO1
REACH: INNOMINADO1 RS: 987

INPUT
Description:
Station Elevation Data num= 495

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.18	.21	72.18	.69	72.15	1.32	72.12	2.01	72.09
2.65	72.06	3.25	72.03	3.8	72	4.25	71.97	4.62	71.94
5.29	71.91	5.85	71.88	6.13	71.85	6.4	71.82	6.67	71.79
7.21	71.73	7.77	71.67	8.06	71.64	8.69	71.61	9.39	71.58
10.05	71.55	10.27	71.52	10.45	71.49	10.64	71.46	10.84	71.43
11.24	71.37	11.66	71.31	12.06	71.25	12.23	71.22	12.41	71.19
12.58	71.16	12.76	71.13	12.93	71.1	13.11	71.07	13.28	71.04
13.45	71.01	13.63	70.98	14.14	70.89	14.36	70.86	14.63	70.83
14.89	70.8	15.39	70.74	15.63	70.71	15.82	70.68	16.1	70.62
16.32	70.59	16.64	70.56	16.95	70.53	17.19	70.5	17.39	70.47
17.58	70.44	17.78	70.41	17.97	70.38	18.17	70.35	18.34	70.32
18.5	70.29	18.66	70.26	19.17	70.23	20.26	70.2	20.92	70.17
21.64	70.14	22.23	70.11	22.67	70.05	22.88	70.02	23.08	69.99
23.27	69.96	23.46	69.93	23.65	69.9	24.25	69.81	26.62	69.78
28.49	69.75	30.43	69.72	30.91	69.66	31.37	69.6	31.6	69.57
31.82	69.54	32.05	69.51	32.25	69.48	32.37	69.45	32.45	69.39
32.48	69.36	32.52	69.33	32.6	69.27	32.63	69.24	32.67	69.21
32.71	69.18	32.75	69.15	32.78	69.12	32.86	69.06	32.9	69.03
32.93	69	33.01	68.94	33.09	68.88	33.12	68.85	33.2	68.79
33.36	68.67	33.4	68.64	33.43	68.61	33.63	68.46	33.67	68.43
33.91	68.25	33.95	68.22	34.11	68.1	34.15	68.07	34.19	68.04
34.23	68.01	34.27	67.98	34.31	67.95	34.37	67.89	34.42	67.86
34.6	67.8	34.69	67.77	34.79	67.74	34.88	67.71	34.97	67.68
35.06	67.65	35.16	67.62	35.43	67.53	35.52	67.5	35.62	67.47
35.71	67.44	35.98	67.35	36.08	67.32	36.17	67.29	36.35	67.23
36.56	67.2	36.83	67.17	37.11	67.14	37.38	67.11	37.65	67.08
37.92	67.05	38.19	67.02	38.45	66.99	38.58	66.96	38.74	66.93
38.91	66.9	39.1	66.87	39.32	66.84	39.58	66.81	39.87	66.78
40.22	66.75	40.52	66.72	40.7	66.69	40.91	66.66	41.15	66.63
41.44	66.6	41.78	66.57	42.19	66.54	42.69	66.51	43.23	66.48

43.86	66.45	44.68	66.42	46.32	66.39	46.97	66.36	47.48	66.33
48.02	66.3	48.64	66.27	48.94	66.24	49.25	66.21	49.55	66.18
49.85	66.15	50.13	66.12	50.41	66.09	51.17	66.06	53.3	66.06
55.58	66.06	56.62	66.09	58.94	66.09	59.73	66.06	61.39	66.03
62.99	66	64.15	65.97	65.28	65.97	67.39	65.97	68.78	66
69.53	66.03	70.47	66.06	72.87	66.06	75.83	66.09	76.94	66.09
77.62	65.97	77.79	65.94	77.96	65.91	78.3	65.85	78.47	65.82
78.6	65.79	78.72	65.76	78.94	65.7	79.07	65.67	79.19	65.64
79.45	65.58	79.57	65.55	79.7	65.52	79.83	65.49	79.95	65.46
80.08	65.43	80.2	65.4	80.42	65.34	80.53	65.31	80.63	65.28
80.73	65.25	80.83	65.22	80.93	65.19	81.25	65.07	81.33	65.04
81.49	64.98	81.57	64.95	81.65	64.92	81.97	64.8	82.05	64.77
83.14	64.77	83.4	64.74	83.65	64.71	83.91	64.68	84.17	64.65
84.41	64.62	84.56	64.59	84.71	64.56	84.87	64.53	85.63	64.5
86.93	64.47	87.28	64.44	87.9	64.38	88.22	64.35	88.53	64.32
88.96	64.29	89.11	64.26	89.23	64.23	89.35	64.2	89.46	64.17
89.7	64.11	89.94	64.05	90.07	64.02	90.2	63.99	90.46	63.93
90.72	63.87	90.85	63.84	90.98	63.81	91.09	63.78	91.62	63.75
92.42	63.72	93	63.69	93.65	63.66	94.55	63.63	95.15	63.6
95.79	63.54	96.13	63.51	96.47	63.48	96.83	63.45	97.14	63.42
97.33	63.39	97.57	63.36	97.82	63.33	98.08	63.3	98.34	63.27
98.6	63.24	98.87	63.21	99.14	63.18	99.67	63.15	100.19	63.12
100.73	63.09	101.06	63.06	101.52	63.06	102.7	63.09	103.57	63.09
104.6	63.06	105.36	63.03	105.8	63	106.86	62.94	107.32	62.91
107.7	62.88	108.18	62.85	108.82	62.82	109.32	62.79	109.82	62.73
110.31	62.7	110.79	62.67	111.21	62.64	111.55	62.61	111.93	62.58
112.32	62.55	112.72	62.52	113.12	62.49	114.3	62.46	117.48	62.46
117.85	62.43	118.57	62.37	118.94	62.34	119.32	62.31	119.68	62.28
120.03	62.25	120.39	62.22	120.78	62.19	121.21	62.16	121.46	62.13
121.64	62.1	121.85	62.07	122.06	62.04	122.5	61.98	122.73	61.95
122.96	61.92	123.13	61.89	123.29	61.86	123.52	61.83	123.83	61.8
124.15	61.77	124.53	61.74	124.9	61.71	125.33	61.68	125.78	61.65
126.17	61.62	126.54	61.59	126.92	61.56	127.15	61.53	127.31	61.5
127.46	61.47	127.6	61.44	127.75	61.41	127.89	61.38	128.17	61.32
128.31	61.29	128.46	61.26	128.6	61.23	128.74	61.2	128.87	61.17
129.15	61.11	129.29	61.08	129.39	61.05	129.5	61.02	129.71	60.99
129.91	60.96	130.11	60.93	130.26	60.9	130.28	60.9	130.36	60.87
130.44	60.84	130.52	60.81	130.6	60.78	130.67	60.75	130.68	60.75
130.76	60.72	130.84	60.69	130.91	60.66	130.97	60.63	131.09	60.57
131.14	60.54	131.2	60.51	131.3	60.45	131.35	60.42	131.4	60.39
131.45	60.36	131.5	60.33	131.54	60.3	131.59	60.27	131.63	60.24
131.68	60.21	131.72	60.18	131.78	60.15	131.87	60.12	131.95	60.09
132.04	60.06	132.12	60.03	132.2	60	132.27	59.97	132.35	59.94
132.42	59.91	132.48	59.88	132.55	59.85	132.61	59.82	132.79	59.73
132.84	59.7	132.9	59.67	132.95	59.64	133.05	59.58	133.1	59.55
133.14	59.52	133.26	59.4	133.32	59.34	133.5	59.16	133.53	59.13
133.59	59.07	133.61	59.07	133.81	59.08	134.07	59.1	134.27	59.13
134.29	59.16	134.32	59.19	134.34	59.22	134.37	59.25	134.39	59.28
134.42	59.31	134.44	59.34	134.47	59.37	134.49	59.4	134.52	59.43
134.54	59.46	134.57	59.49	134.59	59.52	134.62	59.55	134.64	59.58
134.67	59.61	134.69	59.64	134.72	59.67	134.74	59.7	134.77	59.73
134.79	59.76	134.85	59.82	134.87	59.85	134.9	59.88	134.92	59.91

134.95	59.94	134.97	59.97	135.01	60	135.05	60.03	135.13	60.09
135.17	60.12	135.21	60.15	135.26	60.18	135.3	60.21	135.34	60.24
135.39	60.27	135.44	60.3	135.48	60.33	135.63	60.42	135.68	60.45
135.74	60.48	135.79	60.51	135.84	60.54	136.02	60.63	136.08	60.66
136.14	60.69	136.2	60.72	136.27	60.75	136.33	60.78	136.41	60.81
136.47	60.84	136.54	60.87	136.61	60.9	136.69	60.93	136.76	60.96
136.84	60.99	136.93	61.02	137	61.05	137.08	61.08	137.16	61.11
137.24	61.14	137.31	61.17	137.39	61.2	137.47	61.23	137.56	61.26
137.64	61.29	137.8	61.35	137.89	61.38	137.97	61.41	138.06	61.44
138.14	61.47	138.5	61.59	138.58	61.62	138.65	61.65	138.73	61.68
138.81	61.71	138.88	61.74	138.96	61.77	139.04	61.8	139.11	61.83
139.2	61.86	139.33	61.89	139.47	61.92	139.61	61.95	139.77	61.98
139.91	62.01	140.06	62.04	140.34	62.1	140.47	62.13	140.6	62.16
140.73	62.19	140.86	62.22	140.98	62.25	141.1	62.28	141.21	62.31
141.75	62.31	142.26	62.28	142.74	62.25	143.19	62.22	144.43	62.19
145.41	62.16	145.85	62.16	146.7	62.19	147.3	62.22	148.14	62.25
150.23	62.28	150.95	62.31	151.58	62.34	153.3	62.34	153.31	62.34

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	65.28	.03	83.65	.035	131.09	.1	141.75	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
130.67	136.41	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:INNOMINADO1

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
INNOMINADO1	1000	.035	.1					
INNOMINADO1	999	.035	.1					
INNOMINADO1	998	.035	.1					
INNOMINADO1	997	.035	.1					
INNOMINADO1	996	.035	.07	.1				
INNOMINADO1	995	.035	.07	.1				
INNOMINADO1	994	.035	.07	.1				
INNOMINADO1	993	.045	.035	.03	.07			

```
 .1
 INNOMINADO1          992               .045      .035       .03       .07
 .1
 INNOMINADO1          988               .045      .035       .03       .07
.04      .035        .1
 INNOMINADO1          987.8             .045       .03       .04      .035
 .1      .045
 INNOMINADO1          987.6             .045       .03      .035        .1
.045
 INNOMINADO1          987.5             .045       .03      .035        .1
.045
 INNOMINADO1          987               .045       .03      .035        .1
.045
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SUMMARY OF REACH LENGTHS

River: INNOMINADO1

Reach	River Sta.	Left	Channel	Right
INNOMINADO1	1000	10.78	10.78	10.78
INNOMINADO1	999	12.65	12.65	12.65
INNOMINADO1	998	16.7	16.7	16.7
INNOMINADO1	997	12.81	12.81	12.81
INNOMINADO1	996	13.55	13.55	13.55
INNOMINADO1	995	12.34	12.34	12.34
INNOMINADO1	994	17.59	17.59	17.59
INNOMINADO1	993	22.86	22.86	22.86
INNOMINADO1	992	14.42	14.42	14.42
INNOMINADO1	988	5.73	5.73	5.73
INNOMINADO1	987.8	6.48	6.48	6.48
INNOMINADO1	987.6	4.76	4.76	4.76
INNOMINADO1	987.5	16.53	16.53	16.53
INNOMINADO1	987	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: INNOMINADO1

Reach	River Sta.	Contr.	Expan.
INNOMINADO1	1000	.1	.3
INNOMINADO1	999	.1	.3
INNOMINADO1	998	.1	.3
INNOMINADO1	997	.1	.3

INNOMINADO1	996	.1	.3
INNOMINADO1	995	.1	.3
INNOMINADO1	994	.1	.3
INNOMINADO1	993	.1	.3
INNOMINADO1	992	.1	.3
INNOMINADO1	988	.1	.3
INNOMINADO1	987.8	.1	.3
INNOMINADO1	987.6	.1	.3
INNOMINADO1	987.5	.1	.3
INNOMINADO1	987	.1	.3

HIDROLOGICO HIDRAULICO.rep

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   X
XXXXXXX  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     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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PROJECT DATA
Project Title: HEC-RAS Model
Project File : HIDROLOGICO HIDRAULICO.prj
Run Date and Time: 02/01/2018 8:59:03

Project in SI units

Project Description:
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PLAN DATA

Plan Title: ANALISIS PROYECTO CHURRIANA
Plan File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.p03

Geometry Title: GEOMETRIA CULVERT
Geometry File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.g03

Flow Title   : FLOWDATAP
Flow File   : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.f03

Plan Description:
Default Scenario

Plan Summary Information:
Number of: Cross Sections = 22 Multiple Openings = 0
Culverts = 2 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: Mixed Flow

FLOW DATA

Flow Title: FLOWDATAP
Flow File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.f03

Flow Data (m3/s)

River	Reach	RS	TR 5	TR 10	TR 100	TR 500
DE LA CALERA	CALERA	1000	2.88	3.96	9.07	14.79

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
DE LA CALERA	CALERA	TR 5	Critical	Normal S = 0.055709
DE LA CALERA	CALERA	TR 10	Critical	Normal S = 0.055709
DE LA CALERA	CALERA	TR 100	Critical	Normal S = 0.055709
DE LA CALERA	CALERA	TR 500	Critical	Normal S = 0.055709

GEOMETRY DATA

Geometry Title: GEOMETRIA CULVERT
Geometry File : C:\Users\JoseEnrique\Desktop\18-05 EAE EL HIGUERAL CHURRIANA\HECGEORAS\HIDROLOGICO HIDRAULICO.g03

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 1000

INPUT
Description:
Station Elevation Data num= 401

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.24	.13	98.22	.27	98.19	.42	98.16	.56	98.13
.71	98.1	.85	98.07	.99	98.04	1.13	98.01	1.28	97.98
1.56	97.92	1.71	97.89	1.85	97.86	2	97.83	2.24	97.77
2.37	97.74	2.49	97.71	2.61	97.68	2.74	97.65	2.86	97.62
2.99	97.59	3.23	97.53	3.36	97.5	3.48	97.47	3.61	97.44
3.73	97.41	3.86	97.38	3.98	97.35	4.25	97.32	4.54	97.29
4.79	97.26	5.99	97.11	6.27	97.08	6.57	97.05	6.83	97.02
7.31	96.96	7.55	96.93	8.03	96.87	8.28	96.84	8.54	96.81
8.81	96.78	9.1	96.75	9.42	96.72	9.76	96.69	10.08	96.66
10.56	96.6	10.81	96.57	11.05	96.54	11.28	96.51	11.5	96.48
11.73	96.45	11.95	96.42	12.18	96.39	12.43	96.36	12.67	96.33
12.92	96.3	13.16	96.27	13.41	96.24	13.63	96.21	13.85	96.18
14.08	96.15	14.33	96.12	14.57	96.09	15.57	95.97	16.11	95.91
16.35	95.88	16.58	95.85	16.82	95.82	17.06	95.79	17.54	95.73
17.77	95.7	18.08	95.67	18.3	95.64	18.51	95.61	18.73	95.58
18.94	95.55	19.16	95.52	19.37	95.49	19.59	95.46	19.81	95.43
20.02	95.4	20.29	95.37	20.59	95.34	21.21	95.28	21.51	95.25
21.82	95.22	22.12	95.19	22.39	95.16	22.7	95.13	23.34	95.07
23.67	95.04	23.99	95.01	24.26	94.98	24.58	94.95	25.32	94.89
25.68	94.86	26.07	94.83	26.2	94.83	26.83	94.86	27.81	94.89
28.2	94.92	28.37	94.95	28.56	94.98	28.92	95.04	29.09	95.07
29.45	95.13	29.79	95.19	29.95	95.22	30.08	95.25	30.79	95.28
32.12	95.31	32.16	95.31	32.68	95.25	32.97	95.22	33.81	95.13
34.11	95.1	34.46	95.07	34.87	95.04	35.31	95.01	35.74	94.98
36.1	94.95	40.13	94.95	40.86	94.92	41.57	94.89	42.32	94.86
42.93	94.83	44.07	94.77	44.9	94.74	45.52	94.71	46.13	94.68
46.37	94.65	46.54	94.62	46.85	94.59	47.19	94.56	47.83	94.5
48.14	94.47	48.55	94.44	49.81	94.35	50.22	94.32	57.02	94.32
58.45	94.32	58.76	94.29	59.4	94.23	59.74	94.2	60.4	94.14
61.14	94.08	62.4	93.99	62.85	93.96	63.3	93.93	64.2	93.87
65.04	93.87	66.17	93.89	66.9	93.9	69.28	93.93	70.58	93.93

71.42	93.87	71.84	93.84	72.48	93.78	74.86	93.78	75.74	93.84
76.64	93.9	76.94	93.93	77.23	93.96	77.52	93.99	77.82	94.02
78.11	94.05	78.71	94.11	79.4	94.14	80.14	94.17	82	94.17
83.05	94.14	84.92	94.14	85.12	94.14	85.34	94.11	85.57	94.08
85.74	94.05	86.02	93.99	86.16	93.96	86.3	93.93	86.43	93.9
86.57	93.87	86.83	93.81	86.95	93.78	87.61	93.6	87.71	93.57
87.93	93.51	88.17	93.45	88.22	93.44	88.29	93.42	88.41	93.39
88.54	93.36	88.66	93.33	89.18	93.21	89.31	93.18	89.47	93.15
89.65	93.12	89.86	93.09	90.62	93.06	91.61	93.03	92.68	93.03
93.02	93.06	93.41	93.09	93.81	93.12	94.13	93.15	94.43	93.18
94.68	93.21	94.9	93.24	95.11	93.27	95.33	93.3	95.59	93.33
95.88	93.36	96.18	93.39	96.47	93.42	96.77	93.45	97.02	93.48
97.31	93.51	97.68	93.54	98.29	93.57	99.56	93.6	99.59	93.6
99.72	93.6	100.26	93.63	100.92	93.69	101.24	93.72	101.54	93.75
101.83	93.78	102.11	93.81	102.47	93.84	102.88	93.87	103.32	93.9
103.79	93.93	104.29	93.96	104.98	93.99	105.85	94.02	106.62	94.05
107.11	94.08	108.13	94.14	108.7	94.17	109.71	94.2	110.73	94.23
111.41	94.26	112.07	94.29	112.75	94.32	113.15	94.35	113.87	94.41
114.23	94.44	114.57	94.47	114.92	94.5	115.2	94.53	116.2	94.65
116.44	94.68	116.68	94.71	116.9	94.74	117.11	94.77	117.3	94.8
117.5	94.83	117.69	94.86	118.49	94.98	118.89	95.04	119.1	95.07
119.29	95.1	119.46	95.13	119.62	95.16	119.79	95.19	119.96	95.22
120.14	95.25	120.48	95.31	120.66	95.34	120.83	95.37	121.01	95.4
121.18	95.43	121.36	95.46	121.75	95.55	121.87	95.58	122	95.61
122.12	95.64	122.64	95.76	122.78	95.79	122.92	95.82	123.2	95.88
123.34	95.91	123.47	95.94	123.65	95.97	124.31	96.06	124.52	96.09
124.73	96.12	124.94	96.15	125.14	96.18	125.34	96.21	125.53	96.24
125.7	96.27	126.15	96.36	126.29	96.39	126.59	96.45	126.73	96.48
126.88	96.51	127.02	96.54	127.17	96.57	127.31	96.6	127.46	96.63
127.74	96.69	128.22	96.78	128.37	96.81	128.69	96.87	128.84	96.9
129	96.93	129.16	96.96	129.33	96.99	129.49	97.02	129.66	97.05
129.83	97.08	130.15	97.14	130.3	97.17	130.62	97.23	130.77	97.26
130.92	97.29	131.08	97.32	131.23	97.35	131.83	97.47	131.98	97.5
132.27	97.53	132.6	97.56	132.94	97.59	133.26	97.62	133.59	97.65
133.91	97.68	134.19	97.71	134.33	97.74	134.47	97.77	134.62	97.8
134.9	97.86	135.06	97.89	135.21	97.92	135.53	97.98	135.87	98.04
136.23	98.1	136.77	98.19	137.72	98.34	137.92	98.37	138.11	98.4
138.22	98.42	138.31	98.43	138.46	98.46	138.58	98.49	138.69	98.52
138.81	98.55	138.92	98.58	139.03	98.61	139.15	98.64	139.48	98.73
139.92	98.85	140.02	98.88	140.26	98.94	140.39	98.97	140.51	99
140.72	99.03	141.18	99.09	141.42	99.12	141.65	99.15	141.88	99.18
142.11	99.21	142.34	99.24	142.58	99.27	142.79	99.3	142.98	99.33
143.19	99.36	143.44	99.39	143.68	99.42	143.91	99.45	144.13	99.48
144.34	99.51	144.54	99.54	144.74	99.57	145.04	99.63	145.18	99.66
145.33	99.69	145.48	99.72	145.62	99.75	145.77	99.78	146.22	99.87
146.54	99.93	146.69	99.96	146.85	99.99	147.42	100.08	148.02	100.17
148.23	100.2	148.65	100.26	148.84	100.29	149.03	100.32	149.36	100.35
149.69	100.38	150.03	100.41	150.34	100.44	150.67	100.47	150.99	100.5
151.3	100.53	151.71	100.56	152.26	100.59	152.85	100.62	153.55	100.65
154.06	100.67								

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.07	3.23	.1	40.13	.07	57.02	.035	86.83	.1
117.11	.035								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84.92	99.59	30.97	30.97	.1	.3

Left Levee Station= 82 Elevation= 94.75

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
7.56	25.82	99.86	30.22	35.48	100.01

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 999

INPUT
Description:
Station Elevation Data num= 403

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	90.93	.5	90.9	1.07	90.87	1.64	90.84	2.8	90.84
4.08	90.87	4.1	90.87	4.45	90.84	4.8	90.81	5.17	90.78
6.2	90.75	6.8	90.72	7.41	90.69	8.07	90.66	8.83	90.63
9.51	90.6	10.15	90.57	12.36	90.54	13.2	90.51	14.04	90.48
16.96	90.45	18.39	90.42	20.78	90.39	22.44	90.36	22.7	90.36
27.43	90.39	28.37	90.42	29.51	90.45	30.43	90.48	31.31	90.48
32.33	90.45	32.92	90.42	33.2	90.39	33.49	90.36	33.77	90.33
34.05	90.3	34.32	90.27	34.58	90.24	34.83	90.21	34.86	90.21
35.55	90.24	36.38	90.27	37.11	90.3	37.68	90.33	38.3	90.36
38.43	90.37	38.96	90.39	39.44	90.42	39.94	90.45	40.46	90.48
41.09	90.51	43.32	90.54	44.56	90.57	45.34	90.6	45.89	90.63
46.51	90.66	49.73	90.66	50.27	90.63	50.78	90.6	52.19	90.6
52.91	90.63	53.48	90.66	53.8	90.69	54.14	90.72	54.51	90.75
54.91	90.78	55.34	90.81	55.89	90.84	56.66	90.87	57.53	90.9
59.33	90.93	60.41	90.96	61.03	90.99	61.75	91.02	62.86	91.05
63.98	91.08	65.21	91.11	66.74	91.14	67.16	91.17	67.54	91.2
67.95	91.23	68.75	91.26	72.31	91.26	73.18	91.29	73.65	91.32
74.13	91.35	74.76	91.38	79.03	91.38	80.38	91.4	80.84	91.41
81.26	91.44	81.71	91.47	82.14	91.5	82.56	91.53	82.96	91.56
83.52	91.56	83.85	91.53	83.89	91.53	84.21	91.5	84.6	91.47
85.02	91.44	85.48	91.41	85.81	91.38	86.03	91.35	86.24	91.32
86.41	91.29	86.56	91.26	86.71	91.23	86.85	91.2	86.94	91.17
87.04	91.14	87.13	91.11	87.23	91.08	87.32	91.05	87.42	91.02
87.51	90.99	87.6	90.96	87.7	90.93	87.79	90.9	87.88	90.87
87.98	90.84	88.07	90.81	88.16	90.78	88.24	90.75	88.32	90.72
88.41	90.69	88.43	90.68	88.5	90.66	88.6	90.63	88.69	90.6
88.8	90.57	88.9	90.54	89.01	90.51	89.12	90.48	89.24	90.45
89.36	90.42	89.49	90.39	89.63	90.36	89.76	90.33	89.91	90.3
90.07	90.27	90.23	90.24	90.5	90.21	90.55	90.21	90.86	90.24
91.19	90.27	91.47	90.3	91.72	90.33	91.94	90.36	92.14	90.39

92.32	90.42	92.44	90.45	92.53	90.48	92.62	90.51	92.72	90.54
92.81	90.57	92.9	90.6	92.99	90.63	93.09	90.66	93.18	90.69
93.27	90.72	93.37	90.75	93.46	90.78	93.56	90.81	93.65	90.84
93.74	90.87	93.83	90.9	93.92	90.93	94	90.96	94.09	90.99
94.17	91.02	94.26	91.05	94.35	91.08	94.46	91.11	94.57	91.14
94.68	91.17	94.81	91.2	94.94	91.23	95.09	91.26	95.24	91.29
95.48	91.32	95.79	91.35	96.27	91.38	96.86	91.41	98.18	91.41
98.86	91.41	99.95	91.44	100.64	91.47	102.26	91.5	103.03	91.53
103.77	91.56	104.27	91.59	105.02	91.62	105.76	91.65	106.36	91.68
106.83	91.71	107.29	91.74	107.75	91.77	108.31	91.8	109.15	91.83
109.7	91.86	110.81	91.89	112.42	91.92	112.76	91.95	113.11	91.98
113.49	92.01	113.9	92.04	114.29	92.07	114.57	92.1	114.85	92.13
115.13	92.16	115.41	92.19	115.69	92.22	116.06	92.25	116.35	92.28
116.52	92.31	116.69	92.34	116.86	92.37	117.03	92.4	117.21	92.43
117.39	92.46	117.57	92.49	117.74	92.52	117.91	92.55	118.07	92.58
118.24	92.61	118.53	92.64	119.04	92.67	119.54	92.7	120.05	92.73
121.08	92.76	122.37	92.79	122.53	92.82	122.7	92.85	122.87	92.88
123.04	92.91	123.25	92.94	123.47	92.97	123.7	93	123.92	93.03
124.15	93.06	124.37	93.09	124.52	93.12	124.68	93.15	124.83	93.18
124.99	93.21	125.14	93.24	125.32	93.27	125.53	93.3	125.74	93.33
125.97	93.36	126.25	93.39	126.48	93.42	126.68	93.45	126.87	93.48
127.07	93.51	127.26	93.54	127.45	93.57	127.65	93.6	127.84	93.63
128.04	93.66	128.23	93.69	128.44	93.72	128.7	93.75	128.96	93.78
129.23	93.81	129.49	93.84	129.76	93.87	130.03	93.9	130.29	93.93
130.51	93.96	130.68	93.99	130.84	94.02	131.01	94.05	131.19	94.08
131.37	94.11	131.55	94.14	131.72	94.17	131.9	94.2	132.08	94.23
132.26	94.26	132.44	94.29	132.58	94.32	132.71	94.35	132.84	94.38
132.97	94.41	133.1	94.44	133.23	94.47	133.36	94.5	133.47	94.52
133.5	94.53	133.64	94.56	133.79	94.59	133.94	94.62	134.09	94.65
134.24	94.68	134.39	94.71	134.54	94.74	134.77	94.77	135	94.8
135.23	94.83	135.45	94.86	135.69	94.89	135.92	94.92	136.16	94.95
136.39	94.98	136.62	95.01	136.76	95.04	136.91	95.07	137.05	95.1
137.2	95.13	137.34	95.16	137.49	95.19	137.64	95.22	137.79	95.25
137.94	95.28	138.09	95.31	138.23	95.34	138.38	95.37	138.43	95.38
138.52	95.4	138.68	95.43	138.81	95.46	138.94	95.49	139.06	95.52
139.19	95.55	139.32	95.58	139.45	95.61	139.58	95.64	139.71	95.67
139.84	95.7	139.97	95.73	140.1	95.76	140.23	95.79	140.36	95.82
140.49	95.85	140.62	95.88	140.75	95.91	140.87	95.94	141	95.97
141.15	96	141.31	96.03	141.46	96.06	141.61	96.09	141.76	96.12
141.91	96.15	142.05	96.18	142.19	96.21	142.33	96.24	142.47	96.27
142.61	96.3	142.74	96.33	142.9	96.36	143.04	96.39	143.18	96.42
143.32	96.45	143.46	96.48	143.6	96.51	143.75	96.54	143.89	96.57
144.04	96.6	144.19	96.63	144.34	96.66	144.49	96.69	144.65	96.72
144.8	96.75	144.93	96.78	145.14	96.81	145.35	96.84	145.57	96.87
145.78	96.9	146	96.93	146.22	96.96	146.44	96.99	146.66	97.02
146.88	97.05	147.13	97.08	147.38	97.11	147.62	97.14	147.86	97.17
148.09	97.2	148.31	97.23	148.54	97.26	148.77	97.29	148.99	97.32
149.29	97.35	149.64	97.38	150	97.41	150.37	97.44	150.78	97.47
151.19	97.5	151.49	97.53	151.78	97.56	152.08	97.59	152.37	97.62
152.67	97.65	152.96	97.68	153.26	97.71	155.37	97.74	158.66	97.71
159.71	97.68	160.19	97.65	160.25	97.65				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.07	22.7	.035	85.48	.1	119.04	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
83.89	98.18	17.69	17.69	17.69	.1 .3

Left Levee Station= 83.02 Elevation= 91.6

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 998

INPUT
Description:
Station Elevation Data num= 489

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	89.98	.09	89.97	.41	89.94	.73	89.91	1.05	89.88
1.36	89.85	1.68	89.82	2	89.79	2.25	89.76	2.49	89.73
2.74	89.7	3	89.67	3.27	89.64	3.55	89.61	3.85	89.58
4.14	89.55	4.33	89.52	4.52	89.49	4.71	89.46	4.9	89.43
5.12	89.4	5.35	89.37	5.59	89.34	5.85	89.31	6.13	89.28
10.69	89.25	12.43	89.22	12.77	89.19	13.12	89.16	13.46	89.13
13.81	89.1	14.16	89.07	14.51	89.04	14.88	89.01	15.26	88.98
15.63	88.95	16	88.92	16.38	88.89	16.83	88.86	17.18	88.83
17.52	88.8	17.86	88.77	18.2	88.74	18.54	88.71	19.02	88.68
19.54	88.65	20.1	88.62	20.97	88.62	21.58	88.65	22.43	88.68
22.9	88.71	23.26	88.74	23.73	88.77	24.25	88.8	24.75	88.83
25.31	88.86	25.95	88.89	26.53	88.92	26.93	88.95	27.36	88.98
27.78	89.01	28.18	89.04	28.5	89.07	28.83	89.1	30.09	89.13
31.01	89.16	32.26	89.19	33.08	89.19	33.31	89.16	33.54	89.13
33.78	89.1	34.03	89.07	34.27	89.04	34.52	89.01	34.76	88.98
35.01	88.95	35.4	88.92	35.99	88.89	36.71	88.86	37.49	88.86
38.23	88.89	38.89	88.92	39.7	88.95	40.99	88.98	41.77	89.01
42.29	89.04	42.79	89.07	43.26	89.1	43.83	89.13	44.35	89.16
44.84	89.19	45.3	89.22	45.74	89.25	45.9	89.26	46.23	89.28
