AJUNTAMENT DE VANDELLÒS I L'HOSPITALET DE L'INFANT (BAIX CAMP)

PLA D'ORDENACIÓ URBANÍSTICA MUNICIPAL

VOLUM XII ANNEX JUSTIFICATIU DE ZONES INUNDABLES CONTIGÜES A RIERES AFECTADES EN SÒL URBÀ O URBANITZABLE. (10 volums)

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volum (7/10) ESTUDIS D'INUNDABILITAT DEL BARRANC DE L'ALCANTARILLA GRAN, AL NORD I AIGÜES AVALL DE LA N-340. realitzats per CEDIPSA.

volum (8/10) ESTUDI D'INUNDABILITAT DEL BARRANC DE LA BASSETA AIGÜES AVALL DE LA N-340. realitzat per CEDIPSA.

volum (9/10) ESTUDI D'INUNDABILITAT DEL BARRANC DE CADALOQUES. realitzat per CEDIPSA.

volum (10/10) ESTUDI D'INUNDABILITAT DELS BARRANCS DE MALASET I LLÈRIA.

POUM de Vandellòs i l'Hospitalet de l'Infant

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ESTUDIO DE INUNDABILIDAD DE LOS BARRANCOS DE MALASET Y LLERIA Y SU INFLUENCIA EN LA CENTRAL NUCLEAR VANDELLÒS II

INDICE

1. ÁMBITO DEL ESTUDIO

El presente documento tiene como objeto el desarrollo del cálculo y análisis de la inundabilidad de la zona donde se ubica la Central Nuclear Vandellòs II.

Los objetivos principales son:

- Analizar el riesgo actual frente a inundaciones en la zona, para lo cual se han identificado 2 cauces, con la denominación de Barraco de Malaset y Barranco de Lleria
- Determinar los caudales de cálculo.
- Comprobar la capacidad de evacuación y la zona de inundación en la situación actual de los cauces.
- Definir la zona inundable correspondiente a ambos cauces.

El Barranco de Malaset esta situado en la ladera meridional de las estribaciones montañosas del macizo de Vandellòs, en sus últimos 600 metros se encuentra intervenido por las distintas vías que lo atraviesan, la autovía A-7, la autopista AP-7, la carretera nacional CN-340, la línea de ferrocarril Tarragona-Valencia y un vial de servicio en deshuso paralelo a la línea de ferrocarril. Además a la altura de la central, tras pasar por debajo de la línea de ferrocarril el barranco está entubado a su paso por la parte este de la Central hasta algo menos de 100 metros de la costa.

El barranco del Lleria se encuentra a su vez en la ladera meridional de las estribaciones montañosas del macizo de Vandellòs. Se encuentra profundamente encajonado, estando intervenido en el último kilómetro previo a la desembocadura por diversas obras de drenaje y estructuras de distintas vías que salvan el cauce siendo estás la autovía A-7, la autopista AP-7, la carretera CN-340, la antigua CN-340, el ferrocarril Tarragona-Valencia, un vial en deshuso y el vial de conexión de la las CN Vandellòs I y Vandellòs II.

2. CARACTERÍSTICAS FÍSICAS DE LA CUENCA

2.1. Generalidades

BARRANCO DE MALASET

La cuenca del barranco de Malaset tiene una superficie de 1,55 km^2 una longitud de 3,07 km y un desnivle máximo de 354 m, desaguando al mar por la parte oeste de la central. Se caracteriza por tener un régimen intermitente dónde sólo discurren caudales en fuertes tormentas.

Los últimos 600 metros previos a la desembocadura el cauce se halla intervenido por distintas obras de drenaje, siendo estas:

Tubo armco bajo la antigua carretera nacional 340, de 33,55 metros de longitud, de 3 metros de diámetro.

Tubo armco bajo la antigua CN-340 y canal trapezoidal con solera de hormigón y taludes de escollera entre la autopista y el ferrocarril.

Galería bajo la vía del ferrocarril Tarragona Valencia, la parte inferior de la sección es cuadrada y su lado varía de 2 metros aguas arriba hasta los 2,80 aguas abajo, la parte superior es semicircular de 1 metro de diámetro.

Sección aguas debajo de la galería bajo la vía del ferrocarril

Tubo armco bajo la Central Nuclear, con una longitud aproximada de 310 metros con una sección sensiblemente elíptica de 3.6 metros en su proyección horizontal y de 2,4 metros en la vertical.

Resalto y pozo de sedimentación a la salida de la galería del ferrocarril y a la entrada del tubo bajo la CNVII

Salida del tubo armco bajo la central nuclear.

Salida del tubo armco bajo la central nuclear, desnivel de 13 metros hasta el mar.

Desembocadura del Malaset al mar

BARRANCO DEL LLERIA

La cuenca del barranco del Lleria tiene una superficie de 5,82 km^2 una longitud de 5,84 km y un desnivel máximo de 696 m, desaguando al mar por la parte este de la central. Se caracteriza por tener un régimen intermitente dónde sólo discurren caudales en fuertes tormentas.

El cauce en su último kilómetro y medio previo a la desembocadura se encuentra intervenido por distintas obras de drenaje, siendo estas:

.

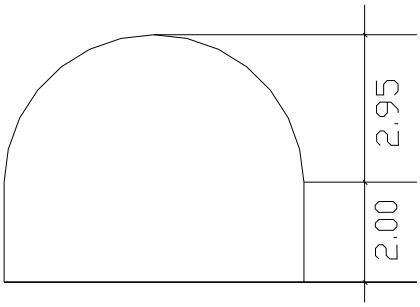
Puente de la autovía A-7, de cinco vanos con una luz total de 139.40 metros de luz total y una altura libre entre el cauce y el tablero de 33.15 metros.

Puente de la A-7 sobre el Barranco del Lleria

Tubería sobre el cauce, de 1,60 m de diámetro con un gálibo de 16.40 metros

Tubería de 1,60 de diámetro sobre el cauce con el puente de la A-7 de fondo

Pontón bajo la autopista AP-7, de 86,10 metros de longitud, de 6m de ancho por 4,95 m de alto tal y como se refleja en el siguiente croquis.



Puente de la carretera nacional CN-340, con una longitud entre estribos de 71metros, de tres vanos y una altura sobre el cauce de 13,95 metros.

Puente de la CN-340 sobre el Barranco del Lleria

Puente de la antigua carretera nacional CN-340, de 46,15 metros de luz, formado por cinco vanos.

Puente de la antigua carretera nacional CN-340 sobre el Lleria

Puente del vial en desuso entre la CN-340 y el ferrocarril, de 5 metros de luz con una altura entre el tablero y el cauce de 10,4 metros.

Puente del vial en desuso.

Pontón del ferrocarril, de 7 metros de luz con una altura entre el tablero y el cauce de 13,45 metros.

Pontón del ferrocarril. Foto realizada desde el puente del vial en desuso

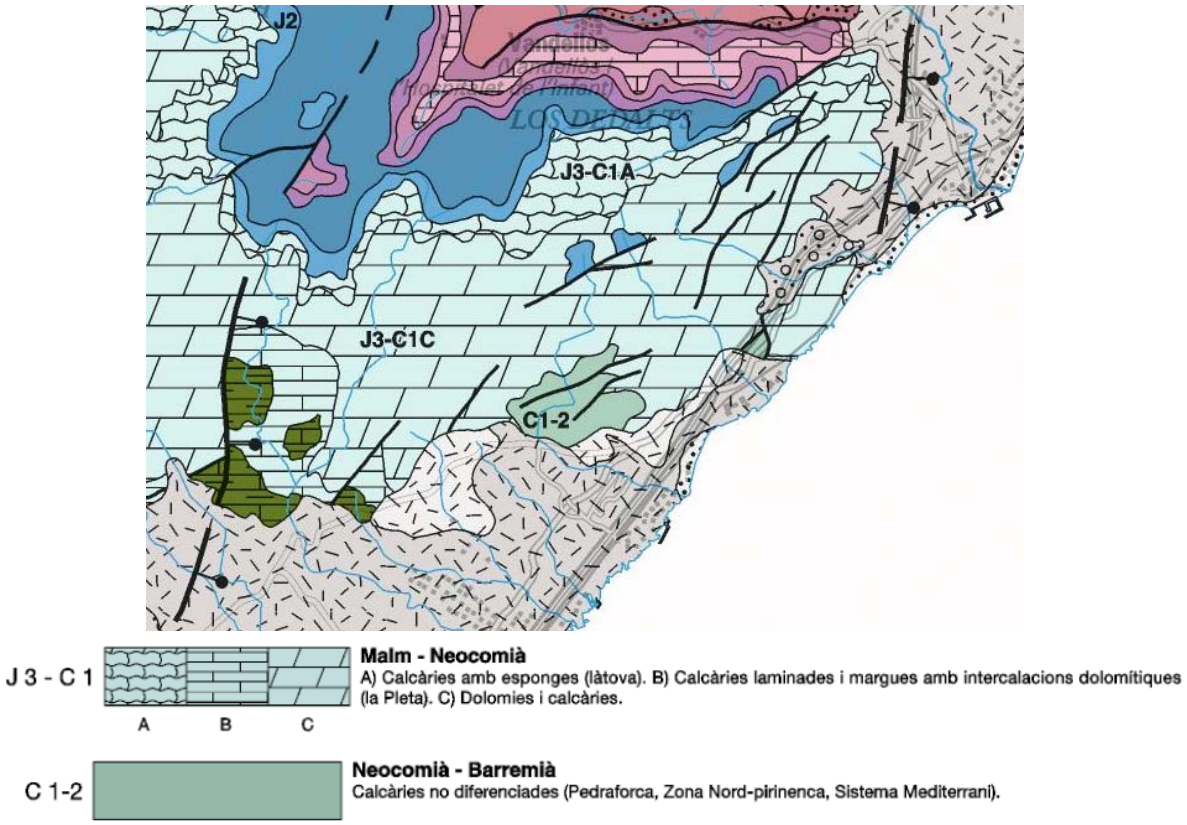
Puente de conexión de Vandellòs I y II, de 7 metros de longitud entre estribos con una altura entre el tablero y el cauce de 10,6 metros.

Puente de conexión de Vandellòs I y II

2.2. Características físicas de la cuenca

Sobre el plano a escala 1:50.000 de Instituto Cartográfico de Cataluña (www.icc.cat) se ha estudiado la geología de las cuencas para, de acuerdo con la instrucción 5.2-IC y la Guía Técnica de ACA "Recomanacions tècniques per als estudis d'inundabilitat d'àmbit local", clasificar las cuencas en función de su comportamiento frente al drenaje (bueno, medio, malo o muy malo).

En la misma línea se ha analizado los usos del suelo de ambas cuencas para, en función del tipo de suelo sobre el que se encuentren dichos usos, poder obtener un umbral de escorrentía global de las cuencas, es decir, obtener la precipitación a partir de la cual se inicia la escorrentía. Esta información sobre los usos del suelo se ha obtenido a través del departamento de Medi Ambient i Habitage de la Generalitat de Catalunya: http://www6.gencat.cat/mediamb/sig/cartografia/habitats.html



Plano geológico de la zona de estudio del Instituto Cartográfico de Cataluña (ICC)

2.3. Cartografía y topografía

El estudio se ha realizado sobre una cartografia 1:1000 existente en la zona más proxima a la central y con una cartografía a escala 1:5000 para el resto de la cuenca, la información se ha complementado con la caracterización mediante un trabajo topográfico consistente en obtener las dimensiones de todas las obras de drenaje y de las estructuras así como las cotas más significativas del cauce y de todos los elementos que intervienen el barranco.

Para la realización del presente estudio se ha empleado la siguiente documentación cartográfica y topográfica:

- Base topográfica 1:5000 del Instituto Cartográfico de Cataluña referenciado al sistema geodésico ED50. las cotas están referidas al nivel medio del mar en Alicante.
- Cartografía topográfica digital 3D del Instituto Cartográfico de Cataluña a escala 1:1000 georreferenciado al sistema de referencia ETRS89 y constituido por el elipsoide GRS80, las cotas están referidas al nivel medio del mar en Alicante.
- Trabajos topograficos para obtener las dimensiones de todas las obras de drenaje y de las estructuras así como las cotas más significativas del cauce y de todos los elementos que intervienen el barranco

3. DETERMINACIÓN DE LOS CAUDALES DE CÁLCULO

3.1. Metodología de cálculo de la escorrentía superficial

El método más usado para estimar caudales máximos de escorrentía superficial a partir de las lluvias es el "método racional". Según éste, el caudal correspondiente a un periodo de retorno se puede obtener mediante la fórmula:

$$Q = \frac{A \cdot I_t \cdot C}{3{,}6} \cdot K$$

Donde:

- Q: caudal buscado en m^3/s
- A: área de la cuenca en km^2
- I: máxima intensidad media de la lluvia en mm/h, durante un tiempo igual al tiempo de concentración Tc de la cuenca, con el mismo periodo de retorno que el caudal buscado
- C: coeficiente de escorrentía (calculado con el umbral de escorrentía y la precipitación máxima diaria) (adimensional)
- K: coeficiente de uniformidad que tiene en cuenta las variaciones en la distribución temporal de la lluvia, y para la que Témez va deducir la siguiente fórmula:

$$K = 1 + \frac{Tc^{1,25}}{Tc^{1,25} + 14}$$

Siendo TC, el tiempo de concentración de la cuenca expresado en horas.

A continuación se describe el cálculo del Coeficiente de Escorrentía y de la Intensidad, al igual que la determinación del coeficiente K.

3.2. Estimación del coeficiente de escorrentía

El coeficiente de escorrentía C (relación entre el caudal máximo y la lluvia máxima sobre la cuenca) dependen de la permeabilidad del suelo, la pendiente y los usos del suelo.

Para la estimación del coeficiente de escorrentía se emplea la fórmula que J.R. Témez adapta del método del US Soil Conservation Service (S.C.S) y que es la utilizada en la instrucción de carreteras 5.2-IC "Drenaje Superficial":

$$C = \frac{\left(P_d - P'_0\right) \cdot \left(P_d + 23 \cdot P'_0\right)}{\left(P_d + 11 \cdot P'_0\right)^2}$$

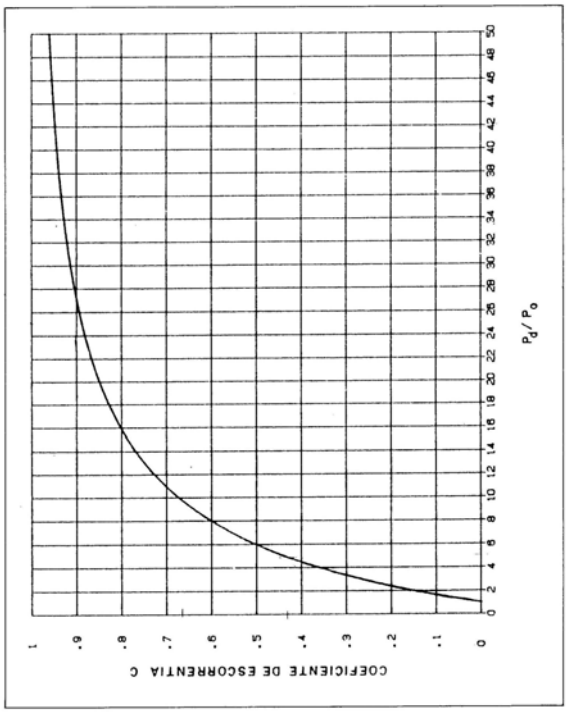
Donde

- C: coeficiente de escorrentía (adimensional)
- Pd: volumen de lluvia máxima en un dia (mm)
- P'0: valor propio de la cuenca denominado "umbral de escorrentía", que representa la cantidad de lluvia necesaria para que se produzca escorrentía (mm)

El valor de P'0 se calcula multiplicando el P0 obtenido de la tabla 2.1 de la Instrucción de Carreteras 5.2.-I.C. por un multiplicador regional.

El umbral de escorrentía, ha de ser corregido según el factor regional, que según la Agencia Catalana del Agua es de r=1,30 del que se tiene que el umbral de escorrentía corregido es:

$$P_0' = r \cdot P_0$$



LEY DEL COEFICIENTE DE ESCORRENTIA Y LA RELACION Pd / Po

CLASIFICACION DE SUELOS A EFECTOS DEL UMBRAL DE ESCORRENTIA

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

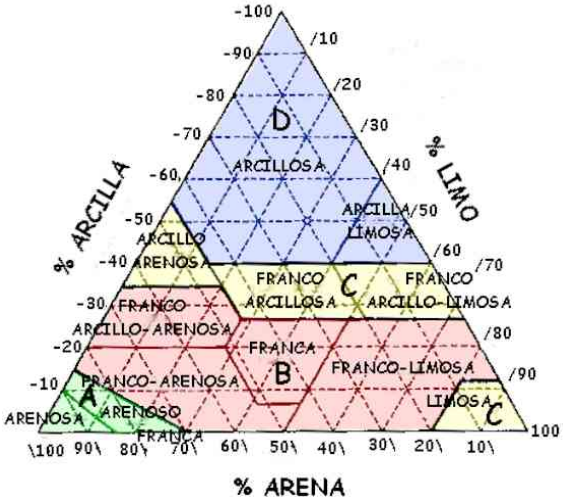
Nota: Los terrenos con nivel freático alto se incluirán en el Grupo D.

3.3. Naturaleza del suelo

Para la determinación del umbral de escorrentía de la cuenca se ha de analizar previamente el comportamiento del suelo respecto a la infiltración, dependiente de su pendiente y su uso. La zonificación de las cuencas, según su naturaleza geológica, se realiza de acuerdo con la relación que figura en la tabla presentada a continuación:

Grupo de suelo	Formación geológica
A	Formaciones de gravas, arenas y arcillas Depósitos aluviales, delatis y de planes costeros
B	Formaciones de calcareas i dolomitas masivas Calcareas triásicas Calcareas devonianes Formaciones de gres, pizarras y esquistos Depósitos detríticos cambro-ordovicians i silurians Formaciones graníticas Depósitos mixtos de las depresiones neógenas y quaternárias Dipósitos detríticos mio-pliocenos
C	Formaciones de conglomerados i gres masivos Conglomerados eocenos Gres eocéno Formaciones de conglomerados, gres y margas Dipósitos detríticos paleógenos Dipósitos detríticos del estefano-permitano y Buntsandstein
D	Formaciones de margas y evaporices Margas y guixos triásicos

Según la instrucción 5.2-IC y la Guía Técnica del ACA antes mencionada, los suelos se clasifican en cuatro grupos, A, B, C, D, en función de su comportamento frente al drenaje (bueno, medio, malo o muy malo). Como se indicó previamente, se han considerado diferentes tipos de suelo de la cuenca que van desde comportamientos buenos (suelo tipo B) a malos o muy malos (suelos tipo C o D).



Para determinar el tipo de suelo a efectos del umbral de escorrentía se emplea el Mapa del Instituto Cartográfico de Cataluña a escala 1:50.000, extrayéndose del mismo un subsuelo formado por dolomías y rocas calizas (ver apartado 2.2), por lo que siendo considerablemente conservadores el tipo de suelo se clasificaría para ambas cuencas dentro del grupo C

3.4. Usos del suelo

Los diferentes usos del suelo en las cuencas se han obtenido a través del departamento de Medi Ambient i Habitage de la Generalitat de Catalunya http://www6.gencat.cat/mediamb/sig/cartografia/habitats.html

A partir de los datos del tipo y uso del suelo y del valor de las pendientes medias encontradas, se obtiene, de la instrucción 5.2-IC, un valor del umbral de escorrentía para cada sector a drenar, el cual se empleará en la expresión de Témez para el coeficiente de escorrentía.

Los valores correspondientes a los umbrales de escorrentía (P0) de cada sector se indicarán en el Anexo 2, Umbrales de Escorrentía.

ESTIMACION INICIAL DEL UMBRAL DE ESCORRENTIA Po (mm)

Uso de la tierra	Pendiente (%)	Características hidrológicas	Grupo de suelo A	B	C	D
Barbecho	≥3	R	15	8	6	4
		N	17	11	8	6
	<3	R/N	20	14	11	8
Cultivos en hilera	≥3	R	23	13	8	6
		N	25	16	11	8
	<3	R/N	28	19	14	11
Cereales de invierno	≥3	R	29	17	10	8
		N	32	19	12	10
	<3	R/N	34	21	14	12
Rotación de cultivos pobres	≥3	R	26	15	9	6
		N	28	17	11	8
	<3	R/N	30	19	13	10
Rotación de cultivos densos	≥3	R	37	20	12	9
		N	42	23	14	11
	<3	R/N	47	25	16	13
Praderas	≥3	Pobre	24	14	8	6
		Media	53	23	14	9
		Buena	*	33	18	13
		Muy buena	*	41	22	15
	<3	Pobre	58	25	12	7
		Media	*	35	17	10
		Buena	*	*	22	14
		Muy buena	*	*	25	16
Plantaciones regulares de aprovechamiento forestal	≥3	Pobre	62	26	15	10
		Media	*	34	19	14
		Buena	*	42	22	15
	<3	Pobre	*	34	19	14
		Media	*	42	22	15
		Buena	*	50	25	16
Masas forestales (bosques, Monte bajo, etc.)		Muy clara	40	17	8	5
		Clara	60	24	14	10
		Media	*	34	22	16
		Espesa	*	47	31	23
		Muy espesa	*	65	43	33

Notas: 1. N: denota cultivo según las curvas de nivel
R: denota cultivo según la línea de máxima pendiente.
2. *: denota que esa parte de cuenca debe considerarse inexistente a efectos de cálculo de caudales de avenida
3. Las zonas abancaladas se incluirán entre las de pendiente menor del 3 por 100

Tipo de terreno	Pendiente (%)	Umbral de escorrentía (mm)
Rocas permeables	≥3	3
	<3	5
Rocas impermeables	≥3	2
	<3	4
Firmes granulares sin pavimento		2
Adoquinados		1.5
Pavimentos bituminosos o de hormigón		1

Nota: N: denota cultivo según las curvas de nivel
R: denota cultivo según la línea de máxima pendiente

3.5. Estimación de la intensidad de lluvia de diseño

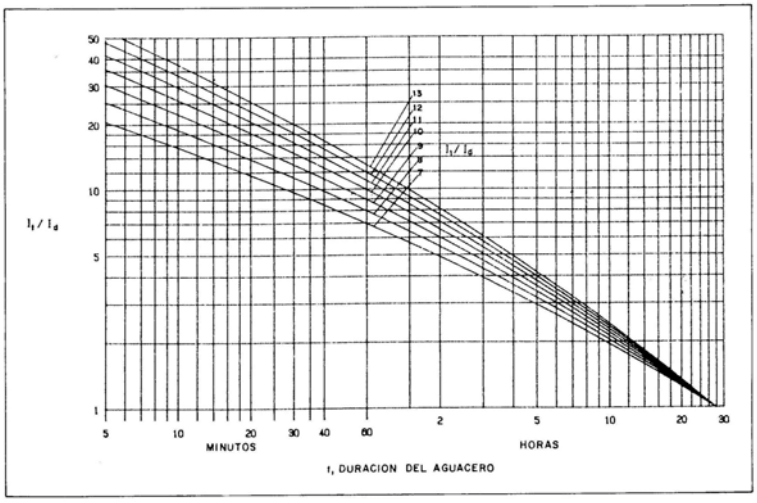
Para obtener la intensidad de lluvia correspondiente a una lluvia de una duración determinada, se emplea la fórmula de la curva IDF propuesta por Témez:

$$\left(I_t / I_d\right) = \left(I_1 / I_d\right)^{\frac{28^{0,1} - t^{0,1}}{0,4}}$$

Donde:

- It: intensidad de precipitación para una duración efectiva de lluvia de t horas (para el periodo de retorno considerado) (mm/h)
- Id: Pd / 24: intensidad media máxima diaria (Pd: precipitación total máxima en un día -obtenida del mapa de isomáximas-) (mm/h)

- I1: intensidad de precipitación para una duración efectiva de lluvia de una hora (mm/h)
- t: duración efectiva de la lluvia para la cual se va a calcular la intensidad (horas)



LEYES DE INTENSIDAD – DURACION DE AGUACERO

La relación I1/Id es conocida geograficamente y su valor se obtiene del mapa de la figura 2.2 de la instrucción 5.2-IC. Para este caso se ha considerado I1/Id = 11

A partir de los datos conocidos de Pd se pueden obtener diferentes curvas IDF para los diferentes periodos de retorno y a partir de ellas deducir la intensidad media máxima It para precipitaciones de diferente duración.

Como se verá más adelante, para la utilización del mètodo racional la duración t de la precipitación a utilizar será igual al tiempo de concentración del área a drenar.

A continuación se determinan los coeficientes utilizados para el cálculo de la intensidad de la lluvia de diseño.

3.6. Estimación de los tiempos de concentración TC

El tiempo de concentración T_C se calculará con la fórmula propuesta por Témez según los casos siguientes:

a). Para cuencas rurales con un grado de urbanización no superior al 4% del área de la cuenca:

$$Tc = 0{,}3 \cdot \left(\frac{L}{J^{1/4}} \right)^{0{,}76}$$

b). Para cuencas urbanizadas con un grado de urbanización superior al 4% del área de la cuenca y con urbanizaciones independientes que tengan red de aguas prluviales no unificado o completo:

$$Tc = \frac{1}{1+\sqrt{\mu(2-\mu)}} 0{,}3 \cdot \left(\frac{L}{J^{1/4}} \right)^{0{,}76}$$

c). Para cuencas urbanas con un grado de urbanización superior al 4% del área de la cuenca con red de aguas pluviales completa y/o curso principal canalizado, impermeable y de pequeña rugosidad:

$$Tc = \frac{1}{1+3\sqrt{\mu(2-\mu)}}\,0{,}3\cdot\left(\frac{L}{J^{1/4}}\right)^{0{,}76}$$

Donde

Tc: tiempo de concentración (h)
L: longitud del área a drenar (km)
J: pendiente media (m/m)
μ: grado de urbanización de la cuenca (Km^2/km^2)

El cálculo de los tiempos de concentración, que como se observa depende de las características físicas de la zona a drenar, se incluye en el Anexo 3. Caudales.

3.7. Estimación de la intensidad de lluvia media máxima diaria (Id)

La precipitación máxima en 24 horas para los diferentes periodos de retorno considerados se ha obtenido tomando el valor valor obtenido de los mapas de precipitación máxima diaria esperada para Cataluña del Servicio Meterológico de Cataluña (SMC) y del documento "Máximas Lluvias en la España Peninsular"

T (años)	Pt (mm/dia)		
	MaxPLuwin	SMC	Valor adoptado
5	106	127	127
10	127	154	154
25	161	188	188
50	187	212	212
100	216	236	236
250	255	272	272
500	288	296	296
1000	321	318	321

Después de la obtención de la lluvia máxima diaria Pd, es posible determinar el valor del coeficiente de escorrentía para las cuencas del ámbito de estudio (mediante la fórmula desarrollada por Témez), ya que se dispone del valor del umbral de escorrentía. Como se ha indicado anteriormente, los valores correspondientes a los umbrales de escorrentía (P0) para los sectores delimitados se presentan en el Anexo 1.

3.8. Cuadro resumen de caudales

Substituyendo los valores de las diferentes variables en la fórmula del mètodo racional, se obtienen los caudales de escorrentía para los diferentes periodos de retorno. Estos caudales quedan reflejados en las tablas incluidas en el Anejo 4 conjuntamente con las características requeridas para el cálculo de caudales de los sectores drenados.

	Caudales (m3/s) correspondientes al período de retorno indicado			
	10 años	**100 años**	**500 años**	**1000 años**
Malaset	21,51	39,87	53,81	59,67
Lleria	37,64	74,65	106,56	1067,37

Cabe destacar que la tabla anterior anterior presenta los caudales correspondientes a la totalidad del área de cada cuenca asociada hasta su desembocadura en el mar.

Además del estudio hidrológico realizado en este Informe se han considerado para el modelo matemático el caudal recogido como Avenida Máxima Probable en el Estudio de Seguridad de la Central Nuclear Vandellòs II, siendo este de 38,34 m^3/s.para el Barranco de Malaset y de 123,50 m^3/s para el Barranco del Lleria.

4. MODELO HIDRÁULICO HEC-RAS

4.1. Metodología

La hipótesis aceptada habitualmente para la determinación del régimen de calados en un cauce y su llanura de inundación es la de que el flujo en los mismos es unidimensional y se puede estimar el nivel de agua suponiendo régimen permanente para el caudal de cálculo. Esta hipótesis es evidentemente precisa cuando se puede suponer que el río permanece dentro del cauce y no desborda hacia llanuras de inundación, desbordamiento que conduce a incrementar extraordinariamente la laminación. Por otra parte su aplicación tiene la ventaja de que permite establecer una relación biunívoca entre el nivel y el caudal y por consiguiente entre este último y los límites de las zonas inundadas. Ello facilita la gestión posterior de las zonas inundables y el tratamiento de los niveles de avenida y superficies afectadas. La problemática planteada por el hecho de que el flujo en la llanura de inundación no contribuye realmente al transporte hidráulico puede abordarse sin necesidad de dejar de considerar régimen permanente.

El modelo más tradicional que cumple las condiciones anteriores, añadiendo la posibilidad de considerar coeficiente de rugosidad variable a lo largo de la sección transversal y otra gran cantidad de aspectos que influyen en el régimen, es el HEC-RAS. Este modelo dispone la particularidad de que, aunque el cálculo del campo de velocidades es unidimensional, sí que admite la inclusión de zonas de almacenamiento en el cauce que permiten determinar un efecto de laminación, por lo que se le ha denominado modelo cuasi-2D.

De acuerdo con lo expuesto, la determinación de la altura de la lámina de agua en el cauce asociada a cada caudal se ha realizado a partir del modelo matemático HEC-RAS (Versión 4.1), Water Surface Profiles, River Analysis System. Las principales hipótesis asumidas en el modelo son las siguientes:

- Flujo estacionario; por tanto no hay variación del calado o la velocidad con el tiempo.
- Flujo gradualmente variado. Esto conduce a una distribución hidrostática de presiones.
- Flujo unidimensional: la única componente de la velocidad es en la dirección del flujo, aunque, como hemos indicado anteriormente, la aplicación permite crear efectos de laminación y almacenamiento.
- Las pendientes deben ser pequeñas, menores de 1/10; de manera que cos $\theta \approx 1$ y el calado vertical es representativo de la altura de presión.
- Los contornos son rígidos, no admitiéndose erosión o sedimentación en el cauce.

El procedimiento de cálculo está basado en la resolución de la ecuación de la conservación de la energía, con pérdidas de fricción evaluadas por la fórmula de Manning, en pasos sucesivos, procedimiento conocido como Standard Step Method.

La fórmula utilizada para el cálculo de las pérdidas de fricción (fórmula de Manning) es la siguiente:

$$I = \frac{n^2 \, v^2}{R_H^{\frac{4}{3}}}$$

donde:

I= Pendiente de la línea de energía, en tanto por uno

n= Coeficiente de rugosidad de Manning

v= Velocidad, en m/s

R_H= Radio hidráulico, en m

4.2. Descripción de los modelos

Generalidades

Se han realizado los modelos de ambos Barrancos con las cartografías disponibles a escala 1:1000 en la zona cercana a la central y 1:5000 en la zona aguas arriba de la autopista para avenidas con periodo de retorno de 10, 100, 500 y 1000 años así como para un caudal de 38 m3/s correspondientes a un estudio previo que lo tasa como la Avenida Máxima Probable.

Se han considerado todos aquellos elementos que modifican el cauce natural como muros de escollera o la solera de hormigón situado entre la autopista y el ferrocarril, así como todas las obras de drenaje y estructuras ubicadas sobre el cauce, descritas en el apartado 2.1

Los coeficientes de Manning utilizados tanto para las márgenes como para el cauce es de 0.040 dada la similitud del estado de ambos, para el canal del Malaset y para todas las obras de drenaje se ha adoptado un coeficiente de 0.015 propio del hormigón, para los dos tubos armco del Barranco de Malaset se ha estimado un coeficiente de 0.024 ya que en las ranuras de dichos tubos se produce sedimentación del propio cauce.

Se han adoptado coeficientes de expansión y contracción de 0.3 y 0.1 respectivamente excepto para las secciones anteriores y posteriores a las obras de drenaje donde se ha elevado estos coeficientes a 0.5 y 0.3.

Barranco de Malaset. Trasvase de caudal a través de la autopista AP-7

El flujo natural de las aguas se ve afectado en primer lugar por el cajón bajo la autopista AP-7, este cajón de 42,77 metros de longitud y sección de 2.5 m x 2 m reducida por dos tuberías de 300 mm de diámetro tiene insuficiente capacidad de desagüe para todos los caudales estudiados, por lo que provoca un remanso que hace subir la cota del agua hasta alcanzar la calzada, pudiendo, llegado el caso, pasar por encima de esta y reintegrarse al cauce aguas abajo de la autopista.

La cota que alcanza el agua en el cauce a la entrada de la ODT para los distintos caudales de cálculo tal y como se observa en el anejo 5 es:

Cota de la lámina de agua aguas arriba de la AP-7 según el periodo de retorno				
10 años	**AMP**	**100 años**	**500 años**	**1000 años**
35,57	35,59	35,54	35,71	35,76

Los caudales que es capaz de evacuar el cajón para estas alturas a la entrada de la obra son:

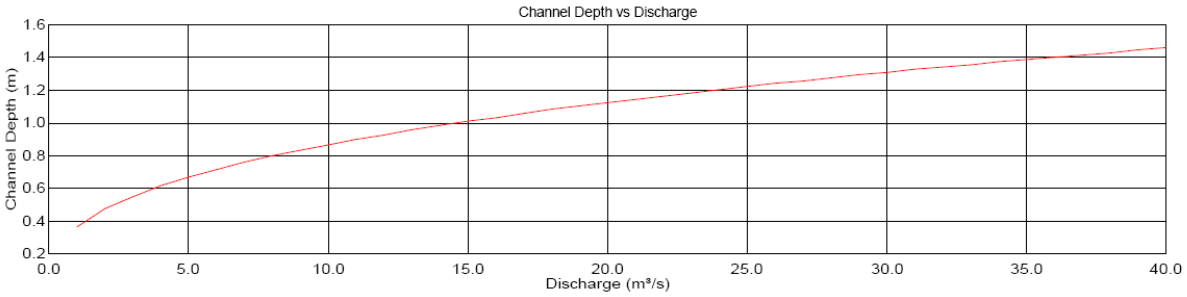
Periodo de retorno	**10 años**	**AMP**	**100 años**	**500 años**	**1000 años**
Caudal de cálculo (m3/s)	21,51	38,34	39,87	53,81	59,67
Caudal que pasa por la ODT (m3/s)	21,03	21,19	25,16	25,24	25,04
Diferencia (m3/s)	0,48	17,15	14,71	28,57	34,63

Por otro lado la cuneta de la autopista situada justo encima de la entrada del cajón tiene una pendiente longitudinal del 4% en dirección Valencia atravesando en desmonte la divisoria de la cuenca, por lo que, el caudal que discurra por ella pasaría a la cuenca colindante sin volver al cauce.