46.76	89.31	47.34	89.34	47.87	89.37	48.38	89.4	48.88	89.43
49.38	89.46	49.69	89.49	49.93	89.52	50.17	89.55	50.41	89.58
50.67	89.61	50.92	89.64	51.17	89.67	51.5	89.7	52.28	89.73
52.94	89.76	53.49	89.79	53.59	89.79	53.94	89.76	54.29	89.73
54.66	89.7	55.07	89.67	55.49	89.64	58.2	89.64	58.67	89.67
59.1	89.7	59.65	89.73	60.47	89.76	67.16	89.76	68.47	89.79
69.77	89.82	71.48	89.85	72.69	89.88	73.37	89.91	80.61	89.91
81.38	89.88	82.08	89.85	83.48	89.82	85.43	89.79	86.28	89.76
87.27	89.73	87.37	89.73	88.03	89.76	88.38	89.78	88.7	89.79
89.36	89.82	90.35	89.82	90.99	89.79	91.64	89.76	92.1	89.73
92.46	89.7	92.77	89.67	93.05	89.64	93.31	89.61	93.53	89.58
93.72	89.55	93.92	89.52	94.11	89.49	94.27	89.46	94.4	89.43
94.53	89.4	94.65	89.37	94.77	89.34	94.89	89.31	95	89.28
95.11	89.25	95.22	89.22	95.33	89.19	95.43	89.16	95.53	89.13

95.63	89.1	95.73	89.07	95.83	89.04	95.9	89.02	95.92	89.01
96.01	88.98	96.1	88.95	96.19	88.92	96.28	88.89	96.36	88.86
96.45	88.83	96.53	88.8	96.61	88.77	96.71	88.74	96.82	88.71
96.94	88.68	97.08	88.65	97.23	88.62	97.41	88.59	97.61	88.56
97.85	88.53	98.04	88.5	98.26	88.5	98.6	88.53	98.68	88.56
98.76	88.59	98.84	88.62	98.91	88.65	98.98	88.68	99.05	88.71
99.12	88.74	99.19	88.77	99.26	88.8	99.33	88.83	99.4	88.86
99.47	88.89	99.54	88.92	99.61	88.95	99.68	88.98	99.76	89.01
99.86	89.04	99.96	89.07	100.07	89.1	100.18	89.13	100.29	89.16
100.4	89.19	100.52	89.22	100.66	89.25	100.8	89.28	100.95	89.31
101.1	89.34	101.23	89.37	101.35	89.4	101.46	89.43	101.57	89.46
101.67	89.49	101.78	89.52	101.89	89.55	101.99	89.58	102.08	89.61
102.18	89.64	102.27	89.67	102.4	89.7	102.55	89.73	102.73	89.76
102.95	89.79	103.17	89.82	103.31	89.85	103.46	89.88	103.86	89.91
104.25	89.94	104.6	89.97	105.01	90	105.49	90.03	105.51	90.03
105.93	90.03	106.12	90	106.31	89.97	106.5	89.94	106.7	89.91
106.89	89.88	107.2	89.85	107.4	89.83	107.55	89.82	107.98	89.79
110.91	89.79	111.58	89.82	112.26	89.85	112.96	89.88	113.42	89.88
116.25	89.85	117.26	89.82	118.1	89.79	118.33	89.79	119.4	89.82
120.21	89.85	120.82	89.88	121.33	89.91	121.78	89.94	121.84	89.94
122.37	89.91	122.98	89.88	123.67	89.85	125.37	89.82	128.84	89.82
130.36	89.85	131.22	89.88	132.23	89.91	133.06	89.94	133.89	89.97
135.19	90	135.97	90.03	136.26	90.06	136.55	90.09	136.83	90.12
137.12	90.15	137.42	90.18	137.7	90.21	138	90.24	138.35	90.27
138.69	90.3	139.04	90.33	139.38	90.36	139.72	90.39	140.04	90.42
140.33	90.45	140.62	90.48	140.91	90.51	141.19	90.54	141.47	90.57
141.73	90.6	141.95	90.63	142.2	90.66	142.44	90.69	142.66	90.72
142.88	90.75	143.1	90.78	143.32	90.81	143.52	90.84	143.69	90.87
143.86	90.9	144.01	90.93	144.16	90.96	144.3	90.99	144.45	91.02
144.59	91.05	144.73	91.08	144.87	91.11	145.01	91.14	145.15	91.17
145.29	91.2	145.42	91.23	145.55	91.26	145.68	91.29	145.81	91.32
145.9	91.34	145.92	91.35	146.02	91.38	146.12	91.41	146.22	91.44
146.32	91.47	146.42	91.5	146.53	91.53	146.63	91.56	146.74	91.59
146.84	91.62	146.95	91.65	147.05	91.68	147.16	91.71	147.26	91.74
147.37	91.77	147.48	91.8	147.58	91.83	147.7	91.86	147.81	91.89
147.93	91.92	148.1	91.95	148.28	91.98	148.44	92.01	148.6	92.04
148.76	92.07	148.92	92.1	149.07	92.13	149.22	92.16	149.37	92.19
149.51	92.22	149.66	92.25	149.8	92.28	149.95	92.31	150.12	92.34
150.28	92.37	150.44	92.4	150.61	92.43	150.77	92.46	150.94	92.49
151.1	92.52	151.27	92.55	151.43	92.58	151.6	92.61	151.76	92.64
151.92	92.67	151.99	92.7	152.06	92.73	152.17	92.76	152.3	92.79
152.42	92.82	152.55	92.85	152.68	92.88	152.81	92.91	152.93	92.94
153.06	92.97	153.19	93	153.32	93.03	153.46	93.06	153.59	93.09
153.72	93.12	153.84	93.15	153.93	93.18	154.07	93.21	154.21	93.24
154.35	93.27	154.49	93.3	154.62	93.33	154.76	93.36	154.9	93.39
155.03	93.42	155.17	93.45	155.31	93.48	155.44	93.51	155.58	93.54
155.72	93.57	155.85	93.6	155.99	93.63	156.14	93.66	156.3	93.69
156.45	93.72	156.61	93.75	156.76	93.78	156.92	93.81	157.07	93.84
157.23	93.87	157.38	93.9	157.54	93.93	157.7	93.96	157.85	93.99
158.03	94.02	158.24	94.05	158.45	94.08	158.66	94.11	158.86	94.14
159.07	94.17	159.28	94.2	159.49	94.23	159.69	94.26	159.9	94.29
160.04	94.32	160.17	94.35	160.29	94.38	160.42	94.41	160.55	94.44

160.67	94.47	160.8	94.5	160.93	94.53	161.06	94.56	161.18	94.59
161.31	94.62	161.44	94.65	161.56	94.68	161.69	94.71	161.82	94.74
161.95	94.77	162.15	94.8	162.29	94.83	162.44	94.86	162.58	94.89
162.71	94.92	162.84	94.95	162.98	94.98	163.11	95.01	163.24	95.04
163.38	95.07	163.51	95.1	163.64	95.13	163.77	95.16	163.91	95.19
164.1	95.22	164.32	95.25	164.55	95.28	164.79	95.31	165.04	95.34
165.29	95.37	165.53	95.4	165.78	95.43	166.04	95.46	166.33	95.49
166.62	95.52	166.88	95.55	167.13	95.58	167.37	95.61	167.62	95.64
167.86	95.67	168.19	95.7	168.58	95.73	168.96	95.76	169.34	95.79
169.72	95.82	170.07	95.85	170.39	95.88	170.75	95.91	171.14	95.94
171.57	95.97	172.01	96	172.27	96.03	172.54	96.06	172.8	96.09
173.04	96.12	173.28	96.15	173.5	96.18	173.71	96.21	173.93	96.24
174.45	96.27	175.06	96.3	175.7	96.33	176.24	96.33		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.07	2.74	.035	93.92	.1	125.37	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
88.38	105.51	18.07	18.07	18.07	.1 .3

Left Levee Station= 89.05 Elevation= 89.85

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 997

INPUT
Description:
Station Elevation Data num= 416

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	85.95	.47	85.98	.98	86.01	1.44	86.04	1.88	86.07
2.2	86.1	2.42	86.13	2.64	86.16	2.85	86.19	3.06	86.22
3.26	86.25	3.46	86.28	3.65	86.31	3.84	86.34	4.03	86.37
4.22	86.4	4.42	86.43	4.61	86.46	4.8	86.49	4.99	86.52
5.16	86.55	5.34	86.58	5.51	86.61	5.69	86.64	5.86	86.67
6.04	86.7	6.21	86.73	8.79	86.76	9.66	86.79	10.51	86.82
10.72	86.85	10.95	86.88	11.2	86.91	11.51	86.94	11.85	86.97
12.19	87	12.52	87.03	12.8	87.06	13.03	87.09	13.25	87.12
13.47	87.15	13.69	87.18	13.91	87.21	14.13	87.24	14.49	87.27
15.88	87.27	17.89	87.24	23.15	87.24	24.7	87.21	25.96	87.21
27.22	87.24	30.21	87.27	30.98	87.3	32.62	87.3	33.52	87.27
34.6	87.24	36.31	87.24	36.96	87.27	37.59	87.3	38.4	87.33
38.98	87.36	39.46	87.39	39.86	87.42	40.2	87.45	40.53	87.48
40.89	87.51	41.3	87.54	41.78	87.57	42.4	87.6	43.02	87.63
43.52	87.66	43.94	87.69	44.26	87.72	44.53	87.75	44.83	87.78
45.14	87.81	45.45	87.84	45.71	87.87	46.02	87.9	46.43	87.93
46.9	87.96	47.77	87.99	49.13	87.99	49.4	87.99	50.42	87.96
50.51	87.96	51.8	87.99	52.59	88.02	52.85	88.05	53.1	88.08
53.36	88.11	53.68	88.14	54.06	88.17	54.49	88.2	54.91	88.2

56.5	88.17	56.85	88.17	57.89	88.2	58.57	88.23	60.51	88.26
61.21	88.29	61.53	88.32	62.02	88.35	62.76	88.38	63.22	88.38
63.76	88.35	64.29	88.32	64.81	88.29	65.62	88.26	66.59	88.23
67.56	88.23	68.05	88.26	68.58	88.29	69.16	88.32	69.74	88.35
70.12	88.38	70.53	88.41	71.13	88.44	71.94	88.47	77.44	88.5
78.47	88.53	79.44	88.56	81.93	88.59	87.26	88.62	88.99	88.62
89.72	88.59	90.45	88.56	91.03	88.53	91.27	88.51	91.48	88.5
91.92	88.47	92.38	88.44	92.75	88.41	93.07	88.38	93.28	88.35
93.46	88.32	93.64	88.29	93.82	88.26	93.99	88.23	94.16	88.2
94.33	88.17	94.49	88.14	94.66	88.11	94.82	88.08	94.97	88.05
95.12	88.02	95.27	87.99	95.41	87.96	95.56	87.93	95.7	87.9
95.84	87.87	95.98	87.84	96.12	87.81	96.26	87.78	96.4	87.75
96.53	87.72	96.67	87.69	96.79	87.66	96.92	87.63	97.05	87.6
97.17	87.57	97.29	87.54	97.41	87.51	97.52	87.48	97.61	87.45
97.71	87.42	97.8	87.39	97.91	87.36	98.02	87.33	98.14	87.3
98.25	87.27	98.37	87.24	98.49	87.21	98.67	87.18	98.86	87.15
99.05	87.12	99.13	87.11	99.26	87.09	99.48	87.06	99.72	87.03
99.98	87	100.23	87	100.3	87.03	100.38	87.06	100.45	87.09
100.53	87.12	100.61	87.15	100.68	87.18	100.76	87.21	100.83	87.24
100.91	87.27	100.98	87.3	101.06	87.33	101.13	87.36	101.21	87.39
101.28	87.42	101.36	87.45	101.43	87.48	101.51	87.51	101.59	87.54
101.66	87.57	101.74	87.6	101.82	87.63	101.91	87.66	101.99	87.69
102.07	87.72	102.15	87.75	102.23	87.78	102.31	87.81	102.39	87.84
102.48	87.87	102.55	87.9	102.62	87.93	102.68	87.96	102.74	87.99
102.8	88.02	102.87	88.05	102.94	88.08	103.05	88.11	103.16	88.14
103.27	88.17	103.38	88.2	103.5	88.23	103.62	88.26	103.75	88.29
103.88	88.32	103.99	88.35	104.09	88.38	104.13	88.39	104.2	88.41
104.32	88.44	104.43	88.47	104.58	88.5	105.05	88.53	105.68	88.56
106.45	88.59	108.7	88.59	111.46	88.59	114.6	88.59	115.55	88.62
116.47	88.65	117.51	88.68	120.74	88.71	126.37	88.74	126.98	88.74
128.45	88.71	129.57	88.71	131.26	88.71	133.09	88.74	138.12	88.77
139.18	88.8	143.52	88.8	144.17	88.77	144.8	88.74	145.43	88.71
145.52	88.71	146.8	88.74	147.96	88.77	148.84	88.8	149.13	88.81
149.6	88.83	149.82	88.86	150.05	88.89	150.28	88.92	150.5	88.95
150.73	88.98	150.96	89.01	151.18	89.04	151.41	89.07	151.62	89.1
151.9	89.13	152.21	89.16	152.52	89.19	152.82	89.22	153.13	89.25
153.44	89.28	153.72	89.31	154.01	89.34	154.29	89.37	154.58	89.4
154.87	89.43	155.16	89.46	155.45	89.49	155.84	89.52	156.12	89.55
156.39	89.58	156.66	89.61	156.93	89.64	157.2	89.67	157.46	89.7
157.69	89.73	157.91	89.76	158.17	89.79	158.43	89.82	158.7	89.85
158.97	89.88	159.24	89.91	159.51	89.94	159.8	89.97	160.08	90
160.33	90.03	160.57	90.06	160.8	90.09	161.03	90.12	161.27	90.15
161.49	90.18	161.62	90.21	161.76	90.24	161.89	90.27	162	90.3
162.12	90.33	162.24	90.36	162.36	90.39	162.48	90.42	162.6	90.45
162.71	90.48	162.83	90.51	162.94	90.54	163.05	90.57	163.16	90.6
163.27	90.63	163.38	90.66	163.49	90.69	163.69	90.72	163.89	90.75
164.09	90.78	164.29	90.81	164.52	90.84	164.75	90.87	164.98	90.9
165.21	90.93	165.44	90.96	165.74	90.99	166.05	91.02	166.35	91.05
166.64	91.08	166.93	91.11	167.22	91.14	167.5	91.17	167.82	91.2
168.13	91.23	168.44	91.26	168.75	91.29	169.06	91.32	169.37	91.35
169.58	91.38	169.73	91.41	169.88	91.44	170.03	91.47	170.18	91.5
170.33	91.53	170.51	91.56	170.71	91.59	170.9	91.62	171.11	91.65

171.38	91.68	171.79	91.71	172.32	91.74	172.8	91.77	173.03	91.8
173.23	91.83	173.43	91.86	173.63	91.89	173.83	91.92	174.02	91.95
174.22	91.98	174.42	92.01	174.62	92.04	174.82	92.07	175.01	92.1
175.19	92.13	175.37	92.16	175.61	92.19	175.98	92.22	176.35	92.25
176.71	92.28	177.07	92.31	177.43	92.34	177.7	92.37	177.95	92.4
178.2	92.43	178.45	92.46	178.7	92.49	178.95	92.52	179.25	92.55
179.56	92.58	179.83	92.61	180.11	92.64	180.38	92.67	180.66	92.7
180.93	92.73	181.21	92.76	181.5	92.79	181.76	92.82	182.01	92.85
182.27	92.88	182.53	92.91	182.79	92.94	183.05	92.97	183.31	93
183.63	93.03	183.97	93.06	184.3	93.09	184.64	93.12	184.98	93.15
185.32	93.18	185.61	93.21	185.85	93.24	186.09	93.27	186.33	93.3
186.57	93.33	186.81	93.36	187.05	93.39	187.29	93.42	187.55	93.45
187.67	93.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	96.26	.1	129.57	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

91.27	108.7		27.44	27.44	27.44	.1	.3

Left Levee Station= 88.82 Elevation= 88.65

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 996

INPUT
Description:
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	84.37	.68	84.39	2.57	84.42	3.23	84.45	3.79	84.48
4.48	84.51	5.46	84.54	6.21	84.57	6.53	84.6	6.85	84.63
7.19	84.66	7.53	84.69	7.89	84.72	8.21	84.75	8.5	84.78
8.79	84.81	9.11	84.84	9.42	84.87	9.74	84.9	10.05	84.93
11	84.96	11.88	84.99	13.33	85.02	14.32	85.05	14.74	85.08
15.17	85.11	15.63	85.14	16.1	85.17	16.49	85.2	16.86	85.23
17.24	85.26	17.64	85.29	18.06	85.32	18.83	85.35	20.13	85.38
22.83	85.41	23.7	85.44	30.92	85.44	31.9	85.47	32.78	85.47
33.19	85.44	33.59	85.41	33.99	85.38	34.39	85.35	37.17	85.35
38.69	85.38	39.13	85.41	39.59	85.44	40.13	85.47	40.73	85.5
41.36	85.53	42.03	85.56	46.85	85.59	47.26	85.62	47.67	85.65
48.09	85.68	48.43	85.71	48.76	85.74	49.56	85.77	50.78	85.8
51.81	85.83	52.83	85.86	53.86	85.89	54.97	85.92	57.32	85.95
59.12	85.95	59.7	85.92	60.28	85.89	60.87	85.86	63.48	85.86
64.02	85.89	64.54	85.92	65.05	85.95	65.48	85.98	65.87	86.01
66.25	86.04	66.74	86.07	67.38	86.1	67.7	86.13	68.02	86.16
68.4	86.19	68.86	86.22	69.39	86.25	73	86.25	74.3	86.28
76.24	86.31	77.41	86.34	79.29	86.37	80.99	86.4	82.5	86.4
84.26	86.43	85.91	86.43	87.72	86.4	90.27	86.4	91.65	86.43

92.07	86.43	93.72	86.4	94.3	86.37	94.88	86.34	95.37	86.31
96.14	86.28	96.95	86.25	97.91	86.25	99.16	86.28	100.14	86.28
101.33	86.25	102.71	86.23	103.26	86.22	104.72	86.19	105.87	86.16
105.91	86.16	106.68	86.13	107.05	86.1	107.4	86.07	107.73	86.04
108.04	86.01	108.35	85.98	108.67	85.95	109.18	85.92	109.77	85.89
110.35	85.86	110.76	85.83	111.07	85.8	111.19	85.77	111.37	85.74
111.58	85.71	111.8	85.68	112.01	85.65	112.22	85.62	112.39	85.59
112.55	85.56	112.7	85.53	112.85	85.5	113	85.47	113.15	85.44
113.15	85.37	113.15	85.34	113.25	85.31	113.59	85.31	114.11	85.31
114.11	85.33	115.08	85.33	115.54	85.38	115.81	85.41	116	85.44
116.17	85.47	116.32	85.5	116.47	85.53	116.63	85.56	116.84	85.59
117.08	85.62	117.32	85.65	117.46	85.68	117.59	85.71	117.71	85.74
117.87	85.77	118.03	85.8	118.2	85.83	118.37	85.86	118.55	85.89
118.72	85.92	118.9	85.95	119.08	85.98	119.29	86.01	119.51	86.04
119.75	86.07	119.92	86.09	119.98	86.1	120.16	86.13	120.34	86.16
120.58	86.19	120.98	86.22	121.38	86.25	121.78	86.28	122.17	86.31
122.57	86.34	122.96	86.37	123.08	86.38	123.36	86.4	123.95	86.43
124.55	86.46	126.12	86.49	127.8	86.49	130.44	86.46	130.97	86.46
131.69	86.49	132.4	86.52	132.98	86.55	133.29	86.58	133.69	86.61
134.09	86.64	134.53	86.67	135	86.7	135.63	86.73	136.26	86.76
136.86	86.79	137.62	86.82	138.46	86.85	140.05	86.85	141.88	86.82
142.64	86.79	143.05	86.76	143.6	86.73	145.38	86.73	145.83	86.7
146.31	86.67	146.83	86.64	149.43	86.64	150.33	86.67	151.53	86.7
152.56	86.73	153.62	86.76	154.59	86.79	155.34	86.82	155.6	86.85
155.87	86.88	156.13	86.91	156.4	86.94	156.67	86.97	157.02	87
157.52	87.03	158.11	87.06	158.7	87.09	159.41	87.12	160.18	87.15
160.91	87.18	161.64	87.21	162.52	87.24	163.17	87.27	163.48	87.28
164.14	87.3	165.51	87.33	166.38	87.36	168.89	87.39	170.68	87.42
172.5	87.45	173.58	87.48	174.19	87.51	174.76	87.54	175.31	87.57
176.05	87.6	176.66	87.63	177.19	87.66	177.67	87.69	178.15	87.72
178.7	87.75	179.77	87.75	180.34	87.72	180.89	87.69	181.54	87.66
183.54	87.63	184.6	87.6	186.26	87.6	187.28	87.63	187.41	87.66
187.54	87.69	187.67	87.72	187.8	87.75	187.93	87.78	188.06	87.81
188.19	87.84	188.32	87.87	188.45	87.9	188.59	87.93	188.72	87.96
188.85	87.99	188.98	88.02	189.12	88.05	189.26	88.08	189.49	88.11
189.73	88.14	189.96	88.17	190.2	88.2	190.43	88.23	190.66	88.26
190.89	88.29	191.12	88.32	191.34	88.35	191.61	88.38	191.88	88.41
192.15	88.44	192.42	88.47	192.69	88.5	192.96	88.53	193.25	88.56
193.65	88.59	194.05	88.62	194.45	88.65	194.85	88.68	195.2	88.71
195.44	88.74	195.69	88.77	195.94	88.8	196.19	88.83	196.44	88.86
196.69	88.89	196.94	88.92	197.19	88.95	197.49	88.98	197.8	89.01
198.1	89.04	198.41	89.07	198.72	89.1	199.02	89.13	199.26	89.16
200.43	89.19	201.2	89.22	201.71	89.25	202.19	89.28	202.68	89.31
203.28	89.34	203.48	89.37	203.69	89.4	203.89	89.43	204.09	89.46
204.3	89.49	204.5	89.52	204.7	89.55	204.91	89.58	205.11	89.61
205.34	89.64	205.5	89.67	205.67	89.7	205.83	89.73	206	89.76
206.16	89.79	206.33	89.82	206.49	89.85	206.65	89.88	206.82	89.91
206.98	89.94	207.06	89.95						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	109.18	.1	145.38	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

102.71	123.08	9.4	9.4	9.4	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	113.35	85.15	F
121.06	207.06	84.86	F

Left Levee Station= 93.04 Elevation= 86.53

CULVERT

RIVER: DE LA CALERA
REACH: CALERA RS: 995.48

INPUT
Description:
Distance from Upstream XS = 2.85
Deck/Roadway Width = 3.31
Weir Coefficient = 1.45
Upstream Deck/Roadway Coordinates
num= 44

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
99.38	85.71	0	99.55	85.71	0	100.25	85.74	0
100.97	85.77	0	101.71	85.8	0	101.74	85.8	0
103.32	85.77	0	104.55	85.74	0	105.49	85.71	0
106.32	85.7	0	107.32	85.68	0	109.37	85.65	0
109.52	85.65	0	109.54	85.65	0	110.28	85.62	0
111.1	85.59	0	112.04	85.56	0	112.34	85.53	0
112.57	85.5	0	114.53	85.5	0	114.89	85.52	0
115.19	85.53	0	115.63	85.56	0	116.19	85.59	0
116.66	85.62	0	117.06	85.65	0	117.37	85.68	0
117.64	85.71	0	117.91	85.74	0	118.28	85.77	0
118.71	85.8	0	119.14	85.83	0	119.56	85.86	0
119.98	85.89	0	120.39	85.92	0	120.68	85.92	0
121.52	85.89	0	122.06	85.86	0	122.59	85.83	0
122.94	85.81	0	123.19	85.8	0	123.93	85.77	0
124.75	85.74	0	125.23	85.73	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	84.37	.68	84.39	2.57	84.42	3.23	84.45	3.79	84.48
4.48	84.51	5.46	84.54	6.21	84.57	6.53	84.6	6.85	84.63
7.19	84.66	7.53	84.69	7.89	84.72	8.21	84.75	8.5	84.78
8.79	84.81	9.11	84.84	9.42	84.87	9.74	84.9	10.05	84.93
11	84.96	11.88	84.99	13.33	85.02	14.32	85.05	14.74	85.08
15.17	85.11	15.63	85.14	16.1	85.17	16.49	85.2	16.86	85.23
17.24	85.26	17.64	85.29	18.06	85.32	18.83	85.35	20.13	85.38
22.83	85.41	23.7	85.44	30.92	85.44	31.9	85.47	32.78	85.47
33.19	85.44	33.59	85.41	33.99	85.38	34.39	85.35	37.17	85.35

38.69	85.38	39.13	85.41	39.59	85.44	40.13	85.47	40.73	85.5
41.36	85.53	42.03	85.56	46.85	85.59	47.26	85.62	47.67	85.65
48.09	85.68	48.43	85.71	48.76	85.74	49.56	85.77	50.78	85.8
51.81	85.83	52.83	85.86	53.86	85.89	54.97	85.92	57.32	85.95
59.12	85.95	59.7	85.92	60.28	85.89	60.87	85.86	63.48	85.86
64.02	85.89	64.54	85.92	65.05	85.95	65.48	85.98	65.87	86.01
66.25	86.04	66.74	86.07	67.38	86.1	67.7	86.13	68.02	86.16
68.4	86.19	68.86	86.22	69.39	86.25	73	86.25	74.3	86.28
76.24	86.31	77.41	86.34	79.29	86.37	80.99	86.4	82.5	86.4
84.26	86.43	85.91	86.43	87.72	86.4	90.27	86.4	91.65	86.43
92.07	86.43	93.72	86.4	94.3	86.37	94.88	86.34	95.37	86.31
96.14	86.28	96.95	86.25	97.91	86.25	99.16	86.28	100.14	86.28
101.33	86.25	102.71	86.23	103.26	86.22	104.72	86.19	105.87	86.16
105.91	86.16	106.68	86.13	107.05	86.1	107.4	86.07	107.73	86.04
108.04	86.01	108.35	85.98	108.67	85.95	109.18	85.92	109.77	85.89
110.35	85.86	110.76	85.83	111.07	85.8	111.19	85.77	111.37	85.74
111.58	85.71	111.8	85.68	112.01	85.65	112.22	85.62	112.39	85.59
112.55	85.56	112.7	85.53	112.85	85.5	113	85.47	113.15	85.44
113.15	85.37	113.15	85.34	113.25	85.31	113.59	85.31	114.11	85.31
114.11	85.33	115.08	85.33	115.54	85.38	115.81	85.41	116	85.44
116.17	85.47	116.32	85.5	116.47	85.53	116.63	85.56	116.84	85.59
117.08	85.62	117.32	85.65	117.46	85.68	117.59	85.71	117.71	85.74
117.87	85.77	118.03	85.8	118.2	85.83	118.37	85.86	118.55	85.89
118.72	85.92	118.9	85.95	119.08	85.98	119.29	86.01	119.51	86.04
119.75	86.07	119.92	86.09	119.98	86.1	120.16	86.13	120.34	86.16
120.58	86.19	120.98	86.22	121.38	86.25	121.78	86.28	122.17	86.31
122.57	86.34	122.96	86.37	123.08	86.38	123.36	86.4	123.95	86.43
124.55	86.46	126.12	86.49	127.8	86.49	130.44	86.46	130.97	86.46
131.69	86.49	132.4	86.52	132.98	86.55	133.29	86.58	133.69	86.61
134.09	86.64	134.53	86.67	135	86.7	135.63	86.73	136.26	86.76
136.86	86.79	137.62	86.82	138.46	86.85	140.05	86.85	141.88	86.82
142.64	86.79	143.05	86.76	143.6	86.73	145.38	86.73	145.83	86.7
146.31	86.67	146.83	86.64	149.43	86.64	150.33	86.67	151.53	86.7
152.56	86.73	153.62	86.76	154.59	86.79	155.34	86.82	155.6	86.85
155.87	86.88	156.13	86.91	156.4	86.94	156.67	86.97	157.02	87
157.52	87.03	158.11	87.06	158.7	87.09	159.41	87.12	160.18	87.15
160.91	87.18	161.64	87.21	162.52	87.24	163.17	87.27	163.48	87.28
164.14	87.3	165.51	87.33	166.38	87.36	168.89	87.39	170.68	87.42
172.5	87.45	173.58	87.48	174.19	87.51	174.76	87.54	175.31	87.57
176.05	87.6	176.66	87.63	177.19	87.66	177.67	87.69	178.15	87.72
178.7	87.75	179.77	87.75	180.34	87.72	180.89	87.69	181.54	87.66
183.54	87.63	184.6	87.6	186.26	87.6	187.28	87.63	187.41	87.66
187.54	87.69	187.67	87.72	187.8	87.75	187.93	87.78	188.06	87.81
188.19	87.84	188.32	87.87	188.45	87.9	188.59	87.93	188.72	87.96
188.85	87.99	188.98	88.02	189.12	88.05	189.26	88.08	189.49	88.11
189.73	88.14	189.96	88.17	190.2	88.2	190.43	88.23	190.66	88.26
190.89	88.29	191.12	88.32	191.34	88.35	191.61	88.38	191.88	88.41
192.15	88.44	192.42	88.47	192.69	88.5	192.96	88.53	193.25	88.56
193.65	88.59	194.05	88.62	194.45	88.65	194.85	88.68	195.2	88.71
195.44	88.74	195.69	88.77	195.94	88.8	196.19	88.83	196.44	88.86
196.69	88.89	196.94	88.92	197.19	88.95	197.49	88.98	197.8	89.01
198.1	89.04	198.41	89.07	198.72	89.1	199.02	89.13	199.26	89.16

200.43	89.19	201.2	89.22	201.71	89.25	202.19	89.28	202.68	89.31
203.28	89.34	203.48	89.37	203.69	89.4	203.89	89.43	204.09	89.46
204.3	89.49	204.5	89.52	204.7	89.55	204.91	89.58	205.11	89.61
205.34	89.64	205.5	89.67	205.67	89.7	205.83	89.73	206	89.76
206.16	89.79	206.33	89.82	206.49	89.85	206.65	89.88	206.82	89.91
206.98	89.94	207.06	89.95						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	109.18	.1	145.38	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
102.71	123.08	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	113.35	85.15	F
121.06	207.06	84.86	F

Left Levee Station= 93.04 Elevation= 86.53

Downstream Deck/Roadway Coordinates

num= 44

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
103.95	85.71	0	104.12	85.71	0	104.82	85.74	0
105.54	85.77	0	106.28	85.8	0	106.31	85.8	0
107.89	85.77	0	109.12	85.74	0	110.06	85.71	0
110.89	85.7	0	111.89	85.68	0	113.94	85.65	0
114.09	85.65	0	114.11	85.65	0	114.85	85.62	0
115.67	85.59	0	116.61	85.56	0	116.91	85.53	0
117.14	85.5	0	119.1	85.5	0	119.46	85.52	0
119.76	85.53	0	120.2	85.56	0	120.76	85.59	0
121.23	85.62	0	121.63	85.65	0	121.94	85.68	0
122.21	85.71	0	122.48	85.74	0	122.85	85.77	0
123.28	85.8	0	123.71	85.83	0	124.13	85.86	0
124.55	85.89	0	124.96	85.92	0	125.25	85.92	0
126.09	85.89	0	126.63	85.86	0	127.16	85.83	0
127.51	85.81	0	127.76	85.8	0	128.5	85.77	0
129.32	85.74	0	129.8	85.73	0			

Downstream Bridge Cross Section Data

Station Elevation Data num= 319

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	82.81	.45	82.83	1.88	82.86	2.49	82.89	3.1	82.92
3.89	82.95	5.34	82.98	6.53	83.01	6.87	83.04	7.2	83.07
7.52	83.1	7.85	83.13	8.69	83.16	9.71	83.19	10.21	83.22
11.5	83.25	15.02	83.28	15.49	83.31	15.96	83.34	16.44	83.37
16.92	83.4	17.37	83.43	17.78	83.46	18.16	83.49	18.51	83.52
18.85	83.55	19.19	83.58	19.52	83.61	19.84	83.64	20.16	83.67
20.46	83.7	20.76	83.73	21.11	83.76	21.47	83.79	21.82	83.82
22.18	83.85	22.57	83.88	23.17	83.91	24.06	83.94	24.82	83.97
26.71	84	29.71	84.03	30.66	84.06	31.39	84.09	31.93	84.12
32.48	84.15	33.06	84.18	33.9	84.21	35.29	84.24	36.19	84.27
36.79	84.3	39.58	84.3	40.12	84.33	40.67	84.36	41.23	84.39

42.09	84.42	43.78	84.45	44.4	84.48	44.95	84.51	45.45	84.54
45.97	84.57	46.76	84.6	47.87	84.63	48.34	84.66	48.95	84.69
49.77	84.72	51.02	84.75	51.93	84.78	52.91	84.81	53.57	84.84
54.05	84.87	54.67	84.9	55.24	84.93	55.78	84.96	58.76	84.96
59.7	84.93	60.58	84.93	61.09	84.96	61.83	84.99	66.38	85.02
67.44	85.05	68.04	85.07	68.22	85.08	68.76	85.11	69.07	85.14
69.35	85.17	69.6	85.2	69.82	85.23	70.01	85.26	70.17	85.29
70.34	85.32	70.5	85.35	70.66	85.38	70.98	85.41	71.41	85.44
71.95	85.47	72.64	85.5	73	85.5	73.75	85.47	74.45	85.44
80.41	85.44	81.26	85.41	81.76	85.38	82.23	85.35	82.7	85.32
83.17	85.29	83.19	85.29	84.5	85.32	86.46	85.35	89.64	85.35
90.5	85.38	91.45	85.41	92.18	85.41	93.39	85.38	99.62	85.38
102.7	85.35	103.2	85.32	103.54	85.3	103.83	85.29	104.38	85.26
104.97	85.23	105.3	85.2	105.63	85.17	105.95	85.14	106.29	85.11
106.63	85.08	107.73	85.08	108.58	85.11	109.36	85.14	109.91	85.17
110.2	85.19	110.3	85.2	110.52	85.23	110.73	85.26	111.08	85.29
111.65	85.32	112.22	85.35	112.71	85.38	113.12	85.41	114.51	85.47
115.39	85.41	115.81	85.38	116	85.35	116.16	85.32	116.32	85.29
116.48	85.26	116.64	85.23	116.8	85.2	116.98	85.17	117.18	85.14
117.39	85.11	117.61	85.08	117.84	85.05	118.04	85.03	118.09	85.02
118.34	84.99	118.58	84.96	118.82	84.93	119.05	84.9	119.27	84.87
119.48	84.84	119.67	84.81	119.88	84.78	120.12	84.75	120.37	84.72
120.78	84.72	121.05	84.75	121.33	84.78	121.81	84.81	122.22	84.84
122.5	84.87	122.69	84.9	122.83	84.93	122.97	84.96	123.07	84.99
123.17	85.02	123.26	85.05	123.36	85.08	123.47	85.11	123.58	85.14
123.7	85.17	123.82	85.2	123.95	85.23	124.09	85.26	124.23	85.29
124.38	85.32	124.54	85.35	124.71	85.38	124.89	85.41	125.08	85.44
125.21	85.47	125.34	85.5	125.59	85.53	126.02	85.56	126.45	85.59
126.56	85.6	126.88	85.62	127.31	85.65	127.74	85.68	127.98	85.68
128.62	85.65	128.8	85.65	130.22	85.62	130.89	85.59	131.87	85.56
134.86	85.56	135.88	85.59	136.56	85.62	137.2	85.65	137.8	85.68
138.43	85.71	139.02	85.74	139.71	85.77	140.41	85.8	141.45	85.83
142.79	85.86	143.7	85.89	144.4	85.92	145.1	85.95	145.73	85.98
145.77	85.98	146.03	86.01	146.31	86.04	146.59	86.07	146.87	86.1
147.15	86.13	147.43	86.16	147.53	86.16	148.51	86.13	151.17	86.1
155.8	86.07	157.48	86.04	158.94	86.01	161.49	86.01	161.89	85.98
162.36	85.95	163.24	85.92	163.76	85.92	164.71	85.95	165.17	85.98
165.65	86.01	166.4	86.04	167.19	86.07	168.04	86.09	168.22	86.1
169.28	86.13	170.09	86.16	170.86	86.19	171.57	86.22	172.05	86.25
172.52	86.28	173.11	86.31	174.05	86.34	174.98	86.37	175.53	86.4
176.14	86.43	176.76	86.46	177.34	86.49	178.23	86.52	179.31	86.55
180.44	86.58	181.56	86.61	182.37	86.64	183.2	86.67	184.84	86.7
187.32	86.73	190.71	86.76	192.11	86.79	193.58	86.82	194.47	86.85
195.03	86.88	195.55	86.91	195.88	86.94	196.22	86.97	196.65	87
196.84	87.01	197.09	87.03	197.51	87.06	197.98	87.09	198.42	87.12
198.8	87.15	199.18	87.18	199.55	87.21	199.85	87.24	200.15	87.27
200.45	87.3	200.76	87.33	201.07	87.36	201.38	87.39	201.99	87.42
202.87	87.45	203.7	87.48	204.27	87.51	204.72	87.54	205.06	87.57
205.4	87.6	206.15	87.63	207.05	87.66	207.68	87.69	208.06	87.72
208.42	87.75	208.77	87.78	209.11	87.81	209.44	87.84	209.86	87.87
210.34	87.9	210.85	87.93	211.41	87.96	211.99	87.99	212.61	88.02
213.26	88.05	213.89	88.08	214.45	88.11	214.98	88.14	215.47	88.17

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  215.83    88.2  216.25   88.23  216.77   88.26  217.35   88.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035  130.89      .1  148.51    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
        103.54  126.56             .1       .3
Left Levee      Station=  115.39      Elevation=   87.87
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  112.22  115.03   87.85

Upstream Embankment side slope              =       3 horiz. to 1.0 vertical
Downstream Embankment side slope            =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   85.63
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular     1.8
FHWA Chart # 55-  Circular Culvert
FHWA Scale # 1 - Smooth tapered inlet throat
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss
Coef   Exit Loss Coef
               2.22    5.55      .17      .17       .2                   .2
          1
Upstream   Elevation =  85.25
           Centerline Station =  118.2
Downstream Elevation =  84.92
           Centerline Station =  122.69

CROSS SECTION


RIVER: DE LA CALERA
REACH: CALERA             RS: 995

INPUT
Description:
Station Elevation Data    num=     319
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   82.81     .45   82.83    1.88   82.86    2.49   82.89     3.1   82.92
    3.89   82.95    5.34   82.98    6.53   83.01    6.87   83.04     7.2   83.07
    7.52    83.1    7.85   83.13    8.69   83.16    9.71   83.19   10.21   83.22
    11.5   83.25   15.02   83.28   15.49   83.31   15.96   83.34   16.44   83.37
   16.92    83.4   17.37   83.43   17.78   83.46   18.16   83.49   18.51   83.52
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18.85	83.55	19.19	83.58	19.52	83.61	19.84	83.64	20.16	83.67
20.46	83.7	20.76	83.73	21.11	83.76	21.47	83.79	21.82	83.82
22.18	83.85	22.57	83.88	23.17	83.91	24.06	83.94	24.82	83.97
26.71	84	29.71	84.03	30.66	84.06	31.39	84.09	31.93	84.12
32.48	84.15	33.06	84.18	33.9	84.21	35.29	84.24	36.19	84.27
36.79	84.3	39.58	84.3	40.12	84.33	40.67	84.36	41.23	84.39
42.09	84.42	43.78	84.45	44.4	84.48	44.95	84.51	45.45	84.54
45.97	84.57	46.76	84.6	47.87	84.63	48.34	84.66	48.95	84.69
49.77	84.72	51.02	84.75	51.93	84.78	52.91	84.81	53.57	84.84
54.05	84.87	54.67	84.9	55.24	84.93	55.78	84.96	58.76	84.96
59.7	84.93	60.58	84.93	61.09	84.96	61.83	84.99	66.38	85.02
67.44	85.05	68.04	85.07	68.22	85.08	68.76	85.11	69.07	85.14
69.35	85.17	69.6	85.2	69.82	85.23	70.01	85.26	70.17	85.29
70.34	85.32	70.5	85.35	70.66	85.38	70.98	85.41	71.41	85.44
71.95	85.47	72.64	85.5	73	85.5	73.75	85.47	74.45	85.44
80.41	85.44	81.26	85.41	81.76	85.38	82.23	85.35	82.7	85.32
83.17	85.29	83.19	85.29	84.5	85.32	86.46	85.35	89.64	85.35
90.5	85.38	91.45	85.41	92.18	85.41	93.39	85.38	99.62	85.38
102.7	85.35	103.2	85.32	103.54	85.3	103.83	85.29	104.38	85.26
104.97	85.23	105.3	85.2	105.63	85.17	105.95	85.14	106.29	85.11
106.63	85.08	107.73	85.08	108.58	85.11	109.36	85.14	109.91	85.17
110.2	85.19	110.3	85.2	110.52	85.23	110.73	85.26	111.08	85.29
111.65	85.32	112.22	85.35	112.71	85.38	113.12	85.41	114.51	85.47
115.39	85.41	115.81	85.38	116	85.35	116.16	85.32	116.32	85.29
116.48	85.26	116.64	85.23	116.8	85.2	116.98	85.17	117.18	85.14
117.39	85.11	117.61	85.08	117.84	85.05	118.04	85.03	118.09	85.02
118.34	84.99	118.58	84.96	118.82	84.93	119.05	84.9	119.27	84.87
119.48	84.84	119.67	84.81	119.88	84.78	120.12	84.75	120.37	84.72
120.78	84.72	121.05	84.75	121.33	84.78	121.81	84.81	122.22	84.84
122.5	84.87	122.69	84.9	122.83	84.93	122.97	84.96	123.07	84.99
123.17	85.02	123.26	85.05	123.36	85.08	123.47	85.11	123.58	85.14
123.7	85.17	123.82	85.2	123.95	85.23	124.09	85.26	124.23	85.29
124.38	85.32	124.54	85.35	124.71	85.38	124.89	85.41	125.08	85.44
125.21	85.47	125.34	85.5	125.59	85.53	126.02	85.56	126.45	85.59
126.56	85.6	126.88	85.62	127.31	85.65	127.74	85.68	127.98	85.68
128.62	85.65	128.8	85.65	130.22	85.62	130.89	85.59	131.87	85.56
134.86	85.56	135.88	85.59	136.56	85.62	137.2	85.65	137.8	85.68
138.43	85.71	139.02	85.74	139.71	85.77	140.41	85.8	141.45	85.83
142.79	85.86	143.7	85.89	144.4	85.92	145.1	85.95	145.73	85.98
145.77	85.98	146.03	86.01	146.31	86.04	146.59	86.07	146.87	86.1
147.15	86.13	147.43	86.16	147.53	86.16	148.51	86.13	151.17	86.1
155.8	86.07	157.48	86.04	158.94	86.01	161.49	86.01	161.89	85.98
162.36	85.95	163.24	85.92	163.76	85.92	164.71	85.95	165.17	85.98
165.65	86.01	166.4	86.04	167.19	86.07	168.04	86.09	168.22	86.1
169.28	86.13	170.09	86.16	170.86	86.19	171.57	86.22	172.05	86.25
172.52	86.28	173.11	86.31	174.05	86.34	174.98	86.37	175.53	86.4
176.14	86.43	176.76	86.46	177.34	86.49	178.23	86.52	179.31	86.55
180.44	86.58	181.56	86.61	182.37	86.64	183.2	86.67	184.84	86.7
187.32	86.73	190.71	86.76	192.11	86.79	193.58	86.82	194.47	86.85
195.03	86.88	195.55	86.91	195.88	86.94	196.22	86.97	196.65	87
196.84	87.01	197.09	87.03	197.51	87.06	197.98	87.09	198.42	87.12
198.8	87.15	199.18	87.18	199.55	87.21	199.85	87.24	200.15	87.27

200.45	87.3	200.76	87.33	201.07	87.36	201.38	87.39	201.99	87.42
202.87	87.45	203.7	87.48	204.27	87.51	204.72	87.54	205.06	87.57
205.4	87.6	206.15	87.63	207.05	87.66	207.68	87.69	208.06	87.72
208.42	87.75	208.77	87.78	209.11	87.81	209.44	87.84	209.86	87.87
210.34	87.9	210.85	87.93	211.41	87.96	211.99	87.99	212.61	88.02
213.26	88.05	213.89	88.08	214.45	88.11	214.98	88.14	215.47	88.17
215.83	88.2	216.25	88.23	216.77	88.26	217.35	88.29		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	130.89	.1	148.51	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

103.54	126.56		22.17	22.17	22.17	.1	.3

Left Levee Station= 115.39 Elevation= 87.87

Blocked Obstructions num= 1

Sta L	Sta R	Elev
112.22	115.03	87.85

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 994

INPUT
Description:
Station Elevation Data num= 234

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	81.98	.09	81.99	.57	82.02	1.05	82.05	1.59	82.08
2.19	82.11	2.86	82.14	3.64	82.17	4.35	82.2	4.91	82.23
5.49	82.26	6.09	82.29	6.91	82.32	7.7	82.35	8.41	82.38
9.04	82.41	9.66	82.44	10.28	82.47	10.77	82.5	11.26	82.53
11.75	82.56	12.28	82.59	12.86	82.62	13.34	82.65	13.74	82.68
14.08	82.71	14.39	82.74	14.73	82.77	15.04	82.8	15.33	82.83
15.6	82.86	15.85	82.89	16.08	82.92	16.31	82.95	17.31	82.98
19.5	83.01	21.53	83.04	24.62	83.07	25.15	83.1	25.86	83.13
27.18	83.16	28.34	83.19	29.48	83.22	33.03	83.25	34.24	83.28
37.3	83.31	38.3	83.34	41.76	83.37	43.57	83.4	45.31	83.43
47	83.46	49.84	83.49	51.27	83.52	51.9	83.55	52.38	83.58
52.78	83.61	53.12	83.64	53.59	83.67	54.06	83.7	54.54	83.73
55.02	83.76	55.49	83.79	56.01	83.82	56.58	83.85	61.46	83.85
62.37	83.88	63.33	83.91	64.11	83.94	66.57	83.97	67.96	84
68.31	84.03	68.63	84.06	68.95	84.09	69.3	84.12	69.61	84.12
69.96	84.09	70.1	84.08	70.32	84.06	70.68	84.03	71.03	84
71.39	83.97	72.17	83.94	74.2	83.91	76.13	83.91	76.69	83.94
77.08	83.97	77.41	84	78.13	84.03	79.98	84.03	80.41	84
80.84	83.97	81.27	83.94	81.71	83.91	82.37	83.88	82.99	83.85
83.56	83.82	84.28	83.79	84.99	83.76	85.62	83.73	86.26	83.7
86.91	83.67	87.71	83.64	88.16	83.61	88.54	83.58	88.94	83.55
89.37	83.52	89.8	83.49	92.33	83.46	92.85	83.43	93.42	83.4

94	83.37	94.38	83.34	94.77	83.31	95.15	83.28	95.64	83.25
96.19	83.22	96.75	83.19	97.32	83.16	97.89	83.13	98.57	83.1
98.99	83.09	99.46	83.07	100.4	83.04	101.36	83.01	102.24	82.98
102.94	82.95	103.18	82.95	104.43	82.98	105.09	83.01	105.7	83.04
106.28	83.07	106.84	83.1	107.87	83.13	110.59	83.16	110.98	83.16
118.25	83.13	118.75	83.1	119.25	83.07	120.1	83.04	123.61	83.04
123.93	83.07	124.25	83.1	124.56	83.13	124.88	83.16	125.19	83.19
125.51	83.22	125.96	83.25	126.36	83.26	127.08	83.28	128.46	83.31
130.61	83.34	132.64	83.37	134.51	83.4	135.75	83.43	135.9	83.43
136.36	83.46	136.83	83.49	137.29	83.52	137.74	83.55	138.18	83.58
138.62	83.61	139.02	83.64	139.42	83.67	139.82	83.7	140.22	83.73
140.62	83.76	141.02	83.79	141.5	83.82	142.01	83.85	142.51	83.88
143.15	83.91	144.72	83.94	145.63	83.97	146.82	84	148.11	84.03
149.42	84.06	150.74	84.09	153.43	84.12	154.22	84.15	155.01	84.18
156.03	84.21	157.1	84.24	157.84	84.27	158.64	84.3	159.48	84.33
160.39	84.36	161.29	84.39	161.96	84.42	162.62	84.45	163.42	84.48
164.35	84.51	165.23	84.54	166.93	84.57	167.8	84.57	169.08	84.55
170.08	84.54	170.1	84.54	171.05	84.51	172.12	84.48	173.06	84.45
173.73	84.45	175.3	84.48	175.43	84.48	176.65	84.45	177.45	84.42
178.16	84.39	178.88	84.36	181.94	84.36	182.63	84.39	183.31	84.42
189.09	84.42	190.99	84.45	192.65	84.48	193.49	84.51	193.66	84.51
194.49	84.48	195.27	84.45	197.15	84.42	201.54	84.39	203.52	84.36
203.8	84.36	204.59	84.39	205.38	84.42	206.1	84.45	206.8	84.48
207.21	84.5	207.33	84.51	207.63	84.54	207.92	84.57	208.42	84.6
208.94	84.63	209.56	84.66	212.1	84.69	212.65	84.72		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	137.29	.1	153.43	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
98.99	126.36	15.26	15.26	15.26	.1 .3

Left Levee Station= 69.75 Elevation= 84.13

Blocked Obstructions num= 1

Sta L	Sta R	Elev
125.02	135.38	85.69

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 993

INPUT
Description:
Station Elevation Data num= 369

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	80.75	.37	80.76	1.37	80.79	2.18	80.82	2.59	80.85
3.02	80.88	3.57	80.91	4.2	80.94	4.73	80.97	5.37	81
6.16	81.03	6.9	81.06	7.32	81.09	7.68	81.12	8.04	81.15
8.47	81.18	8.79	81.21	9.03	81.24	9.27	81.27	9.51	81.3

9.75	81.33	10.03	81.36	10.42	81.39	11.48	81.42	12.46	81.45
12.99	81.48	13.77	81.51	14.67	81.54	15.34	81.57	15.91	81.6
16.43	81.63	17.03	81.66	17.69	81.69	18.38	81.72	18.83	81.75
19.35	81.78	19.85	81.81	20.33	81.84	21.03	81.87	21.72	81.9
22.25	81.93	22.84	81.96	23.53	81.99	24.24	82.02	24.88	82.05
25.49	82.08	26.13	82.11	26.79	82.14	27.73	82.17	30.27	82.2
31.28	82.23	32.15	82.26	33.12	82.29	33.88	82.32	34.48	82.35
37.58	82.35	44.19	82.32	47.16	82.32	48.38	82.29	49.46	82.29
50.3	82.32	51.21	82.35	51.95	82.38	52.57	82.41	53.11	82.44
53.6	82.47	54.09	82.5	54.57	82.53	55.04	82.56	57.76	82.59
59.43	82.62	60.03	82.65	60.7	82.68	61.48	82.71	62.15	82.74
62.75	82.77	63.29	82.8	63.97	82.83	64.59	82.86	65.14	82.89
65.96	82.92	67.05	82.95	68.39	82.98	71.99	82.98	72.5	82.95
72.98	82.92	73.47	82.89	74.62	82.86	76.19	82.86	76.92	82.89
77.84	82.92	79.4	82.95	79.76	82.95	80.4	82.92	81	82.89
81.59	82.86	81.78	82.85	82.15	82.83	82.61	82.8	83.02	82.77
83.37	82.74	83.73	82.71	83.95	82.71	85.4	82.74	85.95	82.74
86.37	82.71	86.8	82.68	87.22	82.65	87.65	82.62	88.32	82.59
89.26	82.56	90.04	82.53	90.52	82.5	91.13	82.47	91.74	82.44
92.52	82.41	93.26	82.38	93.87	82.35	94.26	82.32	94.6	82.29
94.95	82.26	95.29	82.23	95.74	82.2	96.27	82.17	96.68	82.14
97.09	82.11	97.5	82.08	97.91	82.05	98.73	82.02	99.86	81.99
100.47	81.96	100.93	81.93	101.4	81.9	101.86	81.87	105.49	81.85
106.77	81.84	109.28	81.81	112.79	81.78	113.39	81.75	113.92	81.72
114.39	81.69	115.23	81.66	116.11	81.63	116.49	81.63	117.16	81.66
117.71	81.69	118.24	81.72	118.75	81.75	119.42	81.78	130.03	81.81
131.45	81.84	132.7	81.84	133.34	81.87	134.03	81.9	134.53	81.93
134.77	81.96	135.01	81.99	135.23	82.02	135.44	82.05	135.64	82.08
135.83	82.11	136.46	82.14	137.12	82.14	141.93	82.14	142.8	82.17
143.67	82.2	144.34	82.23	144.92	82.26	145.5	82.29	146.08	82.32
146.65	82.35	147.22	82.38	147.79	82.41	148.37	82.44	148.94	82.47
149.49	82.5	149.99	82.53	150.55	82.56	151.14	82.59	151.74	82.62
152.31	82.65	152.77	82.68	153.23	82.71	153.68	82.74	154.14	82.77
154.81	82.8	156.42	82.83	157.19	82.86	157.92	82.89	158.53	82.92
159.28	82.95	160.02	82.98	160.67	83.01	161.24	83.04	161.79	83.07
162.35	83.1	163.18	83.13	163.82	83.16	164.41	83.19	167.4	83.22
168.26	83.25	168.97	83.25	169.53	83.22	172.62	83.19	173.08	83.19
173.73	83.22	174.45	83.25	177.02	83.28	177.7	83.31	178.43	83.34
179.26	83.37	180.28	83.4	180.95	83.43	181.55	83.43	181.78	83.43
183.06	83.4	183.42	83.37	183.7	83.34	184.01	83.31	184.32	83.28
184.64	83.25	184.97	83.22	186	83.22	186.42	83.23	187.01	83.25
187.69	83.28	188.2	83.31	188.6	83.34	189.01	83.37	191.17	83.4
191.28	83.4	192.36	83.37	193.53	83.34	194.88	83.31	195.43	83.31
196.64	83.34	198.59	83.37	199.13	83.4	199.76	83.43	200.38	83.46
200.9	83.49	201.4	83.52	202.02	83.55	202.63	83.58	203.22	83.61
203.3	83.61	203.75	83.58	204.15	83.55	204.54	83.52	204.89	83.49
205.23	83.46	205.44	83.43	205.62	83.4	205.81	83.37	206.06	83.34
206.36	83.31	206.73	83.28	207.2	83.25	207.56	83.22	207.88	83.19
208.18	83.16	208.43	83.13	208.67	83.1	208.9	83.07	209.13	83.04
209.45	83.04	209.74	83.07	210.03	83.1	210.35	83.13	210.72	83.16
211.13	83.19	211.47	83.22	211.76	83.25	212.06	83.28	212.35	83.31
212.61	83.34	212.84	83.37	213.07	83.4	213.33	83.43	213.92	83.46

214.53	83.49	215.15	83.52	215.67	83.55	216.17	83.58	216.69	83.61
217.23	83.64	217.8	83.67	218.51	83.7	221.07	83.73	221.94	83.76
222.57	83.79	223.15	83.82	223.6	83.82	224.94	83.79	227.94	83.79
229.04	83.76	229.34	83.76	229.67	83.79	229.99	83.82	230.32	83.85
230.65	83.88	230.99	83.91	235.67	83.91	236.44	83.94	237.28	83.97
237.29	83.97	238.91	83.94	239.51	83.94	240.44	83.97	241.34	84
241.75	84.03	242.14	84.06	242.53	84.09	242.92	84.12	243.45	84.15
245.92	84.15	246.93	84.12	247.73	84.12	249	84.15	253.26	84.18
253.46	84.21	253.64	84.24	253.84	84.27	254.03	84.3	254.22	84.33
254.42	84.36	254.61	84.39	254.81	84.42	255	84.45	255.19	84.48
255.38	84.51	255.57	84.54	255.77	84.57	255.96	84.6	256.16	84.63
256.35	84.66	256.55	84.69	256.74	84.72	256.94	84.75	257.13	84.78
257.37	84.81	257.61	84.84	257.85	84.87	258.1	84.9	258.35	84.93
258.54	84.96	258.73	84.99	258.91	85.02	259.1	85.05	259.28	85.08
259.59	85.11	259.92	85.14	260.24	85.17	260.56	85.2	260.88	85.23
261.2	85.26	261.45	85.29	261.67	85.32	262.27	85.35	263.24	85.38
263.51	85.41	263.8	85.44	264.08	85.47	264.37	85.5	264.65	85.53
264.94	85.56	265.23	85.59	265.5	85.62	265.78	85.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	151.74	.1	164.41	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

105.49	137.12		14.8	14.8	14.8	.1	.3

Left Levee Station= 71.5 Elevation= 83.01
Right Levee Station= 169.14 Elevation= 83.28
Blocked Obstructions num= 1

Sta L	Sta R	Elev
140.61	147.03	85.14

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 992

INPUT
Description:
Station Elevation Data num= 489

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	79.47	2.21	79.47	3.18	79.44	4.21	79.41	4.5	79.38
4.78	79.35	5.06	79.32	5.34	79.29	5.62	79.26	6.14	79.2
6.56	79.17	7.44	79.11	7.88	79.08	15.03	79.08	16.65	79.11
17.18	79.14	17.56	79.17	17.95	79.2	18.37	79.23	18.95	79.26
19.6	79.29	20.22	79.32	20.64	79.35	20.88	79.38	21.38	79.44
21.68	79.47	22.14	79.5	22.68	79.53	23.1	79.56	23.63	79.59
24.41	79.62	25.78	79.65	26.81	79.68	27.06	79.71	27.3	79.74
27.54	79.77	27.78	79.8	28.03	79.83	28.27	79.86	28.58	79.89
28.84	79.92	29.03	79.95	29.43	80.01	29.63	80.04	29.83	80.07
30.25	80.13	30.71	80.19	31.25	80.22	31.86	80.25	32.44	80.28

33	80.31	33.61	80.34	34.29	80.37	34.92	80.4	35.25	80.43
35.65	80.46	36.07	80.49	36.48	80.52	36.86	80.55	37.11	80.58
37.37	80.61	37.63	80.64	37.88	80.67	38.4	80.73	38.66	80.76
38.91	80.79	39.53	80.82	40.2	80.85	40.83	80.88	41.64	80.91
42.51	80.94	43.29	80.97	43.95	81	45.21	81.06	45.78	81.09
46.36	81.12	47.08	81.15	52.53	81.15	55.12	81.18	55.52	81.18
58.14	81.15	59.27	81.12	60.8	81.09	62.17	81.09	63.87	81.12
66.19	81.12	67.62	81.09	70.01	81.09	70.66	81.12	71.35	81.15
72.09	81.18	72.81	81.21	73.56	81.24	76.46	81.24	77.73	81.27
80.16	81.3	80.84	81.33	81.48	81.36	82.01	81.39	82.3	81.42
82.57	81.45	82.85	81.48	83.13	81.51	83.43	81.54	83.91	81.57
84.46	81.6	85.22	81.63	86.66	81.66	88	81.69	90.44	81.69
90.76	81.66	91.08	81.63	91.4	81.6	91.72	81.57	92.04	81.54
95.96	81.51	96.6	81.51	97.28	81.54	97.91	81.57	99.13	81.57
99.85	81.54	100.53	81.51	100.91	81.48	101.34	81.45	101.77	81.42
102.19	81.39	104.14	81.39	105.11	81.39	106.69	81.36	106.97	81.33
107.24	81.3	107.52	81.27	107.8	81.24	108.08	81.21	108.34	81.18
108.7	81.15	109.96	81.12	111.18	81.09	112.15	81.06	113.05	81.03
114.1	81	115.15	80.97	115.57	80.94	115.93	80.91	115.99	80.91
116.47	80.88	117.12	80.85	119.35	80.82	119.82	80.79	120.29	80.76
120.77	80.73	121.24	80.7	121.32	80.7	122.24	80.73	122.77	80.76
123.6	80.79	125.77	80.79	126.32	80.76	126.87	80.73	127.42	80.7
127.99	80.67	128.58	80.64	129.17	80.61	129.76	80.58	131.51	80.55
132.89	80.54	134.79	80.52	136.64	80.52	137.9	80.55	138.4	80.58
139.53	80.61	141.22	80.64	143.34	80.67	144.23	80.7	147.28	80.7
147.65	80.67	148.03	80.64	148.4	80.61	148.77	80.58	149.14	80.55
150.19	80.52	151.47	80.49	151.92	80.46	152.36	80.43	153.04	80.4
153.6	80.37	153.91	80.34	154.14	80.32	154.21	80.31	154.51	80.28
155.03	80.25	155.55	80.22	155.79	80.22	155.99	80.25	156.19	80.28
156.39	80.31	156.6	80.34	156.8	80.37	156.98	80.4	157.15	80.43
157.31	80.46	157.48	80.49	157.64	80.52	157.81	80.55	157.97	80.58
158.13	80.61	158.3	80.64	158.51	80.67	159.01	80.7	159.26	80.72
159.5	80.73	160.38	80.76	160.96	80.76	162.05	80.73	162.68	80.7
163.24	80.67	163.73	80.64	164.17	80.61	164.32	80.61	164.7	80.64
165.01	80.67	165.27	80.7	165.52	80.73	165.72	80.76	165.73	80.76
165.93	80.79	166.1	80.82	166.19	80.85	166.26	80.88	166.34	80.91
166.41	80.94	166.48	80.97	166.55	81	166.63	81.03	166.72	81.06
166.8	81.09	166.89	81.12	166.98	81.15	167.08	81.18	167.19	81.21
167.3	81.24	167.42	81.27	167.53	81.3	167.65	81.33	167.77	81.36
167.89	81.39	168.02	81.42	168.15	81.45	168.27	81.48	168.42	81.51
168.58	81.54	168.78	81.57	168.98	81.6	169.34	81.63	169.72	81.66
170.11	81.69	170.53	81.72	170.97	81.75	171.43	81.78	172.14	81.81
172.95	81.84	174.35	81.84	175.04	81.81	175.6	81.78	176.07	81.75
176.41	81.72	176.76	81.69	177.2	81.66	177.71	81.63	178.33	81.6
178.74	81.57	179.05	81.54	179.28	81.51	179.51	81.48	179.72	81.45
179.9	81.42	180.08	81.39	180.54	81.36	180.9	81.36	181.66	81.39
182.49	81.42	183.24	81.45	184	81.48	184.04	81.48	184.58	81.51
185.14	81.54	185.74	81.57	186.36	81.6	186.99	81.63	187.93	81.66
189.61	81.69	190.35	81.72	191.05	81.75	191.74	81.78	192.57	81.81
193.41	81.84	194.83	81.87	198.36	81.9	198.99	81.93	199.62	81.96
200.29	81.99	202.54	81.99	204.14	81.98	207.3	81.96	208.53	81.93
209.14	81.9	209.16	81.9	210	81.87	210.82	81.84	215.02	81.84

216.81	81.87	217.72	81.9	218.52	81.93	219.19	81.96	220.05	81.99
221.12	82.02	222.75	82.05	223.21	82.05	224.95	82.02	225.87	81.99
226.71	81.96	227.18	81.96	228.03	81.99	228.88	82.02	231.18	82.05
237.4	82.08	238.66	82.11	239.23	82.11	240.77	82.08	241.18	82.05
241.44	82.02	241.7	81.99	242	81.96	242.43	81.93	242.74	81.9
242.98	81.87	243.79	81.84	244.66	81.81	244.82	81.78	245.11	81.78
245.32	81.81	245.61	81.84	245.91	81.87	246.21	81.9	246.51	81.93
246.81	81.96	249.32	81.99	250.01	82.02	250.65	82.05	252.23	82.08