Se procede a calcular el calado alzanzado en la cuneta para evacuar los caudales que no pasan por el cajón de la autopista. La cuneta es de sección triangular con taludes 3H:1V

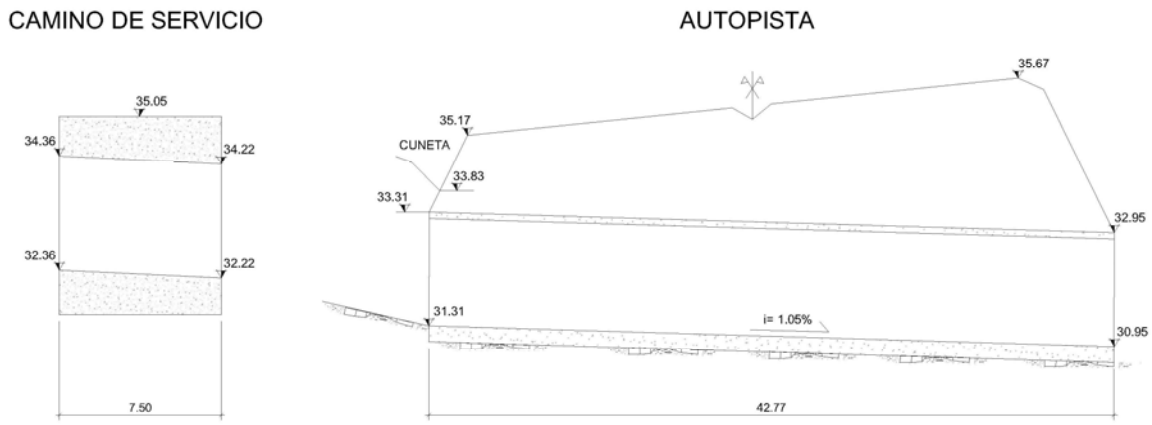
Constant Data		
Mannings Coefficient	0.025	
Channel Slope	0.040000	m/m
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V

Input Data			
	Minimum	Maximum	Increment
Discharge	1.00	40.00	1.00 m³/s



Periodo de retorno	10 años	AMP	100 años	500 años	1000 años
Caudal que ha de evacuar la cuneta (m3/s)	0,48	17,15	14,71	28,57	34,63
Calado alzanzado en la cuneta para ese caudal (m)	0,28	1,06	1,00	1,29	1,38
Cota correspondiente a ese calado (msnm)	34,11	34,89	34,83	35,12	35,21

Por tanto, tal y como se aprecia en el siguiente croquis, para ninguno de los caudales estudiados el agua sobrepasará la autopista reintegrándose al cauce sino que la cuneta transportará todo ese caudal fuera de la cuenca. Por lo que para el estudio de la inundación se ha adoptado en la sección aguas abajo de la autopista exclusivamente el caudal que pasa por el cajón.



Hay que tener en cuenta que estos cálculos son conservadores ya que el caudal que pasaría por el cajón sería algo menor dado que para el cálculo de capacidad del cajón se ha supuesto el nivel a la entrada correspondiente al que alcanzaría el agua si esta se embalsase hasta superar la autopista, pero este nivel nunca se alcanzará ya que la cuneta empieza a transportar agua una vez que la lámina de agua alcance su solera, por lo que la cota de la lámina de agua realmente se encontrará entre la solera de la cuneta y la calzada disminuyendo por tanto la capacidad hidráulica del cajón.

5. RESULTADOS

5.1. BARRANCO DE MALASET

Con todo lo anterior se observa que para todos los caudales estudiados la inundación queda dentro del barranco, pasando todo el caudal por el tubo armco, por lo que, en ninguno de los casos estudiados, se afectará a la Central Nuclear principalmente por la colaboración de la autopista en la evacuación de parte del flujo hacia la cuenca vecina tal y como puede evidenciarse en los resultados de la modelización efectuada en Hec Ras, incluidos en el Anejo 5.

Mancha de inundación correspondiente al Barranco de Malaset

5.2. BARRANCO DEL LLERIA

En el Anejo 6 “Modelo HEC-RAS. Barranco del Lleria” se aprecia como todos los caudales de cálculo se quedan contenidos sobradamente dentro del propio Barranco, se puede observar como es el pontón de la autopista AP-7 el que tiene menor capacidad hidráulica provocando un elevación de la lámina de agua a su entrada pero estando esta muy por debajo de la calzada por lo que incluso el caudal correspondiente al periodo de retorno de 1000 años no causaría ninguna incidencia ni en la Central Nuclear ni en sus alrededores.

Mancha de inundación correspondiente al Barranco del Lleria

6. ESTIMACIÓN DEL CAUDAL A PARTIR DEL CUAL PUEDE VERSE AFECTADA LA CENTRAL NUCLEAR.

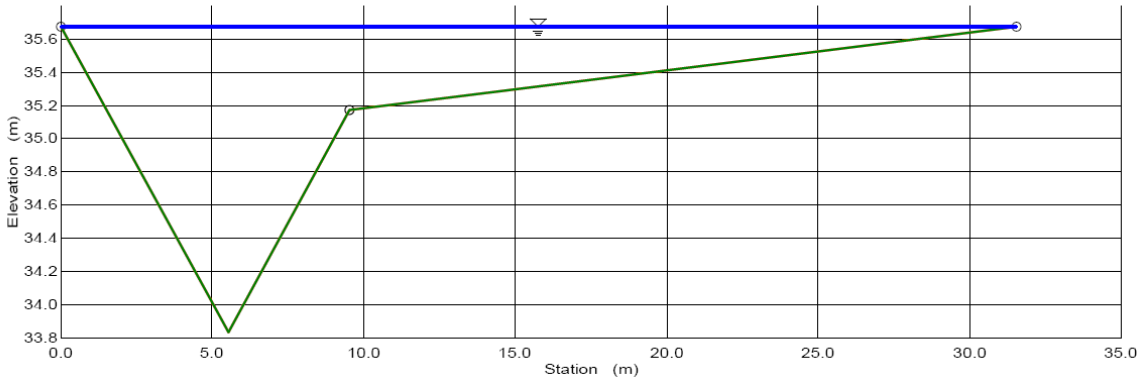
6.1. BARRANCO DE MALASET

En el modelo realizado se aprecia lo significativa que resulta la autopista en el flujo que llega a las inmediaciones de la Central, evacuando parte del caudal fuera de la cuenca de estudio. Si el caudal aumentase de forma que sobrepasara la autopista entonces las obras situadas aguas abajo de esta no tendrían capacidad provocando, en el caso del tubo armco bajo la central, que parte del flujo no entrase en el mismo y empezase a discurrir por el emplazamiento.

En el anejo 7 “Modelo HEC-RAS Caudal de afección del Malaset” se puede ver que es necesario un caudal a la entrada del tubo armco superior a 28,7 m^3/s para que el tubo armco no tenga capacidad a la entrada siendo este el valor para el que empezaría a circular agua por el emplazamiento.

Finalmente para conocer el caudal que debe discurrir por el cauce para que empiece a circular caudal por el emplazamiento debemos cuantificar el caudal máximo que puede evacuar la autopista. Tal y como se comenta en el punto anterior, a partir de la cota 35,67 el agua la sobrepasaría reintegrándose al cauce, por tanto el máximo caudal que la autopista puede transportar se dará cuando el agua alcance esta cota, siendo éste de 87,5 m^3/s. Los cálculos se han efectuado suponiendo un coeficiente de Manning de 0.025 en la cuneta y de 0.018 en la calzada.

Section Data		
Wtd. Mannings Coefficient	0.018	
Channel Slope	0.030000	m/m
Water Surface Elevation	35.67	m
Discharge	87.53	m^3/s



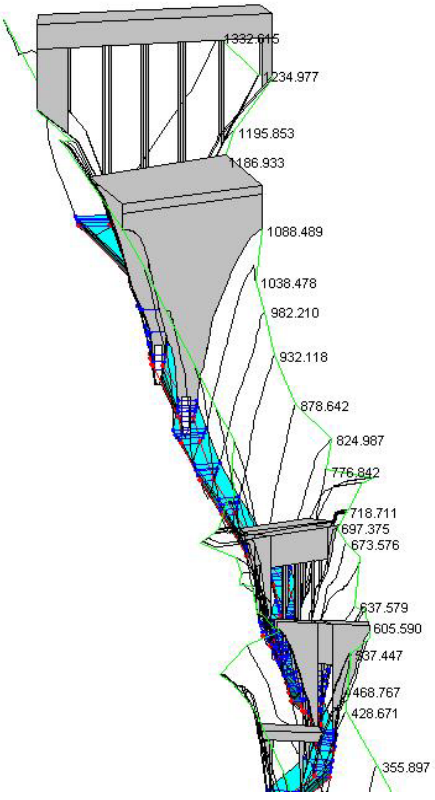
Es decir la autopista puede evacuar hasta 87,5 m^3/s, por lo tanto la lluvia en la cuenca del Malaset tendría que ser tal que circulase un caudal superior a 116 m^3/s para que llegara a la entrada del tubo armco un caudal mayor a los 28,5 m^3/s , que es el límite a partir del cual el agua podría alcanzar el emplazamiento.

Con todo ello se estima que es necesario un caudal de casi dos veces el correspondiente a un periodo de retorno de 1000 años para que la avenida empezara a discurrir por el interior del emplazamiento.

6.2. BARRANCO DEL LLERIA

A la vista de los resultados del modelo realizado para este barranco, se puede apreciar que incluso el caudal correspondiente a un periodo de retorno de 1000 años está muy lejos de sobrepasar los límites del barranco, y que, aún suponiendo un caudal muy superior al estudiado, la autopista laminaría ese caudal, actuando como presa de materiales sueltos con el portón haciendo las veces de aliviadero de fondo.

Incluso sin tener en cuenta el efecto laminador de la autopista los caudales que sobrepasen los límites que marcan el barranco circularían por la zona que se encuentra entre el barranco y la central con una componente de flujo muy marcada hacia el mar lo que limitaría enormemente la escorrentía que pudiese llegar a la Central Nuclear



ANEJO 1: CÁLCULO DEL UMBRAL DE ESCORRENTÍA

DETERMINACIÓN DE LOS CAUDALES DE LAS CUENCAS (Instrucción 5.2-IC)
Cuenca Malaset

DETERMINACIÓN DEL UMBRAL DE ESCORRENTIA Po (mm)

ACA
Coef correct = 1,30 Po (inicial) = 13,9 **P'o = 18** CONCA CT1

uso del suelo	superf (%)	pend (%)	caract hidrol	Po (mm) A	B	C	D	grupo de suelo (%) A	B	C	D	Po (mm)
Barbecho		≥ 3	R	15	8	6	4					
		≥ 3	N	17	11	8	6					
		< 3	R/N	20	14	11	8					
Cultivos en hilera		≥ 3	R	23	16	8	6					
		≥ 3	N	25	16	11	8					
		< 3	R/N	28	19	14	11					
Cereales de invierno		≥ 3	R	29	17	10	8					
		≥ 3	N	32	19	12	10					
		< 3	R/N	34	21	14	12					
Rotación cultivos pobres	0,79	≥ 3	R	26	15	9	6					
		≥ 3	N	28	17	11	8			100		0,1
		< 3	R/N	30	19	13	10					
Rotación cultivos densos	26,79	≥ 3	R	37	20	12	9					
		≥ 3	N	42	23	14	11			100		3,8
		< 3	R/N	47	25	16	13					
Praderas	0,83	≥ 3	pobre	24	14	8	6					
			media	53	23	14	9			100		0,1
			buena	69	33	18	13					
			m. buena	82	41	22	15					
		< 3	pobre	58	25	12	7					
			media	82	35	17	10					
			buena	122	54	22	14					
			m. buena	244	101	25	16					
Plantaciones regulares de aprovechamiento forestal		≥ 3	pobre	62	26	15	10					
			media	80	34	19	14					
			buena	101	42	22	15					
		< 3	pobre	75	34	19	14					
			media	97	42	22	15					
			buena	150	50	25	16					
Masas forestales (bosques, matorrales, etc.)	71,13		m. clara	40	17	8	5					
			clara	60	24	14	10			100		10,0
			media	75	34	22	16					
			espesa	89	47	31	23					
			m. esp.	122	65	43	33					
tipos de suelo	**superf (%)**	**pend (%)**										**Po (mm)**
Rocas permeables		≥ 3					3					
		< 3					5					
Rocas impermeables		≥ 3					2					
		< 3					4					
Firmes granulares (no pavimento)							2					
Empedrados							1,5					
Pavimentos (Bitum/Hormigón)	0,46						1					0,0
	100,00											13,9

(N = cultivo según las curvas de nivel, R = cultivo según la línea de máxima pendiente)

DETERMINACIÓN DE LOS CAUDALES DE LAS CUENCAS (Instrucción 5.2-IC)
Cuenca Lleria

DETERMINACIÓN DEL UMBRAL DE ESCORRENTIA Po (mm)

ACA
Coef correct = 1,30 Po (inicial) = 10,8 **P'o = 14** CONCA CT2

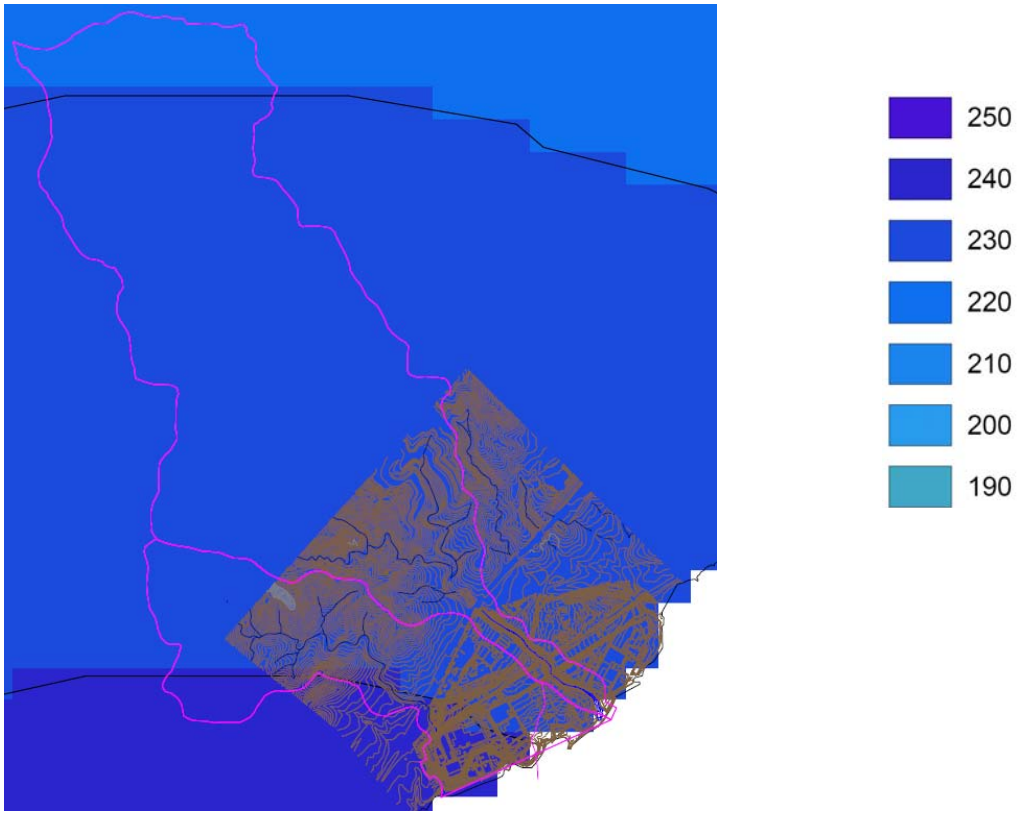
uso del suelo	superf (%)	pend (%)	caract hidrol	Po (mm) A	B	C	D	grupo de suelo (%) A	B	C	D	Po (mm)
Barbecho	74,30	≥ 3	R	15	8	6	4			100		5,9
		≥ 3	N	17	11	8	6					
		< 3	R/N	20	14	11	8					
Cultivos en hilera		≥ 3	R	23	16	8	6					
		≥ 3	N	25	16	11	8					
		< 3	R/N	28	19	14	11					
Cereales de invierno		≥ 3	R	29	17	10	8					
		≥ 3	N	32	19	12	10					
		< 3	R/N	34	21	14	12					
Rotación cultivos pobres		≥ 3	R	26	15	9	6					
		≥ 3	N	28	17	11	8					
		< 3	R/N	30	19	13	10					
Rotación cultivos densos		≥ 3	R	37	20	12	9					
		≥ 3	N	42	23	14	11					
		< 3	R/N	47	25	16	13					
Praderas	2,52	≥ 3	pobre	24	14	8	6			100		0,4
			media	53	23	14	9					
			buena	69	33	18	13					
			m. buena	82	41	22	15					
		< 3	pobre	58	25	12	7					
			media	82	35	17	10					
			buena	122	54	22	14					
			m. buena	244	101	25	16					
Plantaciones regulares de aprovechamiento forestal	0,10	≥ 3	pobre	62	26	15	10			100		0,0
			media	80	34	19	14					
			buena	101	42	22	15					
		< 3	pobre	75	34	19	14					
			media	97	42	22	15					
			buena	150	50	25	16					
Masas forestales (bosques, matorrales, etc.)	19,83		m. clara	40	17	8	5			100		4,4
			clara	60	24	14	10					
			media	75	34	22	16					
			espesa	89	47	31	23					
			m. esp.	122	65	43	33					
tipos de suelo	**superf (%)**	**pend (%)**										**Po (mm)**
Rocas permeables	2,00	≥ 3					3					0,1
		< 3					5					
Rocas impermeables		≥ 3					2					
		< 3					4					
Firmes granulares (no pavimento)							2					
Empedrados							1,5					
Pavimentos (Bitum/Hormigón)	1,25						1					0,0
	100,00											10,8

(N = cultivo según las curvas de nivel, R = cultivo según la línea de máxima pendiente)

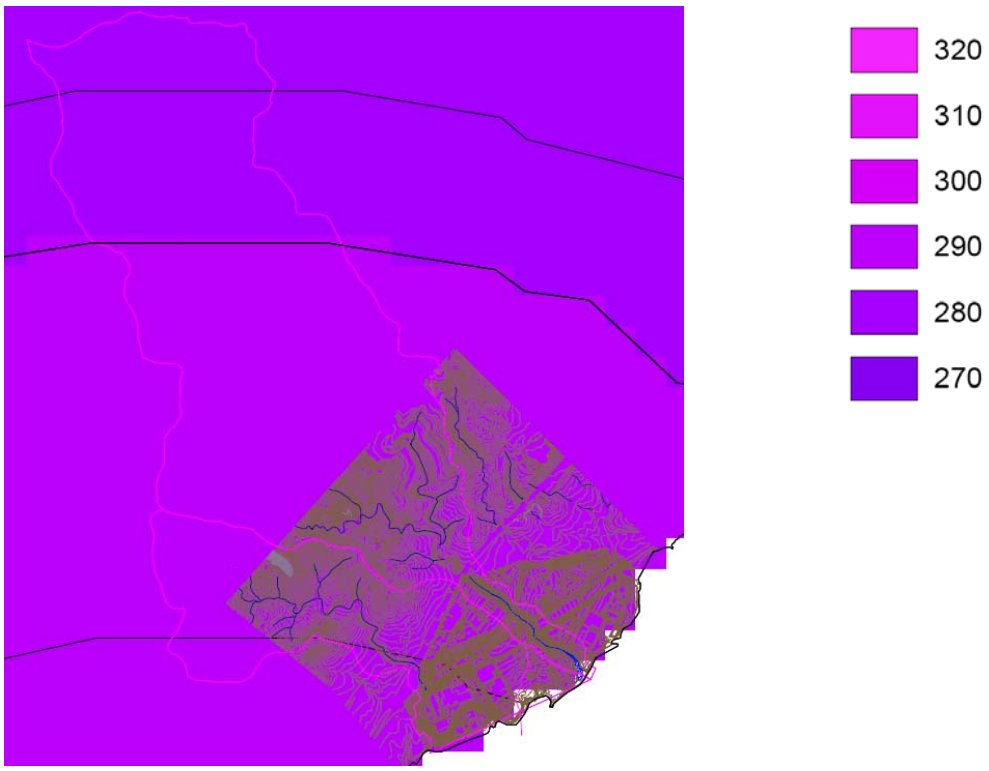
ANEJO 2: INTENSIDADES DE LLUVIA SEGÚN EL SMC PARA CADA PERIODO DE RETORNO

Periodo de retorno: 10 años → Pd= 154 mm/día

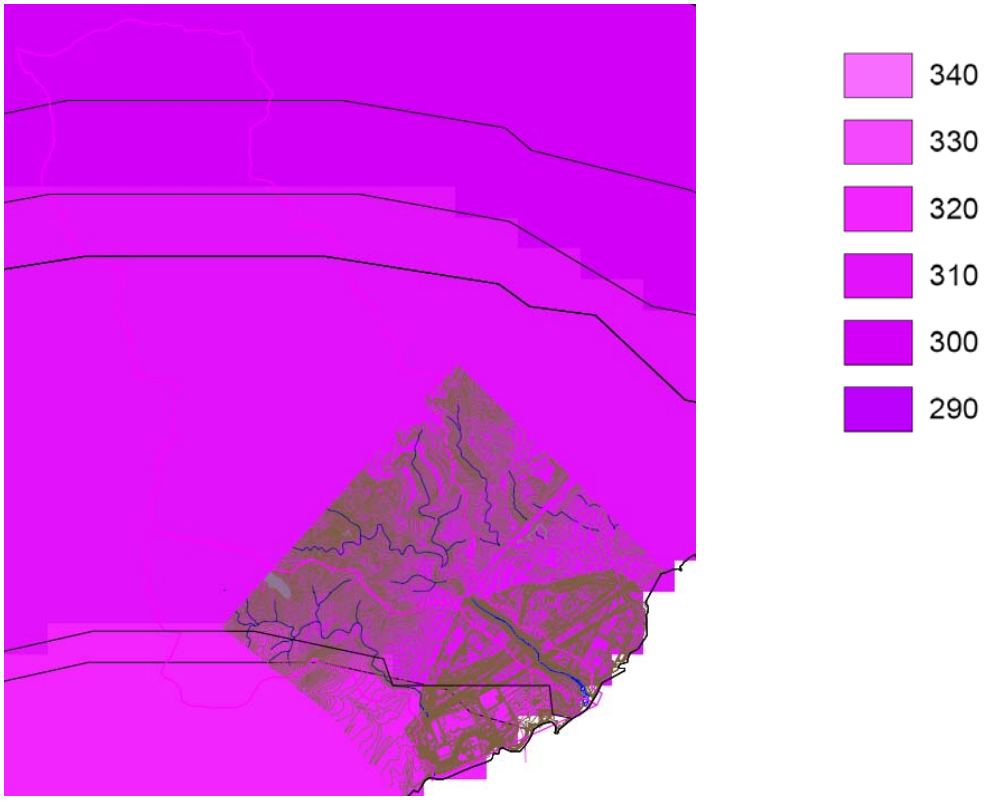
Periodo de retorno: 100 años → Pd= 236 mm/día



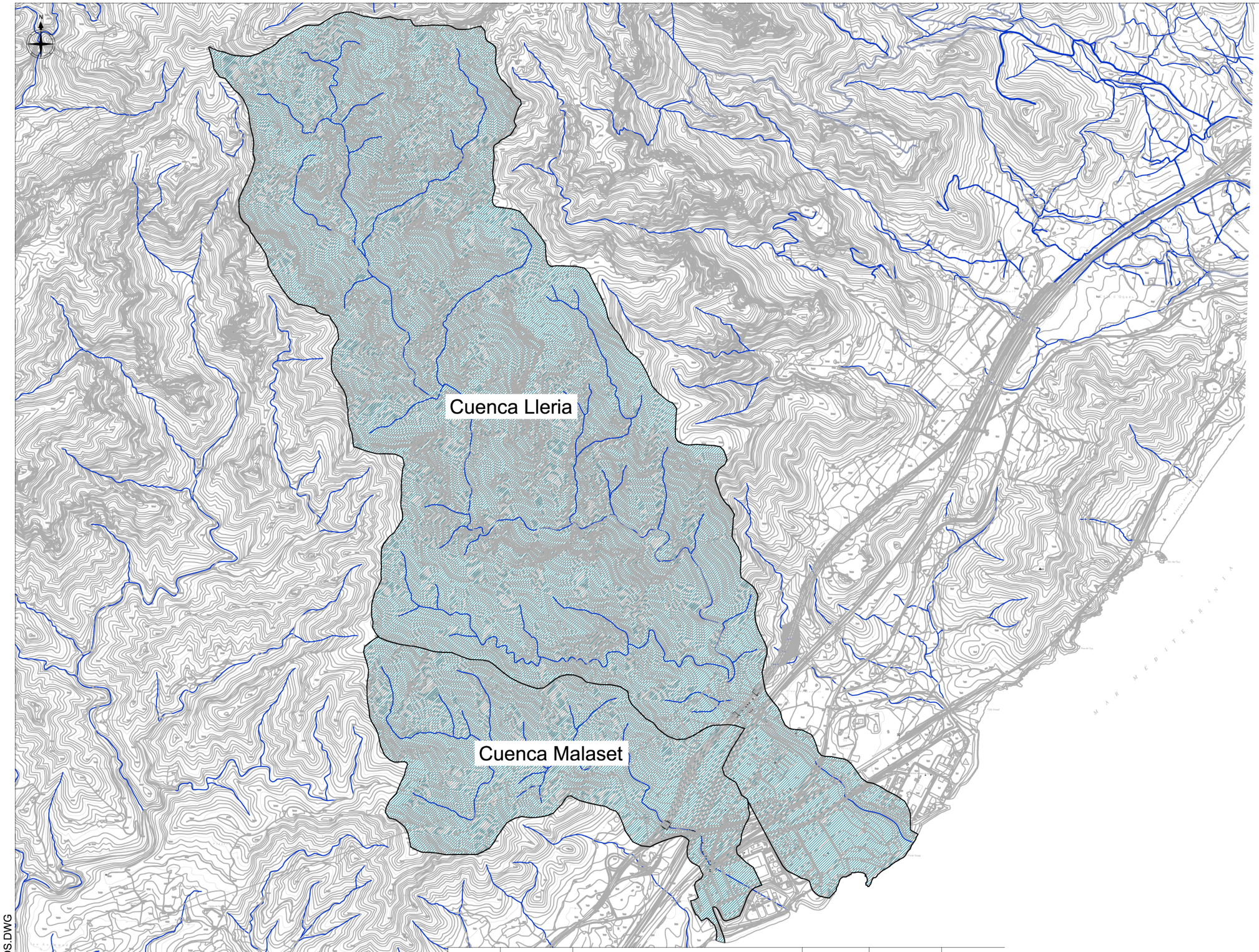
Periodo de retorno: 500 años → Pd= 296 mm/día



Periodo de retorno: 1000 años → Pd= 318 mm/día



ANEJO 3: PLANOS DE CUENCAS



CUENCAS VANDELLÓS.DWG

EDICION	FECHA	DESCRIPCIÓN	REALIZADO	VERIFICADO	APROBADO
0	JULIO 2011	EDICIÓN INICIAL	MLG	PC	ICM

Cuencas Vandellós

ESCALAS:	PLANO N.:	HOJA:	CLASE:	EDICION:
1:20000	Cuencas Vandellós.dwg	1 de 1	-	0

ANEJO 4: CÁLCULO DE CAUDALES

Cálculo de los caudales para los diferentes periodos de retorno - Cuenca Malaset

P_d (T = 10)	154,000	I1/Id	11	P'_0	18,00
P_d (T = 100)	236,000				
P_d (T = 500)	296,000				
P_d (T = 1000)	321,000				

Cuenca Malaset	Área (Km²)	Longitud (Km)	Desnivel (m)	Pendiente	Grado de Impermeabilización (μ) (Km²/Km²)	Tiempo de concentración (h) Tc*	Tiempo de concentración Real (h) Tc	Ka (mm/h)	Intensidad de Precipitación (mm/h)	Coeficiente de Escorrentía	Coeficiente de Uniformidad (K)	Caudal (m³/s)
T = 10	1,55	3,07	354,0	0,115309	0,006	1,061	1,061	152,046	67,2345197	0,619	1,200	**21,511**
T = 100	1,55	3,07	354,0	0,115309	0,006	1,061	1,061	233,005	103,0347185	0,749	1,200	**39,864**
T = 500	1,55	3,07	354,0	0,115309	0,006	1,061	1,061	292,244	129,2299859	0,806	1,200	**53,807**
T = 1000	1,55	3,07	354,0	0,115309	0,006	1,061	1,061	316,927	140,1446806	0,824	1,200	**59,667**

$$I_t = I_d \cdot \left(\frac{I_1}{I_d} \right)^{\frac{28^{0,1} - t^{0,1}}{28^{0,1} - 1}}$$

$$Q = \frac{A \cdot I_t \cdot C}{3,6} \cdot K$$

$$K = 1 + \frac{T_C^{1,25}}{T_C^{1,25} + 14} \geq 1,20$$

$$P_d^{'} = \left(1 - \frac{Log\,(S)}{15} \right) \cdot P_d$$

$$T_C^{*} = 0,3 \cdot \left(\frac{L}{j^{0,25}} \right)^{0,76}$$

$$T_C = \frac{1}{1 + \sqrt{\mu \cdot (2 - \mu)}} \cdot 0,3 \cdot \left(\frac{L}{j^{0,25}} \right)^{0,76}$$

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

Cálculo del grado de impermeabilización			
Cuenca	Área	m²	%
	Rural	1541167,00	0,994
	Urbana	8833,00	0,0060
		1550000,00	m2
		155,000	ha

Cálculo de los caudales para los diferentes periodos de retorno - Cuenca Lleria

P_d (T = 10)	108,000	I1/Id	11	P'_0	14,00
P_d (T = 100)	172,200				
P_d (T = 500)	224,000				
P_d (T = 1000)	321,000				

Cuenca Lleria	Área (Km²)	Longitud (Km)	Desnivel (m)	Pendiente	Grado de Impermeabilización (μ) (Km²/Km²)	Tiempo de concentración (h) Tc*	Tiempo de concentración Real (h) Tc	Ka (mm/h)	Intensidad de Precipitación (mm/h)	Coeficiente de Escorrentía	Coeficiente de Uniformidad (K)	Caudal (m³/s)
T = 10	5,82	5,84	696,0	0,119178	0,000	1,718	1,718	102,493	33,5256474	0,571	1,200	**37,137**
T = 100	5,82	5,84	696,0	0,119178	0,000	1,718	1,718	163,419	53,4547823	0,720	1,200	**74,653**
T = 500	5,82	5,84	696,0	0,119178	0,000	1,718	1,718	212,577	69,5346761	0,790	1,200	**106,564**
T = 1000	5,82	5,84	696,0	0,119178	0,000	1,718	1,718	304,631	99,6456742	0,866	1,200	**167,374**

$$I_t = I_d \cdot \left(\frac{I_1}{I_d} \right)^{\frac{28^{0,1} - t^{0,1}}{28^{0,1} - 1}}$$

$$Q = \frac{A \cdot I_t \cdot C}{3,6} \cdot K$$

$$K = 1 + \frac{T_C^{1,25}}{T_C^{1,25} + 14} \geq 1,20$$

$$P_d^{'} = \left(1 - \frac{Log\,(S)}{15} \right) \cdot P_d$$

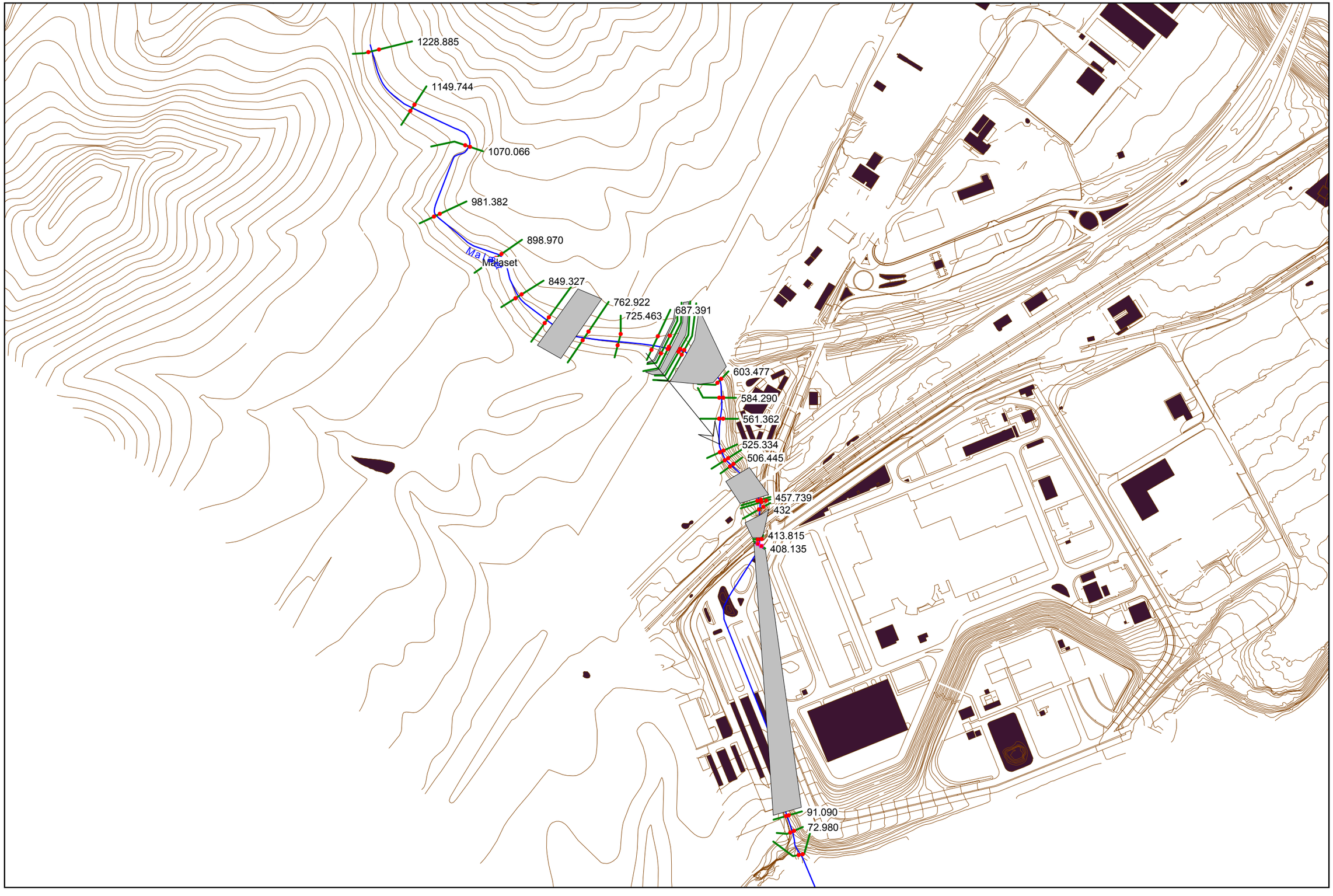
$$T_C^{*} = 0,3 \cdot \left(\frac{L}{j^{0,25}} \right)^{0,76}$$

$$T_C = \frac{1}{1 + \sqrt{\mu \cdot (2 - \mu)}} \cdot 0,3 \cdot \left(\frac{L}{j^{0,25}} \right)^{0,76}$$

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

Cálculo del grado de impermeabilización			
Cuenca	Área	m²	%
	Rural	5819163,46	1,000
	Urbana	836,54	0,0000
		5820000,00	m2
		582,000	ha