253.28	82.11	254.01	82.14	254.81	82.17	257.56	82.17	258.52	82.2
265.33	82.23	267.41	82.26	270.03	82.29	270.87	82.32	270.92	82.32
271.63	82.35	272.21	82.38	272.7	82.41	273.16	82.44	273.7	82.47
274.25	82.5	274.81	82.53	275.47	82.56	276.21	82.59	277.04	82.62
278.25	82.65	281.68	82.65	282.84	82.68	284.23	82.71	285.12	82.74
285.35	82.77	285.62	82.8	285.98	82.83	286.35	82.86	286.73	82.89
287.23	82.92	287.84	82.95	288.44	82.98	289.15	83.01	290.04	83.04
290.74	83.07	291.3	83.1	292.16	83.13	293.17	83.16	294.97	83.19
295.26	83.22	295.53	83.25	295.8	83.28	296.07	83.31	296.35	83.34
296.62	83.37	296.86	83.4	297.07	83.43	297.27	83.46	297.46	83.49
297.66	83.52	297.85	83.55	298.05	83.58	298.25	83.61	298.44	83.64
298.64	83.67	298.83	83.7	299	83.73	299.11	83.76	299.25	83.79
299.4	83.82	299.55	83.85	299.7	83.88	299.86	83.91	300.01	83.94
300.16	83.97	300.3	84	300.45	84.03	300.6	84.06	300.71	84.09
300.82	84.12	300.93	84.15	301.22	84.18	301.54	84.21	301.81	84.24
302	84.27	302.2	84.3	302.39	84.33	302.58	84.36	302.78	84.39
302.97	84.42	303.15	84.45	303.33	84.48	303.51	84.51	303.7	84.54
303.9	84.57	304.1	84.6	304.31	84.63	304.52	84.66	304.72	84.69
304.93	84.72	305.11	84.75	305.29	84.78	305.46	84.81	305.64	84.84
305.81	84.87	305.98	84.9	306.14	84.93	306.31	84.96	306.48	84.99
306.64	85.02	306.81	85.05	306.98	85.08	307.13	85.11	307.28	85.14
307.43	85.17	307.57	85.2	307.72	85.23	307.87	85.26	308.01	85.29
308.15	85.32	308.3	85.35	308.44	85.38	308.58	85.41	308.73	85.44
308.87	85.47	309.03	85.5	309.22	85.53	309.41	85.56	309.6	85.59
309.78	85.62	309.95	85.65	310.13	85.68	310.3	85.71	310.48	85.74
310.65	85.77	310.83	85.8	310.99	85.83	311.11	85.86	311.23	85.89
311.35	85.92	311.5	85.95	311.66	85.98	311.82	86.01	311.98	86.04
312.14	86.07	312.3	86.1	312.47	86.13	312.65	86.16		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	30.25	.035	178.74	.1	191.05	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

132.89	165.72		18.76	18.76	18.76	.1	.3

Left Levee Station= 90.4 Elevation= 81.69

Right Levee Station= 173.95 Elevation= 81.84

Blocked Obstructions num= 1

Sta L	Sta R	Elev
172.17	174.61	84.84

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 991

INPUT
Description:
Station Elevation Data num= 494

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	77.85	.22	77.85	.75	77.88	1.29	77.91	1.93	77.94
2.86	77.97	3.73	78	4.58	78.03	5.58	78.06	6.85	78.09
8.2	78.12	8.68	78.15	9.15	78.18	9.62	78.21	10.08	78.24
10.76	78.27	12.08	78.33	12.61	78.33	14.34	78.3	14.91	78.27
15.47	78.24	16.09	78.21	16.37	78.18	16.94	78.09	17.14	78.06
17.33	78.03	17.53	78	17.72	77.97	17.92	77.94	18.1	77.91
19.49	77.88	20.62	77.85	21.29	77.82	21.91	77.79	22.76	77.79
23.93	77.82	25.3	77.85	26.59	77.88	27.75	77.91	28.45	77.94
29.23	78	29.61	78.03	30.35	78.09	30.79	78.12	31.22	78.15
31.63	78.18	32.03	78.21	32.42	78.24	33.54	78.3	34.12	78.33
34.57	78.36	34.9	78.39	35.27	78.42	35.72	78.45	36.21	78.48
36.71	78.51	37.22	78.54	37.7	78.57	38.19	78.6	38.57	78.63
39.61	78.75	39.86	78.78	40.12	78.81	40.39	78.84	40.75	78.87
41.55	78.93	41.92	78.96	42.2	78.99	42.44	79.02	42.84	79.05
43.29	79.08	43.71	79.11	44.11	79.14	44.5	79.17	44.95	79.2
45.42	79.23	45.9	79.26	46.37	79.29	46.86	79.32	47.48	79.35
48.29	79.38	49.16	79.41	49.88	79.44	51.16	79.5	51.88	79.53
52.66	79.56	53.68	79.62	54.15	79.65	54.52	79.68	55.03	79.71
55.64	79.74	56.24	79.77	56.91	79.8	58.57	79.83	59.24	79.83
61.8	79.8	62.62	79.77	66.14	79.74	67.72	79.71	68.98	79.68
72.8	79.65	74.03	79.62	75.91	79.62	77.18	79.65	77.94	79.68
78.71	79.71	79.63	79.74	80.58	79.77	82.64	79.83	84.47	79.86
85.89	79.89	87.22	79.92	89.5	79.95	90.58	79.98	91.57	79.98
92.55	79.95	94.26	79.95	98.27	79.98	99.25	80.01	100.08	80.04
101.13	80.07	101.55	80.07	102.11	80.04	102.75	80.01	103.49	79.98
104.5	79.95	105.63	79.92	106.51	79.86	107.04	79.83	109.74	79.83
110.35	79.8	111.06	79.77	111.83	79.74	112.26	79.71	112.68	79.68
113.1	79.65	113.53	79.62	114.04	79.59	114.88	79.56	115.51	79.53
115.61	79.53	118.33	79.5	119.23	79.47	119.88	79.44	123.43	79.41
125.33	79.41	126.66	79.44	128.13	79.47	128.31	79.47	129.99	79.44
132.14	79.41	132.47	79.41	134.05	79.44	134.52	79.44	134.9	79.41
135.29	79.38	135.71	79.35	136.16	79.32	136.8	79.29	137.91	79.26
138.9	79.23	140.16	79.2	141.11	79.17	141.66	79.14	142.14	79.11
142.63	79.08	144.9	79.08	145.94	79.05	149.29	79.05	150.24	79.08
151.25	79.11	152.2	79.14	153.05	79.17	155.49	79.17	156.83	79.2
157.43	79.22	157.63	79.23	158.84	79.26	159.92	79.26	160.86	79.2
161.32	79.17	162.28	79.14	163.51	79.11	163.88	79.08	164.07	79.05
164.47	78.99	164.68	78.96	164.88	78.93	165.28	78.87	165.47	78.84
165.51	78.83	165.67	78.81	165.86	78.78	165.99	78.75	166.13	78.72
166.26	78.69	166.54	78.63	166.67	78.6	166.81	78.57	166.94	78.54
167.08	78.51	167.21	78.48	167.49	78.42	167.62	78.39	167.76	78.36
167.89	78.33	168.59	78.33	169.3	78.36	169.59	78.39	169.85	78.42
170.12	78.45	170.4	78.48	170.69	78.51	171	78.54	171.3	78.57
171.92	78.63	172.26	78.66	172.74	78.69	173.24	78.72	173.76	78.75

174.3	78.78	174.39	78.78	176.24	78.75	177.89	78.75	178.41	78.78
178.94	78.81	179.51	78.84	180.11	78.87	181.56	78.9	182.83	78.93
183.81	78.96	183.84	78.96	184.86	78.99	185.45	79.02	185.97	79.05
186.5	79.08	187	79.11	187.83	79.11	188.6	79.08	189.75	79.05
189.8	79.05	190.26	79.08	190.67	79.11	191.11	79.14	192.05	79.2
192.45	79.23	192.8	79.26	193.18	79.29	193.57	79.32	194.08	79.35
194.61	79.38	195.22	79.41	195.77	79.44	196.36	79.47	196.94	79.5
197	79.5	197.23	79.47	197.4	79.44	198.04	79.32	198.21	79.29
198.74	79.26	199.87	79.26	200.8	79.29	202.95	79.32	203.45	79.34
203.78	79.35	204.37	79.38	205.17	79.41	205.97	79.44	206.63	79.47
207.27	79.5	207.9	79.53	208.83	79.56	209.75	79.59	210.38	79.62
210.85	79.65	211.47	79.68	212.11	79.71	212.5	79.74	212.86	79.77
213.23	79.8	213.99	79.86	214.49	79.89	215.11	79.92	215.51	79.94
215.69	79.95	216.13	79.98	216.67	80.01	217.24	80.04	217.81	80.07
218.42	80.1	219.06	80.13	219.66	80.16	220.25	80.19	220.74	80.22
221.48	80.28	221.86	80.31	222.23	80.34	222.7	80.37	223.29	80.4
224.06	80.43	224.81	80.46	225.46	80.49	226	80.52	226.92	80.55
228.61	80.58	229.65	80.61	231.73	80.64	233.62	80.67	235.38	80.7
237.63	80.73	239.24	80.73	240.29	80.7	240.95	80.7	242.19	80.73
242.76	80.76	243.05	80.79	243.31	80.82	243.57	80.85	243.82	80.88
244.08	80.91	244.33	80.94	244.59	80.97	245.71	81	251.23	81.03
252.2	81.06	253.25	81.09	254.03	81.12	254.8	81.15	255.44	81.18
256.02	81.21	256.57	81.24	256.98	81.27	257.32	81.3	257.66	81.33
258.34	81.39	258.67	81.42	259.1	81.45	259.69	81.48	260.31	81.51
261.18	81.51	261.52	81.48	261.85	81.45	262.17	81.42	262.42	81.39
262.88	81.33	262.9	81.33	264.4	81.36	265.07	81.36	265.4	81.33
266.51	81.24	266.87	81.21	267.35	81.18	267.84	81.15	268.34	81.12
268.76	81.09	269.2	81.06	269.86	81.03	270.83	81	272.92	80.97
273.87	80.94	274.69	80.91	277.13	80.88	277.37	80.85	277.6	80.82
277.84	80.79	278.3	80.73	278.53	80.7	278.77	80.67	279	80.64
279.17	80.61	279.23	80.59	279.27	80.58	279.49	80.52	279.59	80.49
279.92	80.4	280.03	80.37	280.47	80.25	280.58	80.22	280.91	80.13
281.02	80.1	281.26	80.1	281.54	80.16	281.96	80.25	282.1	80.28
282.66	80.4	283.08	80.49	284.28	80.52	284.8	80.55	285.32	80.58
285.83	80.61	286.32	80.64	286.77	80.67	288.66	80.67	289.85	80.64
291.18	80.61	293.59	80.58	294.77	80.55	295.67	80.52	296.51	80.49
297.53	80.46	299.37	80.43	301.04	80.4	301.76	80.4	303.13	80.43
303.66	80.43	305.18	80.4	305.64	80.4	306.7	80.43	307.84	80.46
309.2	80.49	310.06	80.52	311.88	80.55	312.82	80.58	313.46	80.61
314.51	80.64	315.27	80.67	316.65	80.7	317.81	80.73	318.47	80.76
319.1	80.79	320.66	80.82	321.83	80.85	322.24	80.88	322.88	80.91
323.53	80.94	323.98	80.97	324.41	81	324.91	81.03	325.46	81.06
325.89	81.09	326.27	81.12	326.93	81.18	327.24	81.21	327.51	81.24
328	81.27	328.81	81.3	329.39	81.33	329.77	81.36	330.01	81.39
330.47	81.45	330.71	81.48	330.94	81.51	331.18	81.54	331.41	81.57
331.65	81.6	331.88	81.63	332.1	81.66	332.3	81.69	332.72	81.75
333.12	81.81	333.33	81.84	333.53	81.87	333.74	81.9	333.98	81.93
334.2	81.96	334.43	81.99	334.65	82.02	334.89	82.05	335.73	82.17
335.96	82.2	336.17	82.23	336.55	82.29	336.93	82.35	337.11	82.38
337.45	82.44	337.63	82.47	337.8	82.5	338.18	82.56	338.36	82.59
338.56	82.62	338.98	82.68	339.19	82.71	339.43	82.74	339.66	82.77
339.94	82.8	340.27	82.83	340.61	82.86	340.94	82.89	341.25	82.92

341.73	82.98	342.1	83.01	342.53	83.04	342.97	83.07	343.85	83.13
344.07	83.16	344.28	83.19	344.5	83.22	344.71	83.25	344.93	83.28
345.14	83.31	345.8	83.4	347.2	83.43	347.85	83.45		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	54.52	.035	195.22	.1	207.9	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
157.43	183.81	14.84	14.84	14.84	.1 .3

Left Levee Station= 100.98 Elevation= 80.06
Right Levee Station= 260.03 Elevation= 81.52

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 990

INPUT
Description:
Station Elevation Data num= 468

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	76.9	.34	76.92	.78	76.95	1.22	76.98	1.67	77.01
4.08	77.04	5.1	77.07	6.19	77.1	6.6	77.13	7.01	77.16
7.4	77.19	7.78	77.22	8.16	77.25	8.61	77.28	9.09	77.31
9.6	77.34	10.24	77.37	11.4	77.4	16.56	77.4	17.25	77.37
17.91	77.34	18.41	77.31	18.83	77.28	19.25	77.25	19.68	77.22
20.11	77.19	21.57	77.16	24.7	77.16	25.28	77.13	25.86	77.1
27.08	77.1	27.83	77.13	28.18	77.16	28.5	77.19	28.82	77.22
29.15	77.25	29.48	77.28	29.83	77.31	30.17	77.34	30.98	77.37
31.97	77.4	34.39	77.43	34.79	77.46	35.19	77.49	35.59	77.52
35.99	77.55	36.53	77.58	37.1	77.61	37.67	77.64	38.11	77.67
38.57	77.7	39.04	77.73	39.56	77.76	40.15	77.79	40.47	77.82
40.72	77.85	40.97	77.88	41.22	77.91	41.47	77.94	41.72	77.97
41.97	78	42.21	78.03	42.8	78.06	43.43	78.09	43.96	78.12
44.39	78.15	44.76	78.18	45.15	78.21	45.56	78.24	46	78.27
46.43	78.3	46.85	78.33	47.32	78.36	47.83	78.39	48.34	78.42
48.74	78.45	49.18	78.48	49.62	78.51	50.06	78.54	50.61	78.57
51.04	78.6	51.46	78.63	51.87	78.66	52.28	78.69	52.92	78.72
53.63	78.75	54.6	78.78	55.62	78.81	56.97	78.84	58.25	78.87
62.12	78.9	62.48	78.9	63.03	78.87	63.69	78.84	64.7	78.81
66.14	78.78	67.24	78.75	68.44	78.72	70.15	78.69	71.82	78.66
73.22	78.66	76.89	78.69	77.5	78.72	78.03	78.75	78.49	78.78
84.6	78.81	85	78.84	85.28	78.87	85.56	78.9	85.84	78.93
86.12	78.96	86.41	78.99	86.9	79.02	87.57	79.05	88.25	79.08
88.74	79.11	89.19	79.14	89.64	79.17	90.17	79.2	91.12	79.2
91.92	79.17	92.65	79.14	93.4	79.11	94.1	79.08	94.91	79.05
96	79.02	96.9	78.99	97.84	78.96	99.04	78.93	100.36	78.9
101.98	78.87	104.83	78.87	105.28	78.84	105.72	78.81	106.16	78.78
106.59	78.75	108.97	78.75	110.09	78.72	110.84	78.69	111.28	78.66

111.77	78.63	112.43	78.6	113.37	78.57	114.18	78.54	114.71	78.51
115.12	78.48	115.53	78.45	115.94	78.42	116.4	78.39	117.39	78.39
118.16	78.42	119.14	78.42	119.54	78.39	119.71	78.38	119.94	78.36
120.34	78.33	120.74	78.3	121.26	78.27	121.82	78.24	122.39	78.21
122.97	78.18	123.56	78.15	124.11	78.12	124.65	78.09	125.92	78.06
127.11	78.03	127.73	78	128.32	77.97	128.87	77.94	129.45	77.91
129.99	77.88	130.5	77.85	130.95	77.82	131.27	77.79	131.58	77.76
131.9	77.73	132.26	77.7	132.76	77.67	135.48	77.67	135.82	77.7
136.15	77.73	136.46	77.76	136.93	77.79	138.11	77.82	140.85	77.82
142.59	77.79	146.3	77.79	146.79	77.82	147.2	77.85	147.78	77.88
150.03	77.91	151.17	77.94	151.72	77.97	152.43	78	153.84	78.03
157.33	78.03	158.64	78.06	158.72	78.06	159.75	78.03	163.26	78.03
163.71	78	164.11	77.98	164.25	77.97	164.83	77.94	165.34	77.91
165.74	77.88	166.15	77.85	166.56	77.82	166.97	77.79	167.37	77.76
167.82	77.73	168.29	77.7	168.76	77.67	169.24	77.64	169.71	77.62
170.15	77.61	171.36	77.58	172.4	77.55	172.97	77.52	173.39	77.49
173.8	77.46	176.12	77.43	177.19	77.4	178.89	77.4	179.4	77.43
179.49	77.43	179.84	77.46	180.15	77.49	180.42	77.52	180.68	77.55
180.99	77.58	182.05	77.61	182.85	77.64	183.01	77.67	183.18	77.7
183.34	77.73	183.51	77.76	183.68	77.79	183.92	77.82	186.38	77.85
186.85	77.88	187.3	77.91	187.87	77.94	189.59	77.97	190.74	77.97
193.6	77.97	194.36	78	196.44	78.03	197.74	78.06	201.03	78.09
201.28	78.12	201.44	78.15	201.6	78.18	201.76	78.21	201.92	78.24
202.07	78.27	202.23	78.3	202.39	78.33	202.72	78.36	203.18	78.39
203.61	78.42	204.01	78.45	205.73	78.45	207.69	78.42	208.93	78.39
210.45	78.36	213.94	78.33	218.81	78.33	219.68	78.36	219.71	78.36
220.71	78.39	226.62	78.39	228.18	78.36	228.3	78.36	229.14	78.39
230.05	78.42	233.67	78.45	234.6	78.48	235.59	78.51	235.86	78.51
237.78	78.48	237.83	78.48	238.45	78.51	238.88	78.54	239.3	78.57
239.73	78.6	240.22	78.63	241.24	78.66	244.37	78.69	244.76	78.72
245.17	78.75	245.57	78.78	245.98	78.81	246.41	78.84	246.86	78.87
247.3	78.9	247.74	78.93	248.16	78.96	248.83	78.96	249.97	78.93
250.5	78.93	250.98	78.96	251.46	78.99	251.93	79.02	252.36	79.05
252.57	79.08	252.83	79.11	253.09	79.14	253.34	79.17	253.58	79.2
253.82	79.23	254.06	79.26	254.29	79.29	254.7	79.29	255.15	79.26
255.62	79.23	256.06	79.2	257.97	79.2	258.22	79.23	258.99	79.23
259.91	79.2	260.9	79.17	261.3	79.14	261.69	79.11	262.09	79.08
265.25	79.05	268.06	79.02	268.75	79.02	269.62	79.05	270.34	79.08
270.71	79.11	271.33	79.14	271.95	79.17	272.55	79.2	272.86	79.2
273.52	79.17	274.18	79.14	276.88	79.14	277.49	79.11	278.25	79.08
279.21	79.05	280.35	79.02	281.15	79.02	281.96	79.05	282.76	79.08
283.02	79.08	283.83	79.05	284.79	79.02	285.71	78.99	286.62	78.96
288.99	78.93	289.66	78.9	291.75	78.87	293.11	78.84	293.65	78.81
294.17	78.78	294.73	78.75	297.27	78.72	298.01	78.72	298.93	78.75
301.37	78.75	301.63	78.78	301.9	78.81	302.16	78.84	302.41	78.87
302.66	78.9	302.9	78.93	303.13	78.96	303.47	78.99	304.13	79.02
304.88	79.05	307.47	79.05	307.72	79.02	307.98	78.99	308.3	78.96
308.66	78.93	309.07	78.9	309.54	78.87	310.06	78.84	310.63	78.81
311.26	78.78	312.66	78.75	315.55	78.72	315.82	78.69	316.08	78.66
316.34	78.63	316.6	78.6	316.86	78.57	317.13	78.54	317.53	78.51
318.2	78.48	318.73	78.45	319.17	78.42	319.53	78.39	319.89	78.36
320.32	78.33	320.86	78.3	321.54	78.27	322.05	78.24	322.8	78.21

325.9	78.21	327.19	78.24	327.95	78.27	328.41	78.3	328.86	78.33
329.31	78.36	330.13	78.36	330.82	78.33	331.7	78.3	331.71	78.3
332	78.33	332.29	78.36	332.61	78.39	332.97	78.42	333.31	78.45
333.72	78.48	335.07	78.51	335.75	78.54	336.47	78.57	337.21	78.6
337.86	78.63	338.27	78.66	338.66	78.69	339.04	78.72	339.43	78.75
339.81	78.78	340.94	78.81	342.17	78.84	342.91	78.87	343.51	78.9
344.11	78.93	345.52	78.96	346.82	78.99	347.85	79.02	349.22	79.05
352.37	79.08	352.84	79.11	353.39	79.14	353.97	79.17	354.4	79.2
354.79	79.23	355.18	79.26	355.58	79.29	356	79.32	356.47	79.35
356.98	79.38	357.48	79.41	357.99	79.44	358.46	79.47	358.88	79.5
359.33	79.53	359.8	79.56	360.31	79.59	360.99	79.62	361.59	79.65
362.18	79.68	362.55	79.71	362.89	79.74	363.27	79.77	363.67	79.8
364.07	79.83	364.49	79.86	364.92	79.89	365.34	79.92	365.67	79.95
365.94	79.98	366.21	80.01	366.48	80.04				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	68.44	.035	201.28	.1	213.94	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
164.11	190.74	9.49	9.49	9.49	.1	.3

Left Levee Station= 91.1 Elevation= 79.2
Right Levee Station= 254.2 Elevation= 79.3

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 989

INPUT
Description:
Station Elevation Data num= 429

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	76.11	2.24	76.11	3.2	76.08	4.25	76.05	4.69	76.02
5.23	75.99	5.94	75.96	8.28	75.96	9.52	75.99	10.18	76.02
10.96	76.05	11.98	76.08	12.54	76.11	12.99	76.14	13.44	76.17
13.86	76.2	14.22	76.23	16.27	76.26	16.7	76.29	17.17	76.32
17.7	76.35	18.28	76.38	18.91	76.41	19.55	76.44	20.18	76.47
21.26	76.5	22.5	76.53	23.76	76.56	24.34	76.59	24.8	76.62
25.28	76.65	25.77	76.68	26.29	76.71	26.64	76.74	26.94	76.77
27.31	76.8	27.78	76.83	28.39	76.86	29.04	76.89	29.83	76.92
30.66	76.95	31.12	76.98	31.47	77.01	31.83	77.04	32.18	77.07
32.54	77.1	32.91	77.13	33.29	77.16	33.66	77.19	34.02	77.22
34.38	77.25	35.47	77.28	36.64	77.31	37.48	77.34	38.15	77.37
38.87	77.4	40.54	77.43	41.77	77.46	43.06	77.49	45.84	77.52
47.08	77.55	47.98	77.58	50.72	77.58	52.75	77.55	55.56	77.55
56.48	77.58	57.37	77.61	58.18	77.64	61.08	77.67	61.81	77.7
62.44	77.73	62.99	77.76	63.61	77.79	64.19	77.82	64.72	77.85
65.56	77.88	66.64	77.91	67.63	77.94	68.77	77.97	69.72	78
70.55	78.03	71.47	78.06	72.97	78.09	76.39	78.09	78.37	78.06

79.8	78.03	81.57	78	82.7	77.97	87.07	77.94	89.63	77.91
91.43	77.88	92.79	77.85	93.72	77.82	94.07	77.79	94.42	77.76
94.76	77.73	95.09	77.7	95.42	77.67	97.63	77.64	99.65	77.61
100.2	77.58	100.74	77.55	101.29	77.52	102.34	77.49	103.74	77.46
104.22	77.43	104.75	77.4	105.29	77.37	105.79	77.35	105.95	77.34
106.84	77.31	107.51	77.28	108.1	77.25	108.7	77.22	109.43	77.19
110.43	77.16	111.43	77.13	112.26	77.1	113.01	77.07	113.76	77.04
114.73	77.01	115.61	76.98	120.81	76.98	121.94	77.01	123.61	77.04
129.39	77.04	130.57	77.07	133.25	77.07	134.07	77.1	135.23	77.13
139.88	77.13	143.83	77.1	145.58	77.07	146.92	77.04	147.01	77.04
148.02	77.01	148.75	76.98	149.37	76.95	149.97	76.92	150.49	76.89
151.05	76.86	151.65	76.83	152.25	76.8	152.78	76.77	153.31	76.74
153.87	76.71	154.38	76.68	155.17	76.65	155.79	76.63	155.97	76.62
156.75	76.59	157.46	76.56	158.24	76.53	163.32	76.53	164.41	76.5
165.46	76.47	166.49	76.44	168.59	76.44	169.02	76.47	169.47	76.5
169.82	76.53	170.11	76.56	170.35	76.59	170.58	76.62	170.83	76.65
171.11	76.68	171.42	76.71	171.74	76.74	172.05	76.77	172.36	76.8
172.66	76.83	172.82	76.85	172.97	76.86	173.27	76.89	173.68	76.92
174.26	76.95	175.37	76.98	176.64	77.01	178.66	77.04	181.02	77.07
185.04	77.1	185.45	77.13	185.74	77.16	186.02	77.19	186.57	77.22
187.6	77.25	188.25	77.28	188.82	77.31	189.64	77.34	190.49	77.37
191.65	77.4	197.4	77.4	198.26	77.37	198.89	77.34	199.59	77.31
200.34	77.28	205.79	77.28	206.63	77.28	209.47	77.25	210.54	77.22
211.54	77.19	212.41	77.16	213.59	77.13	215.56	77.1	216.64	77.07
217.73	77.04	219.96	77.01	221.39	76.98	222.06	76.95	224.02	76.92
224.38	76.92	226.65	76.95	226.97	76.95	227.68	76.98	228.66	77.01
229.56	77.04	229.96	77.07	230.33	77.1	230.71	77.13	231.09	77.16
231.47	77.19	231.81	77.22	232.16	77.25	232.51	77.28	232.86	77.31
233.21	77.34	233.58	77.37	234.8	77.4	235.35	77.43	236.02	77.46
236.68	77.49	237.2	77.52	237.64	77.55	238.03	77.58	238.43	77.61
238.93	77.64	239.53	77.67	239.79	77.7	239.98	77.73	240.17	77.76
240.36	77.79	240.56	77.82	240.8	77.85	241.06	77.88	241.31	77.91
241.54	77.94	244.18	77.94	245.45	77.91	246.4	77.88	247.7	77.85
249.78	77.85	250.76	77.82	253.52	77.82	254.43	77.85	255.2	77.88
255.81	77.91	256.07	77.94	256.33	77.97	256.59	78	256.85	78.03
257.11	78.06	257.37	78.09	257.63	78.12	264.76	78.12	266.3	78.09
267.01	78.06	267.64	78.03	270.72	78.03	273.94	78	274.38	77.97
274.83	77.94	275.29	77.91	275.68	77.88	282.05	77.88	282.44	77.91
282.82	77.94	283.21	77.97	283.6	78	284.07	78.03	284.33	78.06
284.6	78.09	284.86	78.12	285.13	78.15	285.4	78.18	285.66	78.21
285.93	78.24	287.71	78.27	289.58	78.27	290.79	78.24	291.42	78.21
291.97	78.18	294.5	78.15	295.03	78.12	295.45	78.09	295.76	78.06
296.08	78.03	296.33	78	296.55	77.97	296.78	77.94	297.08	77.91
297.38	77.88	297.68	77.85	297.98	77.82	298.51	77.79	299.75	77.76
300.46	77.73	300.75	77.7	301.03	77.67	301.3	77.64	301.58	77.61
301.85	77.58	302.32	77.55	305.22	77.52	313.01	77.52	313.69	77.55
316.71	77.55	317.06	77.52	317.4	77.49	317.75	77.46	318.24	77.43
318.78	77.4	319.31	77.37	320.17	77.34	321.83	77.31	324.03	77.31
325	77.34	325.59	77.37	326.22	77.4	328.86	77.43	329.28	77.46
329.65	77.49	330.03	77.52	330.41	77.55	331.02	77.58	331.8	77.61
332.56	77.64	332.97	77.67	333.29	77.7	333.58	77.73	333.87	77.76
334.16	77.79	334.45	77.82	334.79	77.85	335.15	77.88	335.5	77.91

335.77	77.94	336.05	77.97	336.33	78	336.62	78.03	337.1	78.06
337.57	78.09	338.01	78.12	338.43	78.15	341.36	78.18	342.28	78.21
342.91	78.24	343.45	78.27	344.06	78.3	344.69	78.33	346.74	78.36
348.21	78.39	350.18	78.42	351.21	78.45	351.93	78.48	352.75	78.51
354.42	78.48	354.87	78.48	355.11	78.51	355.35	78.54	355.59	78.57
355.83	78.6	356.07	78.63	356.32	78.66	356.56	78.69	356.82	78.72
356.97	78.75	357.13	78.78	357.28	78.81	357.43	78.84	357.58	78.87
357.74	78.9	357.9	78.93	358.06	78.96	358.23	78.99	358.39	79.02
358.55	79.05	358.71	79.08	358.96	79.11	359.31	79.14	359.69	79.17
360.08	79.2	360.18	79.21	360.38	79.23	360.65	79.26	360.89	79.29
361.11	79.32	361.34	79.35	361.63	79.38	361.95	79.41	362.27	79.44
362.59	79.47	363.01	79.5	363.71	79.53	364.52	79.56	365.37	79.59
366.31	79.62	367.02	79.65	367.36	79.68	367.57	79.71	367.79	79.74
368	79.77	368.21	79.8	368.43	79.83	368.64	79.86	368.87	79.89
369.15	79.92	369.45	79.95	369.77	79.98	370.09	80.01	370.41	80.04
370.73	80.07	370.93	80.1	371.09	80.13	371.3	80.16	371.54	80.19
371.79	80.22	372.04	80.25	372.28	80.28	372.45	80.3		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	64.19	.035	186.57	.1	200.34	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
147.01	172.82	17.91	17.91	17.91	.1 .3

Left Levee Station= 76.92 Elevation= 78.1
Right Levee Station= 257.25 Elevation= 78.14

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 988.4

INPUT
Description:
Station Elevation Data num= 333

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.96	.53	75.96	2.67	75.99	9.6	75.99	10.72	75.96
11.43	75.93	12.14	75.9	16.78	75.9	17.51	75.93	18.26	75.96
18.76	75.99	19.23	76.02	19.67	76.05	20.08	76.08	21.45	76.11
22.73	76.14	23.23	76.17	23.63	76.2	24.04	76.23	24.5	76.26
25.07	76.29	25.72	76.32	26.4	76.35	27.67	76.38	28.73	76.41
29.67	76.44	30.54	76.47	30.97	76.5	31.43	76.53	32.04	76.56
32.56	76.59	32.93	76.62	33.28	76.65	33.64	76.68	33.99	76.71
34.34	76.74	34.69	76.77	35.25	76.8	35.93	76.83	36.86	76.86
37.34	76.89	37.83	76.92	38.37	76.95	38.75	76.98	39.14	77.01
39.52	77.04	39.91	77.07	40.29	77.1	40.8	77.13	41.57	77.16
42.65	77.19	44.6	77.22	44.73	77.22	45.76	77.25	49.1	77.28
50.4	77.31	51.29	77.34	52.25	77.37	53.84	77.4	57.15	77.4
61.64	77.43	62.66	77.46	64.42	77.49	65.45	77.52	66.76	77.55
67.58	77.58	68.34	77.61	69.22	77.64	70.09	77.67	70.74	77.7

73.7	77.73	75.12	77.76	75.92	77.79	76.7	77.82	77.48	77.85
78.37	77.88	79.58	77.91	82.01	77.91	83.13	77.88	86.59	77.88