ANEJO 5: RESULTADOS DEL MODELO HEC-RAS. BARRANCO DE MALASET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Malaset
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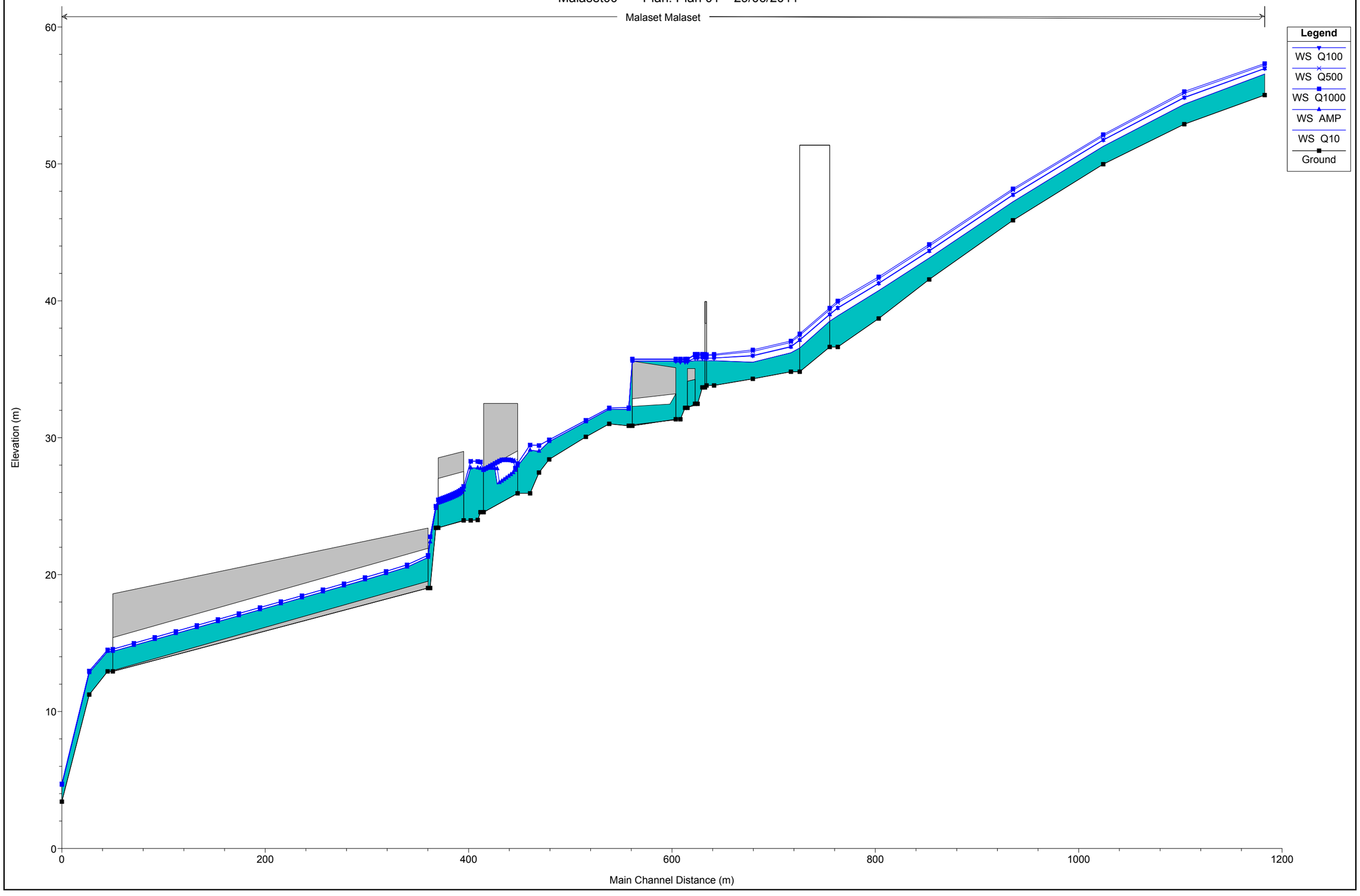
72.980

Malaset00 Plan: Plan 01 29/06/2011

Malaset Malaset



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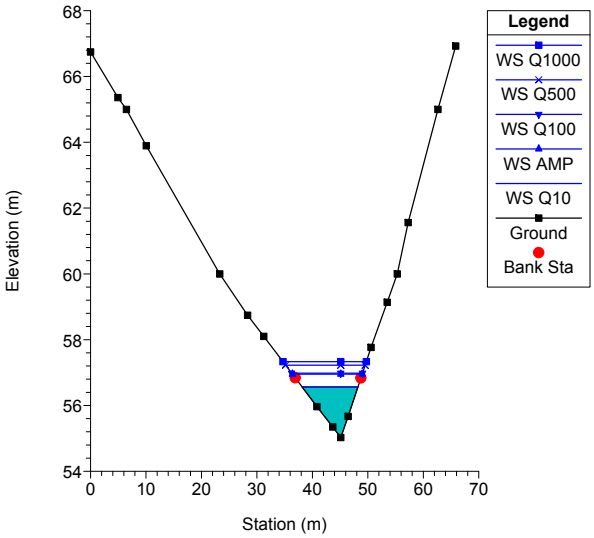

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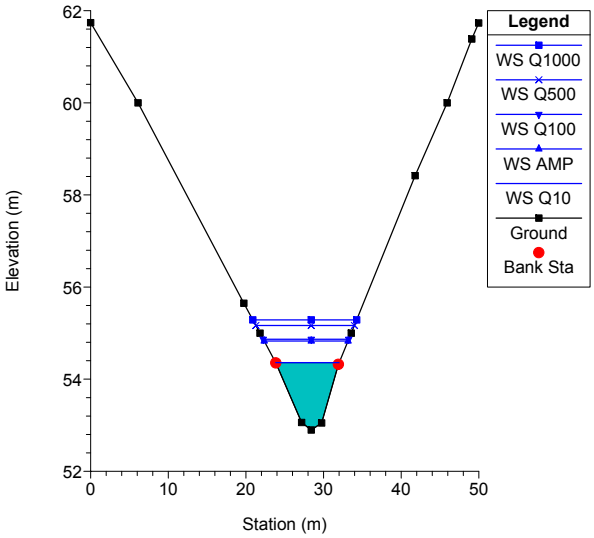

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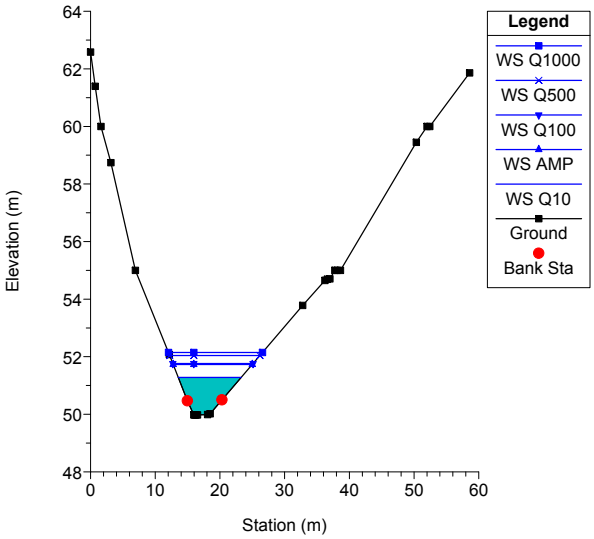

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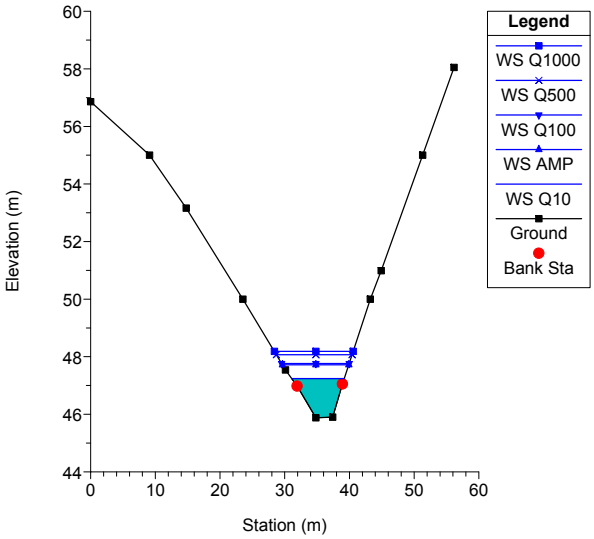

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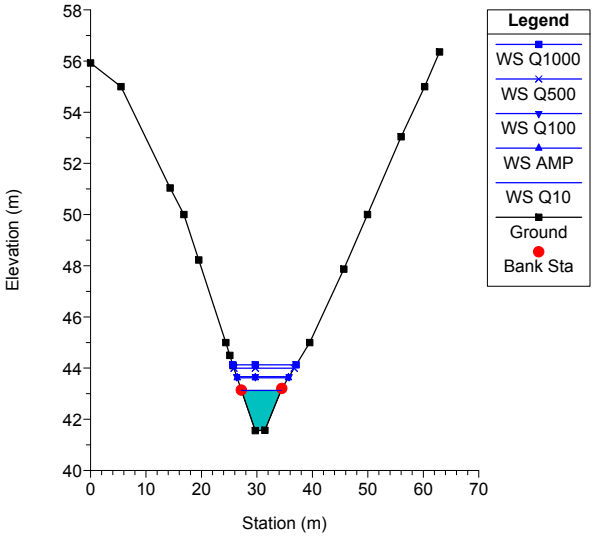

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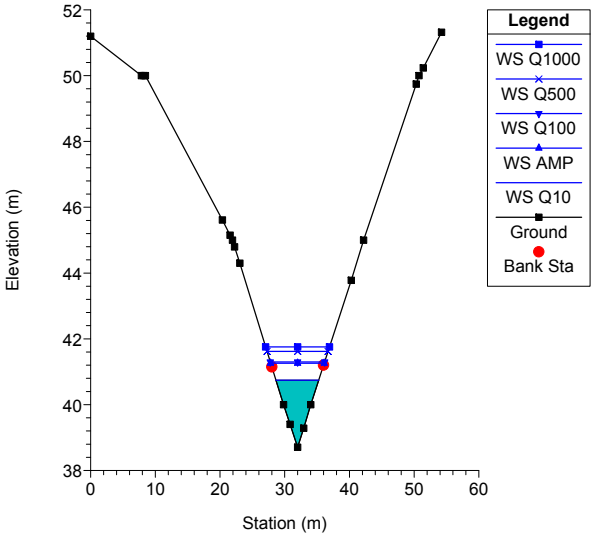

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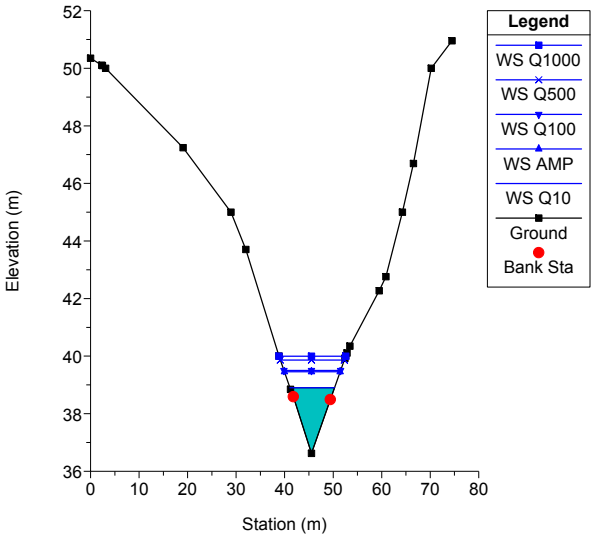

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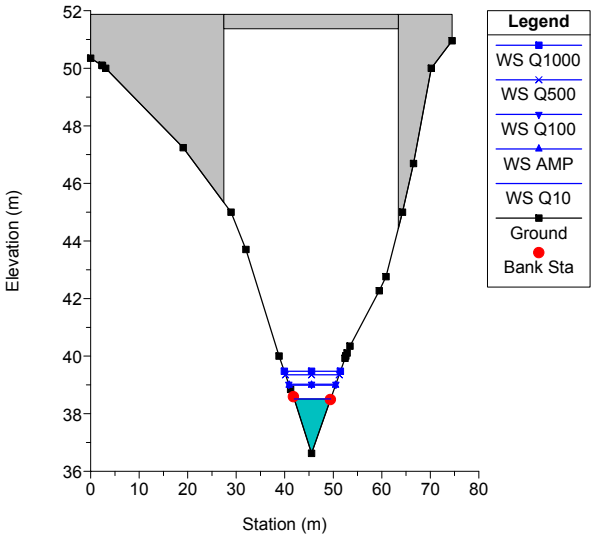

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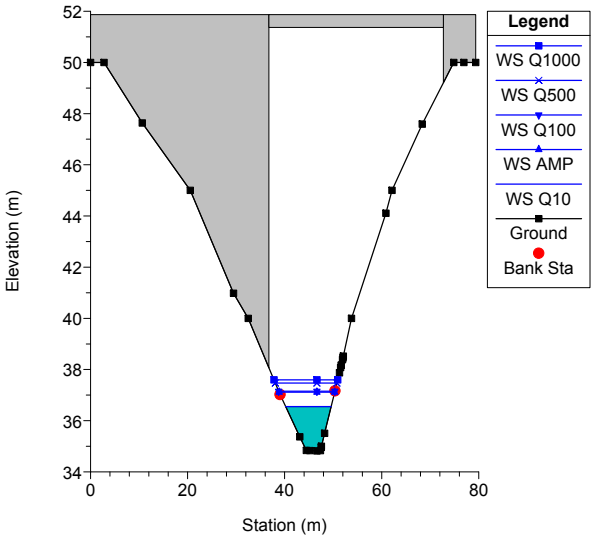

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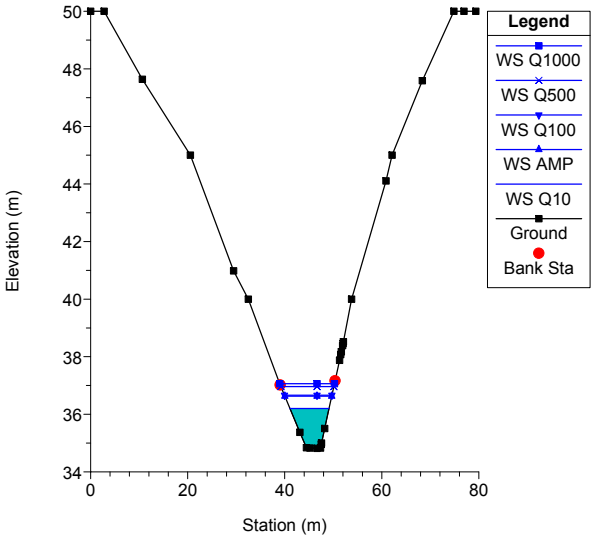

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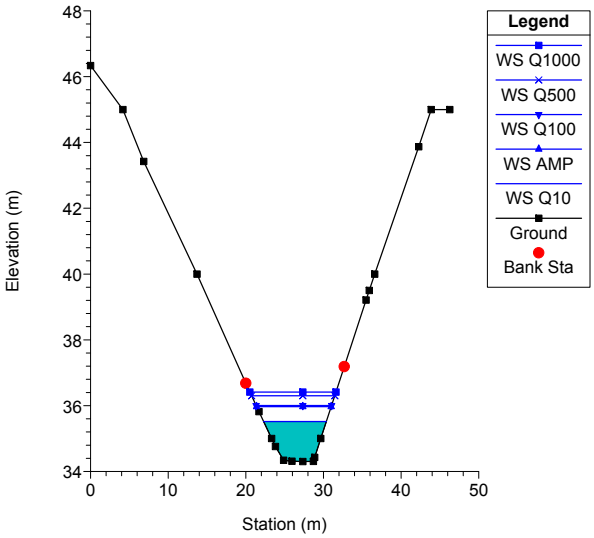

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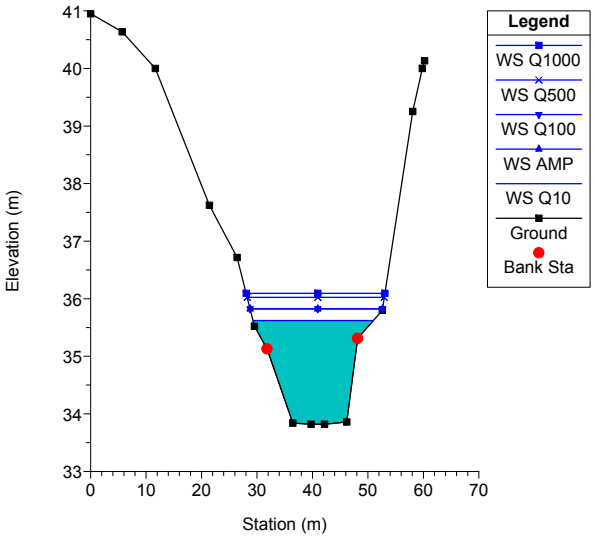

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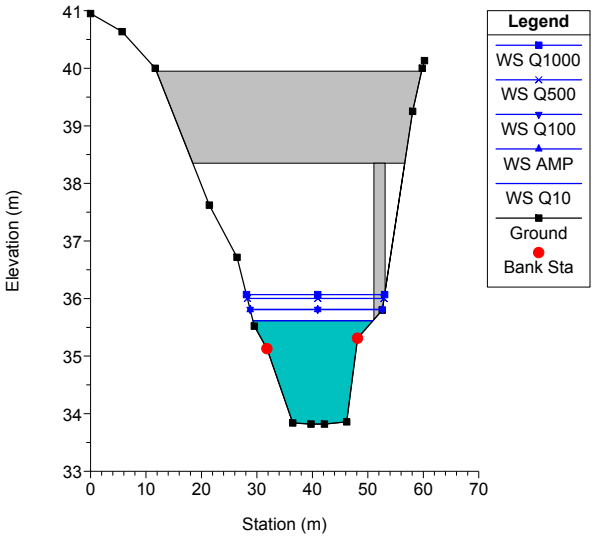

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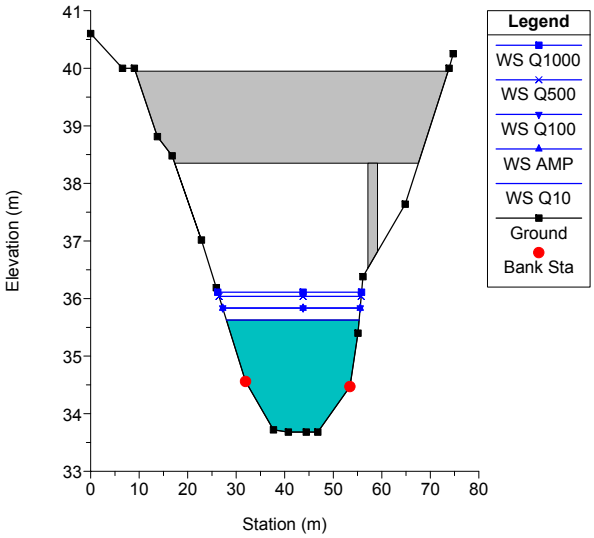

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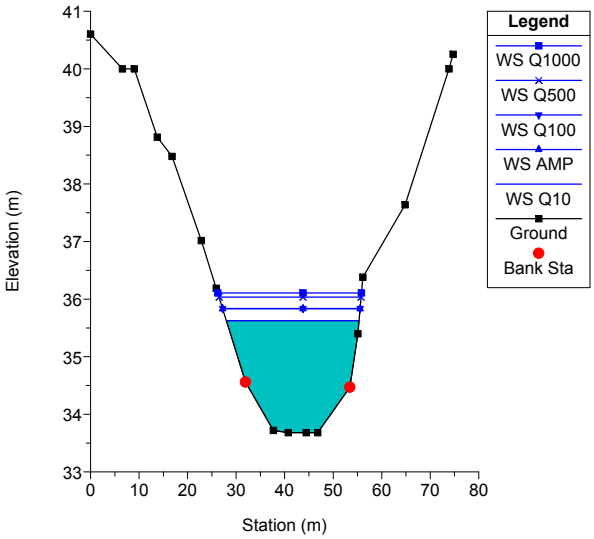

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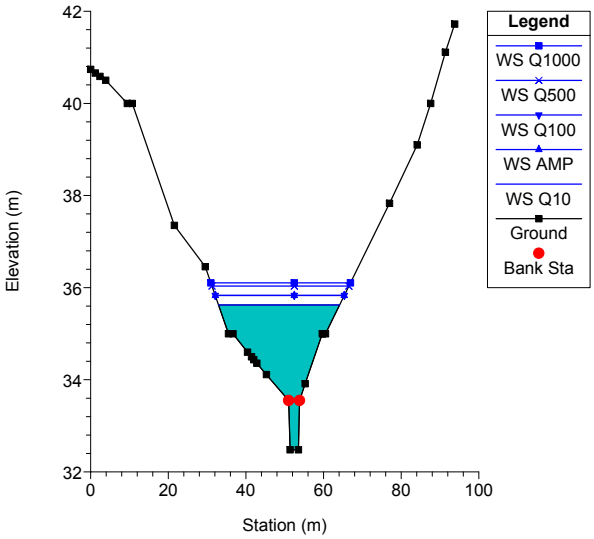

Malaset00 Plan: Plan 01 29/06/2011
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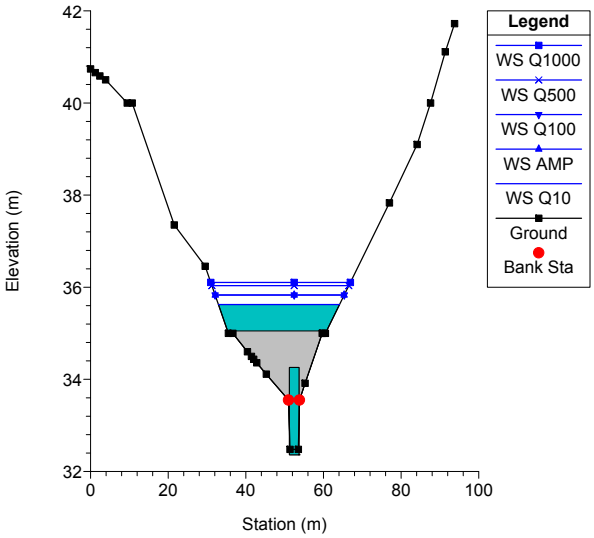

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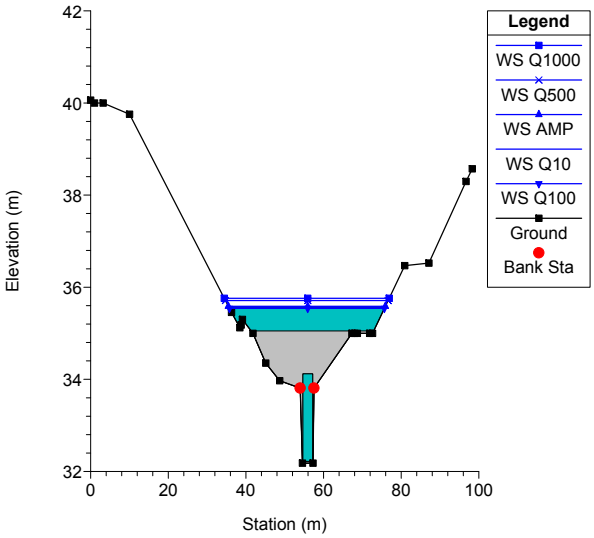

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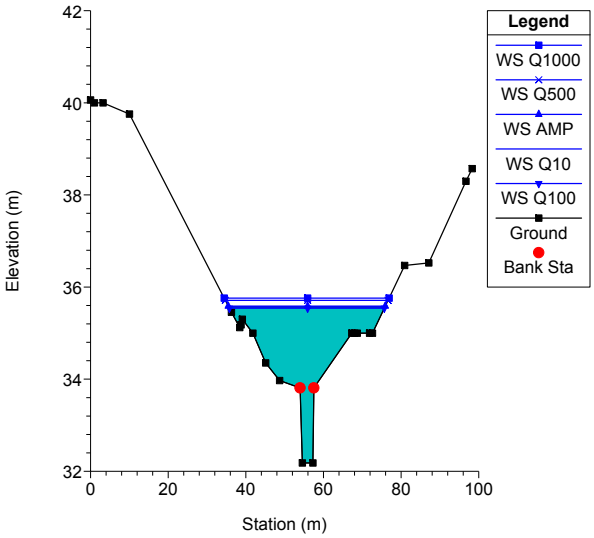

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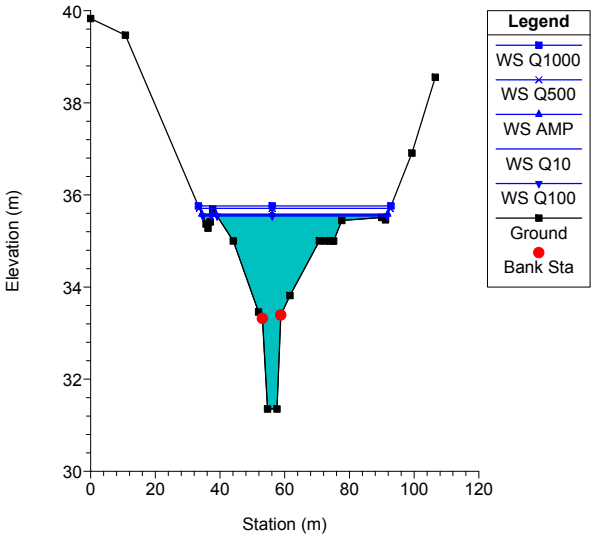

Malaset00 Plan: Plan 01 29/06/2011
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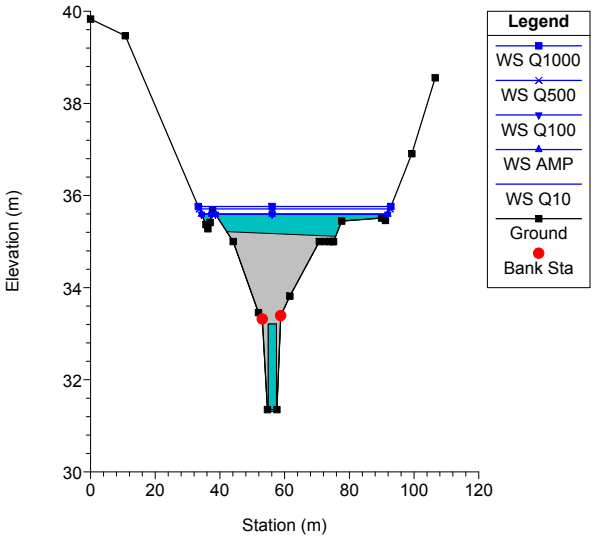

Malaset00 Plan: Plan 01 29/06/2011
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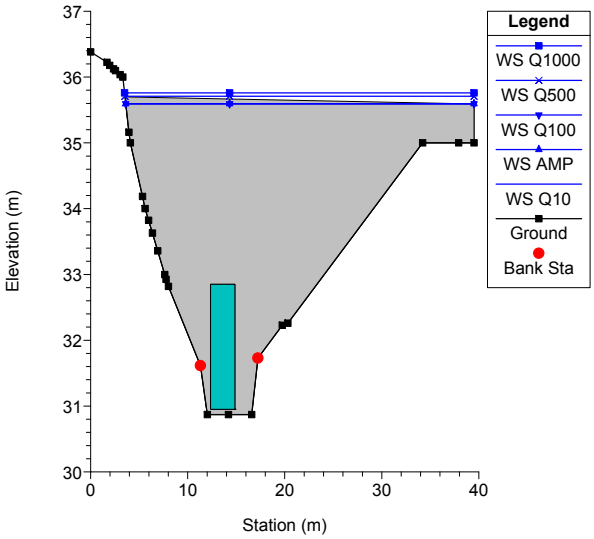

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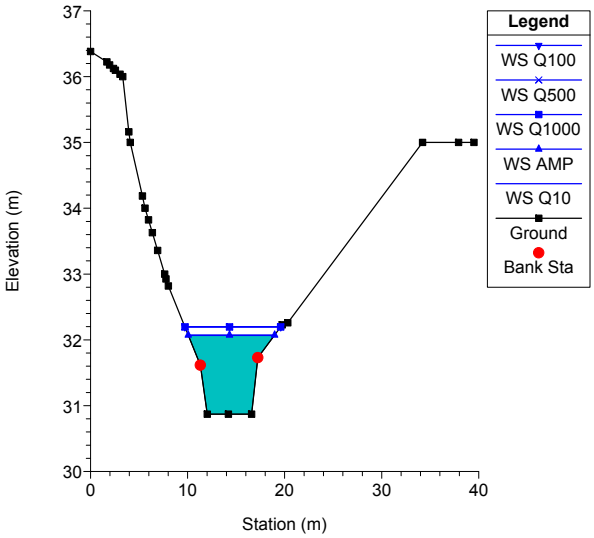

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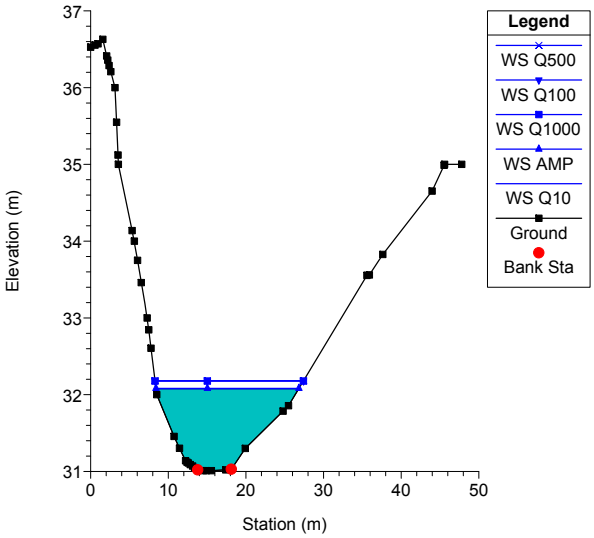

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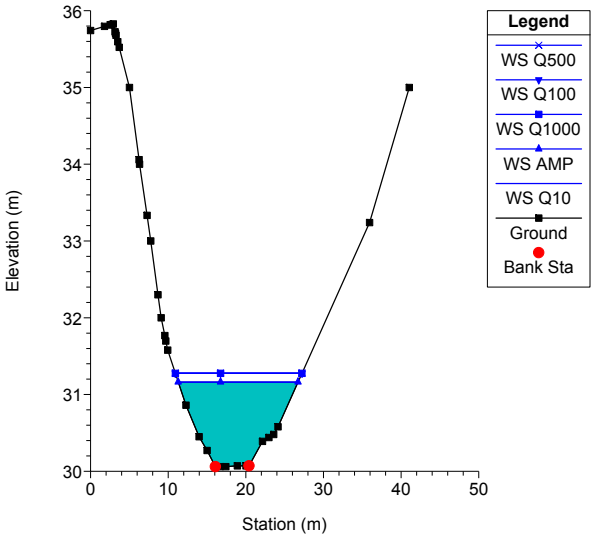

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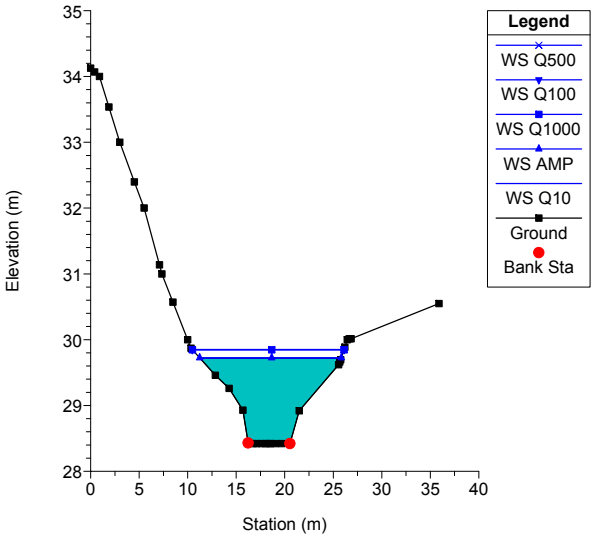

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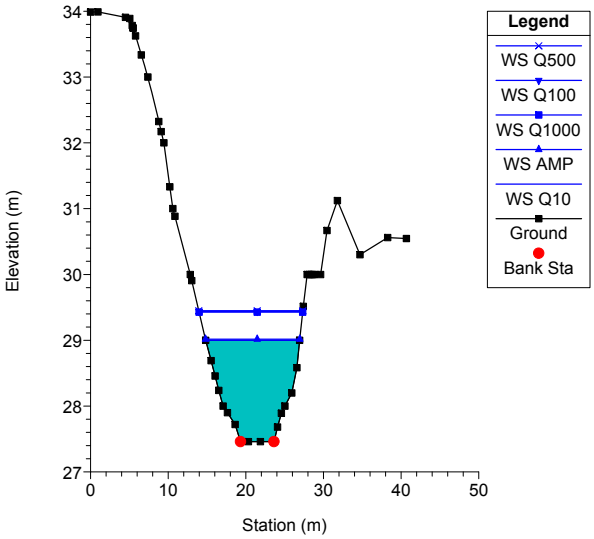

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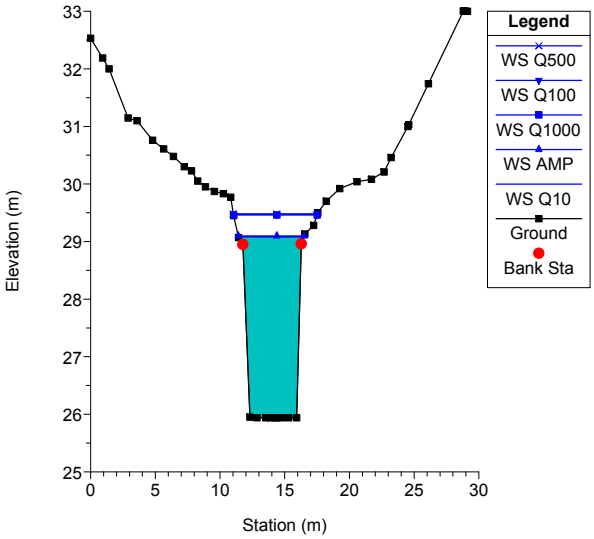

Malaset00 Plan: Plan 01 29/06/2011
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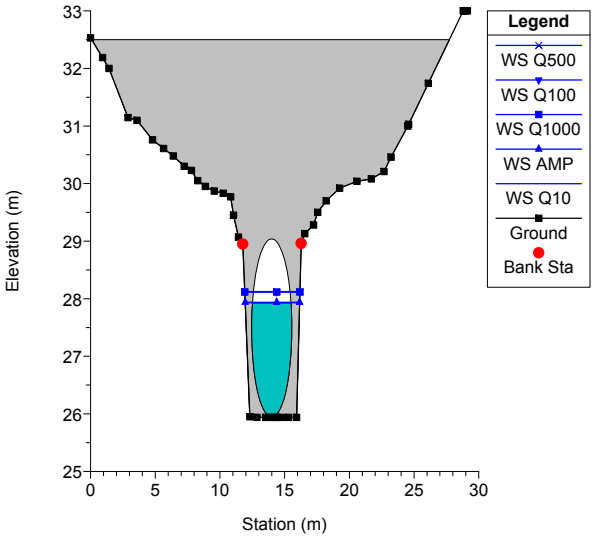

Malaset00 Plan: Plan 01 29/06/2011
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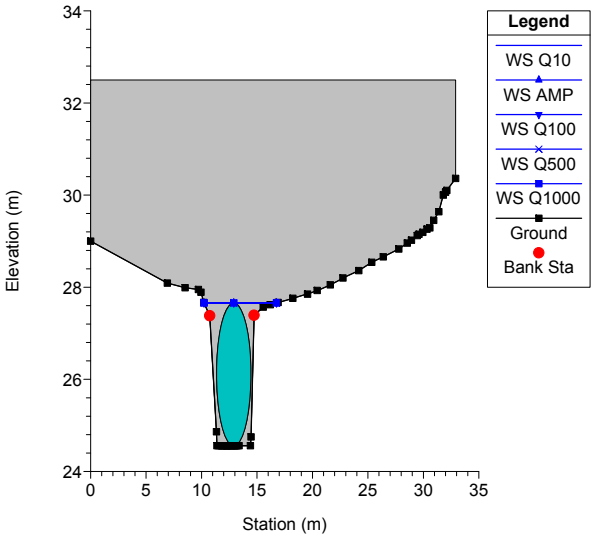

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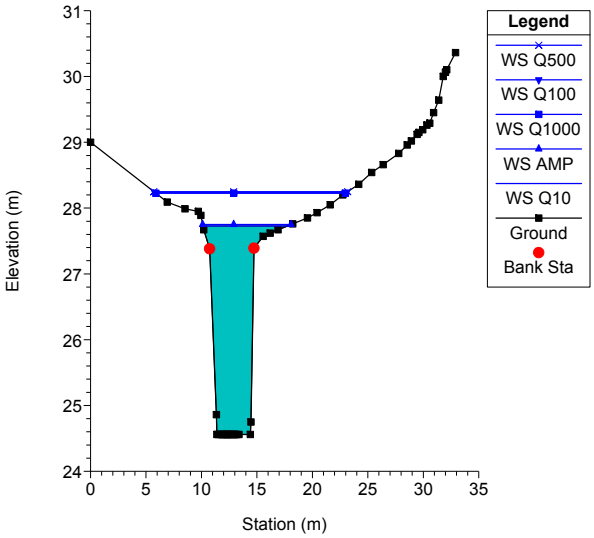

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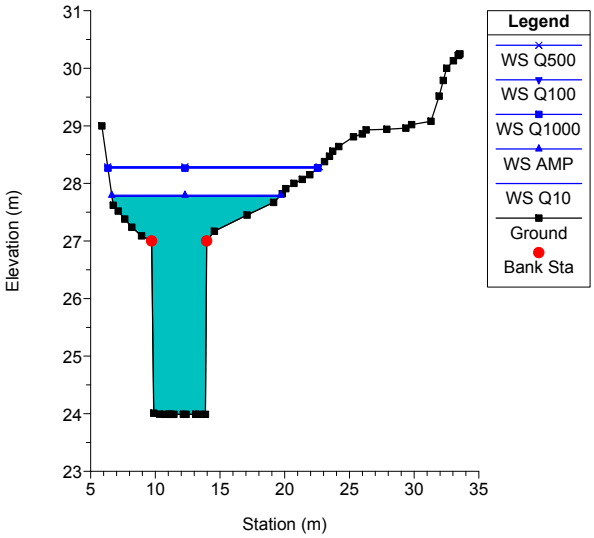

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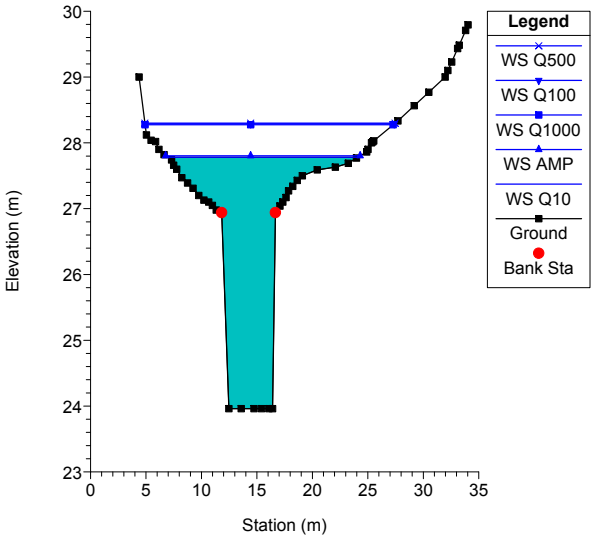

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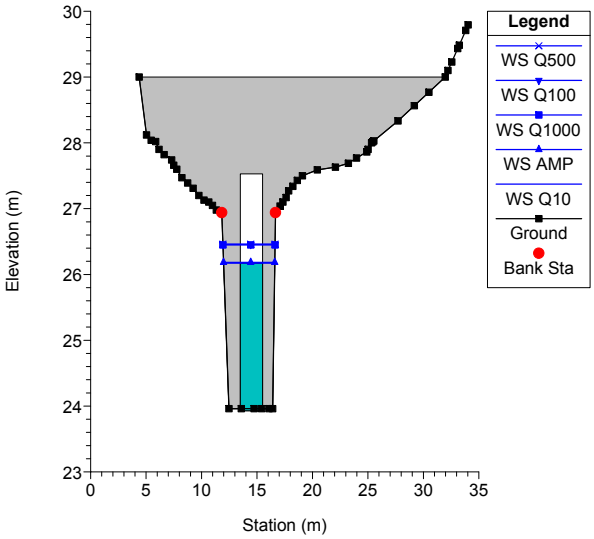

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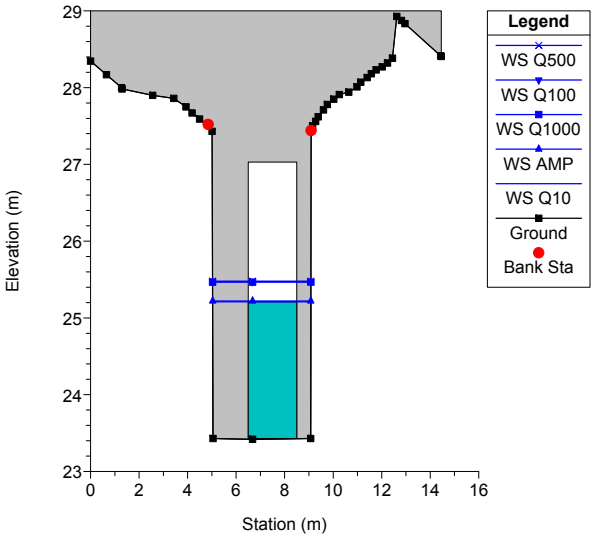

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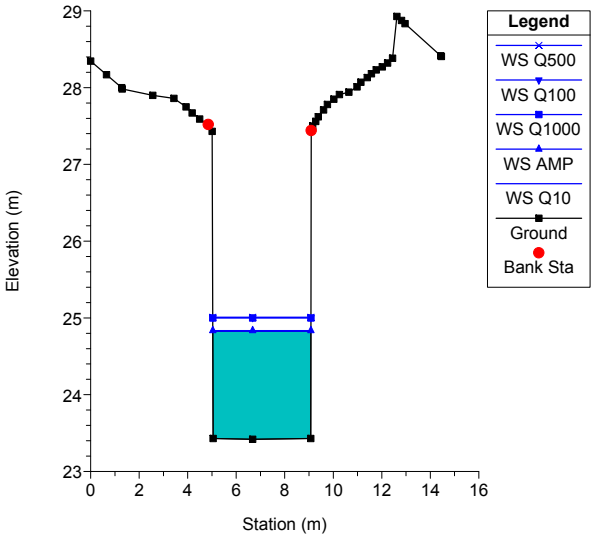

Malaset00 Plan: Plan 01 29/06/2011
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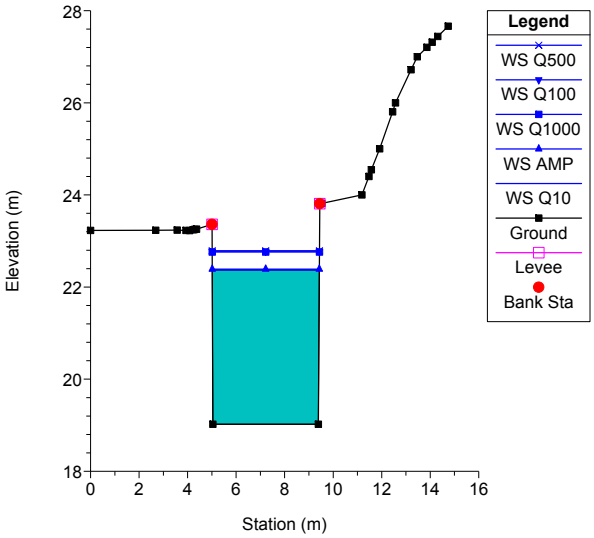

Malaset00 Plan: Plan 01 29/06/2011
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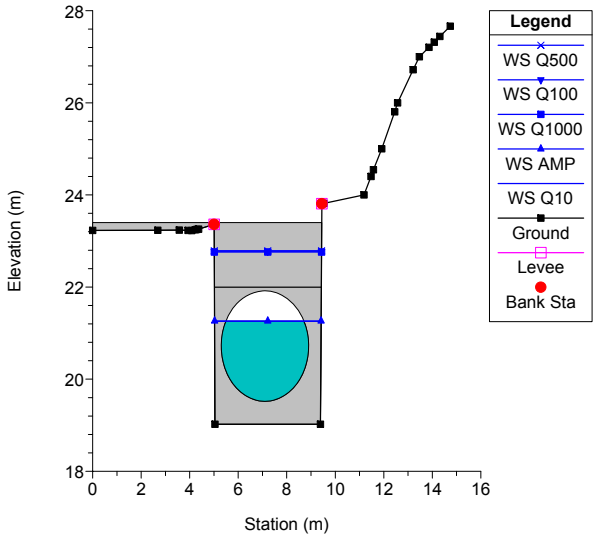

Malaset00 Plan: Plan 01 29/06/2011
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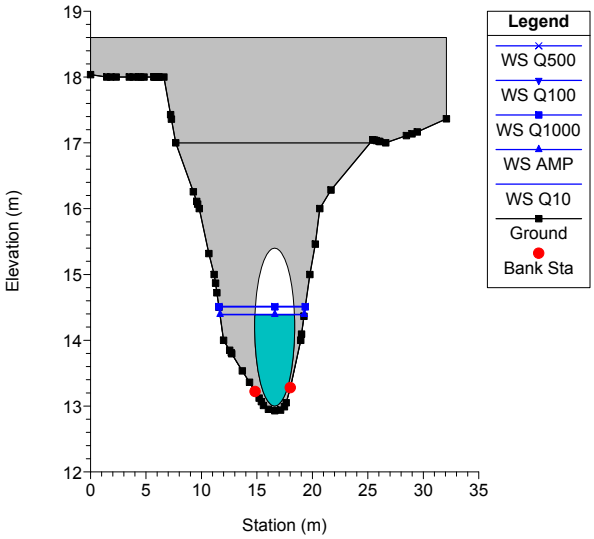

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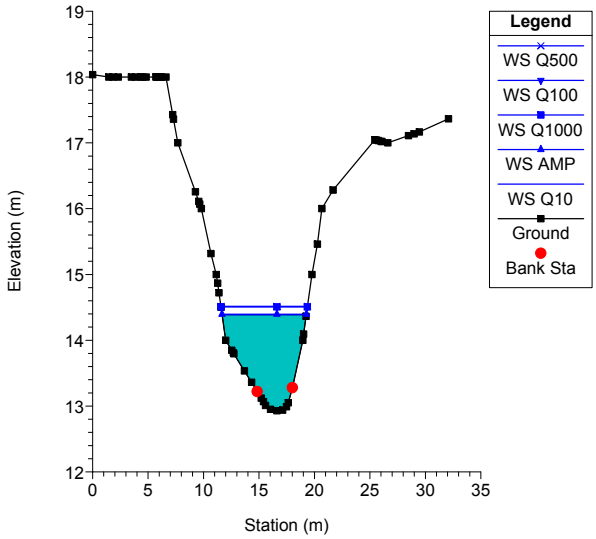

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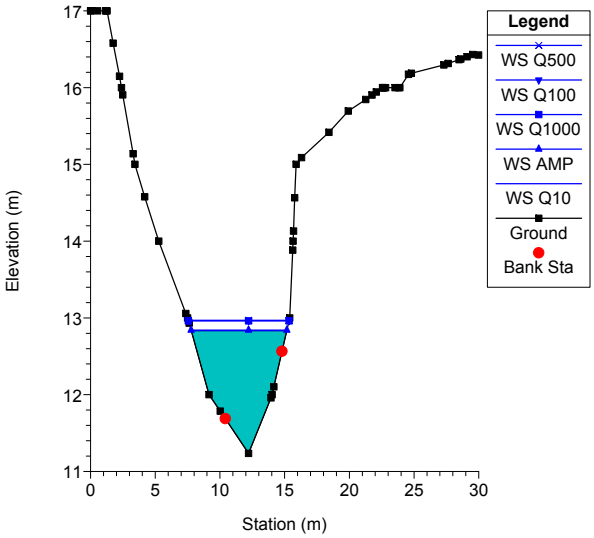

Malaset00 Plan: Plan 01 29/06/2011
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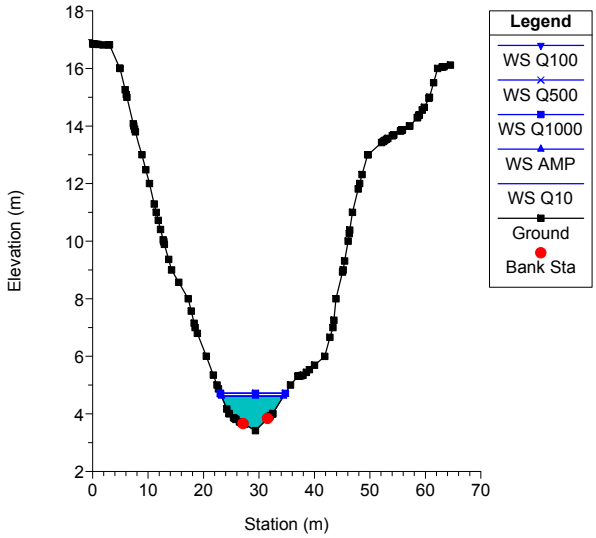

HEC-RAS Plan: Plan 04 River: Malaset Reach: Malaset

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)	
Malaset	1228.885	Q10	21.51	55.03	56.57	56.57	56.95	0.018329	2.76	7.80	10.08	1.00
Malaset	1228.885	AMP	38.34	55.03	56.95	56.95	57.46	0.016496	3.16	12.18	12.57	0.99
Malaset	1228.885	Q100	39.86	55.03	56.98	56.98	57.50	0.016187	3.19	12.56	12.77	0.99
Malaset	1228.885	Q500	53.81	55.03	57.23	57.23	57.83	0.014538	3.47	15.86	14.34	0.97
Malaset	1228.885	Q1000	59.67	55.03	57.33	57.33	57.96	0.013604	3.53	17.42	15.03	0.95
Malaset	1149.744	Q10	21.51	52.90	54.36	54.36	54.81	0.018393	2.99	7.19	8.17	1.01
Malaset	1149.744	AMP	38.34	52.90	54.83	54.83	55.42	0.013739	3.43	11.64	10.80	0.94
Malaset	1149.744	Q100	39.86	52.90	54.87	54.87	55.46	0.013482	3.46	12.05	11.01	0.93
Malaset	1149.744	Q500	53.81	52.90	55.16	55.16	55.84	0.012087	3.73	15.60	12.69	0.91
Malaset	1149.744	Q1000	59.67	52.90	55.29	55.29	55.98	0.011463	3.80	17.18	13.37	0.90
Malaset	1070.066	Q10	21.51	49.98	51.28	51.28	51.72	0.012906	3.06	7.93	9.73	0.91
Malaset	1070.066	AMP	38.34	49.98	51.73	51.73	52.28	0.011193	3.55	12.86	12.22	0.89
Malaset	1070.066	Q100	39.86	49.98	51.76	51.76	52.32	0.011090	3.58	13.28	12.41	0.89
Malaset	1070.066	Q500	53.81	49.98	52.04	52.04	52.67	0.010658	3.90	16.91	13.94	0.90
Malaset	1070.066	Q1000	59.67	49.98	52.14	52.14	52.80	0.010491	4.00	18.40	14.52	0.90
Malaset	981.382	Q10	21.51	45.88	47.24	47.24	47.71	0.016690	3.06	7.14	8.12	0.98
Malaset	981.382	AMP	38.34	45.88	47.72	47.72	48.33	0.013175	3.53	11.58	10.27	0.93
Malaset	981.382	Q100	39.86	45.88	47.76	47.76	48.38	0.012851	3.55	12.02	10.45	0.92
Malaset	981.382	Q500	53.81	45.88	48.07	48.07	48.77	0.011747	3.84	15.44	11.72	0.91
Malaset	981.382	Q1000	59.67	45.88	48.18	48.18	48.92	0.011503	3.96	16.78	12.19	0.91
Malaset	898.970	Q10	21.51	41.56	43.13	43.13	43.62	0.018606	3.10	6.93	7.15	1.01
Malaset	898.970	AMP	38.34	41.56	43.62	43.62	44.27	0.014655	3.59	10.99	9.24	0.95
Malaset	898.970	Q100	39.86	41.56	43.66	43.66	44.32	0.014350	3.62	11.37	9.41	0.95
Malaset	898.970	Q500	53.81	41.56	44.00	44.00	44.74	0.012683	3.89	14.73	10.85	0.92
Malaset	898.970	Q1000	59.67	41.56	44.13	44.13	44.90	0.012095	3.98	16.18	11.41	0.91
Malaset	849.327	Q10	21.51	38.71	40.74	40.74	41.26	0.019367	3.18	6.77	6.61	1.00
Malaset	849.327	AMP	38.34	38.71	41.26	41.26	41.93	0.017789	3.61	10.62	8.28	1.00
Malaset	849.327	Q100	39.86	38.71	41.30	41.30	41.98	0.017617	3.66	10.92	8.40	1.00
Malaset	849.327	Q500	53.81	38.71	41.62	41.62	42.42	0.015654	3.97	13.78	9.43	0.98
Malaset	849.327	Q1000	59.67	38.71	41.75	41.75	42.58	0.014726	4.06	15.09	9.87	0.96
Malaset	809.017	Q10	21.51	36.63	38.90	38.51	39.13	0.005813	2.13	10.33	9.19	0.59
Malaset	809.017	AMP	38.34	36.63	39.46	38.99	39.78	0.005258	2.56	16.09	11.50	0.60
Malaset	809.017	Q100	39.86	36.63	39.50	39.03	39.83	0.005214	2.59	16.60	11.68	0.60
Malaset	809.017	Q500	53.81	36.63	39.86	39.34	40.24	0.004955	2.83	21.10	13.18	0.60
Malaset	809.017	Q1000	59.67	36.63	40.00	39.47	40.40	0.004900	2.92	22.88	13.74	0.60
Malaset	786		Bridge									
Malaset	762.922	Q10	21.51	34.82	36.20	36.16	36.62	0.016103	2.86	7.52	8.06	0.94
Malaset	762.922	AMP	38.34	34.82	36.63	36.63	37.22	0.017036	3.40	11.28	9.65	1.00
Malaset	762.922	Q100	39.86	34.82	36.66	36.66	37.26	0.016947	3.43	11.64	9.79	1.00
Malaset	762.922	Q500	53.81	34.82	36.96	36.96	37.64	0.016441	3.66	14.70	10.90	1.01
Malaset	762.922	Q1000	59.67	34.82	37.07	37.07	37.79	0.016252	3.76	15.87	11.28	1.01
Malaset	725.463	Q10	21.51	34.30	35.52	35.52	35.97	0.018269	2.98	7.22	8.07	1.01
Malaset	725.463	AMP	38.34	34.30	35.97	35.97	36.56	0.017017	3.41	11.24	9.61	1.01
Malaset	725.463	Q100	39.86	34.30	36.01	36.01	36.61	0.016937	3.44	11.59	9.72	1.01
Malaset	725.463	Q500	53.81	34.30	36.30	36.30	36.99	0.016332	3.68	14.61	10.71	1.01
Malaset	725.463	Q1000	59.67	34.30	36.41	36.41	37.14	0.016130	3.77	15.83	11.08	1.01
Malaset	687.391	Q10	21.51	33.82	35.62	34.57	35.66	0.000716	0.86	25.85	21.71	0.22
Malaset	687.391	AMP	38.34	33.82	35.82	34.89	35.91	0.001456	1.33	30.41	23.88	0.32
Malaset	687.391	Q100	39.86	33.82	35.83	34.92	35.92	0.001555	1.38	30.55	23.90	0.34
Malaset	687.391	Q500	53.81	33.82	36.02	35.13	36.15	0.001896	1.64	35.32	24.73	0.38
Malaset	687.391	Q1000	59.67	33.82	36.09	35.21	36.24	0.002034	1.74	37.08	25.02	0.39
Malaset	679		Bridge									
Malaset	675.898	Q10	21.51	33.68	35.63		35.64	0.000255	0.57	39.78	27.34	0.14
Malaset	675.898	AMP	38.34	33.68	35.83		35.87	0.000540	0.89	45.50	28.31	0.21
Malaset	675.898	Q100	39.86	33.68	35.84		35.88	0.000577	0.92	45.69	28.34	0.21
Malaset	675.898	Q500	53.81	33.68	36.04		36.10	0.000740	1.11	51.39	29.28	0.24
Malaset	675.898	Q1000	59.67	33.68	36.11		36.18	0.000808	1.19	53.49	29.62	0.26
Malaset	671.200	Q10	21.51	32.48	35.62	34.37	35.64	0.000363	0.74	39.01	31.18	0.14
Malaset	671.200	AMP	38.34	32.48	35.83	34.72	35.87	0.000751	1.11	45.62	33.21	0.20
Malaset	671.200	Q100	39.86	32.48	35.83	34.74	35.88	0.000801	1.15	45.83	33.28	0.20
Malaset	671.200	Q500	53.81	32.48	36.03	34.91	36.09	0.000997	1.33	52.66	35.25	0.23
Malaset	671.200	Q1000	59.67	32.48	36.11	34.98	36.17	0.001076	1.40	55.22	35.97	0.24
Malaset	668.5		Culvert									
Malaset	658.870	Q10	21.51	32.18	35.57		35.58	0.000299	0.65	45.51	40.23	0.12
Malaset	658.870	AMP	38.34	32.18	35.59		35.63	0.000911	1.14	46.22	40.44	0.20
Malaset	658.870	Q100	39.86	32.18	35.54		35.59	0.001095	1.24	44.45	39.92	0.22
Malaset	658.870	Q500	53.81	32.18	35.71		35.77	0.001349	1.43	51.30	41.89	0.25
Malaset	658.870	Q1000	59.67	32.18	35.76		35.83	0.001483	1.51	53.43	42.48	0.26

HEC-RAS Plan: Plan 04 River: Malaset Reach: Malaset (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)	
Malaset	654.216	Q10	21.51	31.35	35.57	32.90	35.58	0.000146	0.59	56.94	55.83	0.10
Malaset	654.216	AMP	38.34	31.35	35.59	33.60	35.62	0.000446	1.03	57.93	56.24	0.17
Malaset	654.216	Q100	39.86	31.35	35.54	33.68	35.58	0.000530	1.12	55.46	55.20	0.18
Malaset	654.216	Q500	53.81	31.35	35.71	34.14	35.76	0.000703	1.32	65.03	58.96	0.21
Malaset	654.216	Q1000	59.67	31.35	35.76	34.28	35.82	0.000773	1.40	68.06	59.56	0.23
Malaset	649.75		Culvert									
Malaset	603.477	Q10	21.03	30.87	32.07	32.07	32.58	0.002335	3.18	7.11	8.85	0.97
Malaset	603.477	AMP	21.19	30.87	32.07	32.07	32.58	0.002327	3.19	7.16	8.90	0.97
Malaset	603.477	Q100	25.16	30.87	32.20	32.20	32.77	0.002259	3.37	8.34	9.88	0.97
Malaset	603.477	Q500	25.24	30.87	32.20	32.20	32.77	0.002277	3.38	8.33	9.87	0.97
Malaset	603.477	Q1000	25.04	30.87	32.20	32.20	32.76	0.002258	3.37	8.31	9.85	0.97
Malaset	584.290	Q10	21.03	31.01	32.08	32.08	32.45	0.002109	3.19	12.68	18.39	0.99
Malaset	584.290	AMP	21.19	31.01	32.08	32.08	32.45	0.002110	3.20	12.75	18.42	0.99
Malaset	584.290	Q100	25.16	31.01	32.18	32.18	32.59	0.002095	3.38	14.61	19.13	1.00
Malaset	584.290	Q500	25.24	31.01	32.18	32.18	32.59	0.002094	3.38	14.65	19.14	1.00
Malaset	584.290	Q1000	25.04	31.01	32.18	32.18	32.58	0.002095	3.37	14.55	19.11	1.00
Malaset	561.362	Q10	21.03	30.06	31.16	31.16	31.58	0.002166	3.29	11.37	15.40	1.01
Malaset	561.362	AMP	21.19	30.06	31.16	31.16	31.58	0.002164	3.30	11.44	15.44	1.01
Malaset	561.362	Q100	25.16	30.06	31.28	31.28	31.73	0.002091	3.47	13.27	16.33	1.01
Malaset	561.362	Q500	25.24	30.06	31.28	31.28	31.74	0.002091	3.47	13.31	16.34	1.01
Malaset	561.362	Q1000	25.04	30.06	31.28	31.28	31.73	0.002092	3.46	13.22	16.30	1.00
Malaset	525.334	Q10	21.03	28.42	29.72	29.72	30.17	0.001631	3.21	10.61	14.55	0.90
Malaset	525.334	AMP	21.19	28.42	29.73	29.73	30.18	0.001630	3.21	10.69	14.60	0.90
Malaset	525.334	Q100	25.16	28.42	29.85	29.85	30.34	0.001604	3.39	12.57	15.64	0.90
Malaset	525.334	Q500	25.24	28.42	29.85	29.85	30.34	0.001604	3.39	12.61	15.66	0.90
Malaset	525.334	Q1000	25.04	28.42	29.85	29.85	30.33	0.001606	3.38	12.51	15.61	0.90
Malaset	515.257	Q10	21.03	27.46	29.00		29.26	0.000810	2.53	13.51	12.09	0.65
Malaset	515.257	AMP	21.19	27.46	29.02		29.28	0.000788	2.51	13.73	12.14	0.64
Malaset	515.257	Q100	25.16	27.46	29.44		29.64	0.000462	2.26	19.13	13.38	0.51
Malaset	515.257	Q500	25.24	27.46	29.45		29.65	0.000458	2.25	19.24	13.41	0.51
Malaset	515.257	Q1000	25.04	27.46	29.43		29.63	0.000468	2.26	18.96	13.35	0.52
Malaset	506.445	Q10	21.03	25.94	29.08	27.42	29.22	0.000416	1.64	12.87	5.06	0.31
Malaset	506.445	AMP	21.19	25.94	29.10	27.43	29.24	0.000415	1.64	12.94	5.10	0.31
Malaset	506.445	Q100	25.16	25.94	29.47	27.60	29.62	0.000384	1.72	15.16	6.49	0.30
Malaset	506.445	Q500	25.24	25.94	29.48	27.61	29.63	0.000384	1.72	15.21	6.50	0.30
Malaset	506.445	Q1000	25.04	25.94	29.46	27.60	29.61	0.000385	1.71	15.08	6.46	0.31
Malaset	494.2		Culvert									
Malaset	457.739	Q10	21.03	24.56	27.73		27.90	0.000553	1.86	11.78	7.65	0.35
Malaset	457.739	AMP	21.19	24.56	27.75		27.92	0.000548	1.86	11.94	7.97	0.35
Malaset	457.739	Q100	25.16	24.56	28.24		28.40	0.000414	1.79	18.11	17.32	0.31
Malaset	457.739	Q500	25.24	24.56	28.25		28.41	0.000411	1.79	18.28	17.48	0.31
Malaset	457.739	Q1000	25.04	24.56	28.23		28.38	0.000418	1.80	17.86	17.08	0.31
Malaset	455.014	Q10	21.03	23.99	27.77		27.86	0.000206	1.29	19.28	12.96	0.22
Malaset	455.014	AMP	21.19	23.99	27.79		27.88	0.000205	1.29	19.55	13.07	0.21
Malaset	455.014	Q100	25.16	23.99	28.28		28.36	0.000171	1.28	26.62	16.28	0.20
Malaset	455.014	Q500	25.24	23.99	28.29		28.37	0.000170	1.28	26.78	16.33	0.20
Malaset	455.014	Q1000	25.04	23.99	28.26		28.34	0.000172	1.28	26.39	16.20	0.20
Malaset	448.070	Q10	21.03	23.96	27.78	25.36	27.85	0.000152	1.18	21.61	17.15	0.20
Malaset	448.070	AMP	21.19	23.96	27.80	25.36	27.87	0.000151	1.18	21.95	17.52	0.20
Malaset	448.070	Q100	25.16	23.96	28.29	25.53	28.35	0.000121	1.15	31.77	22.48	0.18
Malaset	448.070	Q500	25.24	23.96	28.30	25.53	28.36	0.000120	1.15	31.99	22.56	0.18
Malaset	448.070	Q1000	25.04	23.96	28.27	25.53	28.34	0.000121	1.15	31.45	22.37	0.18
Malaset	432		Culvert									
Malaset	413.815	Q10	21.03	23.42	24.83	24.83	25.53	0.004003	3.72	5.65	4.04	1.01
Malaset	413.815	AMP	21.19	23.42	24.83	24.83	25.54	0.004007	3.73	5.68	4.04	1.00
Malaset	413.815	Q100	25.16	23.42	25.00	25.00	25.80	0.004112	3.95	6.37	4.04	1.00
Malaset	413.815	Q500	25.24	23.42	25.01	25.01	25.80	0.004115	3.95	6.38	4.04	1.00
Malaset	413.815	Q1000	25.04	23.42	25.00	25.00	25.79	0.004109	3.94	6.35	4.04	1.00
Malaset	408.135	Q10	21.03	19.02	22.37	20.35	22.48	0.000316	1.43	14.69	4.41	0.25
Malaset	408.135	AMP	21.19	19.02	22.39	20.36	22.49	0.000317	1.44	14.76	4.41	0.25
Malaset	408.135	Q100	25.16	19.02	22.78	20.52	22.90	0.000339	1.53	16.48	4.42	0.25
Malaset	408.135	Q500	25.24	19.02	22.79	20.53	22.91	0.000338	1.53	16.53	4.42	0.25
Malaset	408.135	Q1000	25.04	19.02	22.76	20.52	22.88	0.000339	1.53	16.40	4.42	0.25
Malaset	406		Culvert									
Malaset	91.090	Q10	21.03	12.93	14.39	14.39	14.87	0.012856	3.41	7.39	7.59	0.93
Malaset	91.090	AMP	21.19	12.93	14.39	14.39	14.88	0.012854	3.42	7.43	7.60	0.93

HEC-RAS Plan: Plan 04 River: Malaset Reach: Malaset (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)	
Malaset	91.090	Q100	25.16	12.93	14.51	14.51	15.05	0.013049	3.64	8.33	7.79	0.95
Malaset	91.090	Q500	25.24	12.93	14.51	14.51	15.06	0.013044	3.65	8.35	7.80	0.95
Malaset	91.090	Q1000	25.04	12.93	14.51	14.51	15.05	0.013054	3.64	8.31	7.79	0.95
Malaset	72.980	Q10	21.03	11.23	12.83	12.83	13.33	0.015848	3.29	6.98	7.39	0.97
Malaset	72.980	AMP	21.19	11.23	12.84	12.84	13.34	0.015825	3.30	7.02	7.40	0.97
Malaset	72.980	Q100	25.16	11.23	12.97	12.97	13.51	0.015430	3.48	7.97	7.78	0.98
Malaset	72.980	Q500	25.24	11.23	12.97	12.97	13.52	0.015424	3.49	7.99	7.79	0.98
Malaset	72.980	Q1000	25.04	11.23	12.96	12.96	13.51	0.015439	3.48	7.94	7.77	0.98
Malaset	45.986	Q10	21.03	3.42	4.62	4.62	4.99	0.014129	3.01	8.26	11.20	0.95
Malaset	45.986	AMP	21.19	3.42	4.62	4.62	5.00	0.014289	3.03	8.28	11.21	0.95
Malaset	45.986	Q100	25.16	3.42	4.72	4.72	5.13	0.013823	3.17	9.46	11.76	0.95
Malaset	45.986	Q500	25.24	3.42	4.72	4.72	5.13	0.013932	3.19	9.45	11.75	0.95
Malaset	45.986	Q1000	25.04	3.42	4.71	4.71	5.13	0.013964	3.18	9.39	11.73	0.95

Plan: Plan 04 Malaset Malaset RS: 786 Profile: Q10

E.G. US. (m)	39.13	Element	Inside BR US	Inside BR DS
W.S. US. (m)	38.90	E.G. Elev (m)	38.98	36.76
Q Total (m3/s)	21.51	W.S. Elev (m)	38.51	36.55
Q Bridge (m3/s)	21.51	Crit W.S. (m)	38.51	36.16
Q Weir (m3/s)		Max Chl Dpth (m)	1.89	1.73
Weir Sta Lft (m)		Vel Total (m/s)	3.04	2.03
Weir Sta Rgt (m)		Flow Area (m2)	7.07	10.57
Weir Submerg		Froude # Chl	1.00	0.61
Weir Max Depth (m)		Specif Force (m3)	11.11	11.97
Min El Weir Flow (m)	51.87	Hydr Depth (m)	0.94	1.13
Min El Prs (m)	51.37	W.P. Total (m)	8.40	10.30
Delta EG (m)	2.51	Conv. Total (m3/s)	158.3	269.0
Delta WS (m)	2.70	Top Width (m)	7.51	9.37
BR Open Area (m2)	372.30	Frctn Loss (m)	0.30	0.08
BR Open Vel (m/s)	3.04	C & E Loss (m)	0.13	0.06
Coef of Q		Shear Total (N/m2)	152.44	64.38
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 786 Profile: AMP

E.G. US. (m)	39.78	Element	Inside BR US	Inside BR DS
W.S. US. (m)	39.46	E.G. Elev (m)	39.62	37.39
Q Total (m3/s)	38.34	W.S. Elev (m)	38.99	37.11
Q Bridge (m3/s)	38.34	Crit W.S. (m)	38.99	36.63
Q Weir (m3/s)		Max Chl Dpth (m)	2.36	2.29
Weir Sta Lft (m)		Vel Total (m/s)	3.43	2.34
Weir Sta Rgt (m)		Flow Area (m2)	11.16	16.39
Weir Submerg		Froude # Chl	0.95	0.62
Weir Max Depth (m)		Specif Force (m3)	22.46	24.13
Min El Weir Flow (m)	51.87	Hydr Depth (m)	1.17	1.43
Min El Prs (m)	51.37	W.P. Total (m)	10.67	12.68
Delta EG (m)	2.56	Conv. Total (m3/s)	316.0	491.8
Delta WS (m)	2.83	Top Width (m)	9.56	11.45
BR Open Area (m2)	372.30	Frctn Loss (m)	0.27	0.08
BR Open Vel (m/s)	3.43	C & E Loss (m)	0.17	0.09
Coef of Q		Shear Total (N/m2)	151.04	77.07
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 786 Profile: Q100