88.33	77.85	91.5	77.82	93.05	77.79	96.17	77.76	97.11	77.73
99.67	77.73	100.13	77.7	100.62	77.67	101.26	77.64	102.04	77.61
102.9	77.58	103.85	77.55	105.59	77.52	106.06	77.49	106.53	77.46
107.01	77.43	107.48	77.4	108.35	77.37	109.02	77.34	109.69	77.31
110.29	77.28	110.94	77.25	111.64	77.22	111.99	77.19	112.34	77.16
112.68	77.13	113.06	77.1	113.3	77.08	113.47	77.07	114.06	77.04
114.82	77.01	115.53	76.98	116.07	76.95	116.58	76.92	117.1	76.89
117.61	76.86	118.44	76.83	119.35	76.8	121.61	76.8	124.31	76.8
125.29	76.83	126.69	76.83	128.16	76.8	129.48	76.77	131.09	76.74
132.18	76.71	132.78	76.68	133.38	76.65	134.3	76.62	135.35	76.59
137.29	76.56	140.06	76.53	141.2	76.5	142.26	76.47	143	76.44
143.83	76.41	145.94	76.38	146.51	76.35	147.03	76.32	147.55	76.29
148.22	76.26	150.98	76.26	151.77	76.29	153.4	76.29	154.36	76.26
154.71	76.23	155.05	76.2	155.41	76.17	155.86	76.14	156.25	76.11
156.57	76.08	156.88	76.05	157.2	76.02	157.51	75.99	157.83	75.96
158.15	75.93	158.65	75.9	159.15	75.87	159.64	75.84	160.14	75.81
162.23	75.78	162.72	75.75	163.32	75.72	163.85	75.69	163.93	75.69
164.45	75.66	164.88	75.63	165.24	75.6	165.58	75.57	165.92	75.54
166.25	75.51	166.48	75.48	166.7	75.45	166.93	75.42	167.19	75.39
167.46	75.36	167.71	75.33	167.99	75.3	168.29	75.27	168.5	75.24
168.71	75.21	168.93	75.18	169.15	75.15	169.37	75.12	169.59	75.09
169.81	75.06	170.02	75.03	170.23	75	170.72	75	170.94	75.03
171.17	75.06	171.4	75.09	171.61	75.12	171.62	75.12	171.84	75.15
172.04	75.18	172.53	75.21	172.85	75.23	173.12	75.24	173.43	75.27
173.72	75.3	174	75.33	174.26	75.36	174.52	75.39	174.76	75.42
174.99	75.45	175.22	75.48	175.42	75.51	175.62	75.54	175.82	75.57
176.02	75.6	176.23	75.63	176.43	75.66	176.64	75.69	176.85	75.72
177.06	75.75	177.27	75.78	177.49	75.81	177.7	75.84	177.98	75.87
178.37	75.9	178.78	75.93	179.19	75.96	179.58	75.99	179.96	76.02
180.33	76.05	180.71	76.08	181.09	76.11	181.43	76.14	181.77	76.17
182.13	76.2	182.49	76.23	182.87	76.26	184.26	76.26	185.02	76.23
186.04	76.23	186.74	76.26	187.43	76.29	188.12	76.32	188.69	76.35
189.09	76.38	189.44	76.41	189.75	76.44	190.03	76.47	190.29	76.5
190.78	76.53	193.51	76.53	193.96	76.56	194.37	76.59	195.26	76.62
197.35	76.62	198.29	76.59	201.15	76.59	203.9	76.62	204.47	76.62
205.41	76.59	207.09	76.56	207.98	76.53	208.76	76.5	210.12	76.47
213.63	76.47	215.73	76.5	219.43	76.5	220.46	76.47	221.61	76.44
221.64	76.44	223.68	76.41	238.17	76.41	240.08	76.44	241.19	76.47
241.93	76.5	242.4	76.53	242.82	76.56	243.22	76.59	243.59	76.62
243.95	76.65	244.57	76.68	245.18	76.71	245.76	76.74	246.17	76.77
246.68	76.8	249.79	76.8	250.2	76.77	250.65	76.74	251.91	76.71
254.51	76.68	255.64	76.65	256.48	76.62	257.2	76.59	257.94	76.56
258.92	76.53	260.23	76.53	260.83	76.56	261.45	76.59	262.81	76.59
263.47	76.56	264.18	76.53	265.36	76.5	266.65	76.47	267.14	76.46
267.74	76.44	268.71	76.44	268.96	76.47	269.22	76.5	269.48	76.53
269.73	76.56	269.99	76.59	270.24	76.62	270.5	76.65	270.95	76.68
271.58	76.71	272.2	76.74	272.84	76.77	273.38	76.8	273.92	76.83
274.45	76.86	274.72	76.89	274.98	76.92	275.24	76.95	275.49	76.98
275.75	77.01	276.01	77.04	276.27	77.07	276.58	77.1	277.22	77.13
277.94	77.16	279	77.19	279.89	77.22	280.61	77.25	280.79	77.25

281.9	77.22	282.76	77.19	283.34	77.17

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	73.7	.035	201.15	.1	215.73	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
121.61	221.61	11.94	11.94	11.94	.1 .3

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 988

INPUT
Description:
Station Elevation Data num= 494

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.13	.28	75.15	.66	75.18	1.07	75.21	1.5	75.24
1.95	75.27	2.32	75.3	2.66	75.33	4.06	75.45	4.55	75.48
5.12	75.51	5.78	75.54	7.51	75.57	9.06	75.6	14.85	75.6
18.67	75.57	20	75.54	20.59	75.54	21.54	75.57	22.37	75.6
24.1	75.63	24.81	75.66	26.34	75.75	26.86	75.78	27.4	75.81
27.97	75.84	28.57	75.87	29.36	75.9	30.3	75.93	31.05	75.96
31.7	75.99	32.32	76.02	32.85	76.05	33.73	76.11	34.12	76.14
34.42	76.17	34.73	76.2	35.14	76.23	35.52	76.26	35.87	76.29
36.2	76.32	36.5	76.35	36.82	76.38	37.19	76.41	37.58	76.44
38	76.47	38.44	76.5	38.93	76.53	39.43	76.56	39.94	76.59
40.46	76.62	40.97	76.65	41.49	76.68	42.03	76.71	42.58	76.74
45.35	76.77	45.89	76.8	46.39	76.83	46.91	76.86	47.95	76.89
49.06	76.92	50.74	76.95	51.85	76.98	53.15	77.01	53.93	77.04
59.64	77.04	60.7	77.07	61.68	77.1	62.74	77.13	65.25	77.16
67.04	77.19	68.33	77.22	69.08	77.25	70.42	77.28	71.83	77.31
73.94	77.34	75.09	77.37	76.09	77.4	77.3	77.43	78.81	77.46
81.73	77.46	82.53	77.49	83.16	77.52	85.13	77.55	86.75	77.58
88	77.58	88.7	77.55	89.23	77.52	92.68	77.52	94.06	77.49
94.72	77.46	95.63	77.43	97.7	77.4	98.77	77.37	99.87	77.34
100.51	77.31	101.81	77.28	102.57	77.25	103.21	77.22	103.92	77.19
104.89	77.16	105.39	77.13	105.88	77.1	106.63	77.07	107.78	77.04
109.33	77.01	110.16	76.98	110.78	76.95	111.32	76.92	111.75	76.89
112.06	76.86	112.7	76.8	113.04	76.77	113.41	76.74	113.74	76.71
114.55	76.62	114.85	76.59	115.26	76.56	115.86	76.53	116.8	76.5
117.37	76.47	118.04	76.44	118.98	76.41	119.86	76.38	121.01	76.35
121.83	76.32	122.25	76.29	122.7	76.26	123.23	76.23	123.82	76.2
124.4	76.17	125.54	76.11	126.17	76.08	126.82	76.05	127.45	76.02
129.1	76.02	132.03	76.02	132.48	75.99	132.92	75.96	133.34	75.93
133.67	75.9	134.59	75.87	135.23	75.84	135.9	75.81	137.04	75.78
137.85	75.75	138.57	75.72	139.37	75.69	140.4	75.66	141.52	75.63
143.24	75.6	144.03	75.57	144.58	75.54	145.32	75.51	146.51	75.48
147.2	75.45	147.57	75.42	148.48	75.39	149.78	75.36	150.27	75.33

150.81	75.3	151.42	75.27	151.84	75.24	152.13	75.21	152.43	75.18
152.72	75.15	153.09	75.12	153.54	75.09	154.33	75.06	155.27	75.03
155.98	75	156.53	74.97	157.32	74.94	158.19	74.91	158.53	74.9
159.22	74.88	159.52	74.87	160.17	74.85	160.85	74.82	161.54	74.79
162.86	74.79	164.45	74.82	168.47	74.82	169.23	74.79	170	74.76
170.36	74.73	170.69	74.7	171.01	74.67	171.32	74.64	171.9	74.58
172.22	74.55	172.76	74.52	173.82	74.46	174.31	74.43	174.99	74.4
175.83	74.37	176.4	74.34	176.76	74.31	177.13	74.28	177.51	74.25
177.91	74.22	178.42	74.19	179.1	74.16	179.17	74.16	179.82	74.13
180.56	74.13	181.06	74.19	181.3	74.22	181.59	74.25	181.92	74.28
182.24	74.31	183.27	74.31	185.03	74.28	186.81	74.25	187.82	74.22
188.53	74.19	188.76	74.19	188.89	74.2	189.08	74.22	190	74.34
190.34	74.37	190.69	74.4	191	74.43	191.14	74.45	191.28	74.46
191.49	74.49	191.65	74.52	192.33	74.64	192.49	74.67	192.85	74.73
193.04	74.76	193.44	74.82	194.2	74.94	194.37	74.97	194.53	75
194.91	75.06	195.27	75.12	195.91	75.24	196.05	75.27	196.2	75.3
196.34	75.33	196.49	75.36	196.91	75.45	197.07	75.48	197.22	75.51
197.38	75.54	197.61	75.57	198.11	75.63	198.59	75.69	198.84	75.72
200.51	75.72	201.2	75.69	201.45	75.66	201.71	75.63	203.13	75.6
203.53	75.6	203.89	75.63	204.24	75.66	204.92	75.72	205.25	75.75
205.57	75.78	205.87	75.81	206.09	75.84	206.3	75.87	206.52	75.9
206.79	75.93	207.08	75.96	207.7	76.02	208.02	76.05	209.04	76.11
209.51	76.14	209.95	76.17	211.25	76.2	212.17	76.23	212.33	76.26
212.64	76.26	213.09	76.23	214.5	76.2	218.57	76.2	218.91	76.17
220.11	76.14	222.53	76.11	225.36	76.08	228.17	76.08	228.94	76.11
229.1	76.12	229.64	76.14	232.93	76.17	233.37	76.17	235.28	76.14
236.31	76.11	237.36	76.08	243.92	76.08	244.87	76.11	246.01	76.14
248.97	76.14	250.17	76.11	251.29	76.08	252.55	76.05	253.85	76.05
255.87	76.08	256.88	76.11	258.02	76.14	259.24	76.17	259.81	76.2
260.13	76.23	260.42	76.26	260.69	76.29	260.94	76.32	261.18	76.35
261.41	76.38	261.56	76.41	261.69	76.44	262.11	76.5	262.38	76.53
262.77	76.56	263.2	76.59	263.7	76.62	266.06	76.62	266.45	76.59
266.78	76.56	267.46	76.5	267.81	76.47	268.17	76.44	268.62	76.41
271.16	76.38	272.53	76.35	273.3	76.32	273.88	76.29	275.02	76.23
276.28	76.2	279.01	76.17	280.9	76.14	281.17	76.14	282.34	76.17
286.15	76.17	287.76	76.2	288.18	76.23	288.51	76.26	288.8	76.29
289.34	76.35	289.62	76.38	289.88	76.41	290.06	76.44	290.23	76.47
290.41	76.5	290.58	76.53	290.85	76.56	291.17	76.59	291.57	76.62
293.7	76.65	295.11	76.68	295.93	76.71	296.8	76.74	297.66	76.77
300.17	76.77	300.49	76.74	301.11	76.68	301.43	76.65	301.82	76.62
304.48	76.59	306.8	76.59	307.68	76.62	308.29	76.65	308.8	76.68
309.42	76.71	310.64	76.71	311.25	76.68	311.78	76.65	312.29	76.65
313.85	76.77	314.45	76.77	315.04	76.74	315.73	76.71	316.76	76.68
317.89	76.65	322.67	76.65	323.33	76.62	324.02	76.59	324.54	76.56
325.14	76.53	325.95	76.5	326.62	76.47	327	76.44	328.16	76.32
329.51	76.29	330.57	76.26	331.45	76.2	331.9	76.17	335.2	76.17
335.88	76.2	338.49	76.2	339.15	76.17	340.28	76.14	341.39	76.11
341.98	76.08	342.59	76.05	343.22	76.02	343.84	75.99	344.42	75.96
345.22	75.9	345.62	75.87	346.01	75.84	347.79	75.84	348.67	75.87
349.19	75.9	349.6	75.93	350.26	75.99	352.69	76.02	353.66	76.05
354.92	76.05	355.65	76.02	356.06	75.99	356.48	75.96	357.02	75.93
357.42	75.9	357.73	75.87	358.03	75.84	358.34	75.81	359.2	75.78

361.27	75.75	362.79	75.75	363.19	75.78	363.65	75.84	363.89	75.87
364.12	75.9	364.36	75.93	364.58	75.96	365	76.02	365.25	76.05
365.56	76.08	365.98	76.11	366.43	76.14	366.78	76.17	367.42	76.23
367.75	76.26	368.49	76.32	368.96	76.35	369.46	76.38	370	76.41
370.64	76.44	371.62	76.5	372.1	76.53	373.24	76.53	374.02	76.5
376.68	76.5	377.41	76.53	378.35	76.59	381.21	76.59	383.09	76.65
384.01	76.68	384.75	76.71	385.59	76.8	385.86	76.83	386.14	76.86
386.37	76.89	386.55	76.92	386.76	76.95	388.32	77.04	389.62	77.07
390.91	77.1	391.64	77.13	392.42	77.16	393.09	77.19	393.73	77.22
394.4	77.25	395.54	77.28	396.43	77.31	397.1	77.34	397.92	77.37
398.5	77.4	398.9	77.43	399.36	77.49	399.6	77.52	399.83	77.55
400.08	77.58	400.41	77.61	400.8	77.64	401.16	77.67	402.24	77.76
402.72	77.79	404.33	77.82	405.09	77.85	406.25	77.97	406.55	78
406.84	78.03	407.72	78.06	408.64	78.09	409.14	78.12	409.48	78.15
409.84	78.18	410.62	78.24	411.02	78.27	411.38	78.3		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	78.81	.035	214.5	.1	229.1	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
158.53	191.14	21.48	21.48	21.48	.1 .3

Left Levee Station= 88.32 Elevation= 77.55
Right Levee Station= 266.36 Elevation= 76.64

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 985

INPUT
Description:
Station Elevation Data num= 383

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.33	.47	75.33	1.22	75.36	2.08	75.39	2.6	75.42
3.27	75.45	4.33	75.48	6.82	75.48	7.74	75.45	15.08	75.45
16.57	75.48	17.13	75.51	17.7	75.54	18.39	75.57	19.32	75.6
20.05	75.63	20.71	75.66	21.4	75.69	22.08	75.72	22.84	75.75
23.04	75.76	24.02	75.78	26.42	75.81	27.01	75.84	27.8	75.87
28.8	75.9	29.67	75.93	30.48	75.96	31.55	75.99	32.7	76.02
33.95	76.05	34.71	76.08	35.32	76.11	35.99	76.14	37.09	76.17
38.19	76.2	40.39	76.23	42.95	76.23	43.8	76.2	50.87	76.2
53.31	76.23	59.14	76.23	61.01	76.2	63.22	76.17	64.85	76.16
66.68	76.14	68.9	76.14	69.59	76.17	70.79	76.2	72.45	76.2
73.57	76.17	74.85	76.14	77.93	76.11	78.54	76.11	80.27	76.14
82.04	76.17	82.92	76.17	85.12	76.14	86.45	76.11	87.27	76.08
88.17	76.05	90.66	76.02	92.45	75.99	94.05	75.96	95.05	75.93
95.97	75.9	96.62	75.87	97.07	75.84	97.55	75.81	98.05	75.78
98.52	75.75	98.92	75.72	99.36	75.69	100.01	75.66	102.93	75.63
103.44	75.6	103.84	75.57	104.21	75.54	104.55	75.51	104.88	75.48

105.2	75.45	105.5	75.42	105.77	75.39	106.05	75.36	106.32	75.33
107	75.3	107.65	75.27	108.25	75.24	108.62	75.21	108.95	75.18
109.28	75.15	109.63	75.12	109.98	75.09	110.33	75.06	110.96	75.03
111.74	75	112.59	74.97	113.2	74.94	113.62	74.91	113.98	74.88
114.35	74.85	115.1	74.82	115.86	74.79	116.47	74.76	116.86	74.73
117.29	74.7	117.8	74.67	118.32	74.64	118.41	74.64	118.93	74.61
119.45	74.58	119.88	74.55	120.31	74.52	121.4	74.49	122.46	74.46
122.84	74.43	123.33	74.4	123.83	74.37	124.33	74.34	125.45	74.31
126.29	74.28	127.13	74.25	127.75	74.22	128.34	74.19	128.75	74.16
129.36	74.13	130.02	74.1	130.6	74.07	131.64	74.04	132.75	74.01
133.6	73.98	134.43	73.95	135.07	73.92	135.71	73.89	136.36	73.86
136.77	73.83	136.83	73.83	137.37	73.8	137.9	73.77	138.47	73.74
139.25	73.71	140.01	73.68	141.31	73.65	144.44	73.62	144.76	73.59
145.08	73.56	145.6	73.53	146.45	73.5	147.54	73.47	148.02	73.44
148.42	73.41	149.54	73.38	150.64	73.35	151.84	73.32	152.71	73.29
153.2	73.26	153.68	73.23	154.16	73.2	154.67	73.17	155.18	73.14
155.68	73.11	156.19	73.08	156.93	73.05	157.53	73.02	158.13	72.99
158.87	72.96	159.71	72.93	160.41	72.9	160.63	72.9	161.91	72.93
163.85	72.93	167.08	72.9	168.19	72.87	168.41	72.86	169.27	72.84
170.15	72.81	171.01	72.78	172.13	72.78	173.46	72.81	174.19	72.84
174.86	72.87	175.54	72.9	176.19	72.93	176.79	72.96	177.67	72.99
178.64	73.02	179.58	73.05	180.26	73.08	180.93	73.11	181.6	73.14
183.02	73.17	185.45	73.2	186.13	73.23	186.66	73.26	187.08	73.29
187.42	73.32	187.81	73.35	188.5	73.38	189.15	73.41	189.63	73.44
189.99	73.47	190.27	73.5	190.49	73.53	190.65	73.56	190.84	73.59
191.02	73.62	191.21	73.65	191.4	73.68	191.59	73.71	191.78	73.74
192.12	73.77	192.85	73.8	193.83	73.83	194.7	73.86	195.32	73.89
195.76	73.92	196.14	73.95	196.54	73.98	196.93	74.01	197.31	74.04
197.69	74.07	198.06	74.1	198.42	74.13	198.78	74.16	199.4	74.19
200.22	74.22	200.86	74.25	201.38	74.28	201.85	74.31	204.57	74.31
204.98	74.28	205.31	74.25	205.72	74.22	206.53	74.19	207.55	74.16
210.38	74.16	210.72	74.19	211.03	74.22	211.33	74.25	211.63	74.28
211.91	74.31	212.19	74.34	212.32	74.35	212.45	74.37	212.71	74.4
212.94	74.43	213.16	74.46	213.38	74.49	213.63	74.52	213.9	74.55
214.16	74.58	214.42	74.61	214.67	74.64	214.93	74.67	215.18	74.7
215.43	74.73	215.68	74.76	215.92	74.79	216.17	74.82	216.45	74.85
216.8	74.88	217.17	74.91	217.56	74.94	217.98	74.97	218.38	75
218.41	75	218.91	75.03	219.57	75.03	220.33	75	221.09	74.97
221.42	74.94	221.66	74.91	221.9	74.88	222.14	74.85	222.43	74.82
222.74	74.79	223.07	74.76	223.43	74.73	226.37	74.73	227.79	74.76
228.78	74.79	229.55	74.82	230.35	74.85	232.99	74.88	233.8	74.91
237.22	74.94	238.59	74.97	240.16	74.97	241.43	74.94	241.89	74.91
242.34	74.88	242.8	74.85	243.27	74.82	243.96	74.79	244.74	74.76
245.43	74.73	246.31	74.7	247.52	74.67	251.19	74.64	254.37	74.64
255.53	74.67	256.62	74.7	257.31	74.73	257.99	74.76	258.67	74.79
261.23	74.79	261.61	74.82	261.88	74.85	262.13	74.88	262.38	74.91
262.62	74.94	262.85	74.97	263.06	75	263.38	75.03	263.66	75.06
263.92	75.09	264.17	75.12	264.4	75.15	264.62	75.18	264.79	75.21
264.96	75.24	265.13	75.27	265.84	75.27	266.74	75.24	266.97	75.21
267.17	75.18	267.35	75.15	267.6	75.12	267.96	75.09	268.42	75.06
269	75.03	270.86	75.03	271.95	75.06	272.36	75.09	272.77	75.12
273.18	75.15	273.59	75.18	274.02	75.21	274.54	75.24	275.06	75.27

275.75	75.3	276.47	75.3	277.28	75.27	277.84	75.24	278.55	75.21
279.98	75.18	280.71	75.15	281.15	75.12	281.66	75.09	282.13	75.06
282.39	75.03	282.64	75	282.87	74.97	283.13	74.94	283.41	74.91
283.71	74.88	284.04	74.85	284.39	74.82	284.78	74.79	285.05	74.76
285.39	74.73	285.86	74.7	286.52	74.67	287.13	74.64	287.35	74.61
287.57	74.58	287.84	74.55	288.17	74.52	288.57	74.49	289.07	74.46
289.56	74.46	291.89	74.49	294.16	74.49	295.06	74.46	296.6	74.43
297.97	74.4	299.24	74.37	300.93	74.34	302.52	74.34	303.25	74.37
303.98	74.4	305.24	74.4	306.03	74.38				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	113.2	.035	218.38	.1	232.99	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118.41	218.41	6.03	6.03	.1	.3

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 984

INPUT
Description:
Station Elevation Data num= 344

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.03	.42	75.03	1.05	75.06	1.73	75.09	2.42	75.12
3.07	75.15	3.71	75.18	4.16	75.21	4.43	75.24	4.71	75.27
4.99	75.3	5.34	75.33	5.95	75.36	6.09	75.36	7.35	75.33
8.65	75.33	10.94	75.36	12.64	75.36	14.38	75.33	15.78	75.3
16.79	75.3	18.67	75.33	19.2	75.36	19.74	75.39	20.48	75.42
21.51	75.45	22.69	75.48	24.3	75.51	24.61	75.52	25.19	75.54
28.84	75.57	29.63	75.6	30.25	75.63	30.66	75.66	31.14	75.69
31.62	75.72	32.1	75.75	34.55	75.78	35.49	75.81	37.49	75.84
38.36	75.87	39.28	75.9	40.32	75.93	45.5	75.96	46.55	75.99
47.18	76.02	47.82	76.05	48.47	76.05	49.82	76.02	50.43	76.02
51.54	76.05	56.36	76.05	57.52	76.02	58.74	75.99	60.07	75.96
62.26	75.93	63.69	75.9	72.51	75.87	73.65	75.84	74.45	75.84
74.85	75.87	75.24	75.9	75.63	75.93	76.02	75.96	77.16	75.96
78.26	75.93	78.87	75.9	79.47	75.87	80.14	75.84	82.66	75.81
83.94	75.78	84.67	75.77	86.07	75.75	88.82	75.72	90.81	75.69
91.53	75.66	92	75.63	94.57	75.6	95.19	75.57	95.96	75.54
96.71	75.51	98.02	75.48	100.27	75.45	101.13	75.42	101.96	75.39
102.54	75.36	102.91	75.33	103.27	75.3	103.62	75.27	103.94	75.24
104.27	75.21	104.64	75.18	105.03	75.15	105.41	75.12	105.8	75.09
106.19	75.06	106.7	75.03	107.07	75	107.44	74.97	107.81	74.94
108.18	74.91	108.5	74.88	108.85	74.85	109.21	74.82	109.58	74.79
109.94	74.76	110.3	74.73	110.83	74.7	111.33	74.67	111.84	74.64
112.36	74.61	112.98	74.58	113.6	74.55	114.22	74.52	116.57	74.49
116.98	74.46	117.38	74.43	117.79	74.4	117.93	74.39	118.34	74.37

118.71	74.34	119.07	74.31	119.43	74.28	119.8	74.25	120.14	74.22
120.43	74.19	120.71	74.16	120.98	74.13	121.25	74.1	121.52	74.07
121.8	74.04	122.09	74.01	122.6	73.98	123.66	73.95	124.54	73.92
125.13	73.89	125.73	73.86	126.35	73.83	126.79	73.8	127.23	73.77
127.67	73.74	128.1	73.71	128.84	73.68	130.01	73.65	131.48	73.62
132.5	73.59	133.15	73.56	133.74	73.53	134.29	73.5	135.49	73.47
136.43	73.44	136.76	73.41	137.08	73.38	137.73	73.35	138.58	73.32
139.08	73.29	139.42	73.26	139.67	73.23	139.93	73.2	140.18	73.17
143.25	73.14	144.35	73.11	144.99	73.08	145.75	73.05	146.54	73.02
147.15	72.99	147.86	72.96	148.52	72.93	148.99	72.9	149.37	72.87
149.76	72.84	150.14	72.81	152.39	72.78	152.61	72.75	153.19	72.72
153.82	72.69	154.44	72.66	155.34	72.63	156.32	72.6	157.02	72.57
157.67	72.54	158.32	72.51	158.71	72.48	159.07	72.45	159.43	72.42
159.79	72.39	159.81	72.39	160.32	72.36	162.42	72.33	163.64	72.3
167.93	72.3	171.22	72.32	172.01	72.33	172.71	72.36	173.28	72.39
173.71	72.42	174.11	72.45	174.64	72.48	176.49	72.51	178.2	72.54
178.91	72.57	179.6	72.6	180.37	72.63	182.33	72.63	183.54	72.6
185.11	72.6	187.13	72.63	187.45	72.66	187.78	72.69	188.29	72.72
189.02	72.75	189.86	72.78	190.35	72.81	190.84	72.84	192.51	72.87
193.05	72.9	193.45	72.93	193.82	72.96	194.17	72.99	194.51	73.02
194.82	73.05	195.12	73.08	195.45	73.11	195.77	73.14	196.04	73.17
196.31	73.2	196.59	73.23	196.87	73.26	197.16	73.29	197.45	73.32
197.74	73.35	198.17	73.38	198.61	73.41	199.77	73.44	200.58	73.46
200.82	73.47	201.64	73.5	202.65	73.53	203.45	73.56	204.58	73.59
206.21	73.62	207.94	73.65	210.21	73.68	211.52	73.71	211.95	73.74
212.42	73.77	212.92	73.8	213.43	73.83	213.93	73.86	214.27	73.89
214.59	73.92	214.89	73.95	215.18	73.98	215.46	74.01	215.72	74.04
215.96	74.07	216.18	74.1	216.41	74.13	216.74	74.16	217.09	74.19
217.44	74.22	217.78	74.25	217.93	74.26	218.12	74.28	218.45	74.31
218.77	74.34	220.91	74.34	224.58	74.31	229.35	74.31	230.55	74.34
234.27	74.34	235.2	74.37	235.95	74.4	237.75	74.43	239.74	74.46
243.7	74.46	247.07	74.43	247.7	74.4	248.36	74.37	249.04	74.34
249.71	74.31	250.59	74.28	259.61	74.28	262.3	74.31	263.06	74.34
263.81	74.37	264.35	74.4	264.6	74.43	264.85	74.46	265.1	74.49
265.36	74.52	265.61	74.55	265.87	74.58	266.13	74.61	266.38	74.64
267.72	74.67	269.94	74.67	271.66	74.64	272.38	74.61	272.98	74.58
273.83	74.58	275.68	74.61	276.2	74.64	276.72	74.67	277.25	74.7
278.3	74.7	279.26	74.67	279.87	74.64	280.39	74.61	280.81	74.58
281.17	74.55	281.47	74.52	281.73	74.49	282.15	74.46	282.75	74.43
283.38	74.4	284.47	74.37	285.24	74.34	285.99	74.31	286.43	74.28
286.82	74.25	287.39	74.22	288.33	74.19	289.28	74.16	291.07	74.13
295.22	74.1	295.86	74.07	296.47	74.04	297.05	74.01	298.25	73.98
299.09	73.95	299.63	73.92	299.84	73.91	300.28	73.89	300.91	73.86
301.47	73.83	302.96	73.8	304.8	73.77	306.4	73.77	307.11	73.8
307.87	73.83	308.81	73.86	309.69	73.89	313.29	73.89		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	117.93	.032	123.66	.035	220.91	.1	235.2	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

117.93 217.93 3.77 3.77 3.77 .1 .3

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 983.9

INPUT
Description:
Station Elevation Data num= 329

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.48	2.26	75.48	3.06	75.51	3.85	75.54	4.3	75.57
4.67	75.6	5.03	75.63	5.43	75.66	5.9	75.69	8.1	75.72
8.72	75.75	9.34	75.78	12.48	75.81	13.35	75.84	14.41	75.87
19.54	75.9	21.05	75.93	21.85	75.96	25.66	75.99	30.99	75.99
32.25	75.96	33.66	75.93	35.76	75.9	37.97	75.87	46.28	75.84
48.44	75.84	48.84	75.87	49.24	75.9	49.64	75.93	50.03	75.96
50.55	75.96	51.73	75.93	52.33	75.9	52.94	75.87	53.6	75.84
55.37	75.81	57.15	75.78	58.76	75.75	62.17	75.72	64.43	75.69
65.01	75.66	65.47	75.63	65.93	75.6	68.48	75.57	69.23	75.54
69.99	75.51	71.23	75.48	72.48	75.45	74.29	75.42	74.99	75.39
75.72	75.36	76.33	75.33	76.65	75.3	76.96	75.27	77.28	75.24
77.59	75.21	77.92	75.18	78.26	75.15	78.63	75.12	79	75.09
79.38	75.06	79.8	75.03	80.26	75	80.63	74.97	80.99	74.94
81.37	74.91	81.75	74.88	82.14	74.85	82.51	74.82	82.87	74.79
83.21	74.76	83.55	74.73	83.88	74.7	84.2	74.67	84.69	74.64
85.2	74.61	85.82	74.58	86.43	74.55	87.03	74.52	87.44	74.49
87.85	74.46	88.33	74.43	89.3	74.4	89.87	74.37	90.34	74.34
90.91	74.31	91.71	74.28	92.42	74.25	92.75	74.22	93.06	74.19
93.37	74.16	93.67	74.13	93.98	74.1	94.01	74.1	94.3	74.07
94.69	74.04	95.17	74.01	95.44	73.99	95.65	73.98	96.13	73.95
96.87	73.92	97.63	73.89	98.44	73.86	99.53	73.83	100.47	73.8
101.1	73.77	101.73	73.74	102.3	73.71	102.73	73.68	103.15	73.65
103.57	73.62	104.01	73.59	104.92	73.56	106.32	73.53	107.12	73.5
107.96	73.47	108.52	73.44	108.91	73.41	109.3	73.38	109.69	73.35
110.02	73.32	110.5	73.29	111.3	73.26	111.9	73.23	112.32	73.2
112.57	73.17	112.82	73.14	113.07	73.11	113.31	73.08	113.74	73.05
116.4	73.02	117.52	72.99	118.55	72.96	119.51	72.93	120.44	72.9
121.04	72.87	121.54	72.84	121.94	72.81	122.33	72.78	122.75	72.75
123.7	72.72	126.25	72.69	126.9	72.66	127.41	72.63	127.91	72.6
128.7	72.57	130.62	72.54	131.06	72.51	131.44	72.48	131.82	72.45
132.2	72.42	132.56	72.39	132.9	72.36	133.23	72.33	133.57	72.3
133.9	72.27	134.23	72.24	134.42	72.24	135.02	72.27	135.91	72.3