E.G. US. (m)	39.83	Element	Inside BR US	Inside BR DS
W.S. US. (m)	39.50	E.G. Elev (m)	39.67	37.44
Q Total (m3/s)	39.86	W.S. Elev (m)	39.03	37.15
Q Bridge (m3/s)	39.86	Crit W.S. (m)	39.03	36.67
Q Weir (m3/s)		Max Chl Dpth (m)	2.40	2.33
Weir Sta Lft (m)		Vel Total (m/s)	3.46	2.37
Weir Sta Rgt (m)		Flow Area (m2)	11.52	16.85
Weir Submerg		Froude # Chl	0.95	0.62
Weir Max Depth (m)		Specif Force (m3)	23.55	25.26
Min El Weir Flow (m)	51.87	Hydr Depth (m)	1.19	1.45
Min El Prs (m)	51.37	W.P. Total (m)	10.84	12.84
Delta EG (m)	2.56	Conv. Total (m3/s)	330.9	512.5
Delta WS (m)	2.84	Top Width (m)	9.72	11.58
BR Open Area (m2)	372.30	Frctn Loss (m)	0.26	0.08
BR Open Vel (m/s)	3.46	C & E Loss (m)	0.18	0.09
Coef of Q		Shear Total (N/m2)	151.25	77.85
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 786 Profile: Q500

E.G. US. (m)	40.24	Element	Inside BR US	Inside BR DS
W.S. US. (m)	39.86	E.G. Elev (m)	40.08	37.82
Q Total (m3/s)	53.81	W.S. Elev (m)	39.35	37.47
Q Bridge (m3/s)	53.81	Crit W.S. (m)	39.35	36.97
Q Weir (m3/s)		Max Chl Dpth (m)	2.73	2.65
Weir Sta Lft (m)		Vel Total (m/s)	3.61	2.59
Weir Sta Rgt (m)		Flow Area (m2)	14.91	20.76
Weir Submerg		Froude # Chl	0.92	0.62
Weir Max Depth (m)		Specif Force (m3)	34.02	36.02
Min El Weir Flow (m)	51.87	Hydr Depth (m)	1.35	1.63
Min El Prs (m)	51.37	W.P. Total (m)	12.34	14.14
Delta EG (m)	2.60	Conv. Total (m3/s)	476.1	711.9
Delta WS (m)	2.90	Top Width (m)	11.07	12.71
BR Open Area (m2)	372.30	Frctn Loss (m)	0.24	0.08
BR Open Vel (m/s)	3.61	C & E Loss (m)	0.19	0.10
Coef of Q		Shear Total (N/m2)	151.33	82.23
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 786 Profile: Q1000

E.G. US. (m)	40.40	Element	Inside BR US	Inside BR DS
W.S. US. (m)	40.00	E.G. Elev (m)	40.23	37.97
Q Total (m3/s)	59.67	W.S. Elev (m)	39.47	37.59
Q Bridge (m3/s)	59.67	Crit W.S. (m)	39.47	37.07
Q Weir (m3/s)		Max Chl Dpth (m)	2.85	2.77
Weir Sta Lft (m)		Vel Total (m/s)	3.66	2.67
Weir Sta Rgt (m)		Flow Area (m2)	16.29	22.32
Weir Submerg		Froude # Chl	0.91	0.62
Weir Max Depth (m)		Specif Force (m3)	38.61	40.73
Min El Weir Flow (m)	51.87	Hydr Depth (m)	1.41	1.70
Min El Prs (m)	51.37	W.P. Total (m)	12.90	14.63
Delta EG (m)	2.61	Conv. Total (m3/s)	537.9	794.7
Delta WS (m)	2.93	Top Width (m)	11.57	13.13
BR Open Area (m2)	372.30	Frctn Loss (m)	0.24	0.08
BR Open Vel (m/s)	3.66	C & E Loss (m)	0.19	0.10
Coef of Q		Shear Total (N/m2)	152.34	84.32
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 679 Profile: Q10

E.G. US. (m)	35.66	Element	Inside BR US	Inside BR DS
W.S. US. (m)	35.62	E.G. Elev (m)	35.65	35.64
Q Total (m3/s)	21.51	W.S. Elev (m)	35.62	35.63
Q Bridge (m3/s)	21.51	Crit W.S. (m)	34.58	34.37
Q Weir (m3/s)		Max Chl Dpth (m)	1.80	1.95
Weir Sta Lft (m)		Vel Total (m/s)	0.84	0.54
Weir Sta Rgt (m)		Flow Area (m2)	25.73	39.80
Weir Submerg		Froude # Chl	0.22	0.14
Weir Max Depth (m)		Specif Force (m3)	22.02	34.25
Min El Weir Flow (m)	39.95	Hydr Depth (m)	1.19	1.46
Min El Prs (m)	38.35	W.P. Total (m)	22.36	27.92
Delta EG (m)	0.02	Conv. Total (m3/s)	798.7	1348.5
Delta WS (m)	0.00	Top Width (m)	21.64	27.34
BR Open Area (m2)	102.57	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	0.84	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	8.18	3.56
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 679 Profile: AMP

E.G. US. (m)	35.91	Element	Inside BR US	Inside BR DS
W.S. US. (m)	35.82	E.G. Elev (m)	35.90	35.87
Q Total (m3/s)	38.34	W.S. Elev (m)	35.81	35.83
Q Bridge (m3/s)	38.34	Crit W.S. (m)	34.90	34.62
Q Weir (m3/s)		Max Chl Dpth (m)	1.99	2.15
Weir Sta Lft (m)		Vel Total (m/s)	1.28	0.84
Weir Sta Rgt (m)		Flow Area (m2)	29.97	45.54
Weir Submerg		Froude # Chl	0.33	0.21
Weir Max Depth (m)		Specif Force (m3)	30.65	45.22
Min El Weir Flow (m)	39.95	Hydr Depth (m)	1.34	1.61
Min El Prs (m)	38.35	W.P. Total (m)	23.24	29.01
Delta EG (m)	0.04	Conv. Total (m3/s)	991.3	1651.7
Delta WS (m)	-0.01	Top Width (m)	22.31	28.32
BR Open Area (m2)	102.57	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	1.28	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	18.92	8.29
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 679 Profile: Q100

E.G. US. (m)	35.92	Element	Inside BR US	Inside BR DS
W.S. US. (m)	35.83	E.G. Elev (m)	35.91	35.88
Q Total (m3/s)	39.86	W.S. Elev (m)	35.81	35.84
Q Bridge (m3/s)	39.86	Crit W.S. (m)	34.92	34.64
Q Weir (m3/s)		Max Chl Dpth (m)	1.99	2.16
Weir Sta Lft (m)		Vel Total (m/s)	1.33	0.87
Weir Sta Rgt (m)		Flow Area (m2)	30.08	45.73
Weir Submerg		Froude # Chl	0.34	0.21
Weir Max Depth (m)		Specif Force (m3)	31.19	45.78
Min El Weir Flow (m)	39.95	Hydr Depth (m)	1.35	1.61
Min El Prs (m)	38.35	W.P. Total (m)	23.26	29.05
Delta EG (m)	0.04	Conv. Total (m3/s)	996.3	1661.8
Delta WS (m)	-0.01	Top Width (m)	22.32	28.35
BR Open Area (m2)	102.57	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	1.33	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	20.30	8.88
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 679 Profile: Q500

E.G. US. (m)	36.15	Element	Inside BR US	Inside BR DS
W.S. US. (m)	36.02	E.G. Elev (m)	36.14	36.10
Q Total (m3/s)	53.81	W.S. Elev (m)	36.00	36.04
Q Bridge (m3/s)	53.81	Crit W.S. (m)	35.14	34.80
Q Weir (m3/s)		Max Chl Dpth (m)	2.18	2.36
Weir Sta Lft (m)		Vel Total (m/s)	1.57	1.05
Weir Sta Rgt (m)		Flow Area (m2)	34.33	51.45
Weir Submerg		Froude # Chl	0.39	0.24
Weir Max Depth (m)		Specif Force (m3)	40.60	57.69
Min El Weir Flow (m)	39.95	Hydr Depth (m)	1.50	1.76
Min El Prs (m)	38.35	W.P. Total (m)	23.97	30.09
Delta EG (m)	0.06	Conv. Total (m3/s)	1205.6	1981.5
Delta WS (m)	-0.01	Top Width (m)	22.81	29.29
BR Open Area (m2)	102.57	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	1.57	C & E Loss (m)	0.04	0.00
Coef of Q		Shear Total (N/m2)	27.97	12.36
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 679 Profile: Q1000

E.G. US. (m)	36.24	Element	Inside BR US	Inside BR DS
W.S. US. (m)	36.09	E.G. Elev (m)	36.22	36.18
Q Total (m3/s)	59.67	W.S. Elev (m)	36.07	36.11
Q Bridge (m3/s)	59.67	Crit W.S. (m)	35.22	34.86
Q Weir (m3/s)		Max Chl Dpth (m)	2.25	2.43
Weir Sta Lft (m)		Vel Total (m/s)	1.66	1.11
Weir Sta Rgt (m)		Flow Area (m2)	35.87	53.56
Weir Submerg		Froude # Chl	0.40	0.26
Weir Max Depth (m)		Specif Force (m3)	44.53	62.53
Min El Weir Flow (m)	39.95	Hydr Depth (m)	1.56	1.81
Min El Prs (m)	38.35	W.P. Total (m)	24.23	30.47
Delta EG (m)	0.06	Conv. Total (m3/s)	1284.7	2103.2
Delta WS (m)	-0.01	Top Width (m)	22.99	29.63
BR Open Area (m2)	102.57	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	1.66	C & E Loss (m)	0.04	0.00
Coef of Q		Shear Total (N/m2)	31.32	13.87
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 04 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	4.49	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	0.95
Q Barrel (m3/s)	4.49	Culv Vel DS (m/s)	0.95
E.G. US. (m)	35.64	Culv Inv El Up (m)	32.36
W.S. US. (m)	35.62	Culv Inv El Dn (m)	32.22
E.G. DS (m)	35.58	Culv Frctn Ls (m)	0.00
W.S. DS (m)	35.57	Culv Exit Loss (m)	0.03
Delta EG (m)	0.06	Culv Entr Loss (m)	0.02
Delta WS (m)	0.05	Q Weir (m3/s)	17.02
E.G. IC (m)	35.58	Weir Sta Lft (m)	32.87
E.G. OC (m)	35.64	Weir Sta Rgt (m)	64.24
Culvert Control	Outlet	Weir Submerg	0.87
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	0.59
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	0.54
Culv Nml Depth (m)		Weir Flow Area (m2)	16.84
Culv Crt Depth (m)	0.69	Min El Weir Flow (m)	35.05

Plan: Plan 04 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	8.90	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	1.87
Q Barrel (m3/s)	8.90	Culv Vel DS (m/s)	1.87
E.G. US. (m)	35.87	Culv Inv El Up (m)	32.36
W.S. US. (m)	35.83	Culv Inv El Dn (m)	32.22
E.G. DS (m)	35.63	Culv Frctn Ls (m)	0.01
W.S. DS (m)	35.59	Culv Exit Loss (m)	0.14
Delta EG (m)	0.24	Culv Entr Loss (m)	0.09
Delta WS (m)	0.24	Q Weir (m3/s)	29.44
E.G. IC (m)	35.72	Weir Sta Lft (m)	31.94
E.G. OC (m)	35.87	Weir Sta Rgt (m)	65.56
Culvert Control	Outlet	Weir Submerg	0.62
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	0.82
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	0.72
Culv Nml Depth (m)		Weir Flow Area (m2)	24.18
Culv Crt Depth (m)	1.09	Min El Weir Flow (m)	35.05

Plan: Plan 04 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	9.71	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	2.04
Q Barrel (m3/s)	9.71	Culv Vel DS (m/s)	2.04
E.G. US. (m)	35.88	Culv Inv El Up (m)	32.36
W.S. US. (m)	35.83	Culv Inv El Dn (m)	32.22
E.G. DS (m)	35.59	Culv Frctn Ls (m)	0.02
W.S. DS (m)	35.54	Culv Exit Loss (m)	0.16
Delta EG (m)	0.29	Culv Entr Loss (m)	0.11
Delta WS (m)	0.29	Q Weir (m3/s)	30.15
E.G. IC (m)	35.75	Weir Sta Lft (m)	31.89
E.G. OC (m)	35.88	Weir Sta Rgt (m)	65.63
Culvert Control	Outlet	Weir Submerg	0.55
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	0.83
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	0.73
Culv Nml Depth (m)		Weir Flow Area (m2)	24.60
Culv Crt Depth (m)	1.15	Min El Weir Flow (m)	35.05

Plan: Plan 04 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	10.38	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	2.19
Q Barrel (m3/s)	10.38	Culv Vel DS (m/s)	2.19
E.G. US. (m)	36.09	Culv Inv El Up (m)	32.36
W.S. US. (m)	36.03	Culv Inv El Dn (m)	32.22
E.G. DS (m)	35.77	Culv Frctn Ls (m)	0.02
W.S. DS (m)	35.71	Culv Exit Loss (m)	0.18
Delta EG (m)	0.32	Culv Entr Loss (m)	0.12
Delta WS (m)	0.32	Q Weir (m3/s)	43.43
E.G. IC (m)	35.97	Weir Sta Lft (m)	31.03
E.G. OC (m)	36.09	Weir Sta Rgt (m)	66.85
Culvert Control	Outlet	Weir Submerg	0.59
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	1.04
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	0.89
Culv Nml Depth (m)		Weir Flow Area (m2)	31.93
Culv Crt Depth (m)	1.21	Min El Weir Flow (m)	35.05

Plan: Plan 04 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	10.76	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	2.26
Q Barrel (m3/s)	10.76	Culv Vel DS (m/s)	2.26
E.G. US. (m)	36.17	Culv Inv El Up (m)	32.36
W.S. US. (m)	36.11	Culv Inv El Dn (m)	32.22
E.G. DS (m)	35.83	Culv Frctn Ls (m)	0.02
W.S. DS (m)	35.76	Culv Exit Loss (m)	0.19
Delta EG (m)	0.34	Culv Entr Loss (m)	0.13
Delta WS (m)	0.35	Q Weir (m3/s)	48.91
E.G. IC (m)	36.06	Weir Sta Lft (m)	30.70
E.G. OC (m)	36.17	Weir Sta Rgt (m)	67.31
Culvert Control	Outlet	Weir Submerg	0.58
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	1.12
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	0.95
Culv Nml Depth (m)		Weir Flow Area (m2)	34.78
Culv Crt Depth (m)	1.24	Min El Weir Flow (m)	35.05

Plan: Plan 04 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	21.03	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.43
Q Barrel (m3/s)	21.03	Culv Vel DS (m/s)	6.29
E.G. US. (m)	35.58	Culv Inv El Up (m)	31.31
W.S. US. (m)	35.57	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.58	Culv Frctn Ls (m)	0.78
W.S. DS (m)	32.07	Culv Exit Loss (m)	1.72
Delta EG (m)	3.00	Culv Entr Loss (m)	0.50
Delta WS (m)	3.50	Q Weir (m3/s)	14.37
E.G. IC (m)	35.58	Weir Sta Lft (m)	34.38
E.G. OC (m)	34.78	Weir Sta Rgt (m)	91.83
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	0.47
Culv WS Outlet (m)	32.29	Weir Avg Depth (m)	0.30
Culv Nml Depth (m)	1.71	Weir Flow Area (m2)	17.06
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 04 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	21.19	Culv Full Len (m)	42.77
# Barrels	1	Culv Vel US (m/s)	4.46
Q Barrel (m3/s)	21.19	Culv Vel DS (m/s)	4.46
E.G. US. (m)	35.62	Culv Inv El Up (m)	31.31
W.S. US. (m)	35.59	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.58	Culv Frctn Ls (m)	1.25
W.S. DS (m)	32.07	Culv Exit Loss (m)	1.28
Delta EG (m)	3.04	Culv Entr Loss (m)	0.51
Delta WS (m)	3.51	Q Weir (m3/s)	17.15
E.G. IC (m)	35.62	Weir Sta Lft (m)	34.12
E.G. OC (m)	35.58	Weir Sta Rgt (m)	92.07
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	0.51
Culv WS Outlet (m)	32.85	Weir Avg Depth (m)	0.34
Culv Nml Depth (m)	1.72	Weir Flow Area (m2)	19.49
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 04 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	25.05	Culv Full Len (m)	42.77
# Barrels	1	Culv Vel US (m/s)	5.27
Q Barrel (m3/s)	25.05	Culv Vel DS (m/s)	5.27
E.G. US. (m)	35.58	Culv Inv El Up (m)	31.31
W.S. US. (m)	35.54	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.77	Culv Frctn Ls (m)	0.61
W.S. DS (m)	32.20	Culv Exit Loss (m)	1.50
Delta EG (m)	2.82	Culv Entr Loss (m)	0.71
Delta WS (m)	3.34	Q Weir (m3/s)	14.70
E.G. IC (m)	35.64	Weir Sta Lft (m)	34.35
E.G. OC (m)	35.58	Weir Sta Rgt (m)	91.86
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	0.47
Culv WS Outlet (m)	32.85	Weir Avg Depth (m)	0.31
Culv Nml Depth (m)	1.90	Weir Flow Area (m2)	17.36
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 04 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	25.87	Culv Full Len (m)	42.77
# Barrels	1	Culv Vel US (m/s)	5.45
Q Barrel (m3/s)	25.87	Culv Vel DS (m/s)	5.45
E.G. US. (m)	35.77	Culv Inv El Up (m)	31.31
W.S. US. (m)	35.71	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.77	Culv Frctn Ls (m)	0.65
W.S. DS (m)	32.20	Culv Exit Loss (m)	1.59
Delta EG (m)	3.00	Culv Entr Loss (m)	0.76
Delta WS (m)	3.51	Q Weir (m3/s)	27.94
E.G. IC (m)	35.81	Weir Sta Lft (m)	33.26
E.G. OC (m)	35.77	Weir Sta Rgt (m)	92.88
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	0.65
Culv WS Outlet (m)	32.85	Weir Avg Depth (m)	0.47
Culv Nml Depth (m)	1.90	Weir Flow Area (m2)	27.85
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 04 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	26.13	Culv Full Len (m)	42.77
# Barrels	1	Culv Vel US (m/s)	5.50
Q Barrel (m3/s)	26.13	Culv Vel DS (m/s)	5.50
E.G. US. (m)	35.82	Culv Inv El Up (m)	31.31
W.S. US. (m)	35.76	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.76	Culv Frctn Ls (m)	0.66
W.S. DS (m)	32.20	Culv Exit Loss (m)	1.63
Delta EG (m)	3.06	Culv Entr Loss (m)	0.77
Delta WS (m)	3.56	Q Weir (m3/s)	33.54
E.G. IC (m)	35.89	Weir Sta Lft (m)	32.86
E.G. OC (m)	35.82	Weir Sta Rgt (m)	93.25
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	0.72
Culv WS Outlet (m)	32.85	Weir Avg Depth (m)	0.53
Culv Nml Depth (m)	1.90	Weir Flow Area (m2)	31.73
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 04 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	21.03	Culv Full Len (m)	1.99
# Barrels	1	Culv Vel US (m/s)	4.11
Q Barrel (m3/s)	21.03	Culv Vel DS (m/s)	2.79
E.G. US. (m)	29.22	Culv Inv El Up (m)	25.94
W.S. US. (m)	29.08	Culv Inv El Dn (m)	24.56
E.G. DS (m)	27.90	Culv Frctn Ls (m)	0.66
W.S. DS (m)	27.73	Culv Exit Loss (m)	0.22
Delta EG (m)	1.32	Culv Entr Loss (m)	0.43
Delta WS (m)	1.35	Q Weir (m3/s)	
E.G. IC (m)	28.98	Weir Sta Lft (m)	
E.G. OC (m)	29.22	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	27.93	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.34	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.99	Min El Weir Flow (m)	32.50

Plan: Plan 04 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	21.19	Culv Full Len (m)	2.57
# Barrels	1	Culv Vel US (m/s)	4.12
Q Barrel (m3/s)	21.19	Culv Vel DS (m/s)	2.81
E.G. US. (m)	29.24	Culv Inv El Up (m)	25.94
W.S. US. (m)	29.10	Culv Inv El Dn (m)	24.56
E.G. DS (m)	27.92	Culv Frctn Ls (m)	0.65
W.S. DS (m)	27.75	Culv Exit Loss (m)	0.23
Delta EG (m)	1.31	Culv Entr Loss (m)	0.43
Delta WS (m)	1.35	Q Weir (m3/s)	
E.G. IC (m)	28.99	Weir Sta Lft (m)	
E.G. OC (m)	29.24	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	27.94	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.35	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.00	Min El Weir Flow (m)	32.50

Plan: Plan 04 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	25.16	Culv Full Len (m)	18.05
# Barrels	1	Culv Vel US (m/s)	4.43
Q Barrel (m3/s)	25.16	Culv Vel DS (m/s)	3.33
E.G. US. (m)	29.62	Culv Inv El Up (m)	25.94
W.S. US. (m)	29.47	Culv Inv El Dn (m)	24.56
E.G. DS (m)	28.40	Culv Frctn Ls (m)	0.32
W.S. DS (m)	28.24	Culv Exit Loss (m)	0.41
Delta EG (m)	1.23	Culv Entr Loss (m)	0.50
Delta WS (m)	1.23	Q Weir (m3/s)	
E.G. IC (m)	29.42	Weir Sta Lft (m)	
E.G. OC (m)	29.62	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	28.12	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.49	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.18	Min El Weir Flow (m)	32.50

Plan: Plan 04 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	25.24	Culv Full Len (m)	18.38
# Barrels	1	Culv Vel US (m/s)	4.44
Q Barrel (m3/s)	25.24	Culv Vel DS (m/s)	3.34
E.G. US. (m)	29.63	Culv Inv El Up (m)	25.94
W.S. US. (m)	29.48	Culv Inv El Dn (m)	24.56
E.G. DS (m)	28.41	Culv Frctn Ls (m)	0.31
W.S. DS (m)	28.25	Culv Exit Loss (m)	0.41
Delta EG (m)	1.23	Culv Entr Loss (m)	0.50
Delta WS (m)	1.23	Q Weir (m3/s)	
E.G. IC (m)	29.42	Weir Sta Lft (m)	
E.G. OC (m)	29.63	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	28.12	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.49	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.18	Min El Weir Flow (m)	32.50

Plan: Plan 04 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	25.04	Culv Full Len (m)	17.54
# Barrels	1	Culv Vel US (m/s)	4.42
Q Barrel (m3/s)	25.04	Culv Vel DS (m/s)	3.32
E.G. US. (m)	29.61	Culv Inv El Up (m)	25.94
W.S. US. (m)	29.46	Culv Inv El Dn (m)	24.56
E.G. DS (m)	28.38	Culv Frctn Ls (m)	0.33
W.S. DS (m)	28.23	Culv Exit Loss (m)	0.40
Delta EG (m)	1.23	Culv Entr Loss (m)	0.50
Delta WS (m)	1.24	Q Weir (m3/s)	
E.G. IC (m)	29.40	Weir Sta Lft (m)	
E.G. OC (m)	29.61	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	28.12	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.49	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.18	Min El Weir Flow (m)	32.50

Plan: Plan 04 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	21.03	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.69
Q Barrel (m3/s)	21.03	Culv Vel DS (m/s)	5.91
E.G. US. (m)	27.85	Culv Inv El Up (m)	23.93
W.S. US. (m)	27.78	Culv Inv El Dn (m)	23.43
E.G. DS (m)	25.53	Culv Frctn Ls (m)	0.30
W.S. DS (m)	24.83	Culv Exit Loss (m)	1.45
Delta EG (m)	2.32	Culv Entr Loss (m)	0.56
Delta WS (m)	2.96	Q Weir (m3/s)	
E.G. IC (m)	27.73	Weir Sta Lft (m)	
E.G. OC (m)	27.85	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	26.17	Weir Max Depth (m)	
Culv WS Outlet (m)	25.21	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.55	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.24	Min El Weir Flow (m)	29.00

Plan: Plan 04 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	21.19	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.70
Q Barrel (m3/s)	21.19	Culv Vel DS (m/s)	5.92
E.G. US. (m)	27.87	Culv Inv El Up (m)	23.93
W.S. US. (m)	27.80	Culv Inv El Dn (m)	23.43
E.G. DS (m)	25.54	Culv Frctn Ls (m)	0.31
W.S. DS (m)	24.83	Culv Exit Loss (m)	1.46
Delta EG (m)	2.33	Culv Entr Loss (m)	0.56
Delta WS (m)	2.97	Q Weir (m3/s)	
E.G. IC (m)	27.75	Weir Sta Lft (m)	
E.G. OC (m)	27.87	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	26.18	Weir Max Depth (m)	
Culv WS Outlet (m)	25.22	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.56	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.25	Min El Weir Flow (m)	29.00

Plan: Plan 04 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	25.16	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.98
Q Barrel (m3/s)	25.16	Culv Vel DS (m/s)	6.16
E.G. US. (m)	28.35	Culv Inv El Up (m)	23.93
W.S. US. (m)	28.29	Culv Inv El Dn (m)	23.43
E.G. DS (m)	25.80	Culv Frctn Ls (m)	0.32
W.S. DS (m)	25.00	Culv Exit Loss (m)	1.60
Delta EG (m)	2.55	Culv Entr Loss (m)	0.63
Delta WS (m)	3.28	Q Weir (m3/s)	
E.G. IC (m)	28.23	Weir Sta Lft (m)	
E.G. OC (m)	28.35	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	26.46	Weir Max Depth (m)	
Culv WS Outlet (m)	25.47	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.79	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.53	Min El Weir Flow (m)	29.00

Plan: Plan 04 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	25.24	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.98
Q Barrel (m3/s)	25.24	Culv Vel DS (m/s)	6.16
E.G. US. (m)	28.36	Culv Inv El Up (m)	23.93
W.S. US. (m)	28.30	Culv Inv El Dn (m)	23.43
E.G. DS (m)	25.80	Culv Frctn Ls (m)	0.32
W.S. DS (m)	25.01	Culv Exit Loss (m)	1.61
Delta EG (m)	2.56	Culv Entr Loss (m)	0.63
Delta WS (m)	3.29	Q Weir (m3/s)	
E.G. IC (m)	28.23	Weir Sta Lft (m)	
E.G. OC (m)	28.36	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	26.46	Weir Max Depth (m)	
Culv WS Outlet (m)	25.48	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.80	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.53	Min El Weir Flow (m)	29.00

Plan: Plan 04 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	25.04	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.97
Q Barrel (m3/s)	25.04	Culv Vel DS (m/s)	6.15
E.G. US. (m)	28.34	Culv Inv El Up (m)	23.93
W.S. US. (m)	28.27	Culv Inv El Dn (m)	23.43
E.G. DS (m)	25.79	Culv Frctn Ls (m)	0.31
W.S. DS (m)	25.00	Culv Exit Loss (m)	1.60
Delta EG (m)	2.54	Culv Entr Loss (m)	0.63
Delta WS (m)	3.28	Q Weir (m3/s)	
E.G. IC (m)	28.21	Weir Sta Lft (m)	
E.G. OC (m)	28.34	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	26.45	Weir Max Depth (m)	
Culv WS Outlet (m)	25.47	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.79	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.52	Min El Weir Flow (m)	29.00

Plan: Plan 04 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	21.03	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.00
Q Barrel (m3/s)	21.03	Culv Vel DS (m/s)	5.17
E.G. US. (m)	22.48	Culv Inv El Up (m)	19.52
W.S. US. (m)	22.37	Culv Inv El Dn (m)	13.00
E.G. DS (m)	14.87	Culv Frctn Ls (m)	6.32
W.S. DS (m)	14.39	Culv Exit Loss (m)	0.88
Delta EG (m)	7.61	Culv Entr Loss (m)	0.41
Delta WS (m)	7.98	Q Weir (m3/s)	
E.G. IC (m)	22.36	Weir Sta Lft (m)	
E.G. OC (m)	22.48	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	21.26	Weir Max Depth (m)	
Culv WS Outlet (m)	14.39	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.39	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.74	Min El Weir Flow (m)	23.40

Plan: Plan 04 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	21.19	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.02
Q Barrel (m3/s)	21.19	Culv Vel DS (m/s)	5.18
E.G. US. (m)	22.50	Culv Inv El Up (m)	19.52
W.S. US. (m)	22.39	Culv Inv El Dn (m)	13.00
E.G. DS (m)	14.88	Culv Frctn Ls (m)	6.32
W.S. DS (m)	14.39	Culv Exit Loss (m)	0.88
Delta EG (m)	7.62	Culv Entr Loss (m)	0.41
Delta WS (m)	7.99	Q Weir (m3/s)	
E.G. IC (m)	22.38	Weir Sta Lft (m)	
E.G. OC (m)	22.50	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	21.26	Weir Max Depth (m)	
Culv WS Outlet (m)	14.39	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.39	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.74	Min El Weir Flow (m)	23.40

Plan: Plan 04 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	25.16	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.38
Q Barrel (m3/s)	25.16	Culv Vel DS (m/s)	5.41
E.G. US. (m)	22.90	Culv Inv El Up (m)	19.52
W.S. US. (m)	22.78	Culv Inv El Dn (m)	13.00
E.G. DS (m)	15.05	Culv Frctn Ls (m)	6.35
W.S. DS (m)	14.51	Culv Exit Loss (m)	0.99
Delta EG (m)	7.84	Culv Entr Loss (m)	0.51
Delta WS (m)	8.27	Q Weir (m3/s)	
E.G. IC (m)	22.90	Weir Sta Lft (m)	
E.G. OC (m)	22.88	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	21.42	Weir Max Depth (m)	
Culv WS Outlet (m)	14.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.56	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	23.40

Plan: Plan 04 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	25.24	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.39
Q Barrel (m3/s)	25.24	Culv Vel DS (m/s)	5.42
E.G. US. (m)	22.91	Culv Inv El Up (m)	19.52
W.S. US. (m)	22.79	Culv Inv El Dn (m)	13.00
E.G. DS (m)	15.06	Culv Frctn Ls (m)	6.35
W.S. DS (m)	14.51	Culv Exit Loss (m)	0.99
Delta EG (m)	7.85	Culv Entr Loss (m)	0.51
Delta WS (m)	8.27	Q Weir (m3/s)	
E.G. IC (m)	22.91	Weir Sta Lft (m)	
E.G. OC (m)	22.89	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	21.42	Weir Max Depth (m)	
Culv WS Outlet (m)	14.56	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.56	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	23.40

Plan: Plan 04 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	25.04	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.37
Q Barrel (m3/s)	25.04	Culv Vel DS (m/s)	5.40
E.G. US. (m)	22.88	Culv Inv El Up (m)	19.52
W.S. US. (m)	22.76	Culv Inv El Dn (m)	13.00
E.G. DS (m)	15.05	Culv Frctn Ls (m)	6.35
W.S. DS (m)	14.51	Culv Exit Loss (m)	0.99
Delta EG (m)	7.83	Culv Entr Loss (m)	0.50
Delta WS (m)	8.25	Q Weir (m3/s)	
E.G. IC (m)	22.88	Weir Sta Lft (m)	
E.G. OC (m)	22.87	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	21.41	Weir Max Depth (m)	
Culv WS Outlet (m)	14.55	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.55	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.89	Min El Weir Flow (m)	23.40

ANEJO 6: RESULTADOS DEL MODELO HEC-RAS. BARRANCO DEL LLERIA


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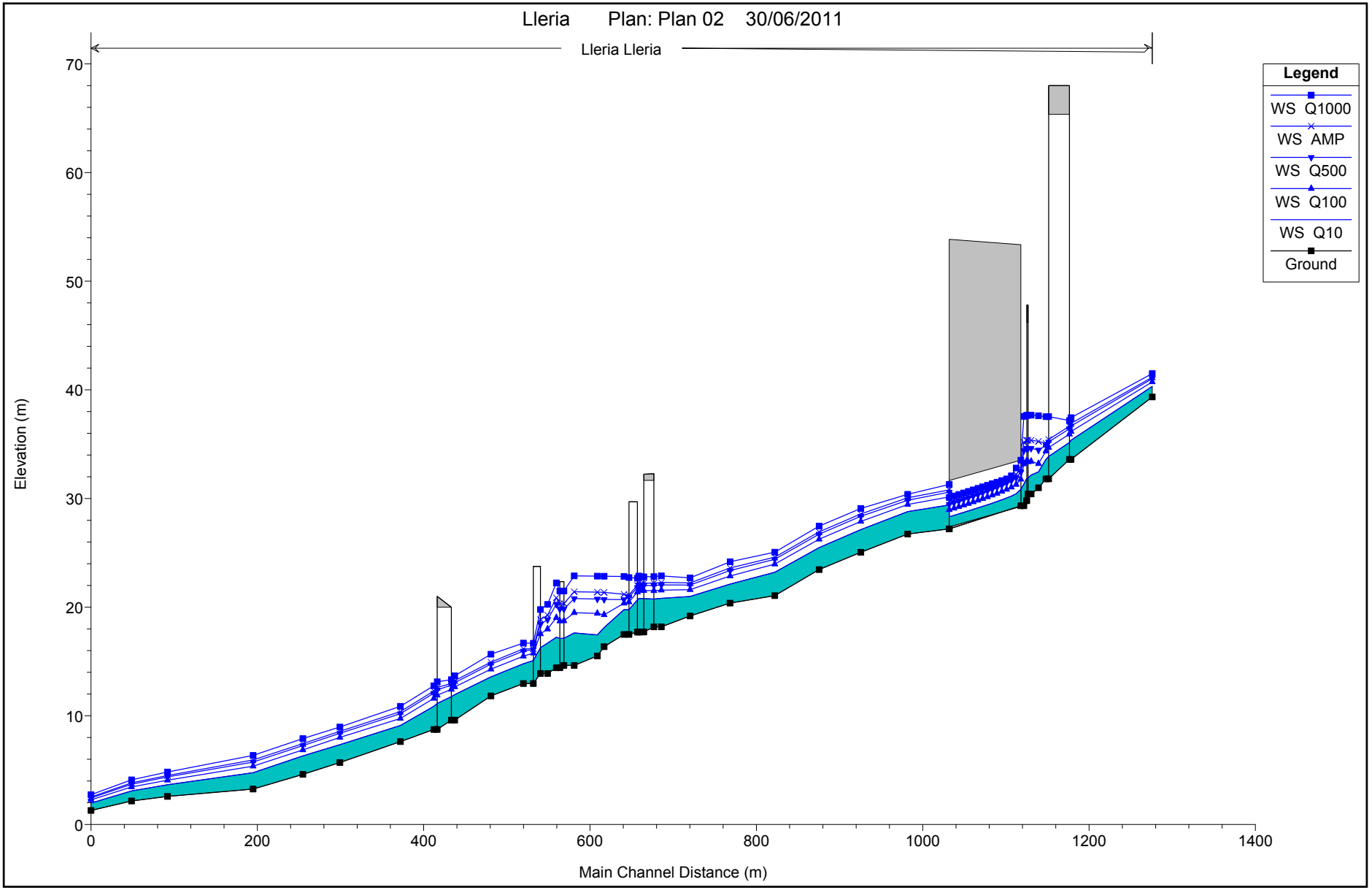
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Lleria Lleria
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WS AMP
WS Q500
WS Q100
WS Q10
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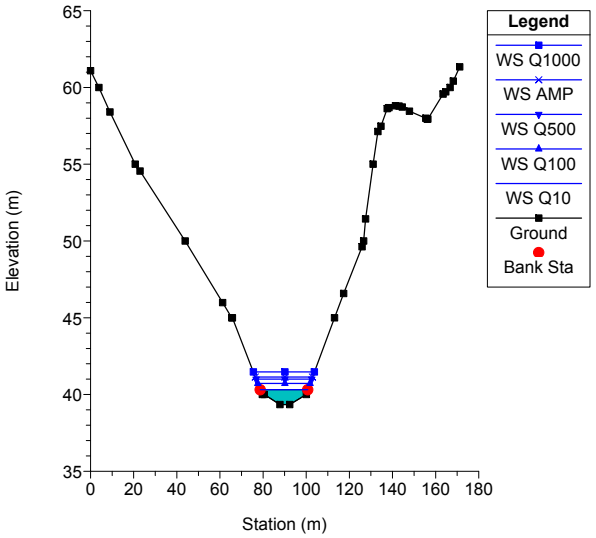

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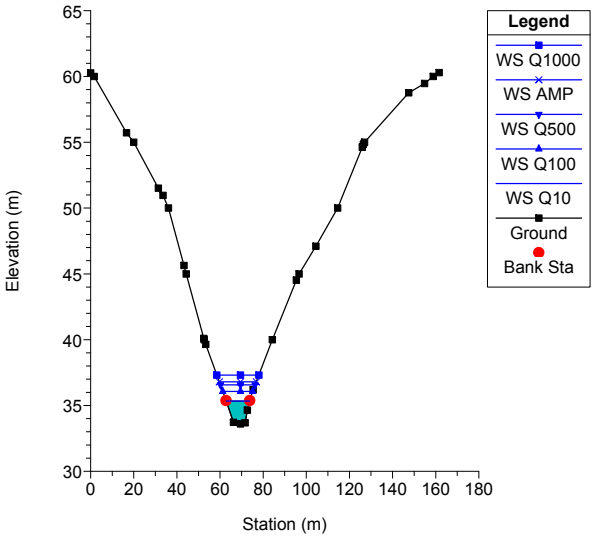
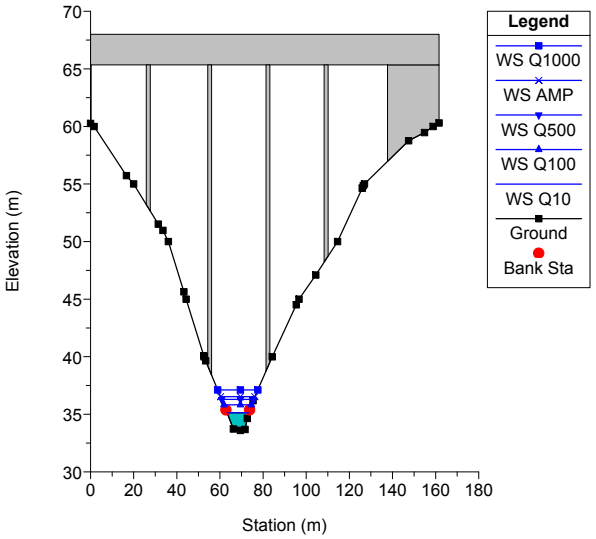
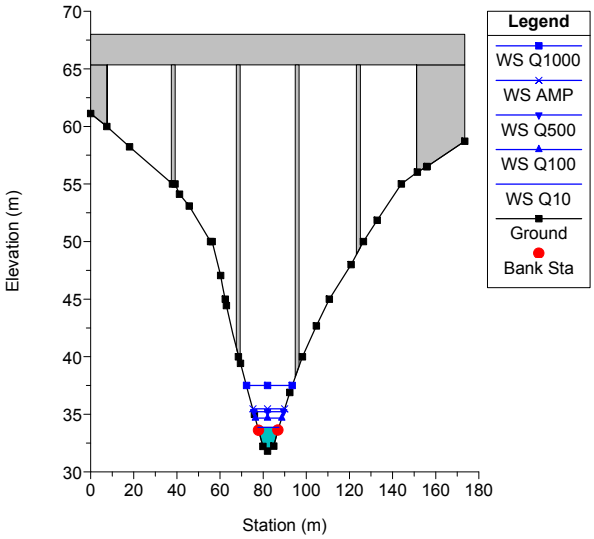


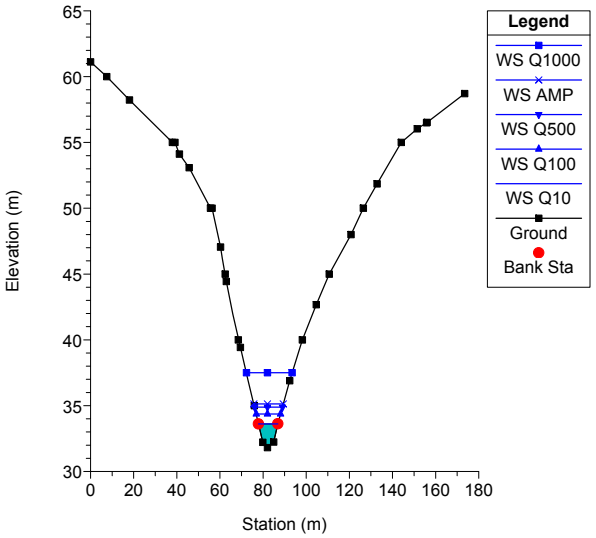
Lleria Plan: Plan 01 01/07/2011
RS = 1220.540 BR Autovía A-7



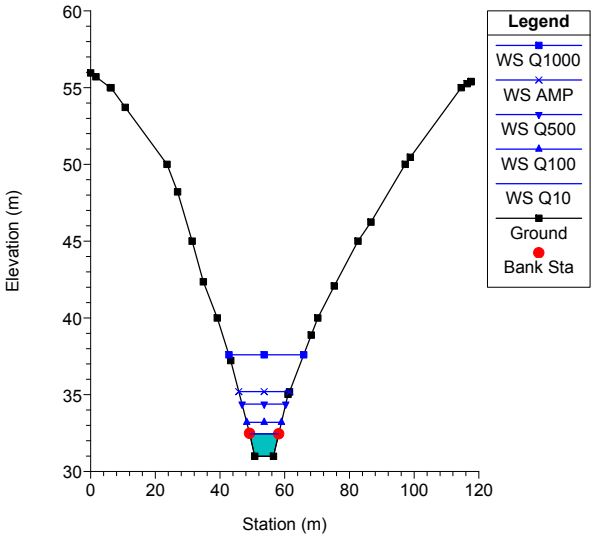
Lleria Plan: Plan 01 01/07/2011
RS = 1220.540 BR Autovía A-7



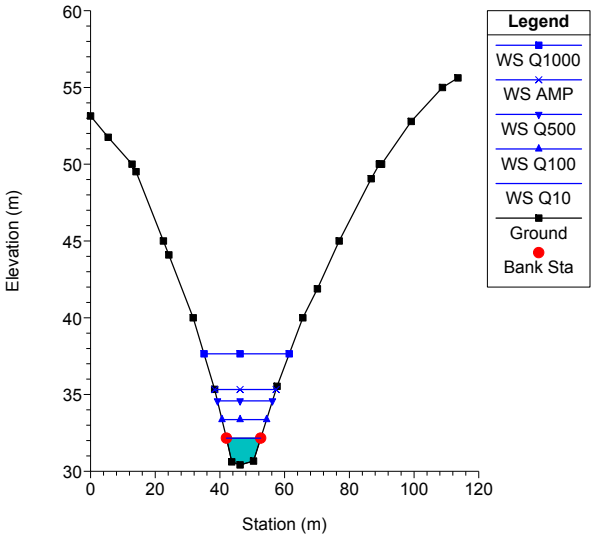
Lleria Plan: Plan 01 01/07/2011
RS = 1204.740



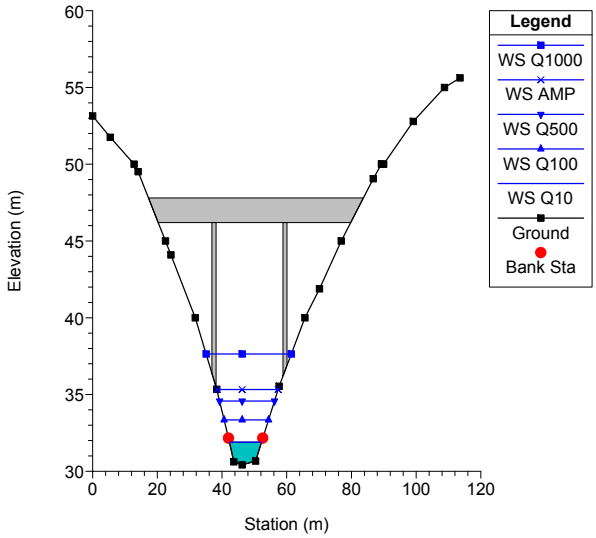
Lleria Plan: Plan 01 01/07/2011
RS = 1195.853



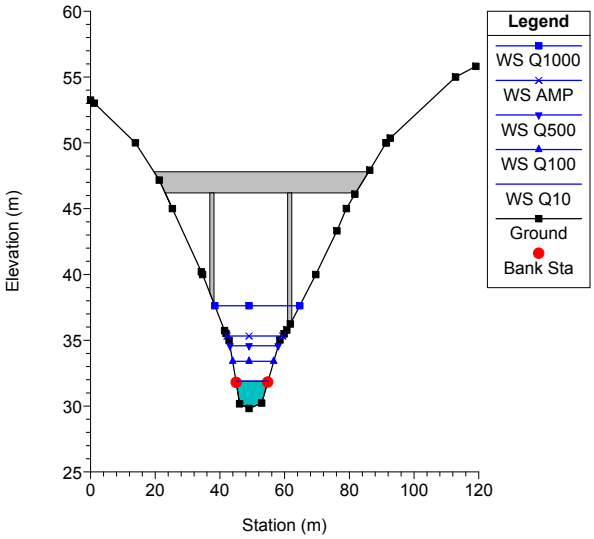
Lleria Plan: Plan 01 01/07/2011
RS = 1186.933



Lleria Plan: Plan 01 01/07/2011
RS = 1183.31 BR Tubería



Lleria Plan: Plan 01 01/07/2011
RS = 1183.31 BR Tubería



Lleria Plan: Plan 01 01/07/2011
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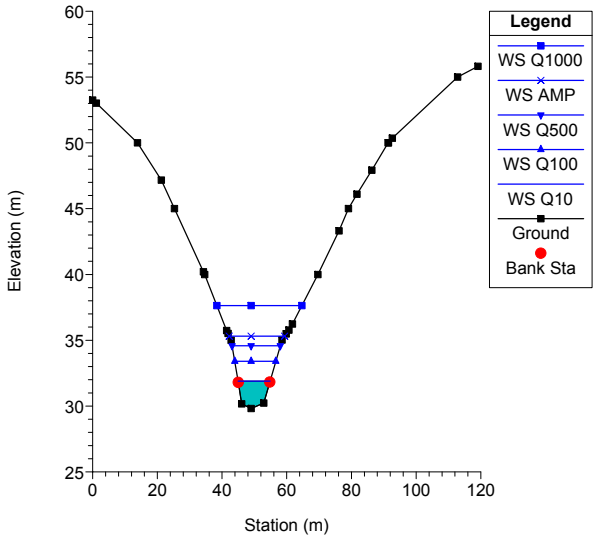
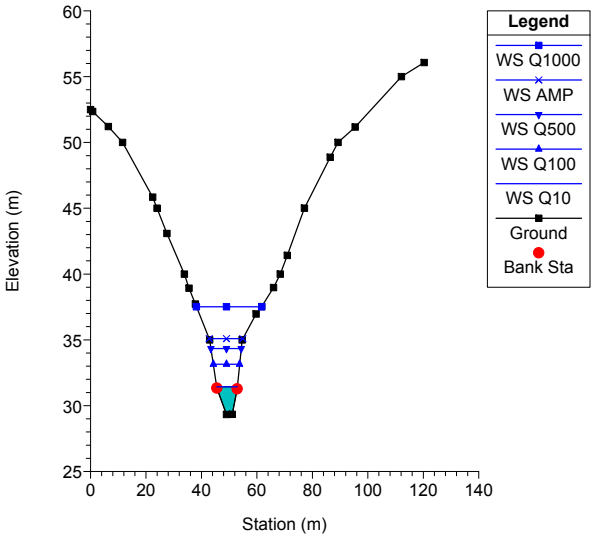
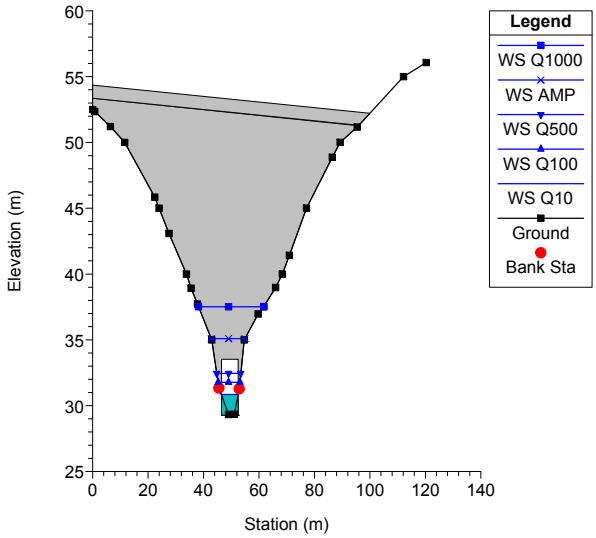


Lleria Plan: Plan 01 01/07/2011
RS = 1178.254

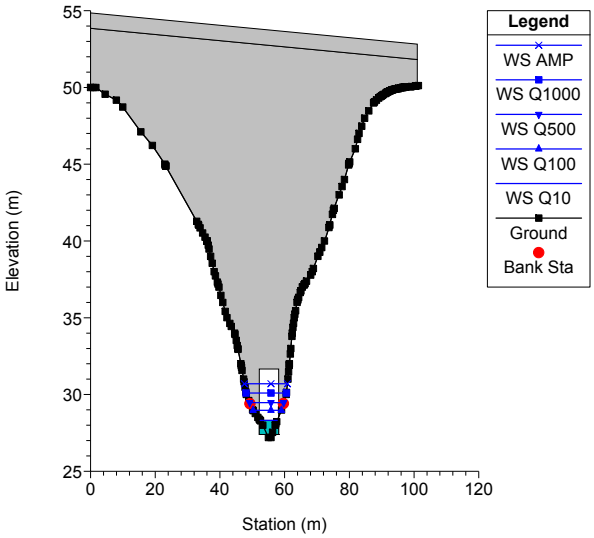


Lleria Plan: Plan 01 01/07/2011
RS = 1173.62 Culv Autopista AP-7



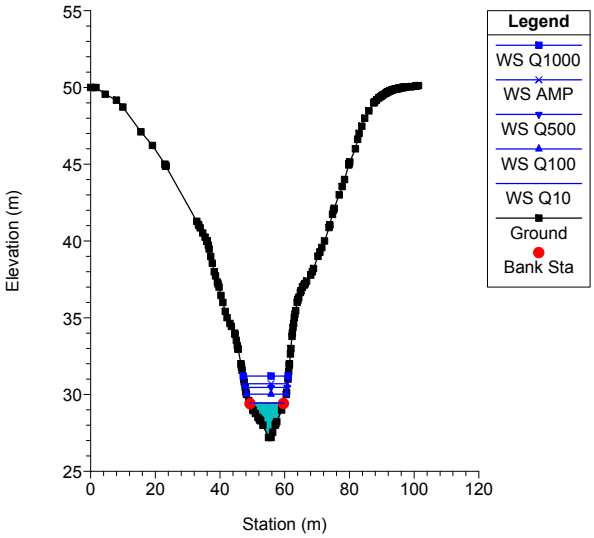
Lleria Plan: Plan 01 01/07/2011

RS = 1173.62 Culv Autopista AP-7



Lleria Plan: Plan 01 01/07/2011

RS = 1088.489



Lleria Plan: Plan 01 01/07/2011

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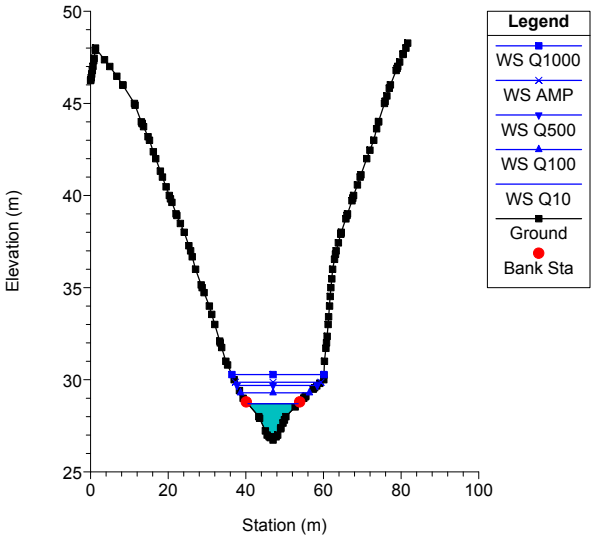

Lleria Plan: Plan 01 01/07/2011

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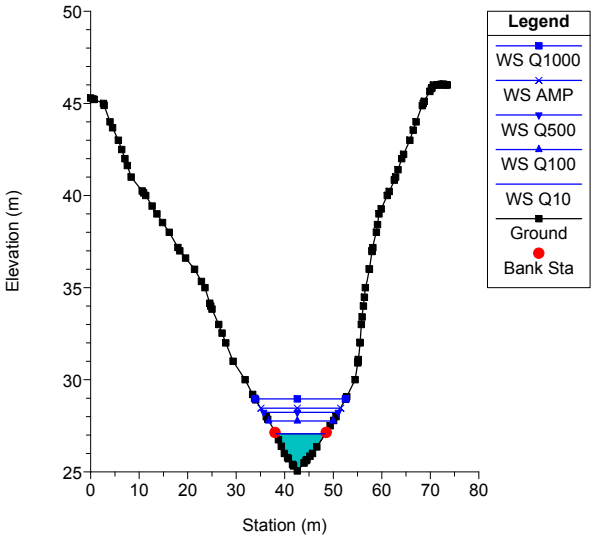

Lleria Plan: Plan 01 01/07/2011

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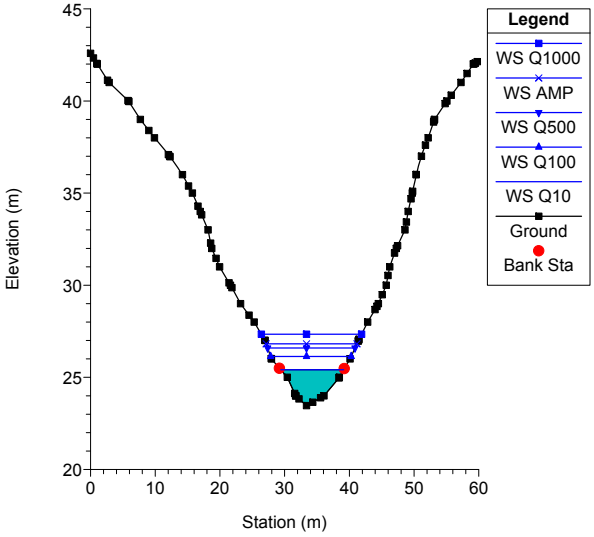

Lleria Plan: Plan 01 01/07/2011

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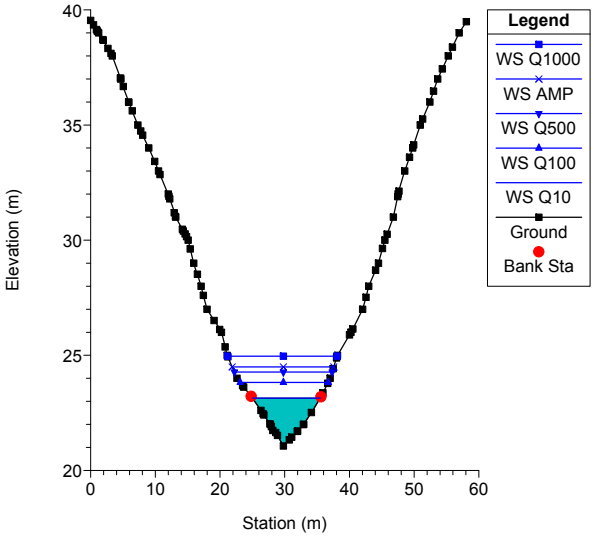

Lleria Plan: Plan 01 01/07/2011
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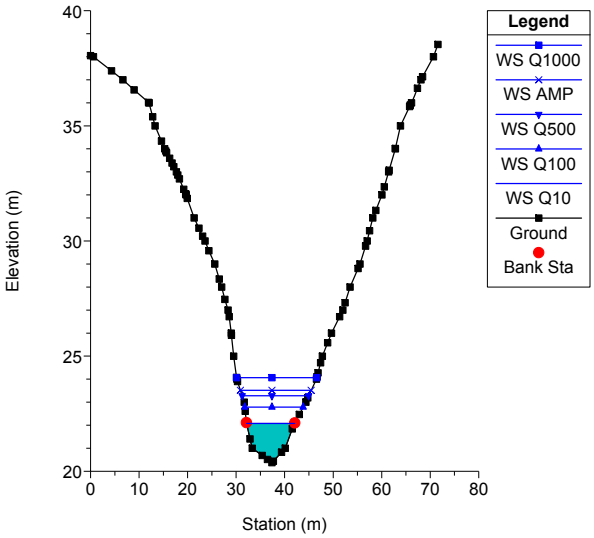

Lleria Plan: Plan 01 01/07/2011
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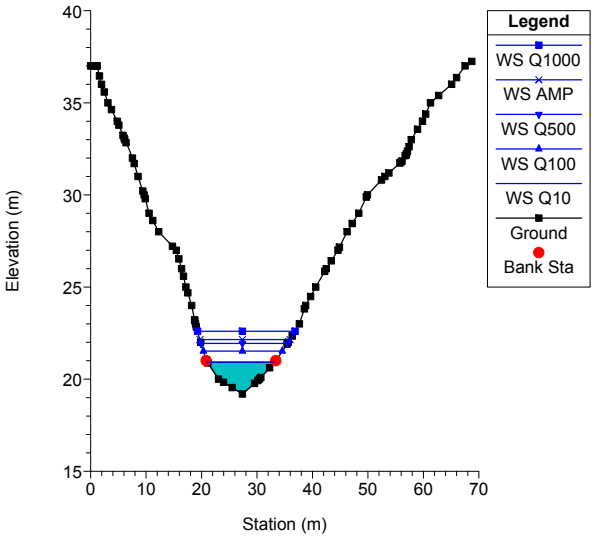
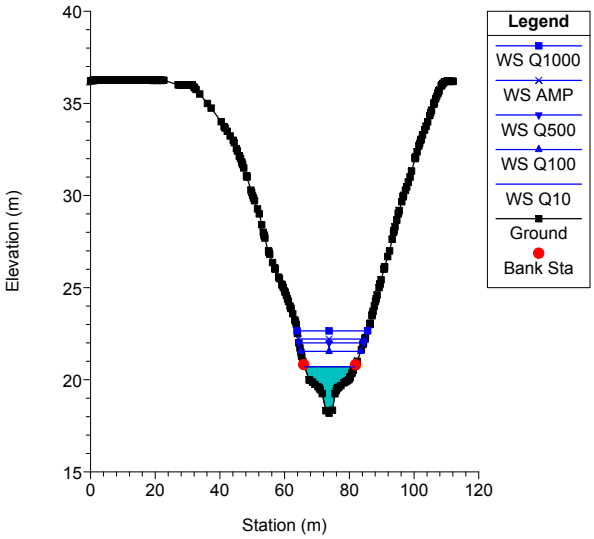
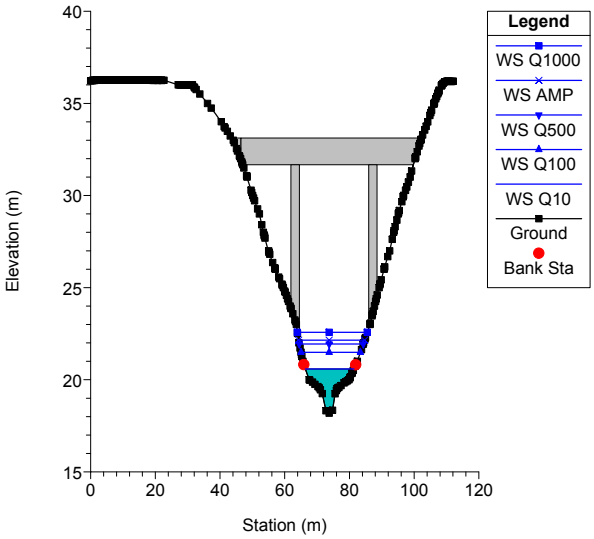


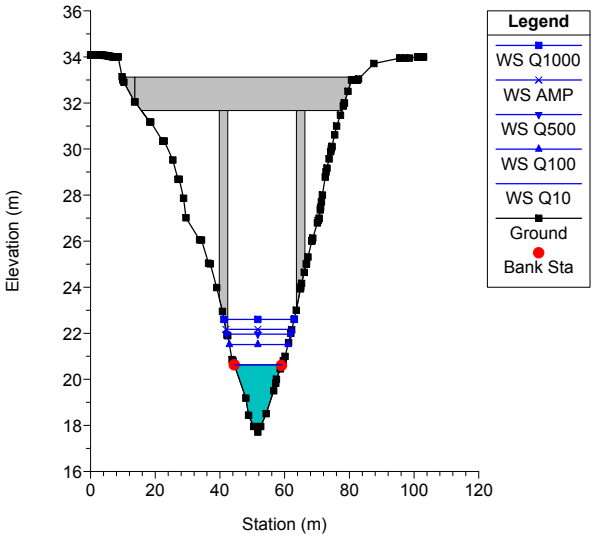
Lleria Plan: Plan 01 01/07/2011
RS = 742.272



Lleria Plan: Plan 01 01/07/2011
RS = 731.35 BR CN-340



Lleria Plan: Plan 01 01/07/2011
RS = 731.35 BR CN-340



Lleria Plan: Plan 01 01/07/2011
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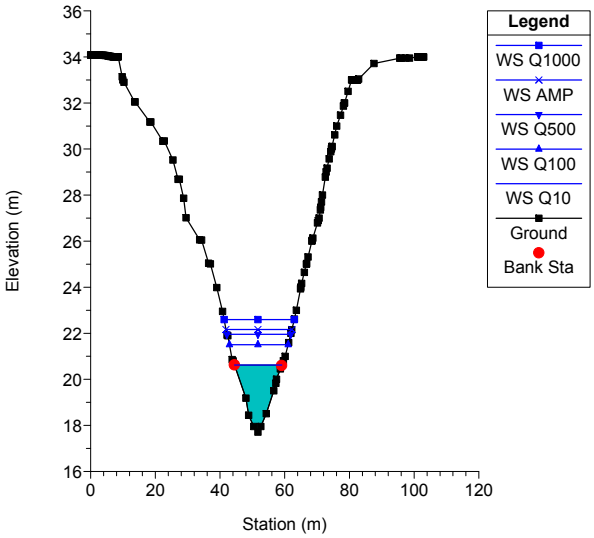

Lleria Plan: Plan 01 01/07/2011
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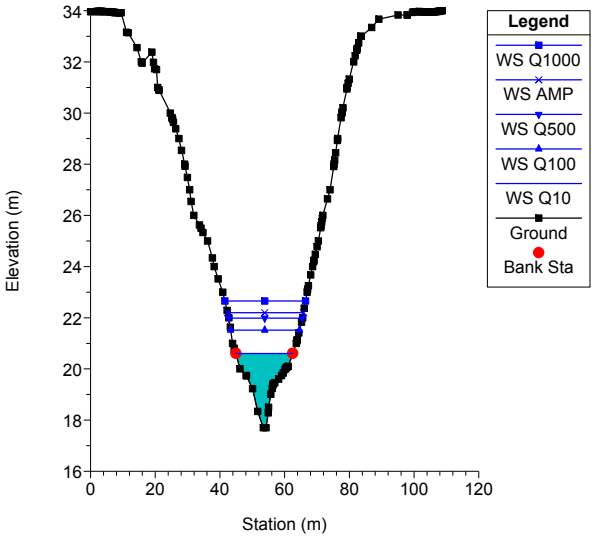
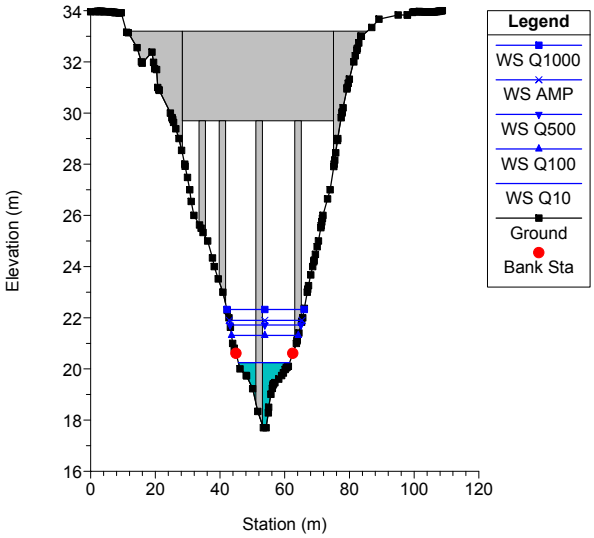


Lleria Plan: Plan 01 01/07/2011
RS = 713.61 BR Antigua CN-340



Lleria Plan: Plan 01 01/07/2011
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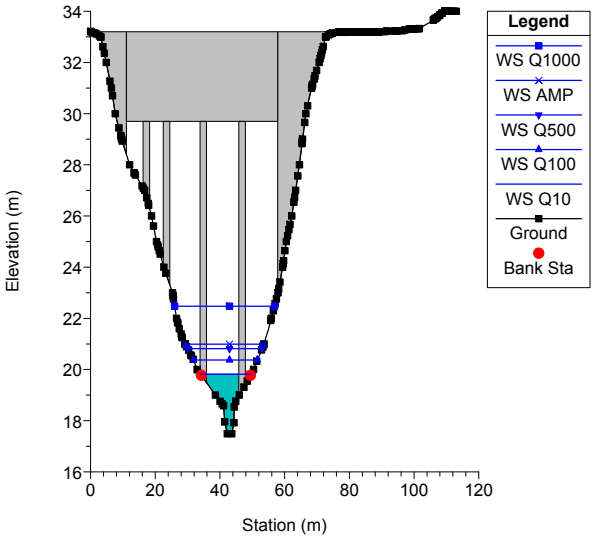

Lleria Plan: Plan 01 01/07/2011
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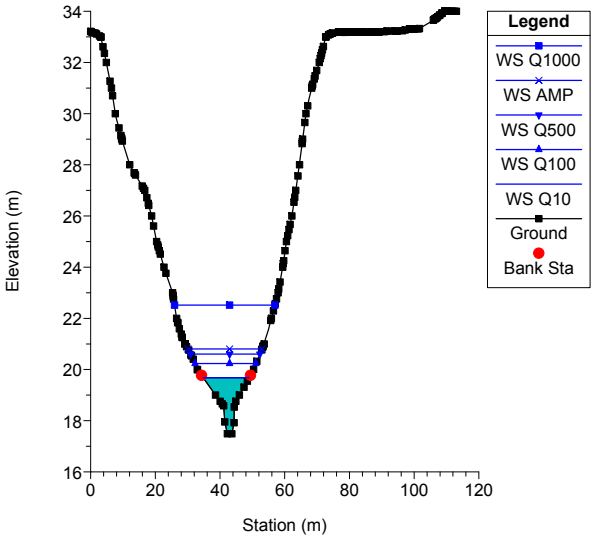

Lleria Plan: Plan 01 01/07/2011
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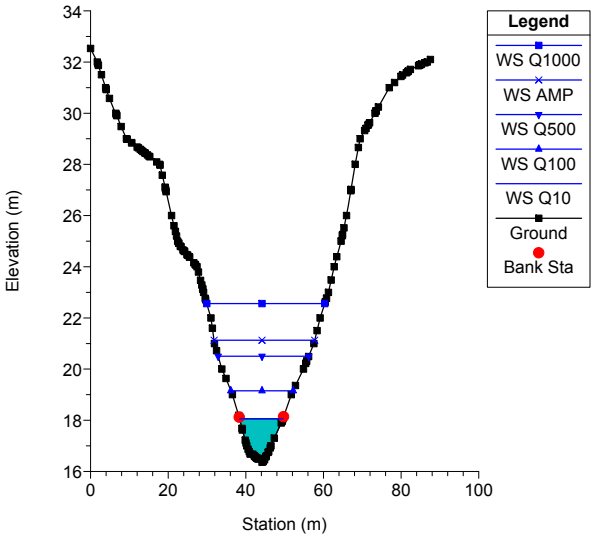

Lleria Plan: Plan 01 01/07/2011
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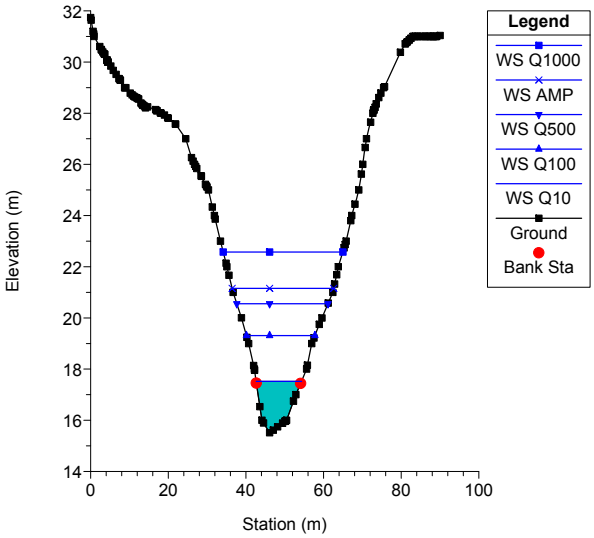

Lleria Plan: Plan 01 01/07/2011
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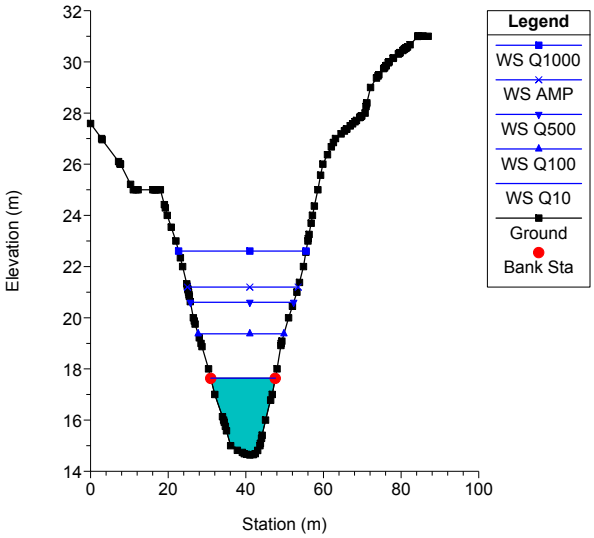
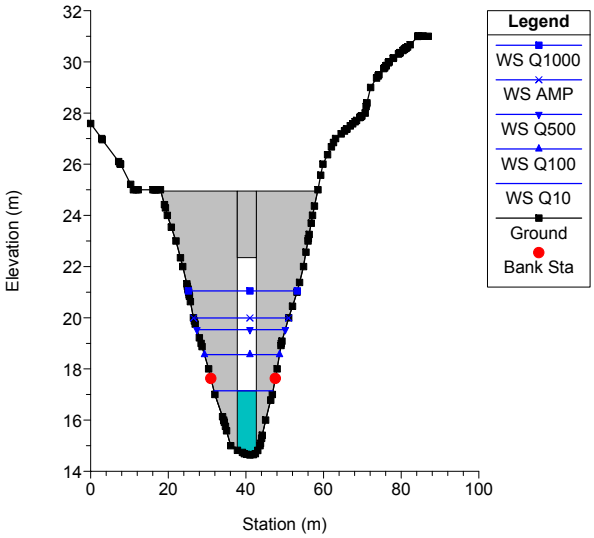
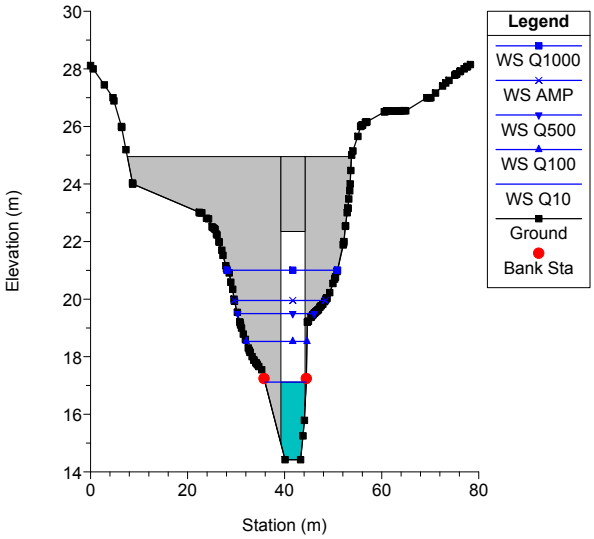