136.65	72.3	137.17	72.27	137.69	72.24	138.2	72.21	139.49	72.18
145.57	72.18	146.24	72.21	146.68	72.24	147.11	72.27	147.61	72.28
149.08	72.3	149.54	72.33	149.99	72.36	150.82	72.39	151.84	72.42
153.75	72.45	155.15	72.45	156.21	72.42	157.06	72.39	160.44	72.39
161.98	72.42	162.83	72.45	163.47	72.48	163.96	72.51	164.44	72.54
165.17	72.57	165.96	72.6	166.77	72.63	167.46	72.66	168.25	72.69
169.16	72.72	170.89	72.75	173.49	72.78	173.88	72.8	174.05	72.81
174.37	72.84	174.7	72.87	175.03	72.9	175.35	72.93	175.8	72.96

176.5	72.99	177.2	73.02	178.23	73.05	179.29	73.08	180.42	73.11
180.93	73.14	181.3	73.17	181.68	73.2	182.03	73.23	182.36	73.26
182.68	73.29	182.99	73.32	183.2	73.35	183.44	73.38	183.72	73.41
184.02	73.44	184.33	73.47	184.65	73.5	184.97	73.53	185.33	73.56
185.8	73.59	189.35	73.62	190.79	73.65	191.94	73.68	192.92	73.71
193.34	73.74	193.81	73.77	194.01	73.78	194.4	73.8	195.37	73.83
196.51	73.86	198.46	73.86	199.26	73.83	200.21	73.8	203.06	73.8
204.9	73.83	208.12	73.86	208.14	73.86	208.62	73.89	209.1	73.92
209.59	73.95	212.09	73.98	212.68	74.01	213.33	74.04	214.01	74.07
215.18	74.1	217.64	74.1	219.39	74.07	221.09	74.04	221.97	74.01
222.69	73.98	224.82	73.95	227.97	73.95	228.79	73.92	235.69	73.92
240.31	73.95	240.84	73.98	241.39	74.01	241.89	74.04	242.42	74.07
242.9	74.1	243.4	74.13	243.84	74.16	244.23	74.19	244.55	74.22
244.81	74.25	245.11	74.28	245.43	74.31	245.73	74.34	246.04	74.37
246.34	74.4	247.15	74.4	247.83	74.37	248.74	74.34	248.88	74.34
250.45	74.37	251.49	74.4	252.35	74.43	255.36	74.43	255.9	74.4
256.61	74.37	259.63	74.34	260.13	74.31	260.61	74.28	261.11	74.25
261.53	74.22	262.03	74.19	262.6	74.16	263.11	74.13	263.55	74.1
263.94	74.07	264.54	74.04	265.42	74.01	266.55	73.98	267.92	73.95
272.93	73.95	273.82	73.98	274.6	74.01	275.64	74.01	276.5	73.98
276.9	73.95	277.19	73.92	277.48	73.89	277.81	73.86	278.24	73.83
278.76	73.8	279.25	73.77	279.65	73.74	280.12	73.71	280.71	73.68
281.3	73.65	281.87	73.62	282.38	73.59	282.94	73.56	285.67	73.56
286.11	73.53	286.51	73.5	286.88	73.47	287.25	73.44	287.67	73.44
288.35	73.47	289.04	73.5	289.64	73.53	290.13	73.56	290.65	73.59
291.18	73.62	292.75	73.65	293.88	73.65	294.69	73.63		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	94.01	.032	107.12	.035	199.26	.1	212.68	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

94.01	194.01	38.87	38.87	38.87	.1	.3	

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 983

INPUT
Description:
Station Elevation Data num= 416

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.3	.45	75.3	2.64	75.27	3.79	75.24	5.58	75.21
8.23	75.21	8.8	75.24	9.64	75.27	10.81	75.3	11.6	75.33
12.6	75.33	13.01	75.3	13.36	75.27	13.72	75.24	16.62	75.24
17.95	75.27	18.48	75.3	18.96	75.33	19.43	75.36	19.91	75.39
20.71	75.42	21.67	75.45	22.87	75.48	26.64	75.51	27.51	75.54
28.23	75.57	28.66	75.6	29.15	75.63	29.75	75.66	34.43	75.69
34.87	75.72	36.82	75.75	37.89	75.78	39.22	75.78	42.12	75.75

43.91	75.72	52.68	75.72	53.63	75.69	54.49	75.66	56.54	75.63
59.44	75.63	62.41	75.66	64.17	75.69	64.19	75.69	65.15	75.66
66.43	75.63	70.26	75.6	71.84	75.58	72.65	75.57	73.87	75.54
75.25	75.51	76.48	75.48	76.91	75.45	77.33	75.42	77.76	75.39
79.72	75.39	81.6	75.42	82.46	75.42	83.05	75.39	83.69	75.36
84.33	75.33	84.78	75.3	85.24	75.27	85.71	75.24	86.18	75.21
87.38	75.18	88.29	75.15	89.06	75.12	89.78	75.09	90.34	75.06
90.72	75.03	91.25	75	92.02	74.97	92.61	74.94	93.02	74.91
93.33	74.88	93.64	74.85	93.94	74.82	94.25	74.79	94.63	74.76
95.02	74.73	95.44	74.7	95.87	74.67	96.28	74.64	96.6	74.61
97.02	74.58	97.52	74.55	98.01	74.52	98.56	74.49	99.26	74.46
99.98	74.43	100.53	74.4	101.01	74.37	101.49	74.34	101.97	74.31
102.45	74.28	102.91	74.25	103.36	74.22	103.81	74.19	104.26	74.16
105.08	74.13	105.89	74.1	106.51	74.07	106.9	74.04	107.28	74.01
107.67	73.98	108.08	73.95	108.58	73.92	109.04	73.89	109.5	73.86
109.95	73.83	110.44	73.8	111.19	73.77	111.85	73.74	112.23	73.71
112.75	73.68	113.29	73.65	113.79	73.62	114.24	73.59	114.72	73.56
115.21	73.53	115.84	73.5	116.49	73.47	116.99	73.44	117.49	73.41
117.98	73.38	119.22	73.35	122.49	73.32	122.9	73.29	123.31	73.26
123.65	73.23	123.93	73.2	124.21	73.17	124.68	73.14	125.17	73.11
125.55	73.08	125.93	73.05	126.31	73.02	126.72	72.99	127.38	72.96
128.21	72.93	129.03	72.9	129.75	72.87	130.57	72.84	131.53	72.81
132.42	72.78	133.14	72.75	133.85	72.72	135.46	72.69	141.07	72.69
142.48	72.66	142.73	72.63	142.97	72.6	143.21	72.57	143.45	72.54
143.69	72.51	143.89	72.48	144.09	72.45	144.29	72.42	144.44	72.42
144.66	72.45	144.88	72.48	145.29	72.51	146.5	72.54	147.31	72.57
147.78	72.6	147.99	72.63	148.21	72.66	148.55	72.66	148.77	72.63
148.82	72.62	149	72.6	149.78	72.58	150.17	72.57	150.38	72.54
150.8	72.51	151.13	72.48	151.46	72.45	151.75	72.42	152.03	72.39
152.31	72.36	152.6	72.33	152.95	72.3	153.38	72.27	153.84	72.24
154.32	72.21	154.87	72.18	155.52	72.15	156.2	72.12	158.76	72.09
159.14	72.06	159.51	72.03	160.62	72	162.11	71.97	162.75	71.97
163.71	72	164.16	72.03	166.56	72.03	168.81	72	169.25	71.97
169.7	71.94	169.87	71.93	170.15	71.91	170.6	71.88	171.02	71.85
171.43	71.82	171.85	71.79	172.27	71.76	172.75	71.73	173.52	71.7
174.29	71.67	174.9	71.64	175.4	71.61	175.91	71.58	176.41	71.55
178.97	71.52	179.62	71.49	180.28	71.46	180.81	71.43	181.22	71.4
181.63	71.37	182.03	71.34	182.44	71.31	184.1	71.28	187.47	71.28
188.71	71.25	189.21	71.22	189.7	71.19	190.19	71.16	190.68	71.13
192.7	71.1	193.08	71.07	193.46	71.04	193.84	71.01	194.21	70.98
194.59	70.95	194.96	70.92	195.33	70.89	196.81	70.89	197.93	70.92
198.6	70.95	198.82	70.96	199.05	70.98	199.45	71.01	199.79	71.04
200.14	71.07	200.48	71.1	200.82	71.13	201.16	71.16	201.55	71.19
201.79	71.2	202.11	71.22	202.72	71.25	205.52	71.25	206.55	71.28
207.56	71.31	208.52	71.34	209.08	71.37	209.6	71.4	209.92	71.43
210.25	71.46	210.52	71.49	210.79	71.52	211.06	71.55	211.26	71.58
211.47	71.61	211.65	71.64	211.81	71.67	211.97	71.7	212.13	71.73
212.3	71.76	212.46	71.79	212.63	71.82	212.83	71.85	213.03	71.88
213.22	71.91	213.4	71.94	213.57	71.97	213.99	72	214.46	72.03
214.94	72.06	215.4	72.09	215.88	72.12	216.53	72.15	217.24	72.18
217.87	72.21	218.52	72.24	219.17	72.27	219.76	72.3	220.07	72.33
220.36	72.36	220.65	72.39	220.95	72.42	221.25	72.45	221.54	72.48

221.81	72.51	222.11	72.54	222.41	72.57	222.72	72.6	223.03	72.63
223.33	72.66	223.63	72.69	226.04	72.69	226.36	72.72	226.68	72.75
226.99	72.78	227.31	72.81	227.63	72.84	227.91	72.87	228.08	72.9
228.25	72.93	228.43	72.96	228.62	72.99	228.8	73.02	228.99	73.05
229.17	73.08	229.36	73.11	229.56	73.14	229.75	73.17	233.01	73.17
234.51	73.2	234.98	73.23	235.46	73.26	235.93	73.29	236.57	73.32
237.48	73.35	239.25	73.38	241.44	73.41	242.75	73.44	243.79	73.47
244.81	73.5	246.08	73.53	247.22	73.56	247.79	73.59	248.39	73.62
248.82	73.64	248.98	73.65	249.95	73.68	251.52	73.71	252.08	73.74
252.7	73.77	253.28	73.8	254.26	73.83	256.54	73.83	257.61	73.8
258.52	73.77	259.46	73.74	260.94	73.71	262.3	73.68	264.92	73.65
265.49	73.62	266.09	73.59	266.71	73.56	270.26	73.56	274.12	73.59
275.93	73.62	276.68	73.65	277.43	73.68	278.22	73.71	279.03	73.74
279.87	73.77	280.24	73.8	280.61	73.83	280.99	73.86	281.38	73.89
281.75	73.92	282.36	73.95	283.25	73.98	284.16	74.01	284.75	74.04
285.61	74.07	291.17	74.07	292.77	74.04	293.74	74.01	294.49	73.98
299.73	73.95	300.22	73.92	300.53	73.89	300.6	73.89	301.22	73.86
302.32	73.83	303.39	73.8	304.1	73.77	308.34	73.77	310.12	73.8
311.49	73.83	312.94	73.86	313.56	73.89	314.07	73.89	314.6	73.86
315.05	73.83	315.45	73.8	315.81	73.77	316.48	73.74	317.62	73.71
318.35	73.68	318.9	73.65	319.55	73.62	320.19	73.59	320.73	73.56
321.39	73.53	324.34	73.53	324.75	73.5	325.13	73.47	325.5	73.44
325.88	73.41	326.56	73.41	327.08	73.44	327.53	73.47	327.99	73.5
329.05	73.53	329.55	73.56	330.06	73.59	334.82	73.59	335.32	73.62
335.83	73.65								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	129.75	.035	235.46	.1	249.95	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
178.97	209.92	51.19	51.19	51.19	.1	.3

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 982

INPUT
Description:
Station Elevation Data num= 493

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.03	.57	75.03	1.48	75.06	2.35	75.09	3.88	75.18
5.43	75.21	6.23	75.21	6.89	75.18	7.56	75.15	8.42	75.15
9.46	75.18	12.02	75.21	15.52	75.24	17.47	75.27	19.59	75.3
20.28	75.33	20.99	75.36	21.76	75.39	22.51	75.42	23.29	75.45
24.06	75.48	25.15	75.51	29.75	75.51	31.05	75.54	32.66	75.54
33.94	75.51	36.74	75.51	39.51	75.48	40.87	75.48	42.8	75.51
48.59	75.51	49.17	75.48	49.76	75.45	50.5	75.42	51.69	75.39
52.55	75.39	53.42	75.42	54.66	75.45	57.35	75.45	57.84	75.42

58.58	75.39	58.66	75.39	65.25	75.36	65.86	75.33	66.57	75.3
67.72	75.27	69.6	75.24	72.93	75.21	73.81	75.18	76.64	75.15
79.61	75.12	80.38	75.09	80.81	75.06	81.48	75.03	82.11	75
82.59	74.97	83.25	74.94	83.9	74.91	84.47	74.88	84.81	74.85
85.14	74.82	85.47	74.79	86.13	74.73	86.49	74.7	86.83	74.67
87.15	74.64	87.45	74.61	87.73	74.58	88	74.55	88.28	74.52
88.69	74.49	90.1	74.46	90.68	74.43	91.05	74.4	91.41	74.37
91.76	74.34	92.12	74.31	92.45	74.28	92.71	74.25	93.21	74.19
93.47	74.16	93.72	74.13	93.98	74.1	94.25	74.07	94.81	74.04
95.48	74.01	96.12	73.98	96.48	73.95	97.34	73.89	97.78	73.86
98.2	73.83	98.69	73.8	99.26	73.77	99.77	73.74	100.22	73.71
101.17	73.68	102.48	73.65	102.89	73.62	103.31	73.59	104.13	73.53
104.97	73.47	105.83	73.41	106.27	73.38	106.87	73.35	107.58	73.32
108.3	73.29	108.76	73.26	109.15	73.23	109.57	73.2	109.98	73.17
110.4	73.14	111.22	73.08	111.65	73.05	112.07	73.02	112.52	72.99
113.15	72.96	113.67	72.93	114.19	72.9	114.87	72.87	115.81	72.84
116.66	72.81	117.27	72.78	117.89	72.75	118.42	72.72	119.18	72.69
119.93	72.66	120.56	72.63	121.12	72.6	121.83	72.57	122.63	72.54
123.01	72.51	123.38	72.48	123.76	72.45	124.58	72.45	126.14	72.48
126.71	72.48	127.47	72.42	128.21	72.36	128.83	72.35	131.89	72.33
132.62	72.3	132.82	72.27	133.28	72.21	133.52	72.18	134	72.12
134.25	72.09	134.51	72.06	136.03	72.03	136.81	72	138.35	72
142.62	72	143.04	71.97	143.86	71.91	144.26	71.88	144.8	71.85
145.71	71.82	147.57	71.79	149.12	71.76	150.4	71.73	150.69	71.73
152.22	71.76	154.24	71.79	156.54	71.79	157.89	71.82	158.66	71.82
159.58	71.79	160.46	71.76	162.67	71.76	162.95	71.73	163.22	71.7
163.78	71.64	164.08	71.61	164.43	71.58	164.81	71.55	165.16	71.52
165.52	71.49	165.89	71.46	166.26	71.43	168.29	71.4	169.01	71.37
169.54	71.34	170.64	71.31	171.42	71.28	172.06	71.25	172.47	71.22
175.07	71.19	175.95	71.16	177.05	71.13	178.28	71.1	179.62	71.07
180.77	71.07	181.24	71.1	181.53	71.12	181.74	71.13	182.28	71.16
182.72	71.19	183.04	71.22	183.5	71.25	184.09	71.28	184.84	71.28
185.52	71.22	185.85	71.19	186.13	71.16	186.37	71.13	186.83	71.07
187.08	71.04	187.34	71.01	188.15	70.92	188.71	70.86	188.98	70.83
189.54	70.77	189.82	70.74	190.09	70.71	190.37	70.68	190.7	70.65
191.12	70.62	191.53	70.59	191.95	70.56	192.36	70.53	192.88	70.5
193.37	70.47	193.83	70.44	194.65	70.38	195.04	70.35	195.45	70.32
195.86	70.29	196.27	70.26	196.75	70.23	197.27	70.2	198.17	70.14
198.66	70.11	199.45	70.08	200.27	70.05	200.86	70.02	201.36	69.99
201.87	69.96	202.37	69.93	202.76	69.9	203.05	69.87	203.33	69.84
203.87	69.78	204.15	69.75	204.42	69.72	204.81	69.69	206.11	69.63
206.65	69.6	207.52	69.51	207.64	69.5	207.81	69.48	208.11	69.45
208.42	69.42	208.86	69.42	209.4	69.45	209.93	69.48	210.47	69.51
210.64	69.51	212.47	69.48	212.72	69.45	213.5	69.36	213.77	69.33
214.06	69.3	214.38	69.27	214.73	69.24	215.09	69.21	215.45	69.18
215.85	69.15	216.28	69.12	216.84	69.09	217.99	69.07	218.41	69.06
221.49	69.06	222.1	69.09	222.53	69.12	223.11	69.18	223.39	69.21
227.39	69.21	227.92	69.18	228.44	69.12	229.25	69.03	229.74	69
230.24	68.97	230.31	68.97	230.76	68.94	230.98	68.91	231.17	68.88
231.53	68.82	231.71	68.79	231.9	68.76	232.08	68.73	232.26	68.7
232.41	68.67	232.57	68.64	232.87	68.58	232.98	68.55	233.1	68.52
233.32	68.46	233.44	68.43	233.6	68.4	233.82	68.37	234.06	68.34

234.33	68.31	234.61	68.28	234.93	68.25	235.92	68.25	236.47	68.28
236.82	68.31	236.89	68.31	237.55	68.4	237.76	68.43	237.98	68.46
238.19	68.49	238.39	68.52	238.58	68.55	238.98	68.61	239.17	68.64
239.36	68.67	239.9	68.76	240.24	68.82	240.33	68.85	240.65	68.97
240.72	69	241.04	69.12	241.13	69.15	241.21	69.18	241.75	69.36
241.84	69.39	241.94	69.42	242.12	69.48	242.32	69.54	242.45	69.57
242.6	69.6	243.11	69.69	243.29	69.72	243.47	69.75	244.04	69.84
244.2	69.87	244.35	69.9	245.48	69.93	246.92	69.96	247.71	69.99
248.4	70.02	251.16	70.02	252.88	70.05	253.93	70.08	255.01	70.11
255.75	70.14	256.37	70.17	256.82	70.2	257.13	70.23	258.41	70.35
259.24	70.38	261.22	70.41	262.1	70.44	262.95	70.47	263.69	70.5
264.42	70.53	265.26	70.56	266.32	70.59	268.87	70.62	270.23	70.65
271.48	70.68	272.51	70.71	274.27	70.71	276.09	70.68	276.58	70.65
277.09	70.62	277.86	70.59	278.43	70.56	278.96	70.53	279.66	70.5
280.26	70.47	280.92	70.44	281.53	70.44	283.36	70.44	283.93	70.47
284.51	70.5	285.04	70.53	285.31	70.56	285.6	70.59	285.88	70.62
286.17	70.65	286.47	70.68	286.76	70.71	287.06	70.74	287.47	70.74
287.96	70.71	288.44	70.68	288.91	70.65	289.87	70.62	290.46	70.59
291.02	70.56	291.44	70.56	291.79	70.59	292.14	70.62	292.47	70.65
292.81	70.68	293.16	70.71	293.66	70.74	295.39	70.77	295.65	70.8
295.92	70.83	296.46	70.89	296.74	70.92	297.03	70.95	297.31	70.98
297.51	71.01	297.68	71.04	297.86	71.07	298.03	71.1	298.21	71.13
298.55	71.19	298.73	71.22	299.24	71.31	299.41	71.34	299.66	71.37
300.2	71.43	300.72	71.49	300.97	71.52	301.21	71.55	301.98	71.55
303.2	71.52	303.61	71.52	304.58	71.55	305.54	71.58	305.63	71.58
307.1	71.55	307.99	71.55	308.57	71.58	311.3	71.58	311.84	71.55
312.56	71.49	312.93	71.46	313.29	71.43	314.29	71.43	314.99	71.46
316.19	71.49	317.17	71.52	317.52	71.55	317.86	71.58	318.33	71.61
318.8	71.64	319.36	71.67	319.71	71.67	319.9	71.64	320.47	71.61
321.07	71.58	322.75	71.58	323.62	71.61	324.67	71.64	325.51	71.67
325.79	71.7	325.99	71.73	326.2	71.76	327.04	71.88	327.25	71.91
327.45	71.94	327.82	71.97	328.29	72	329.21	72.06	329.69	72.09
330.37	72.12	331.12	72.15	332.03	72.18	333.14	72.21	333.72	72.24
334.17	72.27	334.68	72.3	335.18	72.33	336.8	72.33	337.58	72.3
337.81	72.27	338.21	72.21	338.4	72.18	339	72.09	339.19	72.06
339.39	72.03	339.68	72	340.34	71.94	340.67	71.91	341	71.88
341.45	71.85	343.54	71.82	347.35	71.79	348.78	71.76	349.56	71.73
350.52	71.7	351.57	71.67	354.39	71.64	354.73	71.62	355.05	71.61
355.58	71.58	356.68	71.55	358	71.52				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	138.35	.035	239.17	.1	253.93	.035	347.35	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
181.53	281.53	22	22	22	.1	.3

CROSS SECTION

RIVER: DE LA CALERA

REACH: CALERA RS: 981

INPUT
Description:
Station Elevation Data num= 492

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.7	.16	74.7	1.04	74.82	1.25	74.85	1.91	74.94
3.6	74.97	6.34	75	6.8	75.03	7.41	75.06	8.1	75.09
8.69	75.15	9.09	75.18	9.85	75.21	15.41	75.24	20.44	75.24
21.62	75.3	24.09	75.33	24.12	75.33	26.63	75.3	27.73	75.27
31.82	75.24	32.22	75.24	32.94	75.27	33.83	75.3	34.55	75.33
35.79	75.36	36.37	75.36	37.72	75.33	39.41	75.3	42.59	75.3
44.01	75.36	44.53	75.39	46.77	75.39	47.39	75.36	47.84	75.33
48.09	75.3	48.62	75.27	49.27	75.24	49.86	75.21	50.61	75.21
51.26	75.24	51.86	75.27	52.39	75.3	52.96	75.33	53.73	75.36
54.44	75.36	55.12	75.33	58.21	75.3	58.27	75.3	61.38	75.33
62.68	75.33	63.53	75.3	65.27	75.27	67.82	75.24	69.55	75.21
69.97	75.18	70.17	75.15	70.39	75.12	70.86	75.09	71.44	75.06
72.2	75.03	72.37	75.03	74.36	75.06	74.83	75.09	75.65	75.12
76.98	75.12	77.74	75.09	78.3	75.06	78.67	75.03	79.1	75
79.64	74.97	80.27	74.94	80.8	74.91	81.18	74.88	81.96	74.79
82.21	74.76	82.79	74.7	83.47	74.58	83.63	74.55	84.31	74.43
84.54	74.4	84.76	74.37	84.95	74.34	85.15	74.31	85.91	74.19
86.11	74.16	86.3	74.13	87.76	74.1	89.79	74.07	90.63	74.04
91.02	74.01	92.52	73.98	92.85	73.95	93.48	73.89	94.09	73.83
94.27	73.8	94.51	73.77	94.82	73.75	94.93	73.74	95.36	73.71
95.76	73.68	96.42	73.62	97.26	73.56	98.13	73.5	98.5	73.5
98.72	73.53	100.12	73.56	100.32	73.59	100.49	73.59	100.88	73.56
101.29	73.53	101.72	73.5	102.2	73.47	102.64	73.44	103.07	73.41
103.98	73.35	104.47	73.32	104.93	73.29	105.54	73.26	106.13	73.23
106.59	73.2	109.23	73.02	110.1	72.96	110.56	72.93	111.31	72.87
111.64	72.84	111.96	72.81	112.29	72.78	112.91	72.75	114.22	72.69
114.72	72.66	115.89	72.57	116.27	72.54	116.8	72.51	117.92	72.45
120.4	72.45	122.05	72.48	124.6	72.48	124.78	72.45	125.07	72.42
126.06	72.33	126.45	72.3	127.41	72.27	128.08	72.24	128.86	72.15
129.11	72.12	129.42	72.09	129.74	72.06	130.08	72.03	130.57	72
131.56	71.97	132.36	71.94	132.51	71.94	133.07	71.97	136.05	71.97
137.29	71.91	137.67	71.88	138.19	71.82	138.44	71.79	138.89	71.76
139.82	71.73	141.01	71.7	142.06	71.67	143.04	71.64	144.08	71.58
144.98	71.55	146.66	71.55	146.96	71.58	148.12	71.7	148.42	71.73
149.31	71.76	151.18	71.79	151.86	71.82	153.07	71.82	153.74	71.79
154.6	71.76	155.18	71.73	155.81	71.7	156.71	71.67	157.53	71.64
158.42	71.61	158.91	71.58	159.58	71.55	160.48	71.52	160.84	71.49
161.6	71.43	162.33	71.37	162.77	71.34	163.36	71.31	163.85	71.28
164.28	71.25	165.8	71.19	166.24	71.16	168.6	71.13	169.2	71.1
169.63	71.07	170.37	71.01	170.98	70.98	171.55	70.95	172.09	70.92
174.93	70.92	175.85	70.89	176.45	70.88	178.06	70.86	182.67	70.83
183.54	70.74	183.82	70.71	184.4	70.65	185.01	70.62	185.94	70.59
186.66	70.56	187.33	70.5	188.01	70.44	188.34	70.41	188.72	70.38
190.04	70.29	190.49	70.26	191.13	70.23	192.5	70.17	193	70.14
193.98	70.08	194.46	70.05	195.44	69.99	195.92	69.96	196.2	69.94
196.9	69.9	197.4	69.87	198.39	69.81	198.69	69.78	200.23	69.57

200.44	69.54	202.7	69.54	203.99	69.48	207.24	69.45	208.06	69.42
208.76	69.39	210.32	69.3	210.97	69.27	212.47	69.21	213.08	69.18
214.26	69.12	215	69.09	215.88	69.06	216.73	69.03	218.21	68.97
218.92	68.94	220.28	68.88	221.27	68.85	222.46	68.82	224.51	68.79
226.64	68.76	227.54	68.67	227.85	68.64	228.45	68.58	228.81	68.55
229.61	68.49	230	68.46	230.4	68.43	231.72	68.4	232.91	68.4
233.73	68.43	235.19	68.43	236.48	68.37	237.4	68.34	238.35	68.31
238.72	68.28	239.41	68.19	239.63	68.16	240.24	68.08	240.44	68.04
240.69	68.01	241.02	67.98	241.42	67.95	241.95	67.92	242.65	67.89
242.89	67.86	243.25	67.8	243.46	67.77	243.92	67.71	244.16	67.68
244.68	67.62	244.93	67.59	245.33	67.53	245.54	67.5	245.79	67.47
246.05	67.44	246.2	67.42	246.32	67.41	246.86	67.35	248.93	67.35
249.3	67.38	249.49	67.41	249.66	67.44	249.95	67.5	250.14	67.56
250.23	67.59	250.33	67.62	250.51	67.68	250.61	67.71	250.7	67.74
250.9	67.8	251.11	67.86	251.24	67.89	251.42	67.92	251.84	67.95
251.9	67.96	252.11	67.98	252.59	68.04	252.76	68.07	252.92	68.1
253.37	68.19	254.2	68.19	255.11	68.16	256.1	68.16	257.68	68.19
258.13	68.22	258.67	68.25	259.23	68.28	259.82	68.31	260.38	68.34
261.19	68.4	261.63	68.43	262.2	68.46	262.93	68.49	264.28	68.52
265.75	68.55	266.39	68.58	267.16	68.61	268.14	68.61	269.09	68.58
269.75	68.58	270.48	68.64	271.56	68.67	272.09	68.7	273.62	68.79
274.27	68.82	275.83	68.88	276.47	68.91	277.12	68.94	277.68	68.95
278.42	68.97	280.06	69	282.3	69.03	284.52	69.06	287.71	69.09
288.39	69.12	289.12	69.15	292.07	69.18	293.61	69.21	294.01	69.24
295.24	69.33	295.56	69.36	295.71	69.39	296.03	69.45	296.18	69.48
296.2	69.48	296.5	69.54	296.65	69.57	297.13	69.66	297.44	69.72
297.61	69.72	298.31	69.66	299.38	69.57	299.71	69.54	300.58	69.45
301.43	69.36	301.58	69.36	302.46	69.39	303.35	69.42	303.74	69.42
304.71	69.36	305.2	69.33	307.7	69.33	308.59	69.27	309.47	69.21
309.58	69.21	310.12	69.27	310.36	69.3	310.58	69.33	311.04	69.39
311.49	69.45	311.66	69.48	312.34	69.54	313.01	69.6	313.34	69.63
315.57	69.66	315.96	69.69	316.36	69.72	317.14	69.78	317.51	69.81
318.72	69.84	319.56	69.9	320	69.93	320.99	69.99	321.51	70.02
322.03	70.08	323.03	70.2	323.52	70.26	323.66	70.29	323.84	70.32
324.03	70.35	325.11	70.53	325.3	70.56	325.47	70.59	325.68	70.62
325.93	70.65	327.28	70.8	327.6	70.83	328.65	70.89	329.05	70.92
329.43	70.95	330.14	70.98	330.51	71.01	331	71.07	331.5	71.13
331.54	71.13	332.19	71.07	332.77	71.04	334.36	71.01	335.52	70.98
335.74	70.92	335.84	70.89	336.21	70.8	336.47	70.74	336.59	70.71
336.72	70.68	337.09	70.59	337.35	70.53	337.47	70.5	337.62	70.47
337.79	70.44	337.95	70.41	338.46	70.32	338.62	70.29	338.96	70.23
339.29	70.17	339.45	70.14	339.85	70.14	340.36	70.17	340.59	70.2
341.03	70.32	341.13	70.35	341.46	70.44	341.65	70.47	341.89	70.5
342.11	70.53	342.5	70.59	342.82	70.65	343.09	70.71	343.42	70.8
347.55	70.8	347.8	70.77	348.32	70.71	348.88	70.65	349.48	70.59
349.66	70.56	349.83	70.53	350.2	70.47	350.63	70.41	350.86	70.38
351.11	70.35	351.38	70.32	351.61	70.29	351.79	70.26	352	70.23
352.25	70.2	352.56	70.17	352.94	70.14	353.44	70.11	354.06	70.08
354.87	70.05	357.6	70.05	358.78	70.17	359.49	70.2	361.58	70.2
363.17	70.23	363.47	70.26	363.82	70.29	364.54	70.35	364.89	70.38
365.21	70.41	365.5	70.44	366.06	70.47	366.67	70.5	367.56	70.53
368.86	70.62	369.23	70.65	369.47	70.68	369.83	70.71	370.63	70.77

371.02	70.8	371.18	70.82

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	144.98	.035	252.59	.1	262.2	.032	296.2	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
196.2	296.2	31.68	31.68	31.68	.1	.3

CULVERT

RIVER: DE LA CALERA
REACH: CALERA RS: 980.6

INPUT
Description:
Distance from Upstream XS = 5.49
Deck/Roadway Width = 10.09
Weir Coefficient = 1.45
Upstream Deck/Roadway Coordinates
num= 200

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
184.02	70.16	0	184.51	70.14	0	185.56	70.11	0
186.43	70.08	0	187.14	70.05	0	187.87	70.02	0
190.05	69.99	0	190.52	69.96	0	190.99	69.93	0
191.46	69.9	0	192.36	69.87	0	194.52	69.84	0
195.48	69.81	0	196.25	69.78	0	196.68	69.75	0
197.11	69.72	0	197.58	69.69	0	198.57	69.66	0
199.77	69.63	0	200.32	69.6	0	200.78	69.57	0
201.23	69.54	0	202.05	69.51	0	203.31	69.48	0
203.99	69.45	0	204.49	69.42	0	205	69.39	0
205.58	69.36	0	206.5	69.33	0	208.14	69.3	0
208.77	69.27	0	209.51	69.24	0	210.2	69.21	0
210.67	69.18	0	211.15	69.15	0	211.63	69.12	0
212.94	69.09	0	215.59	69.06	0	216.84	69.03	0
217.65	69	0	218.62	68.97	0	219.06	68.94	0