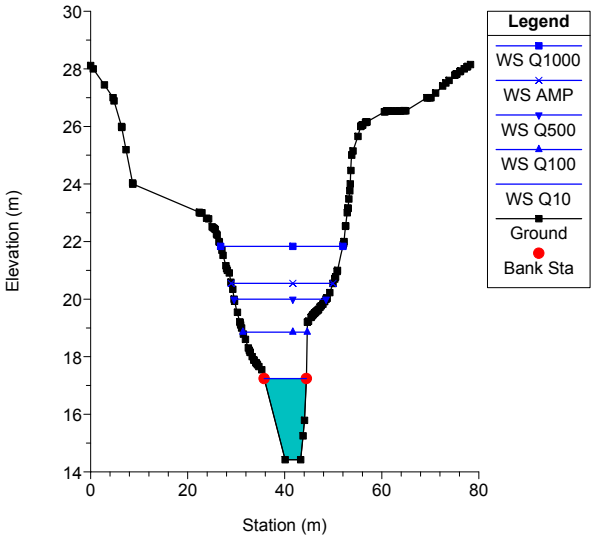
Lleria Plan: Plan 01 01/07/2011
RS = 625.22 BR Vial en deshuso



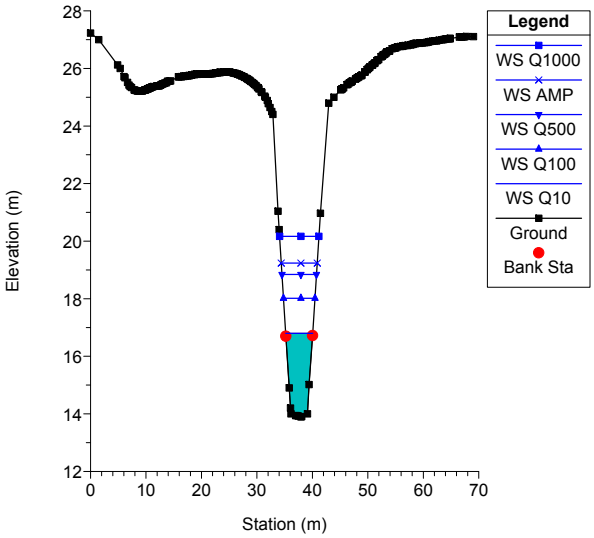
Lleria Plan: Plan 01 01/07/2011
RS = 625.22 BR Vial en deshuso



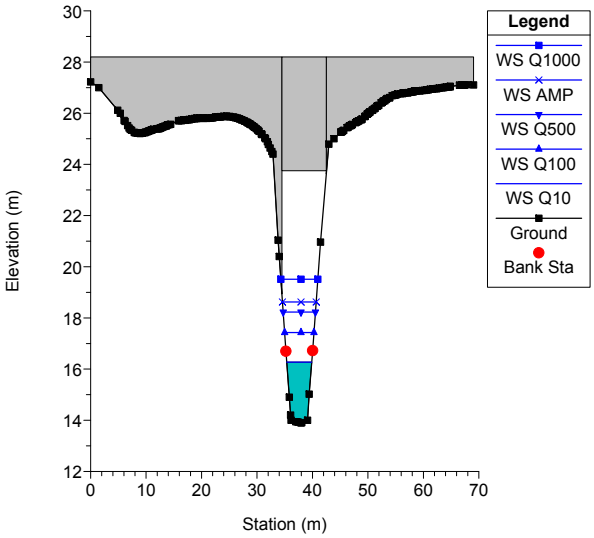
Lleria Plan: Plan 01 01/07/2011
RS = 616.033



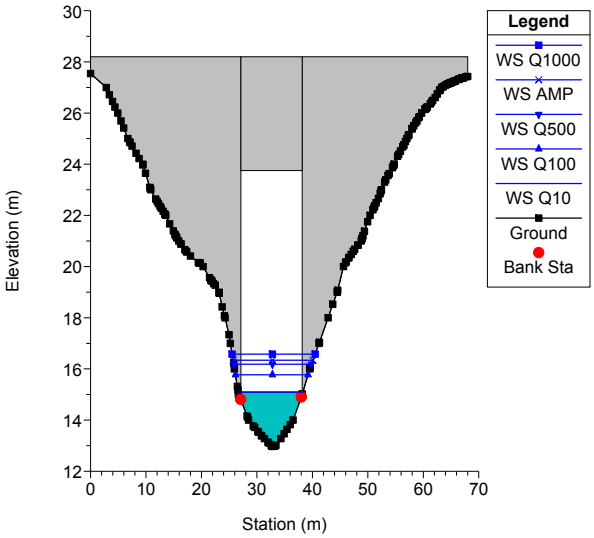
Lleria Plan: Plan 01 01/07/2011
RS = 605.590



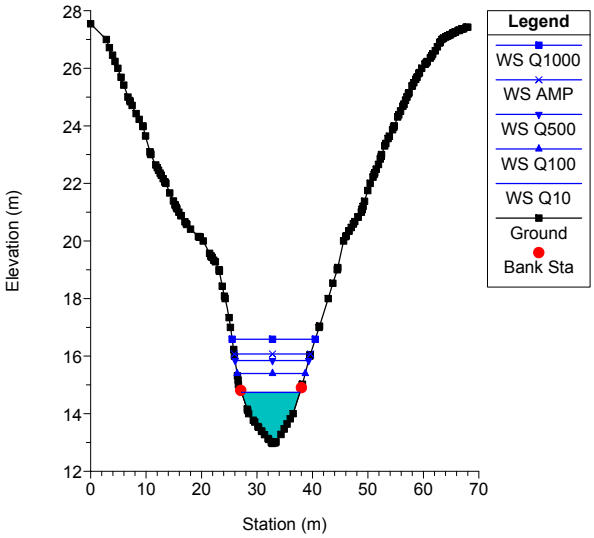
Lleria Plan: Plan 01 01/07/2011
RS = 597.04 BR Ferrocarril



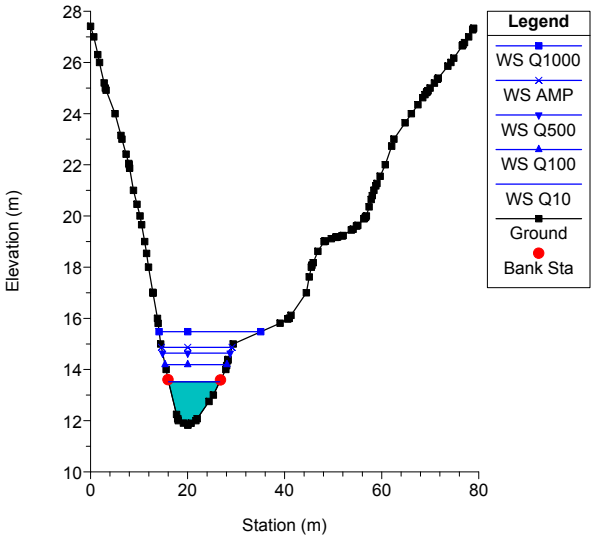
Lleria Plan: Plan 01 01/07/2011
RS = 597.04 BR Ferrocarril



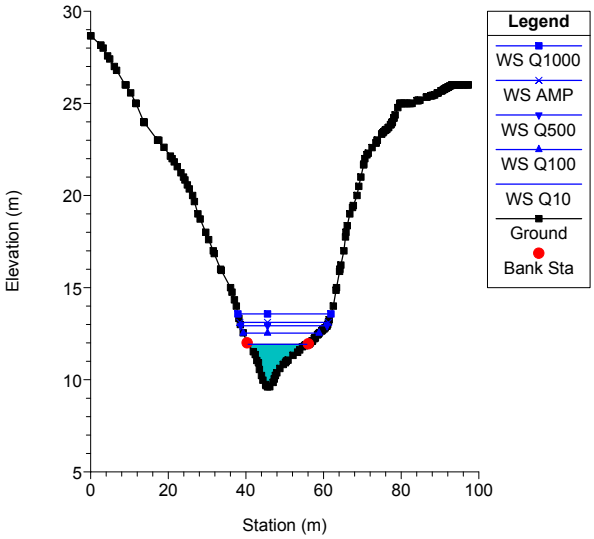
Lleria Plan: Plan 01 01/07/2011
RS = 576.541



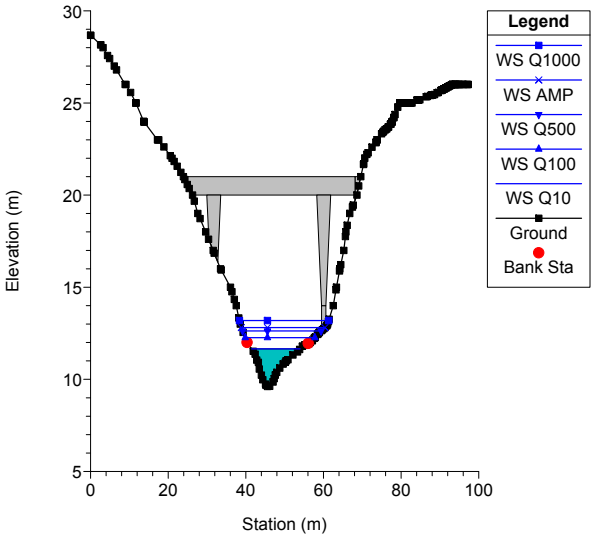
Lleria Plan: Plan 01 01/07/2011
RS = 537.447



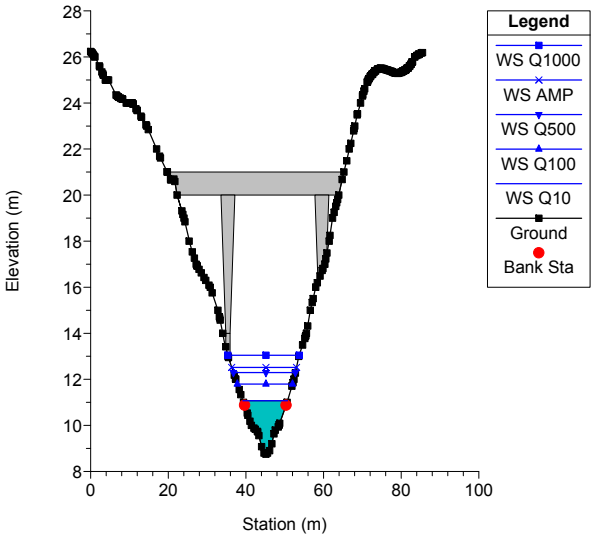
Lleria Plan: Plan 01 01/07/2011
RS = 493.900



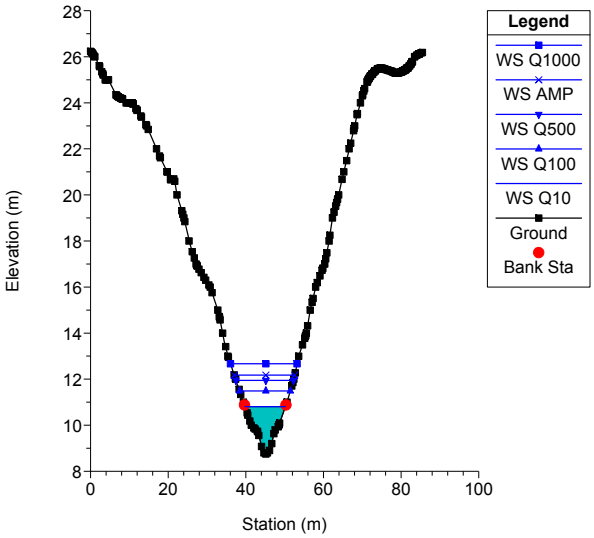
Lleria Plan: Plan 01 01/07/2011
RS = 489.840 BR Hifrensa



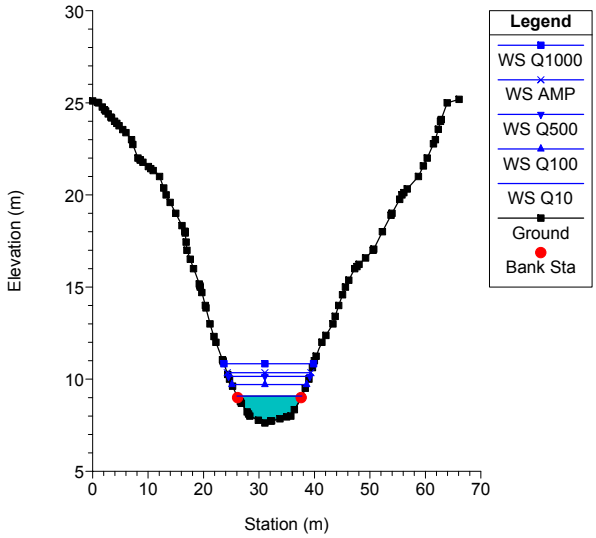
Lleria Plan: Plan 01 01/07/2011
RS = 489.840 BR Hifrensa



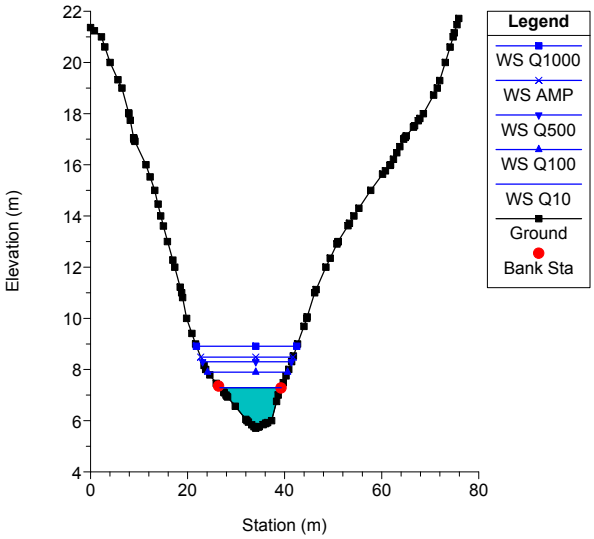
Lleria Plan: Plan 01 01/07/2011
RS = 468.767



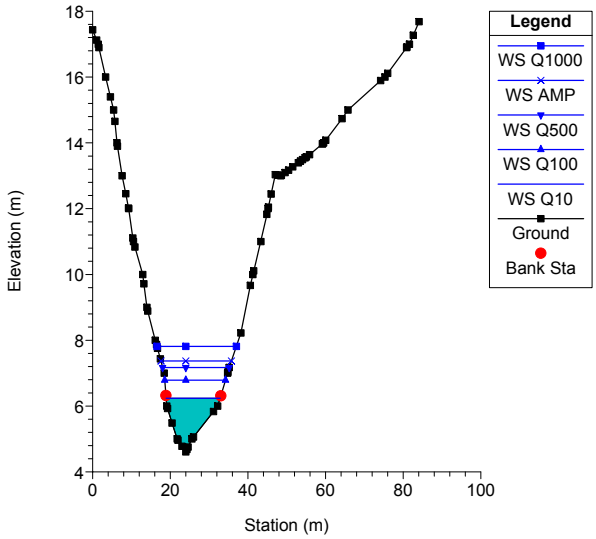
Lleria Plan: Plan 01 01/07/2011
RS = 428.671



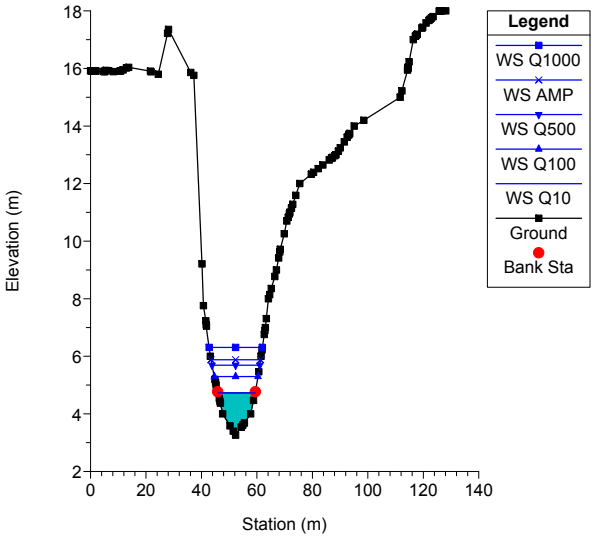
Lleria Plan: Plan 01 01/07/2011
RS = 355.897



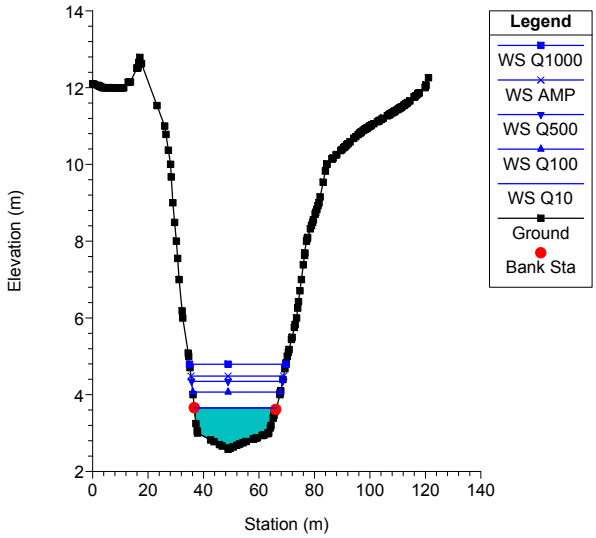
Lleria Plan: Plan 01 01/07/2011
RS = 311.280

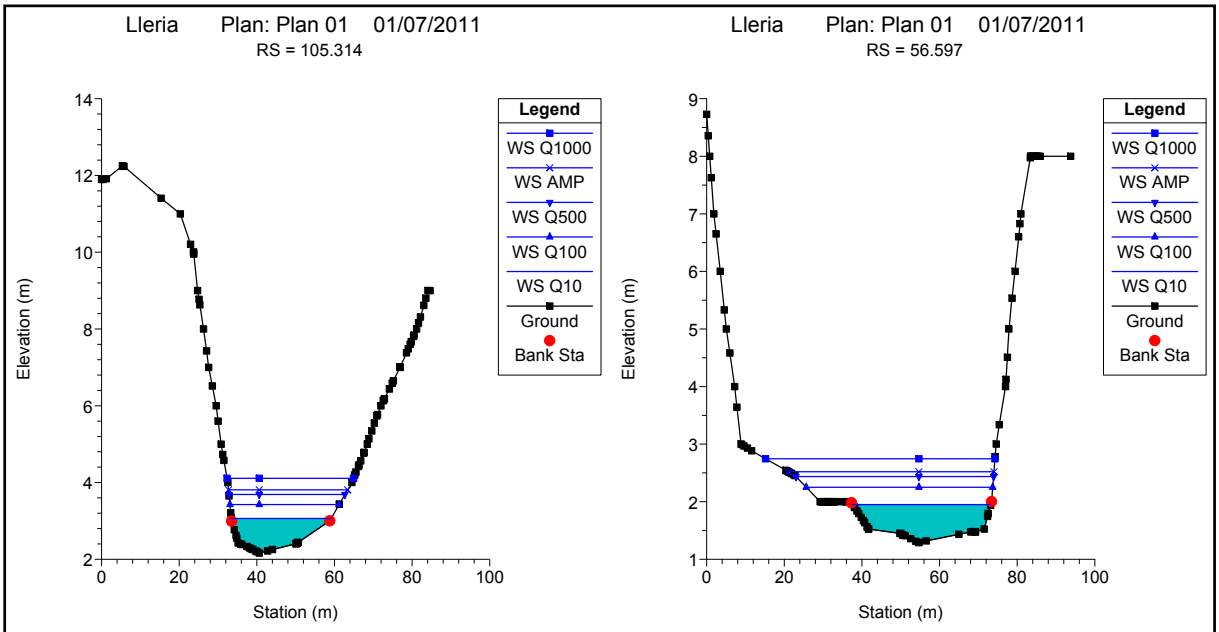


Lleria Plan: Plan 01 01/07/2011
RS = 251.540



Lleria Plan: Plan 01 01/07/2011
RS = 148.594




Lleria Plan: Plan 01 01/07/2011
RS = 105.314
Elevation (m)
Station (m)
Legend
WS Q1000
WS AMP
WS Q500
WS Q100
WS Q10
Ground
Bank Sta
Lleria Plan: Plan 01 01/07/2011
RS = 56.597
Elevation (m)
Station (m)
Legend
WS Q1000
WS AMP
WS Q500
WS Q100
WS Q10
Ground
Bank Sta

HEC-RAS Plan: Plan 02 River: Lleria Reach: Lleria

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)	
Lleria	1332.615	Q10	37.14	39.35	40.32	40.32	40.66	0.017085	2.61	14.50	21.92	0.98
Lleria	1332.615	Q100	74.65	39.35	40.73	40.73	41.25	0.014178	3.23	24.06	23.95	0.97
Lleria	1332.615	Q500	106.56	39.35	41.02	41.02	41.65	0.013006	3.60	31.21	25.48	0.96
Lleria	1332.615	AMP	123.50	39.35	41.16	41.16	41.85	0.012524	3.76	34.85	26.25	0.96
Lleria	1332.615	Q1000	167.37	39.35	41.49	41.49	42.30	0.011623	4.12	43.78	28.07	0.96
Lleria	1234.977	Q10	37.14	33.60	35.36	35.15	35.80	0.008710	2.96	13.25	10.82	0.76
Lleria	1234.977	Q100	74.65	33.60	36.17	35.93	36.77	0.007396	3.60	23.38	14.27	0.75
Lleria	1234.977	Q500	106.56	33.60	36.68	36.41	37.39	0.006975	3.98	31.25	16.58	0.75
Lleria	1234.977	AMP	123.50	33.60	36.92	36.65	37.67	0.006800	4.15	35.30	17.66	0.75
Lleria	1234.977	Q1000	167.37	33.60	37.45	37.16	38.30	0.006509	4.50	45.30	20.07	0.75
Lleria	1220.540		Bridge									
Lleria	1204.740	Q10	37.14	31.81	33.61	33.61	34.21	0.016881	3.43	10.83	9.04	1.00
Lleria	1204.740	Q100	74.65	31.81	34.37	34.37	35.20	0.015680	4.04	18.48	11.18	1.00
Lleria	1204.740	Q500	106.56	31.81	34.87	34.87	35.84	0.014957	4.36	24.42	12.58	1.00
Lleria	1204.740	AMP	123.50	31.81	35.08	35.08	36.13	0.014795	4.56	27.11	13.20	1.01
Lleria	1204.740	Q1000	167.37	31.81	37.53		37.87	0.001778	2.65	69.28	21.25	0.40
Lleria	1195.853	Q10	37.14	30.99	32.45	32.45	33.05	0.017346	3.44	10.79	8.95	1.00
Lleria	1195.853	Q100	74.65	30.99	33.21	33.21	34.07	0.016088	4.11	18.17	10.56	1.00
Lleria	1195.853	Q500	106.56	30.99	34.47		34.99	0.006248	3.21	33.17	13.26	0.65
Lleria	1195.853	AMP	123.50	30.99	35.26		35.65	0.003631	2.79	44.41	15.45	0.51
Lleria	1195.853	Q1000	167.37	30.99	37.62		37.81	0.000889	2.02	89.95	23.19	0.28
Lleria	1186.933	Q10	37.14	30.42	32.16	31.89	32.52	0.009233	2.69	13.82	10.61	0.75
Lleria	1186.933	Q100	74.65	30.42	33.40	32.60	33.74	0.004657	2.57	29.09	13.84	0.56
Lleria	1186.933	Q500	106.56	30.42	34.63	33.07	34.88	0.002430	2.22	47.92	17.00	0.42
Lleria	1186.933	AMP	123.50	30.42	35.37	33.29	35.58	0.001572	2.02	61.31	19.07	0.35
Lleria	1186.933	Q1000	167.37	30.42	37.66	33.80	37.78	0.000479	1.57	113.41	26.40	0.21
Lleria	1183.31		Bridge									
Lleria	1181.331	Q10	37.14	29.81	31.81		32.14	0.007260	2.54	14.63	9.69	0.66
Lleria	1181.331	Q100	74.65	29.81	33.42		33.69	0.003151	2.29	32.57	12.54	0.45
Lleria	1181.331	Q500	106.56	29.81	34.62		34.86	0.002141	2.18	48.82	14.66	0.38
Lleria	1181.331	AMP	123.50	29.81	35.35		35.57	0.001549	2.06	60.34	17.21	0.33
Lleria	1181.331	Q1000	167.37	29.81	37.65		37.78	0.000536	1.65	110.91	26.33	0.21
Lleria	1178.254	Q10	37.14	29.33	31.33	31.33	32.06	0.018823	3.80	9.76	6.64	1.00
Lleria	1178.254	Q100	74.65	29.33	33.18	32.24	33.66	0.006333	3.05	24.48	9.22	0.60
Lleria	1178.254	Q500	106.56	29.33	34.41	32.87	34.83	0.004381	2.90	36.80	10.92	0.50
Lleria	1178.254	AMP	123.50	29.33	35.17	33.15	35.55	0.003251	2.71	45.59	12.50	0.44
Lleria	1178.254	Q1000	167.37	29.33	37.56	33.81	37.77	0.001029	2.10	88.30	23.74	0.27
Lleria	1173.62		Culvert									
Lleria	1088.489	Q10	37.14	27.20	29.40	29.40	29.99	0.011233	3.74	12.05	10.35	0.88
Lleria	1088.489	Q100	74.65	27.20	30.15	30.15	30.95	0.010544	4.54	20.64	12.52	0.90
Lleria	1088.489	Q500	106.56	27.20	30.59	30.59	31.58	0.010887	5.12	26.26	13.13	0.94
Lleria	1088.489	AMP	123.50	27.20	30.80	30.80	31.88	0.010955	5.37	29.09	13.42	0.95
Lleria	1088.489	Q1000	167.37	27.20	31.30	31.30	32.59	0.011080	5.94	35.93	14.07	0.98
Lleria	1038.478	Q10	37.14	26.73	28.80	28.80	29.31	0.009738	3.59	13.49	13.84	0.85
Lleria	1038.478	Q100	74.65	26.73	29.45	29.45	30.09	0.009037	4.24	24.31	18.92	0.86
Lleria	1038.478	Q500	106.56	26.73	29.84	29.84	30.57	0.008992	4.66	32.23	21.86	0.88
Lleria	1038.478	AMP	123.50	26.73	30.06	30.06	30.78	0.008338	4.71	37.14	23.21	0.85
Lleria	1038.478	Q1000	167.37	26.73	30.39	30.39	31.26	0.008967	5.22	44.94	23.97	0.90
Lleria	982.210	Q10	37.14	25.05	27.14	27.14	27.72	0.011571	3.78	12.01	10.52	0.91
Lleria	982.210	Q100	74.65	25.05	27.89	27.89	28.67	0.010378	4.54	21.19	13.88	0.92
Lleria	982.210	Q500	106.56	25.05	28.37	28.37	29.26	0.009902	4.98	28.27	16.00	0.92
Lleria	982.210	AMP	123.50	25.05	28.58	28.58	29.53	0.009737	5.17	31.83	16.97	0.92
Lleria	982.210	Q1000	167.37	25.05	29.09	29.09	30.13	0.009206	5.54	40.98	19.18	0.92
Lleria	932.118	Q10	37.14	23.46	25.48	25.48	26.09	0.011529	3.82	11.75	10.02	0.92
Lleria	932.118	Q100	74.65	23.46	26.26	26.26	27.06	0.010154	4.57	20.72	12.73	0.91
Lleria	932.118	Q500	106.56	23.46	26.72	26.72	27.69	0.010199	5.12	26.81	13.79	0.94
Lleria	932.118	AMP	123.50	23.46	26.93	26.93	27.99	0.010258	5.37	29.79	14.28	0.96
Lleria	932.118	Q1000	167.37	23.46	27.46	27.46	28.68	0.009939	5.85	37.80	15.88	0.96
Lleria	878.642	Q10	37.14	21.06	23.21	23.21	23.79	0.011574	3.72	12.05	10.73	0.90
Lleria	878.642	Q100	74.65	21.06	23.96	23.96	24.72	0.010155	4.43	21.49	14.23	0.89
Lleria	878.642	Q500	106.56	21.06	24.40	24.40	25.29	0.010044	4.90	27.99	15.45	0.91
Lleria	878.642	AMP	123.50	21.06	24.60	24.60	25.56	0.010066	5.12	31.14	15.98	0.92
Lleria	878.642	Q1000	167.37	21.06	25.06	25.06	26.19	0.010127	5.63	38.77	17.23	0.95
Lleria	824.987	Q10	37.14	20.37	22.12	22.12	22.72	0.013306	3.83	11.57	10.03	0.98
Lleria	824.987	Q100	74.65	20.37	22.87	22.87	23.71	0.011844	4.69	19.89	12.30	0.99
Lleria	824.987	Q500	106.56	20.37	23.37	23.37	24.36	0.011089	5.18	26.54	14.07	0.99
Lleria	824.987	AMP	123.50	20.37	23.61	23.61	24.65	0.010831	5.40	29.91	14.94	0.99
Lleria	824.987	Q1000	167.37	20.37	24.18	24.18	25.31	0.009705	5.73	39.02	16.74	0.96

HEC-RAS Plan: Plan 02 River: Lleria Reach: Lleria (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)	
Lleria	776.842	Q10	37.14	19.19	20.98	20.98	21.49	0.012064	3.62	12.70	12.45	0.93
Lleria	776.842	Q100	74.65	19.19	21.61	21.61	22.34	0.011558	4.44	21.16	14.53	0.96
Lleria	776.842	Q500	106.56	19.19	22.04	22.04	22.91	0.011151	4.91	27.65	15.90	0.97
Lleria	776.842	AMP	123.50	19.19	22.23	22.23	23.17	0.011073	5.14	30.80	16.48	0.98
Lleria	776.842	Q1000	167.37	19.19	22.69	22.69	23.78	0.010768	5.61	38.70	17.83	0.99
Lleria	742.272	Q10	37.14	18.19	20.81	20.41	21.03	0.003869	2.41	19.89	15.98	0.51
Lleria	742.272	Q100	74.65	18.19	21.57	21.00	21.87	0.003837	2.90	33.07	18.67	0.53
Lleria	742.272	Q500	106.56	18.19	22.05	21.37	22.42	0.003882	3.22	42.45	20.14	0.55
Lleria	742.272	AMP	123.50	18.19	22.28	21.54	22.67	0.003916	3.37	47.00	20.79	0.55
Lleria	742.272	Q1000	167.37	18.19	22.88	21.95	23.32	0.003619	3.58	60.00	22.42	0.55
Lleria	731.35		Bridge									
Lleria	718.711	Q10	37.14	17.71	20.79		20.93	0.001457	1.82	25.67	15.49	0.35
Lleria	718.711	Q100	74.65	17.71	21.52		21.77	0.002066	2.53	38.16	18.21	0.43
Lleria	718.711	Q500	106.56	17.71	21.99		22.32	0.002423	2.99	46.95	19.84	0.48
Lleria	718.711	AMP	123.50	17.71	22.20		22.57	0.002568	3.18	51.26	20.49	0.50
Lleria	718.711	Q1000	167.37	17.71	22.79		23.22	0.002602	3.50	63.90	22.28	0.51
Lleria	715.208	Q10	37.14	17.70	20.79	20.01	20.92	0.001866	1.78	25.87	18.61	0.36
Lleria	715.208	Q100	74.65	17.70	21.55	20.64	21.75	0.002113	2.27	41.22	21.39	0.40
Lleria	715.208	Q500	106.56	17.70	22.04	21.05	22.28	0.002252	2.58	51.99	22.92	0.43
Lleria	715.208	AMP	123.50	17.70	22.26	21.21	22.53	0.002318	2.72	57.20	23.65	0.44
Lleria	715.208	Q1000	167.37	17.70	22.87	21.59	23.18	0.002227	2.94	72.20	25.64	0.44
Lleria	713.61		Bridge									
Lleria	697.375	Q10	37.14	17.49	19.77	19.77	20.23	0.011126	3.38	13.88	15.15	0.79
Lleria	697.375	Q100	74.65	17.49	20.36	20.36	20.94	0.010836	4.00	24.24	19.63	0.81
Lleria	697.375	Q500	106.56	17.49	20.70	20.70	21.39	0.011314	4.45	31.29	22.08	0.85
Lleria	697.375	AMP	123.50	17.49	21.19		21.67	0.006488	3.76	43.15	25.58	0.66
Lleria	697.375	Q1000	167.37	17.49	22.82		23.01	0.001460	2.33	90.47	32.01	0.33
Lleria	673.576	Q10	37.14	16.36	18.12	18.12	18.66	0.012719	3.90	12.28	11.41	0.97
Lleria	673.576	Q100	74.65	16.36	19.29		19.70	0.005250	3.58	28.69	16.86	0.68
Lleria	673.576	Q500	106.56	16.36	20.72		20.92	0.001663	2.65	58.32	24.33	0.41
Lleria	673.576	AMP	123.50	16.36	21.36		21.52	0.001118	2.39	74.85	26.53	0.34
Lleria	673.576	Q1000	167.37	16.36	22.85		22.96	0.000594	2.08	117.53	31.57	0.26
Lleria	665.383	Q10	37.14	15.51	17.44		17.85	0.007384	3.05	14.26	11.40	0.74
Lleria	665.383	Q100	74.65	15.51	19.42		19.61	0.001406	2.22	43.33	18.14	0.37
Lleria	665.383	Q500	106.56	15.51	20.75		20.89	0.000794	2.05	71.37	24.43	0.29
Lleria	665.383	AMP	123.50	15.51	21.38		21.51	0.000620	1.96	87.67	26.83	0.26
Lleria	665.383	Q1000	167.37	15.51	22.85		22.96	0.000393	1.82	130.72	31.85	0.22
Lleria	637.579	Q10	37.14	14.64	17.63	16.09	17.70	0.000746	1.39	33.56	16.59	0.26
Lleria	637.579	Q100	74.65	14.64	19.49	16.78	19.56	0.000410	1.43	69.65	22.57	0.21
Lleria	637.579	Q500	106.56	14.64	20.79	17.25	20.85	0.000301	1.44	102.13	27.21	0.19
Lleria	637.579	AMP	123.50	14.64	21.41	17.45	21.48	0.000264	1.44	119.74	29.22	0.18
Lleria	637.579	Q1000	167.37	14.64	22.87	17.92	22.94	0.000203	1.44	165.75	33.62	0.16
Lleria	625.22		Bridge									
Lleria	616.033	Q10	37.14	14.42	17.23		17.50	0.003401	2.38	16.88	8.69	0.48
Lleria	616.033	Q100	74.65	14.42	19.03		19.28	0.001679	2.39	37.27	13.62	0.37
Lleria	616.033	Q500	106.56	14.42	20.27		20.49	0.001121	2.32	58.16	20.01	0.31
Lleria	616.033	AMP	123.50	14.42	20.86		21.07	0.000939	2.27	70.62	22.02	0.29
Lleria	616.033	Q1000	167.37	14.42	22.23		22.40	0.000667	2.19	103.89	26.31	0.25
Lleria	605.590	Q10	37.14	13.90	16.69	16.26	17.40	0.009889	3.78	10.53	4.76	0.74
Lleria	605.590	Q100	74.65	13.90	17.98	17.54	19.15	0.009933	4.93	17.21	5.63	0.79
Lleria	605.590	Q500	106.56	13.90	18.85	18.41	20.34	0.009874	5.62	22.37	6.21	0.82
Lleria	605.590	AMP	123.50	13.90	19.27	18.84	20.90	0.009823	5.92	25.00	6.49	0.83
Lleria	605.590	Q1000	167.37	13.90	20.25	19.83	22.21	0.009578	6.56	31.72	7.15	0.84
Lleria	597.04		Bridge									
Lleria	576.541	Q10	37.14	12.97	14.79	14.79	15.37	0.012339	3.77	11.98	10.75	0.94
Lleria	576.541	Q100	74.65	12.97	15.49	15.49	16.31	0.011449	4.61	20.18	12.50	0.96
Lleria	576.541	Q500	106.56	12.97	15.96	15.96	16.94	0.011142	5.13	26.22	13.50	0.98
Lleria	576.541	AMP	123.50	12.97	16.17	16.17	17.24	0.011206	5.40	29.08	13.96	1.00
Lleria	576.541	Q1000	167.37	12.97	16.70	16.70	17.94	0.010695	5.88	36.85	15.26	1.00
Lleria	537.447	Q10	37.14	11.83	13.58	13.58	14.15	0.011814	3.77	12.12	10.78	0.94
Lleria	537.447	Q100	74.65	11.83	14.30	14.30	15.08	0.010750	4.57	20.72	12.99	0.95
Lleria	537.447	Q500	106.56	11.83	14.76	14.76	15.70	0.010511	5.09	26.98	14.25	0.97
Lleria	537.447	AMP	123.50	11.83	14.94	14.94	16.00	0.010845	5.39	29.68	14.78	0.99
Lleria	537.447	Q1000	167.37	11.83	15.67	15.67	16.73	0.009090	5.70	43.40	23.39	0.94
Lleria	493.900	Q10	37.14	9.61	11.95	11.74	12.32	0.006328	3.13	16.23	15.90	0.69
Lleria	493.900	Q100	74.65	9.61	12.66	12.43	13.10	0.005783	3.63	29.18	20.49	0.69