219.51	68.91	0	219.95	68.88	0	220.27	68.85	0
221.61	68.82	0	222.75	68.79	0	223.19	68.76	0
223.64	68.73	0	224.2	68.7	0	226.36	68.67	0
226.84	68.86	0	227.36	68.86	0	228.28	68.85	0
228.8	68.85	0	229.31	68.85	0	229.82	68.84	0
230.42	68.84	0	231.05	68.84	0	231.67	68.83	0
232.44	68.83	0	233.51	68.82	0	235.98	68.81	0
236.47	68.81	0	236.9	68.81	0	237.32	68.8	0
237.79	68.8	0	239.15	68.79	0	239.4	68.79	0
240.1	68.79	0	240.79	68.78	0	241.44	68.78	0
242.06	68.78	0	242.45	68.78	0	249.84	68.74	0
249.87	68.74	0	250.68	68.73	0	251.09	68.73	0
251.14	68.73	0	251.49	68.73	0	251.95	68.72	0
252.41	68.72	0	252.49	68.72	0	252.7	68.72	0

253.07	68.72	0	253.66	68.72	0	253.85	68.71	0
253.94	68.71	0	254.26	68.71	0	254.88	68.71	0
255.67	68.7	0	256.52	68.7	0	257.11	68.7	0
257.7	68.69	0	258.29	68.69	0	258.72	68.69	0
259.24	68.69	0	259.79	68.68	0	260.36	68.68	0
260.56	68.68	0	260.98	68.68	0	261.48	68.67	0
261.99	68.67	0	262.46	68.67	0	262.79	68.67	0
263.13	68.66	0	263.46	68.66	0	263.8	68.66	0
264.09	68.66	0	264.36	68.66	0	264.9	68.66	0
265.55	68.65	0	266.27	68.65	0	266.81	68.64	0
267.25	68.64	0	267.66	68.64	0	268.05	68.64	0
268.41	68.64	0	268.8	68.63	0	269.24	68.63	0
269.58	68.63	0	269.71	66.6	0	270.24	66.57	0
270.67	66.54	0	271.02	66.51	0	271.42	66.48	0
271.81	66.45	0	272.21	66.42	0	272.59	66.39	0
274.2	66.36	0	274.76	66.33	0	275.1	66.3	0
275.44	66.27	0	275.78	66.24	0	276.25	66.21	0
276.85	66.18	0	277.29	66.15	0	277.69	66.12	0
278.07	66.09	0	278.41	66.06	0	278.79	66.03	0
279.25	66	0	279.76	65.97	0	280.37	65.94	0
280.94	65.91	0	281.49	65.88	0	282.08	65.85	0
282.67	65.82	0	283.09	65.79	0	283.56	65.76	0
284.03	65.73	0	284.51	65.7	0	285.12	65.67	0
285.66	65.64	0	285.71	65.64	0	286.26	65.61	0
286.89	65.58	0	287.23	65.55	0	287.59	65.52	0
288.03	65.49	0	288.5	65.46	0	289.16	65.43	0
289.86	65.4	0	290.42	65.37	0	290.88	65.34	0
291.38	65.31	0	291.78	65.28	0	292.14	65.25	0
292.49	65.22	0	292.84	65.19	0	293.3	65.16	0
294.01	65.13	0	294.76	65.1	0	295.24	65.07	0
295.69	65.04	0	296.14	65.01	0	296.61	64.98	0
297.1	64.95	0	297.61	64.92	0	298.1	64.89	0
298.57	64.86	0	299	64.83	0	299.45	64.8	0
300.15	64.77	0	301.12	64.74	0	301.87	64.71	0
302.69	64.68	0	303.35	64.65	0	303.7	64.62	0
304.06	64.59	0	304.41	64.56	0	304.77	64.53	0
305.5	64.5	0	306.15	64.47	0	306.8	64.44	0
307.46	64.41	0	308.1	64.38	0	308.71	64.35	0
309.3	64.32	0	309.9	64.29	0			

Upstream Bridge Cross Section Data

Station Elevation Data num= 492

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.7	.16	74.7	1.04	74.82	1.25	74.85	1.91	74.94
3.6	74.97	6.34	75	6.8	75.03	7.41	75.06	8.1	75.09
8.69	75.15	9.09	75.18	9.85	75.21	15.41	75.24	20.44	75.24
21.62	75.3	24.09	75.33	24.12	75.33	26.63	75.3	27.73	75.27
31.82	75.24	32.22	75.24	32.94	75.27	33.83	75.3	34.55	75.33
35.79	75.36	36.37	75.36	37.72	75.33	39.41	75.3	42.59	75.3
44.01	75.36	44.53	75.39	46.77	75.39	47.39	75.36	47.84	75.33
48.09	75.3	48.62	75.27	49.27	75.24	49.86	75.21	50.61	75.21
51.26	75.24	51.86	75.27	52.39	75.3	52.96	75.33	53.73	75.36

54.44	75.36	55.12	75.33	58.21	75.3	58.27	75.3	61.38	75.33
62.68	75.33	63.53	75.3	65.27	75.27	67.82	75.24	69.55	75.21
69.97	75.18	70.17	75.15	70.39	75.12	70.86	75.09	71.44	75.06
72.2	75.03	72.37	75.03	74.36	75.06	74.83	75.09	75.65	75.12
76.98	75.12	77.74	75.09	78.3	75.06	78.67	75.03	79.1	75
79.64	74.97	80.27	74.94	80.8	74.91	81.18	74.88	81.96	74.79
82.21	74.76	82.79	74.7	83.47	74.58	83.63	74.55	84.31	74.43
84.54	74.4	84.76	74.37	84.95	74.34	85.15	74.31	85.91	74.19
86.11	74.16	86.3	74.13	87.76	74.1	89.79	74.07	90.63	74.04
91.02	74.01	92.52	73.98	92.85	73.95	93.48	73.89	94.09	73.83
94.27	73.8	94.51	73.77	94.82	73.75	94.93	73.74	95.36	73.71
95.76	73.68	96.42	73.62	97.26	73.56	98.13	73.5	98.5	73.5
98.72	73.53	100.12	73.56	100.32	73.59	100.49	73.59	100.88	73.56
101.29	73.53	101.72	73.5	102.2	73.47	102.64	73.44	103.07	73.41
103.98	73.35	104.47	73.32	104.93	73.29	105.54	73.26	106.13	73.23
106.59	73.2	109.23	73.02	110.1	72.96	110.56	72.93	111.31	72.87
111.64	72.84	111.96	72.81	112.29	72.78	112.91	72.75	114.22	72.69
114.72	72.66	115.89	72.57	116.27	72.54	116.8	72.51	117.92	72.45
120.4	72.45	122.05	72.48	124.6	72.48	124.78	72.45	125.07	72.42
126.06	72.33	126.45	72.3	127.41	72.27	128.08	72.24	128.86	72.15
129.11	72.12	129.42	72.09	129.74	72.06	130.08	72.03	130.57	72
131.56	71.97	132.36	71.94	132.51	71.94	133.07	71.97	136.05	71.97
137.29	71.91	137.67	71.88	138.19	71.82	138.44	71.79	138.89	71.76
139.82	71.73	141.01	71.7	142.06	71.67	143.04	71.64	144.08	71.58
144.98	71.55	146.66	71.55	146.96	71.58	148.12	71.7	148.42	71.73
149.31	71.76	151.18	71.79	151.86	71.82	153.07	71.82	153.74	71.79
154.6	71.76	155.18	71.73	155.81	71.7	156.71	71.67	157.53	71.64
158.42	71.61	158.91	71.58	159.58	71.55	160.48	71.52	160.84	71.49
161.6	71.43	162.33	71.37	162.77	71.34	163.36	71.31	163.85	71.28
164.28	71.25	165.8	71.19	166.24	71.16	168.6	71.13	169.2	71.1
169.63	71.07	170.37	71.01	170.98	70.98	171.55	70.95	172.09	70.92
174.93	70.92	175.85	70.89	176.45	70.88	178.06	70.86	182.67	70.83
183.54	70.74	183.82	70.71	184.4	70.65	185.01	70.62	185.94	70.59
186.66	70.56	187.33	70.5	188.01	70.44	188.34	70.41	188.72	70.38
190.04	70.29	190.49	70.26	191.13	70.23	192.5	70.17	193	70.14
193.98	70.08	194.46	70.05	195.44	69.99	195.92	69.96	196.2	69.94
196.9	69.9	197.4	69.87	198.39	69.81	198.69	69.78	200.23	69.57
200.44	69.54	202.7	69.54	203.99	69.48	207.24	69.45	208.06	69.42
208.76	69.39	210.32	69.3	210.97	69.27	212.47	69.21	213.08	69.18
214.26	69.12	215	69.09	215.88	69.06	216.73	69.03	218.21	68.97
218.92	68.94	220.28	68.88	221.27	68.85	222.46	68.82	224.51	68.79
226.64	68.76	227.54	68.67	227.85	68.64	228.45	68.58	228.81	68.55
229.61	68.49	230	68.46	230.4	68.43	231.72	68.4	232.91	68.4
233.73	68.43	235.19	68.43	236.48	68.37	237.4	68.34	238.35	68.31
238.72	68.28	239.41	68.19	239.63	68.16	240.24	68.08	240.44	68.04
240.69	68.01	241.02	67.98	241.42	67.95	241.95	67.92	242.65	67.89
242.89	67.86	243.25	67.8	243.46	67.77	243.92	67.71	244.16	67.68
244.68	67.62	244.93	67.59	245.33	67.53	245.54	67.5	245.79	67.47
246.05	67.44	246.2	67.42	246.32	67.41	246.86	67.35	248.93	67.35
249.3	67.38	249.49	67.41	249.66	67.44	249.95	67.5	250.14	67.56
250.23	67.59	250.33	67.62	250.51	67.68	250.61	67.71	250.7	67.74
250.9	67.8	251.11	67.86	251.24	67.89	251.42	67.92	251.84	67.95

251.9	67.96	252.11	67.98	252.59	68.04	252.76	68.07	252.92	68.1
253.37	68.19	254.2	68.19	255.11	68.16	256.1	68.16	257.68	68.19
258.13	68.22	258.67	68.25	259.23	68.28	259.82	68.31	260.38	68.34
261.19	68.4	261.63	68.43	262.2	68.46	262.93	68.49	264.28	68.52
265.75	68.55	266.39	68.58	267.16	68.61	268.14	68.61	269.09	68.58
269.75	68.58	270.48	68.64	271.56	68.67	272.09	68.7	273.62	68.79
274.27	68.82	275.83	68.88	276.47	68.91	277.12	68.94	277.68	68.95
278.42	68.97	280.06	69	282.3	69.03	284.52	69.06	287.71	69.09
288.39	69.12	289.12	69.15	292.07	69.18	293.61	69.21	294.01	69.24
295.24	69.33	295.56	69.36	295.71	69.39	296.03	69.45	296.18	69.48
296.2	69.48	296.5	69.54	296.65	69.57	297.13	69.66	297.44	69.72
297.61	69.72	298.31	69.66	299.38	69.57	299.71	69.54	300.58	69.45
301.43	69.36	301.58	69.36	302.46	69.39	303.35	69.42	303.74	69.42
304.71	69.36	305.2	69.33	307.7	69.33	308.59	69.27	309.47	69.21
309.58	69.21	310.12	69.27	310.36	69.3	310.58	69.33	311.04	69.39
311.49	69.45	311.66	69.48	312.34	69.54	313.01	69.6	313.34	69.63
315.57	69.66	315.96	69.69	316.36	69.72	317.14	69.78	317.51	69.81
318.72	69.84	319.56	69.9	320	69.93	320.99	69.99	321.51	70.02
322.03	70.08	323.03	70.2	323.52	70.26	323.66	70.29	323.84	70.32
324.03	70.35	325.11	70.53	325.3	70.56	325.47	70.59	325.68	70.62
325.93	70.65	327.28	70.8	327.6	70.83	328.65	70.89	329.05	70.92
329.43	70.95	330.14	70.98	330.51	71.01	331	71.07	331.5	71.13
331.54	71.13	332.19	71.07	332.77	71.04	334.36	71.01	335.52	70.98
335.74	70.92	335.84	70.89	336.21	70.8	336.47	70.74	336.59	70.71
336.72	70.68	337.09	70.59	337.35	70.53	337.47	70.5	337.62	70.47
337.79	70.44	337.95	70.41	338.46	70.32	338.62	70.29	338.96	70.23
339.29	70.17	339.45	70.14	339.85	70.14	340.36	70.17	340.59	70.2
341.03	70.32	341.13	70.35	341.46	70.44	341.65	70.47	341.89	70.5
342.11	70.53	342.5	70.59	342.82	70.65	343.09	70.71	343.42	70.8
347.55	70.8	347.8	70.77	348.32	70.71	348.88	70.65	349.48	70.59
349.66	70.56	349.83	70.53	350.2	70.47	350.63	70.41	350.86	70.38
351.11	70.35	351.38	70.32	351.61	70.29	351.79	70.26	352	70.23
352.25	70.2	352.56	70.17	352.94	70.14	353.44	70.11	354.06	70.08
354.87	70.05	357.6	70.05	358.78	70.17	359.49	70.2	361.58	70.2
363.17	70.23	363.47	70.26	363.82	70.29	364.54	70.35	364.89	70.38
365.21	70.41	365.5	70.44	366.06	70.47	366.67	70.5	367.56	70.53
368.86	70.62	369.23	70.65	369.47	70.68	369.83	70.71	370.63	70.77
371.02	70.8	371.18	70.82						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.045	144.98	.035	252.59	.1	262.2	.032	296.2	.045

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
196.2	296.2	.1	.3

Downstream Deck/Roadway Coordinates

num= 199

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
105.69	70.16	0	106.18	70.14	0	107.23	70.11	0
108.1	70.08	0	108.81	70.05	0	109.54	70.02	0
111.72	69.99	0	112.19	69.96	0	112.66	69.93	0

113.13	69.9	0	114.03	69.87	0	116.19	69.84	0
117.15	69.81	0	117.92	69.78	0	118.35	69.75	0
118.78	69.72	0	119.25	69.69	0	120.24	69.66	0
121.44	69.63	0	121.99	69.6	0	122.45	69.57	0
122.9	69.54	0	123.72	69.51	0	124.98	69.48	0
125.66	69.45	0	126.16	69.42	0	126.67	69.39	0
127.25	69.36	0	128.17	69.33	0	129.81	69.3	0
130.44	69.27	0	131.18	69.24	0	131.87	69.21	0
132.34	69.18	0	132.82	69.15	0	133.3	69.12	0
134.61	69.09	0	137.26	69.06	0	138.51	69.03	0
139.32	69	0	140.29	68.97	0	140.73	68.94	0
141.18	68.91	0	141.62	68.88	0	141.94	68.85	0
143.28	68.82	0	144.42	68.79	0	144.86	68.76	0
145.31	68.73	0	145.87	68.7	0	148.03	68.67	0
149.03	68.64	0	149.95	68.61	0	150.47	68.58	0
150.98	68.55	0	151.49	68.52	0	152.09	68.49	0
152.72	68.46	0	153.34	68.43	0	154.11	68.4	0
155.18	68.37	0	158.14	68.34	0	158.57	68.31	0
158.99	68.28	0	159.46	68.25	0	160.82	68.22	0
161.07	68.22	0	161.77	68.19	0	162.46	68.16	0
163.11	68.13	0	163.73	68.1	0	164.12	68.07	0
164.48	68.04	0	165.11	68.01	0	166.02	67.98	0
166.78	67.95	0	167.77	67.92	0	168.72	67.89	0
169.61	67.86	0	170.54	67.83	0	171.37	67.8	0
171.95	67.77	0	172.35	67.74	0	172.76	67.71	0
173.16	67.68	0	173.62	67.65	0	174.16	67.62	0
174.74	67.59	0	175.33	67.56	0	175.93	67.53	0
176.55	67.5	0	177.34	67.47	0	178.19	67.44	0
178.78	67.41	0	179.37	67.38	0	179.96	67.35	0
180.39	67.32	0	180.91	67.29	0	181.46	67.26	0
182.03	67.23	0	182.65	67.2	0	183.15	67.17	0
183.66	67.14	0	184.13	67.11	0	184.46	67.08	0
184.8	67.05	0	185.13	67.02	0	185.47	66.99	0
185.76	66.96	0	186.03	66.93	0	186.57	66.9	0
187.22	66.87	0	187.94	66.84	0	188.48	66.81	0
188.92	66.78	0	189.33	66.75	0	189.72	66.72	0
190.08	66.69	0	190.47	66.66	0	190.91	66.63	0
191.38	66.6	0	191.91	66.57	0	192.34	66.54	0
192.69	66.51	0	193.09	66.48	0	193.48	66.45	0
193.88	66.42	0	194.26	66.39	0	195.87	66.36	0
196.43	66.33	0	196.77	66.3	0	197.11	66.27	0
197.45	66.24	0	197.92	66.21	0	198.52	66.18	0
198.96	66.15	0	199.36	66.12	0	199.74	66.09	0
200.08	66.06	0	200.46	66.03	0	200.92	66	0
201.43	65.97	0	202.04	65.94	0	202.61	65.91	0
203.16	65.88	0	203.75	65.85	0	204.34	65.82	0
204.76	65.79	0	205.23	65.76	0	205.7	65.73	0
206.18	65.7	0	206.79	65.67	0	207.33	65.64	0
207.38	65.64	0	207.93	65.61	0	208.56	65.58	0
208.9	65.55	0	209.26	65.52	0	209.7	65.49	0
210.17	65.46	0	210.83	65.43	0	211.53	65.4	0
212.09	65.37	0	212.55	65.34	0	213.05	65.31	0

213.45	65.28	0	213.81	65.25	0	214.16	65.22	0
214.51	65.19	0	214.97	65.16	0	215.68	65.13	0
216.43	65.1	0	216.91	65.07	0	217.36	65.04	0
217.81	65.01	0	218.28	64.98	0	218.77	64.95	0
219.28	64.92	0	219.77	64.89	0	220.24	64.86	0
220.67	64.83	0	221.12	64.8	0	221.82	64.77	0
222.79	64.74	0	223.54	64.71	0	224.36	64.68	0
225.02	64.65	0	225.37	64.62	0	225.73	64.59	0
226.08	64.56	0	226.44	64.53	0	227.17	64.5	0
227.82	64.47	0	228.47	64.44	0	229.13	64.41	0
229.77	64.38	0	230.38	64.35	0	230.97	64.32	0
231.57	64.29	0						

Downstream Bridge Cross Section Data
Station Elevation Data num= 477

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	71.16	.11	71.16	.7	71.13	1.29	71.1	1.88	71.07
2.28	71.04	2.64	71.01	3.01	70.98	3.37	70.95	3.74	70.92
4.08	70.89	4.34	70.86	4.6	70.83	4.86	70.8	5.12	70.77
5.37	70.74	5.63	70.71	5.89	70.68	6.3	70.65	6.81	70.62
7.32	70.59	7.83	70.56	8.32	70.53	8.8	70.5	9.28	70.47
9.76	70.44	10.76	70.41	12.07	70.38	12.43	70.35	12.79	70.32
13.15	70.29	13.51	70.26	13.87	70.23	17.67	70.23	18.46	70.2
18.97	70.17	19.48	70.14	19.98	70.11	20.58	70.08	21.18	70.05
21.79	70.02	22.62	69.99	23.37	69.96	24.11	69.93	24.82	69.9
25.53	69.87	26.25	69.84	26.95	69.81	27.65	69.78	28.6	69.75
29.59	69.72	33.16	69.72	34.2	69.69	34.56	69.66	34.91	69.63
35.27	69.6	35.62	69.57	35.97	69.54	36.08	69.54	37.04	69.57
40.77	69.57	41.66	69.6	42.22	69.63	42.68	69.66	43.15	69.69
43.62	69.72	44.14	69.75	44.46	69.78	44.78	69.81	45.1	69.84
45.42	69.87	45.74	69.9	46.34	69.93	47.46	69.96	49.17	69.99
52.33	70.02	53	70.05	56.16	70.05	56.92	70.02	57.46	69.99
58	69.96	58.36	69.93	58.72	69.9	59.09	69.87	59.46	69.84
59.83	69.81	60.24	69.78	60.75	69.75	61.42	69.72	62.04	69.69
62.33	69.66	62.56	69.63	62.8	69.6	63.03	69.57	63.27	69.54
63.5	69.51	63.74	69.48	63.97	69.45	64.22	69.42	64.46	69.39
64.7	69.36	64.93	69.33	65.17	69.3	65.41	69.27	65.64	69.24
65.88	69.21	66.11	69.18	66.39	69.15	67.12	69.12	67.86	69.09
68.26	69.06	68.66	69.03	69.05	69	69.45	68.97	69.87	68.94
70.47	68.91	70.87	68.88	71.25	68.85	71.63	68.82	72.06	68.79
73.48	68.76	74.23	68.73	74.66	68.7	75.08	68.67	75.49	68.64
75.9	68.61	76.39	68.58	76.98	68.55	77.6	68.52	78.09	68.52
78.24	68.55	78.38	68.58	78.53	68.61	78.67	68.64	78.82	68.67
78.98	68.7	79.13	68.73	79.28	68.76	79.43	68.79	79.59	68.82
79.74	68.85	79.9	68.88	81.16	68.88	82.45	68.85	82.93	68.82
83.39	68.79	83.85	68.76	84.44	68.73	84.78	68.7	85.11	68.67
85.45	68.64	85.79	68.61	86.09	68.58	86.38	68.55	87.04	68.52
87.78	68.49	90.84	68.46	91.31	68.43	91.78	68.4	92.52	68.37
93.17	68.34	93.57	68.31	93.97	68.28	94.16	68.25	94.33	68.22
94.58	68.19	95.03	68.16	95.48	68.13	95.93	68.1	96.31	68.07
98.51	68.04	99.6	68.01	100.5	67.98	101.65	67.95	102.21	67.92
102.6	67.89	103	67.86	103.47	67.83	103.97	67.8	104.82	67.77

105.2	67.74	105.58	67.71	105.95	67.68	108.05	67.68	108.71	67.65
109.55	67.62	110.15	67.59	110.43	67.56	110.71	67.53	110.99	67.5
111.27	67.47	111.54	67.44	111.8	67.41	112.1	67.38	112.53	67.35
112.97	67.32	113.41	67.29	113.86	67.26	114.38	67.23	115.01	67.2
115.65	67.17	116.27	67.14	116.84	67.11	117.41	67.08	117.88	67.06
117.98	67.05	119.18	67.02	119.42	67.01	119.98	66.99	120.48	66.96
120.99	66.93	121.49	66.9	121.99	66.87	122.45	66.84	123.03	66.81
123.75	66.78	124.43	66.75	125.07	66.72	125.74	66.69	126.18	66.66
126.59	66.63	127.01	66.6	127.42	66.57	127.84	66.54	128.34	66.51
128.96	66.48	129.59	66.45	130.3	66.42	131.17	66.39	132.04	66.36
132.43	66.33	132.81	66.3	133.18	66.27	133.54	66.24	133.91	66.21
134.34	66.18	136.16	66.15	137	66.12	137.53	66.09	138.05	66.06
140.57	66.03	141.38	66	142.15	65.97	142.99	65.94	143.82	65.91
145.25	65.88	146.28	65.85	146.63	65.82	146.97	65.79	147.32	65.76
147.66	65.73	148	65.7	152.68	65.67	153.11	65.64	153.55	65.61
153.98	65.58	155.23	65.55	158.58	65.52	159.09	65.49	159.6	65.46
160.1	65.43	160.61	65.4	161.12	65.37	161.39	65.36	161.74	65.34
162.59	65.31	163.78	65.28	164.88	65.25	165.59	65.22	166.13	65.19
167.35	65.16	175.3	65.16	176.02	65.13	176.76	65.1	177.54	65.07
178.29	65.04	178.84	65.01	179.7	64.98	181.56	64.95	182.22	64.92
182.78	64.89	183.28	64.86	183.49	64.83	183.8	64.8	184.13	64.77
184.49	64.74	184.87	64.71	185.26	64.68	186.9	64.68	187.8	64.71
187.97	64.74	188.15	64.77	188.33	64.8	188.51	64.83	188.69	64.86
188.88	64.89	189.08	64.92	189.29	64.95	189.51	64.98	189.73	65.01
190.1	65.01	190.65	64.98	191.21	64.95	191.78	64.92	192.17	64.89
192.49	64.86	192.81	64.83	193.12	64.8	193.44	64.77	193.75	64.74
194.21	64.74	194.41	64.76	194.51	64.77	194.79	64.8	195.07	64.83
195.35	64.86	195.62	64.89	195.89	64.92	196.15	64.95	198.37	64.95
199.19	64.98	201.01	65.01	202.47	65.04	202.72	65.04	206.08	65.01
206.45	64.98	206.85	64.95	207.25	64.92	207.68	64.89	208.08	64.86
208.45	64.83	208.81	64.8	209.47	64.77	210.21	64.74	210.64	64.71
210.95	64.68	211.23	64.65	211.5	64.62	211.77	64.59	212.04	64.56
212.29	64.53	212.53	64.5	212.78	64.47	213.02	64.44	213.48	64.41
214.01	64.38	214.23	64.36	214.32	64.35	214.55	64.32	214.79	64.29
215.02	64.26	215.33	64.23	215.9	64.2	216.45	64.17	216.99	64.14
217.88	64.11	218.04	64.11	219.33	64.08	219.73	64.05	220.13	64.02
220.53	63.99	220.93	63.96	221.51	63.93	222.55	63.9	223.37	63.87
223.68	63.84	223.96	63.81	224.23	63.78	224.51	63.75	224.78	63.72
225.06	63.69	225.33	63.66	225.67	63.63	226.01	63.6	226.35	63.57
226.68	63.54	227.01	63.51	227.34	63.48	229.55	63.45	229.97	63.42
230.39	63.39	230.84	63.36	231.29	63.33	231.65	63.3	231.96	63.27
232.27	63.24	232.57	63.21	232.88	63.18	233.19	63.15	233.76	63.12
234.74	63.09	235.67	63.06	236.55	63.03	237.4	63	239.94	62.97
240.81	62.94	241.63	62.91	242.16	62.88	242.7	62.85	244.14	62.82
245.7	62.79	246.75	62.76	247.68	62.73	248.06	62.7	248.5	62.67
248.98	62.64	249.38	62.61	249.76	62.58	250.2	62.55	250.59	62.52
250.99	62.49	251.35	62.46	251.7	62.43	252.4	62.4	253.14	62.37
253.83	62.34	254.29	62.31	254.75	62.28	255.21	62.25	255.64	62.22
255.96	62.19	256.21	62.16	256.47	62.13	256.73	62.1	256.99	62.07
257.25	62.04	257.51	62.01	257.77	61.98	258.35	61.95	258.99	61.92
259.63	61.89	260.4	61.86	261.16	61.83	261.85	61.8	262.59	61.77
263.46	61.74	264.3	61.71	265.41	61.68	266.59	61.65	267.78	61.62

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  268.36   61.59  268.79   61.56  269.22   61.53  269.67    61.5   270.1   61.47
  270.49   61.44  270.87   61.41  271.25   61.38  271.64   61.35  272.04   61.32
  272.59   61.29  272.94   61.26  273.28   61.23  273.61    61.2  273.95   61.17
  275.59   61.14  276.41   61.11  276.86   61.08  277.31   61.05  277.74   61.02
  278.15   60.99  278.46   60.96  278.76   60.93  279.07    60.9  279.37   60.87
  279.68   60.84  279.99   60.81  280.35   60.78  280.75   60.75  281.14   60.72
  281.54   60.69  281.96   60.66   282.5   60.63   283.2    60.6  283.91   60.57
  285.13   60.54  286.75   60.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045  117.88    .032  217.88    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
        117.88  217.88             .1       .3
Right Levee     Station=  206.08      Elevation=   65.27

Upstream Embankment side slope              =       3 horiz. to 1.0 vertical
Downstream Embankment side slope            =       3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular     1.2
FHWA Chart # 56-  Elliptical Inlet Face
FHWA Scale # 1 - Tapered inlet; Beveled edges
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss
Coef   Exit Loss Coef
               6.54   16.73      .17      .17       .2                   .2
         1
Number of Barrels =  2
Upstream   Elevation =  67.43
Centerline Stations
    Sta.    Sta.
  245.75  247.38
Downstream Elevation =  65.2
Centerline Stations
    Sta.    Sta.
  166.32  168.18

CROSS SECTION


RIVER: DE LA CALERA
REACH: CALERA             RS: 980.2
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INPUT
Description:
Station Elevation Data num= 477

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	71.16	.11	71.16	.7	71.13	1.29	71.1	1.88	71.07
2.28	71.04	2.64	71.01	3.01	70.98	3.37	70.95	3.74	70.92
4.08	70.89	4.34	70.86	4.6	70.83	4.86	70.8	5.12	70.77
5.37	70.74	5.63	70.71	5.89	70.68	6.3	70.65	6.81	70.62
7.32	70.59	7.83	70.56	8.32	70.53	8.8	70.5	9.28	70.47
9.76	70.44	10.76	70.41	12.07	70.38	12.43	70.35	12.79	70.32
13.15	70.29	13.51	70.26	13.87	70.23	17.67	70.23	18.46	70.2
18.97	70.17	19.48	70.14	19.98	70.11	20.58	70.08	21.18	70.05
21.79	70.02	22.62	69.99	23.37	69.96	24.11	69.93	24.82	69.9
25.53	69.87	26.25	69.84	26.95	69.81	27.65	69.78	28.6	69.75
29.59	69.72	33.16	69.72	34.2	69.69	34.56	69.66	34.91	69.63
35.27	69.6	35.62	69.57	35.97	69.54	36.08	69.54	37.04	69.57
40.77	69.57	41.66	69.6	42.22	69.63	42.68	69.66	43.15	69.69
43.62	69.72	44.14	69.75	44.46	69.78	44.78	69.81	45.1	69.84
45.42	69.87	45.74	69.9	46.34	69.93	47.46	69.96	49.17	69.99
52.33	70.02	53	70.05	56.16	70.05	56.92	70.02	57.46	69.99
58	69.96	58.36	69.93	58.72	69.9	59.09	69.87	59.46	69.84
59.83	69.81	60.24	69.78	60.75	69.75	61.42	69.72	62.04	69.69
62.33	69.66	62.56	69.63	62.8	69.6	63.03	69.57	63.27	69.54
63.5	69.51	63.74	69.48	63.97	69.45	64.22	69.42	64.46	69.39
64.7	69.36	64.93	69.33	65.17	69.3	65.41	69.27	65.64	69.24
65.88	69.21	66.11	69.18	66.39	69.15	67.12	69.12	67.86	69.09
68.26	69.06	68.66	69.03	69.05	69	69.45	68.97	69.87	68.94
70.47	68.91	70.87	68.88	71.25	68.85	71.63	68.82	72.06	68.79
73.48	68.76	74.23	68.73	74.66	68.7	75.08	68.67	75.49	68.64
75.9	68.61	76.39	68.58	76.98	68.55	77.6	68.52	78.09	68.52
78.24	68.55	78.38	68.58	78.53	68.61	78.67	68.64	78.82	68.67
78.98	68.7	79.13	68.73	79.28	68.76	79.43	68.79	79.59	68.82
79.74	68.85	79.9	68.88	81.16	68.88	82.45	68.85	82.93	68.82
83.39	68.79	83.85	68.76	84.44	68.73	84.78	68.7	85.11	68.67
85.45	68.64	85.79	68.61	86.09	68.58	86.38	68.55	87.04	68.52
87.78	68.49	90.84	68.46	91.31	68.43	91.78	68.4	92.52	68.37
93.17	68.34	93.57	68.31	93.97	68.28	94.16	68.25	94.33	68.22
94.58	68.19	95.03	68.16	95.48	68.13	95.93	68.1	96.31	68.07
98.51	68.04	99.6	68.01	100.5	67.98	101.65	67.95	102.21	67.92
102.6	67.89	103	67.86	103.47	67.83	103.97	67.8	104.82	67.77
105.2	67.74	105.58	67.71	105.95	67.68	108.05	67.68	108.71	67.65
109.55	67.62	110.15	67.59	110.43	67.56	110.71	67.53	110.99	67.5
111.27	67.47	111.54	67.44	111.8	67.41	112.1	67.38	112.53	67.35
112.97	67.32	113.41	67.29	113.86	67.26	114.38	67.23	115.01	67.2
115.65	67.17	116.27	67.14	116.84	67.11	117.41	67.08	117.88	67.06
117.98	67.05	119.18	67.02	119.42	67.01	119.98	66.99	120.48	66.96
120.99	66.93	121.49	66.9	121.99	66.87	122.45	66.84	123.03	66.81
123.75	66.78	124.43	66.75	125.07	66.72	125.74	66.69	126.18	66.66
126.59	66.63	127.01	66.6	127.42	66.57	127.84	66.54	128.34	66.51
128.96	66.48	129.59	66.45	130.3	66.42	131.17	66.39	132.04	66.36
132.43	66.33	132.81	66.3	133.18	66.27	133.54	66.24	133.91	66.21
134.34	66.18	136.16	66.15	137	66.12	137.53	66.09	138.05	66.06

140.57	66.03	141.38	66	142.15	65.97	142.99	65.94	143.82	65.91
145.25	65.88	146.28	65.85	146.63	65.82	146.97	65.79	147.32	65.76
147.66	65.73	148	65.7	152.68	65.67	153.11	65.64	153.55	65.61
153.98	65.58	155.23	65.55	158.58	65.52	159.09	65.49	159.6	65.46
160.1	65.43	160.61	65.4	161.12	65.37	161.39	65.36	161.74	65.34
162.59	65.31	163.78	65.28	164.88	65.25	165.59	65.22	166.13	65.19
167.35	65.16	175.3	65.16	176.02	65.13	176.76	65.1	177.54	65.07
178.29	65.04	178.84	65.01	179.7	64.98	181.56	64.95	182.22	64.92
182.78	64.89	183.28	64.86	183.49	64.83	183.8	64.8	184.13	64.77
184.49	64.74	184.87	64.71	185.26	64.68	186.9	64.68	187.8	64.71
187.97	64.74	188.15	64.77	188.33	64.8	188.51	64.83	188.69	64.86
188.88	64.89	189.08	64.92	189.29	64.95	189.51	64.98	189.73	65.01
190.1	65.01	190.65	64.98	191.21	64.95	191.78	64.92	192.17	64.89
192.49	64.86	192.81	64.83	193.12	64.8	193.44	64.77	193.75	64.74
194.21	64.74	194.41	64.76	194.51	64.77	194.79	64.8	195.07	64.83
195.35	64.86	195.62	64.89	195.89	64.92	196.15	64.95	198.37	64.95
199.19	64.98	201.01	65.01	202.47	65.04	202.72	65.04	206.08	65.01
206.45	64.98	206.85	64.95	207.25	64.92	207.68	64.89	208.08	64.86
208.45	64.83	208.81	64.8	209.47	64.77	210.21	64.74	210.64	64.71
210.95	64.68	211.23	64.65	211.5	64.62	211.77	64.59	212.04	64.56
212.29	64.53	212.53	64.5	212.78	64.47	213.02	64.44	213.48	64.41
214.01	64.38	214.23	64.36	214.32	64.35	214.55	64.32	214.79	64.29
215.02	64.26	215.33	64.23	215.9	64.2	216.45	64.17	216.99	64.14
217.88	64.11	218.04	64.11	219.33	64.08	219.73	64.05	220.13	64.02
220.53	63.99	220.93	63.96	221.51	63.93	222.55	63.9	223.37	63.87
223.68	63.84	223.96	63.81	224.23	63.78	224.51	63.75	224.78	63.72
225.06	63.69	225.33	63.66	225.67	63.63	226.01	63.6	226.35	63.57
226.68	63.54	227.01	63.51	227.34	63.48	229.55	63.45	229.97	63.42
230.39	63.39	230.84	63.36	231.29	63.33	231.65	63.3	231.96	63.27
232.27	63.24	232.57	63.21	232.88	63.18	233.19	63.15	233.76	63.12
234.74	63.09	235.67	63.06	236.55	63.03	237.4	63	239.94	62.97
240.81	62.94	241.63	62.91	242.16	62.88	242.7	62.85	244.14	62.82
245.7	62.79	246.75	62.76	247.68	62.73	248.06	62.7	248.5	62.67
248.98	62.64	249.38	62.61	249.76	62.58	250.2	62.55	250.59	62.52
250.99	62.49	251.35	62.46	251.7	62.43	252.4	62.4	253.14	62.37
253.83	62.34	254.29	62.31	254.75	62.28	255.21	62.25	255.64	62.22
255.96	62.19	256.21	62.16	256.47	62.13	256.73	62.1	256.99	62.07
257.25	62.04	257.51	62.01	257.77	61.98	258.35	61.95	258.99	61.92
259.63	61.89	260.4	61.86	261.16	61.83	261.85	61.8	262.59	61.77
263.46	61.74	264.3	61.71	265.41	61.68	266.59	61.65	267.78	61.62
268.36	61.59	268.79	61.56	269.22	61.53	269.67	61.5	270.1	61.47
270.49	61.44	270.87	61.41	271.25	61.38	271.64	61.35	272.04	61.32
272.59	61.29	272.94	61.26	273.28	61.23	273.61	61.2	273.95	61.17
275.59	61.14	276.41	61.11	276.86	61.08	277.31	61.05	277.74	61.02
278.15	60.99	278.46	60.96	278.76	60.93	279.07	60.9	279.37	60.87
279.68	60.84	279.99	60.81	280.35	60.78	280.75	60.75	281.14	60.72
281.54	60.69	281.96	60.66	282.5	60.63	283.2	60.6	283.91	60.57
285.13	60.54	286.75	60.54						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	117.88	.032	217.88	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
117.88 217.88 7.32 7.32 7.32 .1 .3
Right Levee Station= 206.08 Elevation= 65.27

CROSS SECTION

RIVER: DE LA CALERA
REACH: CALERA RS: 980

INPUT
Description:
Station Elevation Data num= 468

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.06	.17	69.06	.54	69.09	.91	69.12	1.29	69.15
1.76	69.18	4.11	69.18	4.3	69.15	4.48	69.12	4.66	69.09
4.84	69.06	5.02	69.03	5.2	69	5.38	68.97	5.56	68.94
5.74	68.91	5.91	68.88	6.12	68.85	6.38	68.82	6.67	68.79
7.03	68.76	7.41	68.73	7.82	68.7	9.62	68.7	10.43	68.73
10.93	68.76	11.42	68.79	11.9	68.82	12.8	68.85	14.45	68.85
14.86	68.82	15.26	68.79	15.67	68.76	16.18	68.73	16.84	68.7
17.5	68.67	18.31	68.64	19.66	68.61	20.17	68.61	20.42	68.64
20.66	68.67	20.91	68.7	21.15	68.73	21.4	68.76	21.65	68.79
21.95	68.82	27.16	68.82	28.56	68.79	29.25	68.76	29.89	68.73
30.37	68.7	30.74	68.67	31.12	68.64	31.62	68.61	32.4	68.58
33.81	68.55	34.62	68.52	35.23	68.49	35.86	68.46	36.61	68.43
37.43	68.4	38.76	68.37	39.68	68.37	40.62	68.4	41.06	68.43
41.5	68.46	42.06	68.49	44.31	68.49	45.16	68.46	46.03	68.43
48.03	68.4	48.48	68.37	48.75	68.34	49.02	68.31	49.36	68.28
50.34	68.25	50.98	68.22	51.55	68.19	51.99	68.16	52.56	68.13
53.51	68.1	55.16	68.07	58.56	68.04	59.82	68.01	60.71	67.98
61.27	67.95	61.82	67.92	62.39	67.89	63	67.86	63.49	67.83
63.96	67.8	66.81	67.8	68.5	67.83	68.96	67.86	69.4	67.89
69.83	67.92	70.25	67.95	71.13	67.98	72.47	67.98	72.76	67.95
73.07	67.92	73.38	67.89	73.69	67.86	73.99	67.83	74.3	67.8
74.91	67.77	75.63	67.74	76.35	67.71	77	67.68	77.65	67.65
78.3	67.62	80.89	67.59	81.95	67.56	83.23	67.53	84.23	67.5
85.71	67.47	87.37	67.44	88.87	67.41	89.87	67.38	91.06	67.35
95.02	67.32	96.51	67.29	96.85	67.26	97.19	67.23	97.52	67.2
97.86	67.17	98.2	67.14	99.07	67.14	99.7	67.17	100.99	67.2
104.91	67.2	106.05	67.17	107.2	67.14	108.61	67.11	109.12	67.08
109.67	67.05	110.26	67.02	110.74	66.99	111.1	66.96	111.45	66.93
111.8	66.9	112.12	66.87	112.42	66.84	112.79	66.81	113.23	66.78
113.67	66.75	114.16	66.72	114.77	66.69	115.19	66.66	115.6	66.63
116.01	66.6	116.42	66.57	116.85	66.54	117.25	66.51	117.66	66.48
118.07	66.45	118.48	66.42	119.03	66.39	119.59	66.36	120.16	66.33
120.78	66.3	121.54	66.27	122.19	66.24	122.84	66.21	123.51	66.18
123.68	66.17	124.22	66.15	124.9	66.12	125.54	66.09	126.22	66.06
126.8	66.03	127.18	66	127.57	65.97	127.99	65.94	128.42	65.91
128.95	65.88	129.62	65.85	130.29	65.82	130.89	65.79	131.39	65.76

131.89	65.73	132.59	65.7	133.23	65.67	133.85	65.64	134.89	65.61
135.44	65.58	135.99	65.55	136.53	65.52	136.93	65.49	137.25	65.46
137.57	65.43	137.91	65.4	138.26	65.37	138.6	65.34	139.02	65.31
139.52	65.28	140.02	65.25	140.53	65.22	141.07	65.19	141.54	65.16
141.97	65.13	142.41	65.1	142.99	65.07	143.85	65.04	144.52	65.01
145.39	64.98	146.14	64.95	146.7	64.92	146.85	64.92	148.62	64.95
148.8	64.95	149.4	64.92	150	64.89	150.46	64.86	151.3	64.86
151.91	64.88	152.18	64.89	153.32	64.92	154.35	64.95	155.36	64.95
155.82	64.92	157.08	64.89	157.44	64.89	157.88	64.92	158.24	64.95
158.64	64.98	159.07	65.01	159.6	65.01	159.83	64.98	160.16	64.95
160.55	64.92	160.98	64.89	161.44	64.86	163.01	64.83	165.39	64.8
166.62	64.8	168.09	64.83	170.23	64.83	172.36	64.8	172.79	64.79
173.68	64.77	175.29	64.77	177.24	64.8	178.47	64.8	181.82	64.77
182.3	64.74	182.85	64.71	183.53	64.68	184.13	64.65	184.45	64.64
184.79	64.62	185.34	64.59	185.76	64.56	186.24	64.53	186.94	64.5
187.62	64.47	188.27	64.44	189.89	64.41	193.18	64.38	193.75	64.35
194.32	64.32	195.15	64.29	195.2	64.29	196.32	64.32	199.5	64.32
200.83	64.29	201.98	64.29	202.46	64.32	202.93	64.35	203.37	64.38
203.79	64.41	207.86	64.41	208.22	64.38	208.61	64.35	209.06	64.32
209.51	64.29	209.96	64.26	210.41	64.23	210.66	64.2	210.91	64.17
211.15	64.14	211.39	64.11	211.63	64.08	211.87	64.05	212.11	64.02
212.35	63.99	212.55	63.96	212.73	63.93	212.92	63.9	213.11	63.87
213.3	63.84	213.5	63.81	213.71	63.78	213.92	63.75	214.13	63.72
214.33	63.69	214.54	63.66	214.75	63.63	214.96	63.6	215.17	63.57
215.41	63.54	215.65	63.51	215.91	63.48	216.18	63.45	216.47	63.42
217.09	63.39	217.91	63.36	218.76	63.33	219.41	63.3	220.06	63.27
220.85	63.24	222.37	63.21	223.68	63.21	224.73	63.21	225.1	63.18
225.49	63.15	225.91	63.12	226.35	63.09	226.74	63.06	227	63.03
227.26	63	227.53	62.97	227.79	62.94	228.05	62.91	228.32	62.88
228.58	62.85	228.86	62.82	229.14	62.79	229.43	62.76	229.71	62.73
230	62.7	230.28	62.67	230.55	62.64	230.88	62.61	231.29	62.58
231.7	62.55	232.11	62.52	232.52	62.49	239.08	62.49	239.52	62.52
240.03	62.55	240.62	62.58	241.23	62.58	242.37	62.55	243.09	62.52
243.44	62.49	243.79	62.46	244.14	62.43	244.49	62.4	244.88	62.37
244.94	62.37	245.51	62.4	246.09	62.43	246.66	62.46	249.32	62.46
249.73	62.43	250.2	62.4	250.73	62.37	251.19	62.34	251.53	62.31
251.87	62.28	252.21	62.25	252.62	62.22	253.05	62.19	253.59	62.16
254.12	62.13	254.66	62.1	255.14	62.07	255.55	62.04	255.97	62.01
256.38	61.98	256.78	61.95	257.17	61.92	257.54	61.89	257.91	61.86
258.28	61.83	258.65	61.8	259.02	61.77	259.37	61.74	259.76	61.71
260.18	61.68	260.63	61.65	261.08	61.62	261.5	61.59	263.03	61.56
263.36	61.53	263.74	61.5	264.14	61.47	264.55	61.44	264.98	61.41
265.35	61.38	265.66	61.35	265.97	61.32	266.29	61.29	266.61	61.26
266.94	61.23	268.33	61.23	268.95	61.26	269.51	61.26	270.33	61.23
271.29	61.2	271.7	61.17	272.13	61.14	272.57	61.11	273.01	61.08
273.4	61.05	273.67	61.02	273.94	60.99	274.19	60.96	274.42	60.93
274.64	60.9	274.83	60.87	275.02	60.84	275.21	60.81	275.59	60.78
276.6	60.75	277.54	60.72	277.98	60.69	278.43	60.66	278.88	60.63
279.29	60.6	279.55	60.57	279.78	60.54	280	60.51	280.22	60.48
280.44	60.45	280.67	60.42	280.89	60.39	281.11	60.36	281.33	60.33
281.6	60.3	282.11	60.27	283	60.24	284.08	60.24	285.37	60.27
285.72	60.27	287.63	60.24	288.7	60.21	289.51	60.18	289.59	60.18

290.57	60.21	292.76	60.21	293.68	60.18	293.91	60.15	294.23	60.12
294.75	60.09	295.05	60.06	295.32	60.03	295.59	60	295.96	59.97
296.34	59.94	296.67	59.91	296.95	59.88	297.23	59.85	297.52	59.82
297.87	59.79	298.3	59.76	298.74	59.73	299.2	59.7	299.66	59.67
301.83	59.64	302.25	59.61	302.67	59.58	303.09	59.55	303.51	59.52
304.41	59.49	305.84	59.46	306.12	59.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	123.68	.032	184.45	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
123.68	184.45	0	0	0 .1	.3

Right Levee Station= 207.86 Elevation= 64.59

SUMMARY OF MANNING'S N VALUES

River:DE LA CALERA

Reach	River Sta.	n1	n2	n3	n4	n5	n6
CALERA	1000	.07	.1	.07	.035	.1	.035
CALERA	999	.07	.035	.1	.035		
CALERA	998	.07	.035	.1	.035		
CALERA	997	.035	.1	.035			
CALERA	996	.035	.1	.035			
CALERA	995.48	Culvert					
CALERA	995	.035	.1	.035			
CALERA	994	.035	.1	.035			
CALERA	993	.035	.1	.035			
CALERA	992	.045	.035	.1	.035		
CALERA	991	.045	.035	.1	.035		
CALERA	990	.045	.035	.1	.035		
CALERA	989	.045	.035	.1	.035		

CALERA	988.4	.045	.035	.1	.035
CALERA	988	.045	.035	.1	.035
CALERA	985	.045	.035	.1	.035
CALERA	984	.045	.032	.035	.1
.035					
CALERA	983.9	.045	.032	.035	.1
.035					
CALERA	983	.045	.035	.1	.035
CALERA	982	.045	.035	.1	.035
.045					
CALERA	981	.045	.035	.1	.032
.045					
CALERA	980.6	Culvert			
CALERA	980.2	.045	.032	.045	
CALERA	980	.045	.032	.045	

SUMMARY OF REACH LENGTHS

River: DE LA CALERA

Reach	River Sta.	Left	Channel	Right
CALERA	1000	30.97	30.97	30.97
CALERA	999	17.69	17.69	17.69
CALERA	998	18.07	18.07	18.07
CALERA	997	27.44	27.44	27.44
CALERA	996	9.4	9.4	9.4
CALERA	995.48	Culvert		
CALERA	995	22.17	22.17	22.17
CALERA	994	15.26	15.26	15.26
CALERA	993	14.8	14.8	14.8
CALERA	992	18.76	18.76	18.76
CALERA	991	14.84	14.84	14.84
CALERA	990	9.49	9.49	9.49
CALERA	989	17.91	17.91	17.91
CALERA	988.4	11.94	11.94	11.94
CALERA	988	21.48	21.48	21.48
CALERA	985	6.03	6.03	6.03
CALERA	984	3.77	3.77	3.77
CALERA	983.9	38.87	38.87	38.87

CALERA	983	51.19	51.19	51.19
CALERA	982	22	22	22
CALERA	981	31.68	31.68	31.68
CALERA	980.6	Culvert		
CALERA	980.2	7.32	7.32	7.32
CALERA	980	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: DE LA CALERA

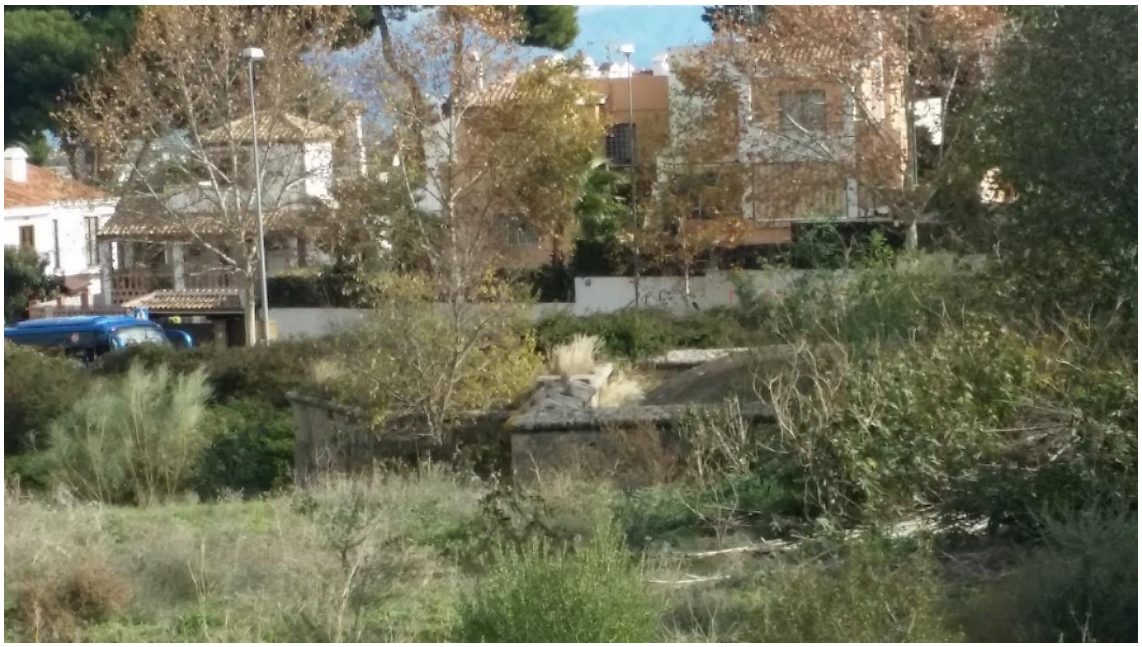
Reach	River Sta.	Contr.	Expan.
CALERA	1000	.1	.3
CALERA	999	.1	.3
CALERA	998	.1	.3
CALERA	997	.1	.3
CALERA	996	.1	.3
CALERA	995.48	Culvert	
CALERA	995	.1	.3
CALERA	994	.1	.3
CALERA	993	.1	.3
CALERA	992	.1	.3
CALERA	991	.1	.3
CALERA	990	.1	.3
CALERA	989	.1	.3
CALERA	988.4	.1	.3
CALERA	988	.1	.3
CALERA	985	.1	.3
CALERA	984	.1	.3
CALERA	983.9	.1	.3
CALERA	983	.1	.3
CALERA	982	.1	.3
CALERA	981	.1	.3
CALERA	980.6	Culvert	
CALERA	980.2	.1	.3
CALERA	980	.1	.3

6- REPORTAJE FOTOGRÁFICO

REPORTAJE FOTOGRÁFICO DEL ENTORNO

Perspectiva de la localización del Arroyo Innominado 1 y su situación con respecto a vegetación y limite con el vial urbano Camino del Pilar. Vegetación muy densa e inaccesibilidad al cauce.

Detalle de la situación actual del cauce del Arroyo Innominado, colonizado especialmente por invasoras tales como ricino.



Construcción que ocupa el propio cauce del Arroyo Innominado.

Detalle del entorno de cauce y su vegetación compuesta por mosaico de matorral, y olivar abandonado para la determinación de la rugosidad del entorno.

Lateral de la obra de drenaje aguas arriba del arroyo Innominado, se presenta desborde, descalzado del vial, aporte de aguas del vial y de la propia obra de drenaje que se encuentra colmatada en su base un 20%. El agua ocupa el cauce proviene de la obra de drenaje en parte, por los regueros y muestras de la calzada otra parte de las aguas provienen de los arrastres de las pluviales de la misma calzada y drenajes superficiales del entorno.

Detalle de la situación y descripción anterior.

Detalle de la obra de drenaje descrita en las dos fotos anteriores.

Detalle de la situación descrita anteriormente sobre rasante de la obra de drenaje donde se pueden ver los arrastres.

Cauce de la Cañada de la Calera, situación próxima al punto de medición critico correspondiente con la obra de drenaje ODT 2, perfil 980. Se ve altamente antropización sobre el cual se han vertido rellenos y restos de RCDs.

ODT2 Arroyo Cañada de la Calera. Perfil 980.

Detalle de la ODT2 y su estado.

Situación del entorno del cauce limitado por carretera de acceso a la Cantera (izquierda del cauce dirección aguas abajo) y viviendas sobre el antiguo cauce original.

Detalle del estado actual del cauce. Arroyo Cañada de la Calera

Detalle del cauce original, aguas arriba de la situación de las edificaciones descritas en el punto anterior.

ODT1 Arroyo Cañada de la Calera. Perfil 995, sobre la odt existe una ocupación por un camino de acceso privado a finca colindante.

Perspectiva del punto de incio del estudio Perfil 1000. No se detectan regueros no procedencia del agua cabecera arriba de su cuenca de drenaje. Por la falta de cauce, la misma carretera de acceso a la Cantera actúa de cauce.

Detalle de la descripción anterior. Se observan arrastres en la misma carretera.

Detalle anterior desde perspectiva alejada.

ANEXO PLANOS:

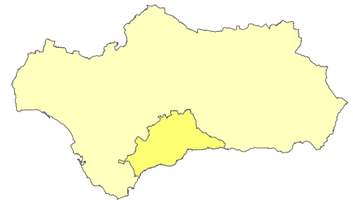
1.- PLANO DE SITUACIÓN SOBRE MAPA NACIONAL 1:25.000
2.- PLANO DE SITUACIÓN SOBRE ORTOFOTO
3.- PLANO DE CUENCAS Y PUNTOS DE CAUDAL
4.- PLANO DE USOS DEL SUELO
5.- PLANO DE UMBRAL DE ESCORRENTÍA "P0"
6.-PLANO DEL NÚMERO DE MANNING (RUGOSIDAD)
7.- SITUACIÓN DE LOS PERFILES TRANSVERSALES
8.- DELIMITACIÓN DE LÁMINA PARA TIEMPO DE RETORNO 5 Y10 AÑOS. ZONA DE SERVIDUMBRE
9.- DELIMITACIÓN DE LÁMINAS SEGÚN AVENIDAS PARA TIEMPOS DE RETORNO 100 y 500 AÑOS. ZONAS INUNDABLES

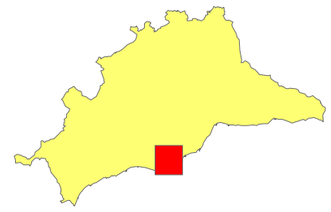
362500 365000 367500

4060000 4057500 4055000

Zona de estudio

N





sfera proyecto ambiental

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

FECHA	ESCALA
Enero de 2018	1/25.000

TÍTULO DEL MAPA

LOCALIZACIÓN

364409 364909 365409 365909

4058550

4058050

4057550

LEYENDA:

ZONA DE ESTUDIO

0 40 80 160 240 320 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:5,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO: ORTOFOTOGRAFÍA

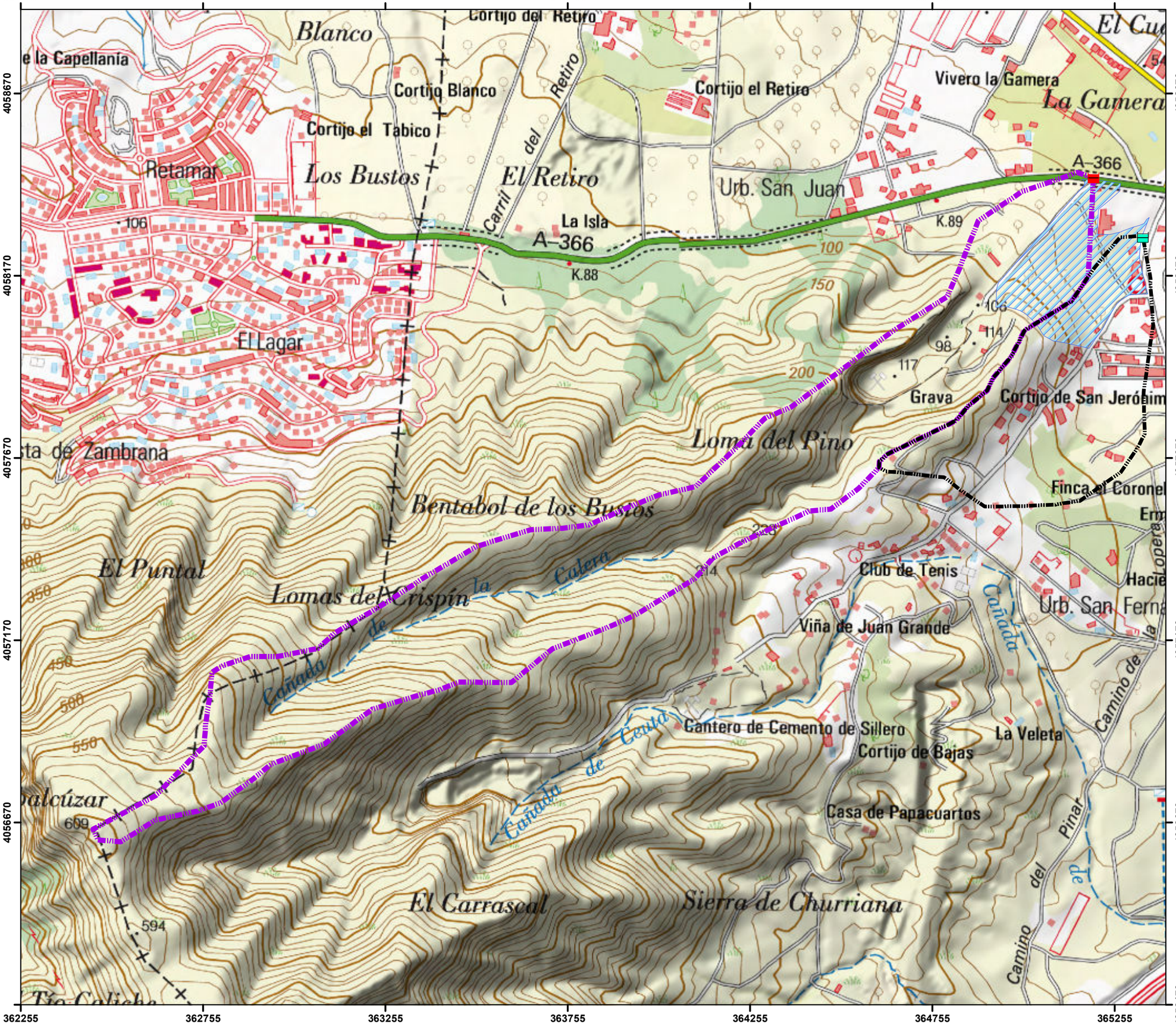
Nº PLANO: 2

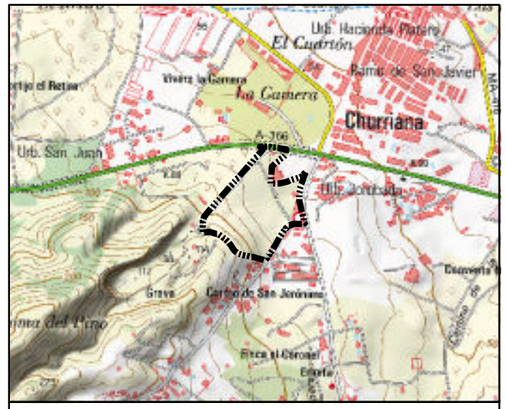
FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30





LEYENDA:

- ZONA DE ESTUDIO
- PUNTO CAUDAL INNOMINADO1
- PUNTO CAUDAL CAÑADA DE LA CALERA
- CUENCA DE DRENAJE ARROYO INNOMINADO 1
- CUENCA DE DRENAJE ARROYO CAÑADA DE LA CALERA

0 80 160 320 480 640 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:10,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

PLANO DE CUENCAS Y PUNTOS DE CAUDAL

Nº PLANO: 3

FORMATO DIN: A3

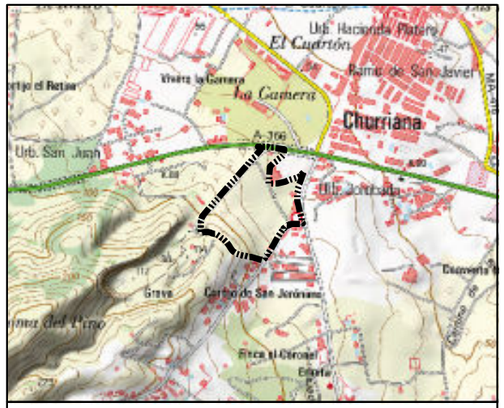
PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

362272 362772 363272 363772 364272 364772 365272

4058490 4057990 4057490 4056990 4056490 4055990



LEYENDA:

- ZONA DE ESTUDIO
- PUNTO CAUDAL INNOMINADO1
- PUNTO CAUDAL CAÑADA DE LA CALERA
- CUENCA DE DRENAJE ARROYO INNOMINADO 1
- CUENCA DE DRENAJE ARROYO CAÑADA DE LA CALERA

0 80 160 320 480 640 Metros

USOS SUELO

- AGRÍCOLA RESIDENCIAL
- CASCO
- COMPLEJO EDUCACIONAL
- CULTIVO HERBÁCEO DISTINTO DE ARROZ
- DISCONTINUO
- ENSANCHE
- FORMACIÓN ARBOLADA DENSA: CONIFERAS
- FORMACIÓN ARBOLADA DENSA: EUCALIPTOS
- FORMACIÓN ARBOLADA DENSA: OTRAS FRONDOSAS
- LÁMINA DE AGUA ARTIFICIAL
- MATORRAL DENSO
- MATORRAL DENSO ARBOLADO: CONIFERAS DENSAS
- MATORRAL DENSO ARBOLADO: CONIFERAS DISPERSAS
- MATORRAL DENSO ARBOLADO: OTRAS MEZCLAS
- MATORRAL DISPERSO ARBOLADO: CONIFERAS. DISPERSO
- MATORRAL DISPERSO ARBOLADO: OTRAS FRONDOSAS
- MATORRAL DISPERSO ARBOLADO: OTRAS MEZCLAS
- MATORRAL DISPERSO CON PASTIZAL
- OLIVAR
- OTROS CULTIVOS LEÑOSOS
- PASTIZAL ARBOLADO: OTRAS FRONDOSAS
- RED VIARIA
- SUELO DESNUDO
- VIAL, APARCAMIENTO O ZONA PEATONAL SIN VEGETACIÓN
- VÍA DE COMUNICACIÓN NO ASFALTADA
- ZONAS MINERAS

REALIZADO POR: sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:10,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO: PLANO DE USOS DEL SUELO

Nº PLANO: 4

FORMATO DIN: A3

PROYECTO:

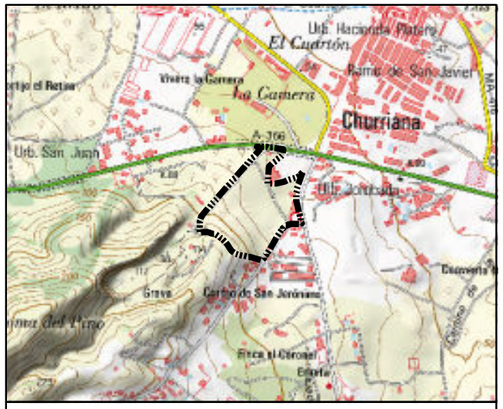
ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

362272 362772 363272 363772 364272 364772 365272

4058490 4057990 4057490 4056990 4056490 4055990

La Gamera
El Retiro
Loma del Rio
Bentabol de los Buenos
El Llano de Cispin
Urbanizacion San Fernando
El Carnescal
Sierra de Churriana
Rojas



LEYENDA:

- ZONA DE ESTUDIO
- PUNTO CAUDAL INNOMINADO1
- PUNTO CAUDAL CAÑADA DE LA CALERA
- CUENCA DE DRENAJE ARROYO INNOMINADO 1
- CUENCA DE DRENAJE ARROYO CAÑADA DE LA CALERA

UMBRAL DE ESCORRENTÍA

P0 mm

- 6
- 12
- 14
- 16
- 20
- 21
- 22
- 24
- 29
- 32

0 80 160 320 480 640 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:10,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO: PLANO UMBRAL DE ESCORRENTÍA

Nº PLANO: 5

FORMATO DIN: A3

PROYECTO:

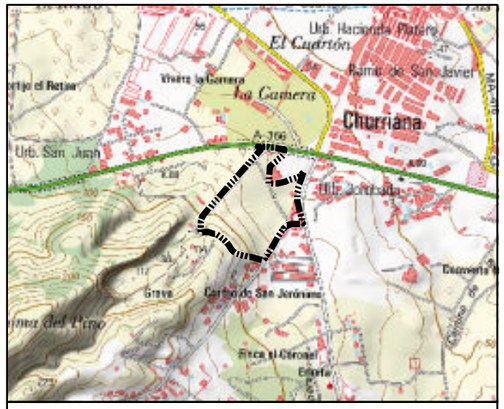
ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

362272 362772 363272 363772 364272 364772 365272

4058490 4057990 4057490 4056990 4056490 4055990

La Gamera
El Retiro
Loma del Rio
Bentabol de los Buenos
El Llano de Crispín
Urbanización San Fernando
El Carnescal
Sierra de Churriana
Rojas



LEYENDA:

- ZONA DE ESTUDIO
- PUNTO CAUDAL INNOMINADO1
- PUNTO CAUDAL CAÑADA DE LA CALERA
- CUENCA DE DRENAJE ARROYO INNOMINADO 1
- CUENCA DE DRENAJE ARROYO CAÑADA DE LA CALERA

COEFICIENTE DE MANNING

MANNING

- 0.03
- 0.035
- 0.04
- 0.045
- 0.07
- 0.1

0 80 160 320 480 640 Metros

REALIZADO POR: sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:10,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO: NUMERO DE MANNING (RUGOSIDAD)

Nº PLANO: 6

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

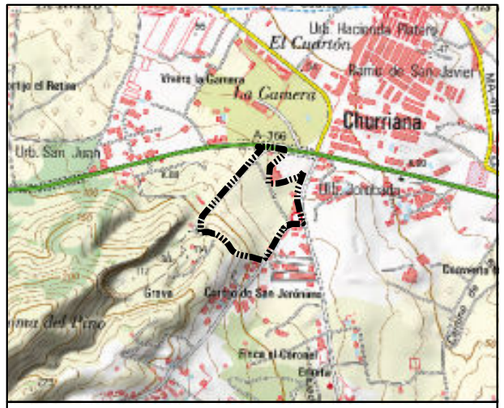
PROYECCIÓN: UTM, ETRS 89 USO 30

364877 365027 365177 365327

4058400 4058250 4058100

980 981 982 988 990 991 992 993 994 995 996 997 998 999 1000

987 987.5 987.6 987.8 988 992 993 994 995 996 997 998 999 1000



LEYENDA:

- ZONA DE ESTUDIO
- PUNTO CAUDAL INNOMINADO1
- PUNTO CAUDAL CAÑADA DE LA CALERA
- ARROYO_INNOMINADO_1
- SECCIONES ARROYO INNOMINADO 1
- ARROYO CAÑADA DE LA CALERA
- SECCIONES ARROYO CAÑADA DE LA CALERA

0 12.5 25 50 75 100 Metros

REALIZADO POR: sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:1,500

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

SITUACIÓN DE LOS PERFILES TRANSVERSALES

Nº PLANO: 7

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

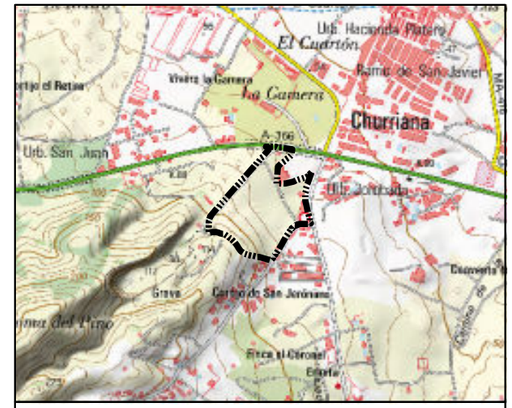
365147

365297

365447

4058220

4058070



LEYENDA:

- PUNTO CAUDAL INNOMINADO1
- ZONA DE ESTUDIO
- ARROYO_INNOMINADO 1
- TR5 INNOMINADO 1
- TR 10 INNOMINADO 1
- SERVIDUMBRE 5m INNOMINADO 1

0 5 10 20 30 40 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:1,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

DELIMITACIÓN DE LÁMINAS
TR 5 Y 10 AÑOS
ARROYO INNOMINADO 1

Nº PLANO: 8.1

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO
DE LA FINCA EL HIGUERAL. SUS-CH.3
CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

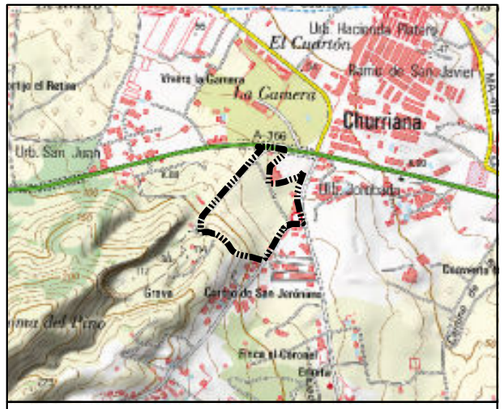
364936

365086

365236

4058350

4058200



LEYENDA:

- PUNTO CAUDAL CAÑADA DE LA CALERA
- ZONA DE ESTUDIO
- ARROYO CAÑADA DE LA CALERA
- TR5 ARROYO CAÑADA DE LA CALERA
- SERVIDUMBRE 5m ARROYO CAÑADA DE LA CALERA
- TR10 ARROYO CAÑADA DE LA CALERA

0 5 10 20 30 40 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:1,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

DELIMITACIÓN DE LÁMINAS
TR 5 Y 10 AÑOS
ARROYO CAÑADA DE LA CALERA

Nº PLANO: 8.2

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO
DE LA FINCA EL HIGUERAL. SUS-CH.3
CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

365142

365292

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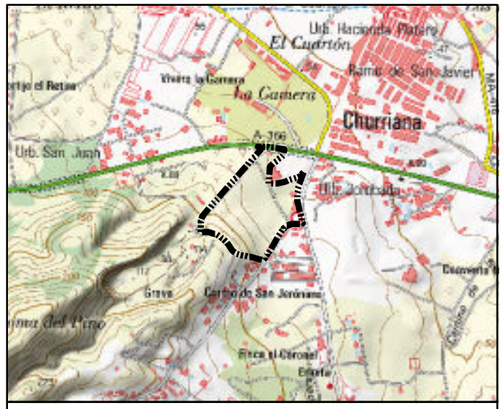
4058070



LEYENDA:

- ZONA DE ESTUDIO
- ARROYO_INNOMINADO 1
- TR 100 INNOMINADO 1
- TR 500 INNOMINADO 1: ZONAS INUNDABLES

0 5 10 20 30 40 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:1,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

DELIMITACIÓN DE LÁMINAS TR 100 Y 500 AÑOS. ZONAS INUNDABLES ARROYO INNOMINADO1

Nº PLANO: 9.1

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30

364936

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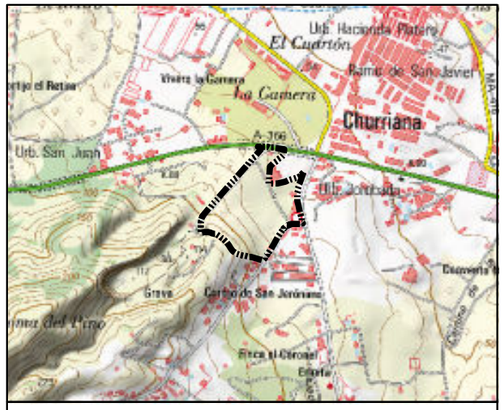

LEYENDA:

- ZONA DE ESTUDIO
- ARROYO CAÑADA DE LA CALERA
- TR100 ARROYO CAÑADA DE LA CALERA
- TR500 ARROYO CAÑADA DE LA CALERA: ZONAS INUNDABLES

0 5 10 20 30 40 Metros

REALIZADO POR:

sfera proyecto ambiental

FECHA: Enero de 2018

ESCALA: 1:1,000

N

AUTOR: SFERA PROYECTO AMBIENTAL S.L.

TÍTULO DEL PLANO:

DELIMITACIÓN DE LÁMINAS TR 100 Y 500 AÑOS. ZONAS INUNDABLES ARROYO CAÑADA DE LA CALERA

Nº PLANO: 9.2

FORMATO DIN: A3

PROYECTO:

ESTUDIO HIDROLÓGICO HIDRÁULICO DE LA FINCA EL HIGUERAL. SUS-CH.3 CHURRIANA T.M. DE MÁLAGA

PROYECCIÓN: UTM, ETRS 89 USO 30