HEC-RAS Plan: Plan 02 River: Lleria Reach: Lleria (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)	
Lleria	493.900	Q500	106.56	9.61	13.05	12.80	13.56	0.006080	4.05	37.47	22.65	0.72
Lleria	493.900	AMP	123.50	9.61	13.24	13.00	13.78	0.005978	4.17	41.82	23.14	0.72
Lleria	493.900	Q1000	167.37	9.61	13.68	13.36	14.29	0.005782	4.45	52.30	24.21	0.72
Lleria	489.840		Bridge									
Lleria	468.767	Q10	37.14	8.75	10.88	10.88	11.46	0.011613	3.76	12.13	10.74	0.88
Lleria	468.767	Q100	74.65	8.75	11.61	11.61	12.38	0.010823	4.53	21.00	13.54	0.90
Lleria	468.767	Q500	106.56	8.75	12.07	12.07	12.98	0.010493	4.98	27.70	15.25	0.91
Lleria	468.767	AMP	123.50	8.75	12.28	12.28	13.25	0.010433	5.20	30.96	15.93	0.92
Lleria	468.767	Q1000	167.37	8.75	12.76	12.76	13.87	0.010251	5.65	39.01	17.47	0.93
Lleria	428.671	Q10	37.14	7.63	9.11	9.11	9.63	0.014277	3.57	12.03	11.75	0.99
Lleria	428.671	Q100	74.65	7.63	9.75	9.75	10.51	0.012793	4.40	20.23	13.63	1.00
Lleria	428.671	Q500	106.56	7.63	10.19	10.19	11.10	0.012084	4.89	26.46	14.75	1.01
Lleria	428.671	AMP	123.50	7.63	10.39	10.39	11.38	0.011906	5.12	29.47	15.19	1.01
Lleria	428.671	Q1000	167.37	7.63	10.87	10.87	12.03	0.011430	5.62	36.98	16.22	1.02
Lleria	355.897	Q10	37.14	5.70	7.35	7.35	7.86	0.012278	3.63	12.83	13.03	0.94
Lleria	355.897	Q100	74.65	5.70	8.02	8.02	8.67	0.010579	4.30	22.91	17.19	0.93
Lleria	355.897	Q500	106.56	5.70	8.39	8.39	9.17	0.010498	4.76	29.67	18.68	0.95
Lleria	355.897	AMP	123.50	5.70	8.57	8.57	9.41	0.010389	4.96	33.10	19.38	0.96
Lleria	355.897	Q1000	167.37	5.70	8.98	8.98	9.96	0.010388	5.43	41.19	20.94	0.98
Lleria	311.280	Q10	37.14	4.61	6.31	6.31	6.77	0.011774	3.50	13.50	14.14	0.91
Lleria	311.280	Q100	74.65	4.61	6.87	6.87	7.55	0.012015	4.36	21.82	15.91	0.97
Lleria	311.280	Q500	106.56	4.61	7.26	7.26	8.08	0.011802	4.86	28.33	17.57	0.99
Lleria	311.280	AMP	123.50	4.61	7.45	7.45	8.33	0.011638	5.07	31.75	18.54	1.00
Lleria	311.280	Q1000	167.37	4.61	7.90	7.90	8.90	0.010885	5.45	40.76	20.92	0.99
Lleria	251.540	Q10	37.14	3.26	4.77	4.77	5.25	0.013615	3.55	12.86	13.61	0.97
Lleria	251.540	Q100	74.65	3.26	5.36	5.36	6.04	0.012328	4.31	21.68	16.01	0.98
Lleria	251.540	Q500	106.56	3.26	5.74	5.74	6.56	0.012072	4.80	28.04	17.38	1.00
Lleria	251.540	AMP	123.50	3.26	5.94	5.94	6.81	0.011658	4.97	31.50	18.07	1.00
Lleria	251.540	Q1000	167.37	3.26	6.35	6.35	7.38	0.011405	5.45	39.27	19.30	1.01
Lleria	148.594	Q10	37.14	2.58	3.65		3.78	0.005486	1.89	23.38	29.52	0.59
Lleria	148.594	Q100	74.65	2.58	4.08		4.30	0.005583	2.41	36.49	31.67	0.64
Lleria	148.594	Q500	106.56	2.58	4.37		4.65	0.005597	2.72	45.94	32.94	0.66
Lleria	148.594	AMP	123.50	2.58	4.51		4.82	0.005651	2.87	50.43	33.52	0.67
Lleria	148.594	Q1000	167.37	2.58	4.83		5.21	0.005720	3.21	61.35	34.87	0.69
Lleria	105.314	Q10	37.14	2.16	3.08	3.08	3.38	0.016552	2.95	15.79	25.87	1.00
Lleria	105.314	Q100	74.65	2.16	3.45	3.45	3.90	0.015256	3.57	25.65	28.27	1.02
Lleria	105.314	Q500	106.56	2.16	3.70	3.70	4.25	0.014746	3.96	32.90	29.95	1.04
Lleria	105.314	AMP	123.50	2.16	3.82	3.82	4.42	0.014250	4.11	36.76	30.78	1.03
Lleria	105.314	Q1000	167.37	2.16	4.11	4.11	4.81	0.013723	4.49	45.70	32.56	1.04
Lleria	56.597	Q10	37.14	1.29	1.96	1.96	2.20	0.018637	2.56	17.41	35.76	1.01
Lleria	56.597	Q100	74.65	1.29	2.27	2.27	2.59	0.015346	3.00	31.23	48.34	0.98
Lleria	56.597	Q500	106.56	1.29	2.44	2.44	2.83	0.015494	3.36	39.50	50.90	1.01
Lleria	56.597	AMP	123.50	1.29	2.52	2.52	2.96	0.015281	3.51	44.03	53.04	1.02
Lleria	56.597	Q1000	167.37	1.29	2.74	2.74	3.23	0.014301	3.79	56.11	58.94	1.01

Plan: Plan 02 Lleria Lleria RS: 1220.540 Profile: Q10

E.G. US. (m)	35.73	Element	Inside BR US	Inside BR DS
W.S. US. (m)	35.33	E.G. Elev (m)	35.69	34.28
Q Total (m3/s)	37.14	W.S. Elev (m)	35.13	33.86
Q Bridge (m3/s)	37.14	Crit W.S. (m)	35.13	33.61
Q Weir (m3/s)		Max Chl Dpth (m)	1.53	2.05
Weir Sta Lft (m)		Vel Total (m/s)	3.30	2.83
Weir Sta Rgt (m)		Flow Area (m2)	11.25	13.13
Weir Submerg		Froude # Chl	1.00	0.75
Weir Max Depth (m)		Specif Force (m3)	19.95	21.48
Min El Weir Flow (m)	68.00	Hydr Depth (m)	1.12	1.35
Min El Prs (m)	65.35	W.P. Total (m)	10.94	10.84
Delta EG (m)	1.51	Conv. Total (m3/s)	286.8	391.1
Delta WS (m)	1.72	Top Width (m)	10.07	9.73
BR Open Area (m2)	2325.11	Frctn Loss (m)	0.30	0.04
BR Open Vel (m/s)	3.30	C & E Loss (m)	0.04	0.02
Coef of Q		Shear Total (N/m2)	169.27	107.15
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1220.540 Profile: Q100

E.G. US. (m)	36.66	Element	Inside BR US	Inside BR DS
W.S. US. (m)	36.07	E.G. Elev (m)	36.62	35.31
Q Total (m3/s)	74.65	W.S. Elev (m)	35.82	34.67
Q Bridge (m3/s)	74.65	Crit W.S. (m)	35.82	34.37
Q Weir (m3/s)		Max Chl Dpth (m)	2.22	2.86
Weir Sta Lft (m)		Vel Total (m/s)	3.91	3.39
Weir Sta Rgt (m)		Flow Area (m2)	19.11	21.99
Weir Submerg		Froude # Chl	0.97	0.76
Weir Max Depth (m)		Specif Force (m3)	47.90	51.43
Min El Weir Flow (m)	68.00	Hydr Depth (m)	1.49	1.80
Min El Prs (m)	65.35	W.P. Total (m)	14.00	13.80
Delta EG (m)	1.41	Conv. Total (m3/s)	633.9	841.0
Delta WS (m)	1.70	Top Width (m)	12.81	12.22
BR Open Area (m2)	2325.11	Frctn Loss (m)	0.26	0.03
BR Open Vel (m/s)	3.91	C & E Loss (m)	0.05	0.02
Coef of Q		Shear Total (N/m2)	185.63	123.11
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1220.540 Profile: Q500

E.G. US. (m)	37.28	Element	Inside BR US	Inside BR DS
W.S. US. (m)	36.57	E.G. Elev (m)	37.24	35.98
Q Total (m3/s)	106.56	W.S. Elev (m)	36.30	35.22
Q Bridge (m3/s)	106.56	Crit W.S. (m)	36.30	34.89
Q Weir (m3/s)		Max Chl Dpth (m)	2.70	3.41
Weir Sta Lft (m)		Vel Total (m/s)	4.14	3.65
Weir Sta Rgt (m)		Flow Area (m2)	25.73	29.18
Weir Submerg		Froude # Chl	0.94	0.76
Weir Max Depth (m)		Specif Force (m3)	74.84	80.36
Min El Weir Flow (m)	68.00	Hydr Depth (m)	1.73	2.10
Min El Prs (m)	65.35	W.P. Total (m)	16.27	15.83
Delta EG (m)	1.35	Conv. Total (m3/s)	976.2	1249.5
Delta WS (m)	1.68	Top Width (m)	14.86	13.92
BR Open Area (m2)	2325.11	Frctn Loss (m)	0.23	0.03
BR Open Vel (m/s)	4.14	C & E Loss (m)	0.05	0.03
Coef of Q		Shear Total (N/m2)	184.77	131.47
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1220.540 Profile: AMP

E.G. US. (m)	37.56	Element	Inside BR US	Inside BR DS
W.S. US. (m)	36.80	E.G. Elev (m)	37.52	36.30
Q Total (m3/s)	123.50	W.S. Elev (m)	36.53	35.47
Q Bridge (m3/s)	123.50	Crit W.S. (m)	36.53	35.14
Q Weir (m3/s)		Max Chl Dpth (m)	2.93	3.66
Weir Sta Lft (m)		Vel Total (m/s)	4.23	3.77
Weir Sta Rgt (m)		Flow Area (m2)	29.22	32.79
Weir Submerg		Froude # Chl	0.92	0.76
Weir Max Depth (m)		Specif Force (m3)	89.96	96.57
Min El Weir Flow (m)	68.00	Hydr Depth (m)	1.84	2.23
Min El Prs (m)	65.35	W.P. Total (m)	17.40	16.77
Delta EG (m)	1.32	Conv. Total (m3/s)	1166.7	1466.5
Delta WS (m)	1.66	Top Width (m)	15.90	14.70
BR Open Area (m2)	2325.11	Frctn Loss (m)	0.22	0.03
BR Open Vel (m/s)	4.23	C & E Loss (m)	0.05	0.03
Coef of Q		Shear Total (N/m2)	184.55	136.03
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1220.540 Profile: Q1000

E.G. US. (m)	38.20	Element	Inside BR US	Inside BR DS
W.S. US. (m)	37.31	E.G. Elev (m)	38.17	37.88
Q Total (m3/s)	167.37	W.S. Elev (m)	37.12	37.51
Q Bridge (m3/s)	167.37	Crit W.S. (m)	37.05	35.71
Q Weir (m3/s)		Max Chl Dpth (m)	3.52	5.70
Weir Sta Lft (m)		Vel Total (m/s)	4.24	2.42
Weir Sta Rgt (m)		Flow Area (m2)	39.46	69.23
Weir Submerg		Froude # Chl	0.86	0.41
Weir Max Depth (m)		Specif Force (m3)	131.36	192.88
Min El Weir Flow (m)	68.00	Hydr Depth (m)	2.12	3.27
Min El Prs (m)	65.35	W.P. Total (m)	20.35	24.43
Delta EG (m)	0.33	Conv. Total (m3/s)	1756.3	3976.3
Delta WS (m)	-0.19	Top Width (m)	18.60	21.19
BR Open Area (m2)	2325.11	Frctn Loss (m)	0.09	0.01
BR Open Vel (m/s)	4.24	C & E Loss (m)	0.20	0.00
Coef of Q		Shear Total (N/m2)	172.67	49.23
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1183.31 Profile: Q10

E.G. US. (m)	32.52	Element	Inside BR US	Inside BR DS
W.S. US. (m)	32.16	E.G. Elev (m)	32.46	32.19
Q Total (m3/s)	37.14	W.S. Elev (m)	31.90	31.90
Q Bridge (m3/s)	37.14	Crit W.S. (m)	31.90	31.40
Q Weir (m3/s)		Max Chl Dpth (m)	1.48	2.09
Weir Sta Lft (m)		Vel Total (m/s)	3.32	2.39
Weir Sta Rgt (m)		Flow Area (m2)	11.19	15.53
Weir Submerg		Froude # Chl	1.00	0.60
Weir Max Depth (m)		Specif Force (m3)	19.67	22.82
Min El Weir Flow (m)	47.80	Hydr Depth (m)	1.12	1.57
Min El Prs (m)	46.20	W.P. Total (m)	10.84	11.51
Delta EG (m)	0.33	Conv. Total (m3/s)	285.7	480.8
Delta WS (m)	0.26	Top Width (m)	9.95	9.88
BR Open Area (m2)	448.84	Frctn Loss (m)	0.02	0.00
BR Open Vel (m/s)	3.32	C & E Loss (m)	0.08	0.00
Coef of Q		Shear Total (N/m2)	171.13	79.00
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1183.31 Profile: Q100

E.G. US. (m)	33.74	Element	Inside BR US	Inside BR DS
W.S. US. (m)	33.37	E.G. Elev (m)	33.72	33.69
Q Total (m3/s)	74.65	W.S. Elev (m)	33.34	33.40
Q Bridge (m3/s)	74.65	Crit W.S. (m)	32.58	32.13
Q Weir (m3/s)		Max Chl Dpth (m)	2.92	3.59
Weir Sta Lft (m)		Vel Total (m/s)	2.64	2.30
Weir Sta Rgt (m)		Flow Area (m2)	28.27	32.46
Weir Submerg		Froude # Chl	0.56	0.44
Weir Max Depth (m)		Specif Force (m3)	55.57	67.30
Min El Weir Flow (m)	47.80	Hydr Depth (m)	2.06	2.56
Min El Prs (m)	46.20	W.P. Total (m)	15.61	15.65
Delta EG (m)	0.05	Conv. Total (m3/s)	1165.9	1489.4
Delta WS (m)	-0.03	Top Width (m)	13.73	12.69
BR Open Area (m2)	448.84	Frctn Loss (m)	0.01	0.00
BR Open Vel (m/s)	2.64	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	72.81	51.12
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1183.31 Profile: Q500

E.G. US. (m)	34.88	Element	Inside BR US	Inside BR DS
W.S. US. (m)	34.58	E.G. Elev (m)	34.87	34.86
Q Total (m3/s)	106.56	W.S. Elev (m)	34.58	34.59
Q Bridge (m3/s)	106.56	Crit W.S. (m)	33.07	32.64
Q Weir (m3/s)		Max Chl Dpth (m)	4.16	4.78
Weir Sta Lft (m)		Vel Total (m/s)	2.26	2.18
Weir Sta Rgt (m)		Flow Area (m2)	47.20	48.83
Weir Submerg		Froude # Chl	0.41	0.37
Weir Max Depth (m)		Specif Force (m3)	106.85	122.18
Min El Weir Flow (m)	47.80	Hydr Depth (m)	2.78	3.28
Min El Prs (m)	46.20	W.P. Total (m)	19.69	18.92
Delta EG (m)	0.02	Conv. Total (m3/s)	2412.7	2663.5
Delta WS (m)	0.00	Top Width (m)	16.98	14.90
BR Open Area (m2)	448.84	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	2.26	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	45.85	40.51
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1183.31 Profile: AMP

E.G. US. (m)	35.58	Element	Inside BR US	Inside BR DS
W.S. US. (m)	35.33	E.G. Elev (m)	35.57	35.57
Q Total (m3/s)	123.50	W.S. Elev (m)	35.33	35.32
Q Bridge (m3/s)	123.50	Crit W.S. (m)	33.30	32.88
Q Weir (m3/s)		Max Chl Dpth (m)	4.91	5.51
Weir Sta Lft (m)		Vel Total (m/s)	2.04	2.05
Weir Sta Rgt (m)		Flow Area (m2)	60.68	60.38
Weir Submerg		Froude # Chl	0.35	0.33
Weir Max Depth (m)		Specif Force (m3)	148.67	164.64
Min El Weir Flow (m)	47.80	Hydr Depth (m)	3.20	3.52
Min El Prs (m)	46.20	W.P. Total (m)	22.18	21.66
Delta EG (m)	0.01	Conv. Total (m3/s)	3407.6	3554.1
Delta WS (m)	0.01	Top Width (m)	18.96	17.14
BR Open Area (m2)	448.84	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	2.05	C & E Loss (m)	0.00	0.00
Coef of Q		Shear Total (N/m2)	35.24	33.00
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1183.31 Profile: Q1000

E.G. US. (m)	37.79	Element	Inside BR US	Inside BR DS
W.S. US. (m)	37.65	E.G. Elev (m)	37.78	37.78
Q Total (m3/s)	167.37	W.S. Elev (m)	37.64	37.63
Q Bridge (m3/s)	167.37	Crit W.S. (m)	33.83	33.46
Q Weir (m3/s)		Max Chl Dpth (m)	7.22	7.82
Weir Sta Lft (m)		Vel Total (m/s)	1.53	1.53
Weir Sta Rgt (m)		Flow Area (m2)	109.45	109.18
Weir Submerg		Froude # Chl	0.23	0.22
Weir Max Depth (m)		Specif Force (m3)	344.43	358.58
Min El Weir Flow (m)	47.80	Hydr Depth (m)	4.60	4.37
Min El Prs (m)	46.20	W.P. Total (m)	33.48	33.49
Delta EG (m)	0.01	Conv. Total (m3/s)	7601.3	7570.3
Delta WS (m)	0.02	Top Width (m)	23.81	25.01
BR Open Area (m2)	448.84	Frctn Loss (m)	0.00	0.00
BR Open Vel (m/s)	1.53	C & E Loss (m)	0.00	0.00
Coef of Q		Shear Total (N/m2)	15.54	15.63
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 731.35 Profile: Q10

E.G. US. (m)	20.92	Element	Inside BR US	Inside BR DS
W.S. US. (m)	20.70	E.G. Elev (m)	20.85	20.76
Q Total (m3/s)	37.14	W.S. Elev (m)	20.59	20.63
Q Bridge (m3/s)	37.14	Crit W.S. (m)	20.31	19.65
Q Weir (m3/s)		Max Chl Dpth (m)	2.40	2.92
Weir Sta Lft (m)		Vel Total (m/s)	2.26	1.60
Weir Sta Rgt (m)		Flow Area (m2)	16.41	23.20
Weir Submerg		Froude # Chl	0.69	0.41
Weir Max Depth (m)		Specif Force (m3)	20.89	30.55
Min El Weir Flow (m)	33.12	Hydr Depth (m)	1.09	1.58
Min El Prs (m)	31.67	W.P. Total (m)	16.20	15.90
Delta EG (m)	0.16	Conv. Total (m3/s)	413.7	749.0
Delta WS (m)	0.08	Top Width (m)	15.01	14.66
BR Open Area (m2)	347.34	Frctn Loss (m)	0.05	0.01
BR Open Vel (m/s)	2.26	C & E Loss (m)	0.04	0.00
Coef of Q		Shear Total (N/m2)	80.07	35.20
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 731.35 Profile: Q100

E.G. US. (m)	21.82	Element	Inside BR US	Inside BR DS
W.S. US. (m)	21.54	E.G. Elev (m)	21.78	21.72
Q Total (m3/s)	74.65	W.S. Elev (m)	21.49	21.51
Q Bridge (m3/s)	74.65	Crit W.S. (m)	20.87	20.38
Q Weir (m3/s)		Max Chl Dpth (m)	3.30	3.80
Weir Sta Lft (m)		Vel Total (m/s)	2.37	1.97
Weir Sta Rgt (m)		Flow Area (m2)	31.50	37.84
Weir Submerg		Froude # Chl	0.56	0.41
Weir Max Depth (m)		Specif Force (m3)	51.84	66.42
Min El Weir Flow (m)	33.12	Hydr Depth (m)	1.71	2.08
Min El Prs (m)	31.67	W.P. Total (m)	20.04	19.86
Delta EG (m)	0.11	Conv. Total (m3/s)	1132.1	1585.7
Delta WS (m)	0.04	Top Width (m)	18.39	18.17
BR Open Area (m2)	347.34	Frctn Loss (m)	0.04	0.01
BR Open Vel (m/s)	2.37	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	67.02	41.41
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 731.35 Profile: Q500

E.G. US. (m)	22.36	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.00	E.G. Elev (m)	22.32	22.25
Q Total (m3/s)	106.56	W.S. Elev (m)	21.94	21.97
Q Bridge (m3/s)	106.56	Crit W.S. (m)	21.24	20.81
Q Weir (m3/s)		Max Chl Dpth (m)	3.75	4.26
Weir Sta Lft (m)		Vel Total (m/s)	2.65	2.29
Weir Sta Rgt (m)		Flow Area (m2)	40.22	46.45
Weir Submerg		Froude # Chl	0.57	0.45
Weir Max Depth (m)		Specif Force (m3)	79.32	95.98
Min El Weir Flow (m)	33.12	Hydr Depth (m)	2.04	2.39
Min El Prs (m)	31.67	W.P. Total (m)	21.71	21.48
Delta EG (m)	0.11	Conv. Total (m3/s)	1639.0	2140.2
Delta WS (m)	0.04	Top Width (m)	19.75	19.46
BR Open Area (m2)	347.34	Frctn Loss (m)	0.04	0.01
BR Open Vel (m/s)	2.65	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	76.79	52.57
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 731.35 Profile: AMP

E.G. US. (m)	22.61	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.21	E.G. Elev (m)	22.57	22.50
Q Total (m3/s)	123.50	W.S. Elev (m)	22.15	22.17
Q Bridge (m3/s)	123.50	Crit W.S. (m)	21.42	21.01
Q Weir (m3/s)		Max Chl Dpth (m)	3.96	4.46
Weir Sta Lft (m)		Vel Total (m/s)	2.78	2.44
Weir Sta Rgt (m)		Flow Area (m2)	44.36	50.51
Weir Submerg		Froude # Chl	0.58	0.47
Weir Max Depth (m)		Specif Force (m3)	94.61	112.14
Min El Weir Flow (m)	33.12	Hydr Depth (m)	2.20	2.55
Min El Prs (m)	31.67	W.P. Total (m)	22.38	22.10
Delta EG (m)	0.11	Conv. Total (m3/s)	1898.7	2418.5
Delta WS (m)	0.05	Top Width (m)	20.17	19.81
BR Open Area (m2)	347.34	Frctn Loss (m)	0.04	0.01
BR Open Vel (m/s)	2.78	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	82.23	58.45
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 731.35 Profile: Q1000

E.G. US. (m)	23.16	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.65	E.G. Elev (m)	23.12	23.05
Q Total (m3/s)	167.37	W.S. Elev (m)	22.58	22.60
Q Bridge (m3/s)	167.37	Crit W.S. (m)	21.84	21.47
Q Weir (m3/s)		Max Chl Dpth (m)	4.39	4.89
Weir Sta Lft (m)		Vel Total (m/s)	3.15	2.83
Weir Sta Rgt (m)		Flow Area (m2)	53.20	59.17
Weir Submerg		Froude # Chl	0.61	0.51
Weir Max Depth (m)		Specif Force (m3)	134.94	153.97
Min El Weir Flow (m)	33.12	Hydr Depth (m)	2.53	2.88
Min El Prs (m)	31.67	W.P. Total (m)	23.77	23.39
Delta EG (m)	0.12	Conv. Total (m3/s)	2489.7	3044.8
Delta WS (m)	0.06	Top Width (m)	21.02	20.56
BR Open Area (m2)	347.34	Frctn Loss (m)	0.04	0.01
BR Open Vel (m/s)	3.15	C & E Loss (m)	0.03	0.00
Coef of Q		Shear Total (N/m2)	99.20	74.95
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 713.61 Profile: Q10

E.G. US. (m)	20.74	Element	Inside BR US	Inside BR DS
W.S. US. (m)	20.60	E.G. Elev (m)	20.70	20.23
Q Total (m3/s)	37.14	W.S. Elev (m)	20.25	19.81
Q Bridge (m3/s)	37.14	Crit W.S. (m)	20.25	19.70
Q Weir (m3/s)		Max Chl Dpth (m)	2.55	2.32
Weir Sta Lft (m)		Vel Total (m/s)	2.98	2.87
Weir Sta Rgt (m)		Flow Area (m2)	12.47	12.96
Weir Submerg		Froude # Chl	1.00	0.87
Weir Max Depth (m)		Specif Force (m3)	20.41	21.01
Min El Weir Flow (m)	33.20	Hydr Depth (m)	0.90	1.10
Min El Prs (m)	29.70	W.P. Total (m)	18.89	14.72
Delta EG (m)	0.62	Conv. Total (m3/s)	236.5	299.8
Delta WS (m)	0.92	Top Width (m)	13.83	11.76
BR Open Area (m2)	277.01	Frctn Loss (m)	0.20	0.10
BR Open Vel (m/s)	2.98	C & E Loss (m)	0.01	0.00
Coef of Q		Shear Total (N/m2)	159.73	132.48
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 713.61 Profile: Q100

E.G. US. (m)	21.70	Element	Inside BR US	Inside BR DS
W.S. US. (m)	21.51	E.G. Elev (m)	21.64	21.07
Q Total (m3/s)	74.65	W.S. Elev (m)	21.31	20.37
Q Bridge (m3/s)	74.65	Crit W.S. (m)	20.81	20.37
Q Weir (m3/s)		Max Chl Dpth (m)	3.61	2.88
Weir Sta Lft (m)		Vel Total (m/s)	2.52	3.61
Weir Sta Rgt (m)		Flow Area (m2)	29.60	20.67
Weir Submerg		Froude # Chl	0.60	0.93
Weir Max Depth (m)		Specif Force (m3)	50.48	47.58
Min El Weir Flow (m)	33.20	Hydr Depth (m)	1.69	1.32
Min El Prs (m)	29.70	W.P. Total (m)	25.59	20.99
Delta EG (m)	0.84	Conv. Total (m3/s)	844.3	560.3
Delta WS (m)	1.28	Top Width (m)	17.54	15.69
BR Open Area (m2)	277.01	Frctn Loss (m)		
BR Open Vel (m/s)	3.61	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	88.69	171.39
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 713.61 Profile: Q500

E.G. US. (m)	22.22	Element	Inside BR US	Inside BR DS
W.S. US. (m)	21.98	E.G. Elev (m)	22.16	21.60
Q Total (m3/s)	106.56	W.S. Elev (m)	21.72	20.82
Q Bridge (m3/s)	106.56	Crit W.S. (m)	21.17	20.82
Q Weir (m3/s)		Max Chl Dpth (m)	4.02	3.33
Weir Sta Lft (m)		Vel Total (m/s)	2.89	3.75
Weir Sta Rgt (m)		Flow Area (m2)	36.84	28.43
Weir Submerg		Froude # Chl	0.63	0.88
Weir Max Depth (m)		Specif Force (m3)	76.44	72.62
Min El Weir Flow (m)	33.20	Hydr Depth (m)	2.05	1.50
Min El Prs (m)	29.70	W.P. Total (m)	27.43	26.20
Delta EG (m)	0.89	Conv. Total (m3/s)	1163.9	826.6
Delta WS (m)	1.38	Top Width (m)	18.01	18.99
BR Open Area (m2)	277.01	Frctn Loss (m)		
BR Open Vel (m/s)	3.75	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	110.39	176.84
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 713.61 Profile: AMP

E.G. US. (m)	22.47	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.20	E.G. Elev (m)	22.40	21.84
Q Total (m3/s)	123.50	W.S. Elev (m)	21.90	20.99
Q Bridge (m3/s)	123.50	Crit W.S. (m)	21.35	20.99
Q Weir (m3/s)		Max Chl Dpth (m)	4.19	3.50
Weir Sta Lft (m)		Vel Total (m/s)	3.08	3.88
Weir Sta Rgt (m)		Flow Area (m2)	40.07	31.81
Weir Submerg		Froude # Chl	0.65	0.89
Weir Max Depth (m)		Specif Force (m3)	90.79	86.39
Min El Weir Flow (m)	33.20	Hydr Depth (m)	2.17	1.57
Min El Prs (m)	29.70	W.P. Total (m)	28.64	28.22
Delta EG (m)	0.91	Conv. Total (m3/s)	1314.5	944.7
Delta WS (m)	1.40	Top Width (m)	18.47	20.28
BR Open Area (m2)	277.01	Frctn Loss (m)		
BR Open Vel (m/s)	3.88	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	121.13	188.91
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 713.61 Profile: Q1000

E.G. US. (m)	23.00	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.65	E.G. Elev (m)	22.97	22.80
Q Total (m3/s)	167.37	W.S. Elev (m)	22.32	22.47
Q Bridge (m3/s)	167.37	Crit W.S. (m)	21.75	21.46
Q Weir (m3/s)		Max Chl Dpth (m)	4.62	4.98
Weir Sta Lft (m)		Vel Total (m/s)	3.47	2.48
Weir Sta Rgt (m)		Flow Area (m2)	48.26	67.39
Weir Submerg		Froude # Chl	0.68	0.45
Weir Max Depth (m)		Specif Force (m3)	130.63	151.11
Min El Weir Flow (m)	33.20	Hydr Depth (m)	2.43	2.51
Min El Prs (m)	29.70	W.P. Total (m)	31.98	41.43
Delta EG (m)	0.24	Conv. Total (m3/s)	1704.3	2394.6
Delta WS (m)	0.14	Top Width (m)	19.85	26.86
BR Open Area (m2)	277.01	Frctn Loss (m)	0.07	0.02
BR Open Vel (m/s)	3.47	C & E Loss (m)	0.09	0.02
Coef of Q		Shear Total (N/m2)	142.73	77.93
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 625.22 Profile: Q10

E.G. US. (m)	17.70	Element	Inside BR US	Inside BR DS
W.S. US. (m)	17.64	E.G. Elev (m)	17.63	17.57
Q Total (m3/s)	37.14	W.S. Elev (m)	17.14	17.12
Q Bridge (m3/s)	37.14	Crit W.S. (m)	16.50	16.40
Q Weir (m3/s)		Max Chl Dpth (m)	2.50	2.70
Weir Sta Lft (m)		Vel Total (m/s)	3.10	2.97
Weir Sta Rgt (m)		Flow Area (m2)	11.98	12.50
Weir Submerg		Froude # Chl	0.63	0.60
Weir Max Depth (m)		Specif Force (m3)	26.38	27.24
Min El Weir Flow (m)	24.95	Hydr Depth (m)	2.44	2.50
Min El Prs (m)	22.35	W.P. Total (m)	9.64	9.30
Delta EG (m)	0.22	Conv. Total (m3/s)	346.1	380.6
Delta WS (m)	0.40	Top Width (m)	4.90	5.00
BR Open Area (m2)	37.49	Frctn Loss (m)	0.05	0.03
BR Open Vel (m/s)	3.10	C & E Loss (m)	0.01	0.06
Coef of Q		Shear Total (N/m2)	140.30	125.48
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 625.22 Profile: Q100

E.G. US. (m)	19.44	Element	Inside BR US	Inside BR DS
W.S. US. (m)	19.37	E.G. Elev (m)	19.35	19.27
Q Total (m3/s)	74.65	W.S. Elev (m)	18.56	18.53
Q Bridge (m3/s)	74.65	Crit W.S. (m)	17.57	17.45
Q Weir (m3/s)		Max Chl Dpth (m)	3.92	4.11
Weir Sta Lft (m)		Vel Total (m/s)	3.95	3.82
Weir Sta Rgt (m)		Flow Area (m2)	18.91	19.54
Weir Submerg		Froude # Chl	0.64	0.62
Weir Max Depth (m)		Specif Force (m3)	66.53	67.62
Min El Weir Flow (m)	24.95	Hydr Depth (m)	3.86	3.91
Min El Prs (m)	22.35	W.P. Total (m)	12.47	12.12
Delta EG (m)	0.33	Conv. Total (m3/s)	624.0	671.8
Delta WS (m)	0.52	Top Width (m)	4.90	5.00
BR Open Area (m2)	37.49	Frctn Loss (m)	0.06	0.02
BR Open Vel (m/s)	3.95	C & E Loss (m)	0.02	0.15
Coef of Q		Shear Total (N/m2)	212.80	195.21
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 625.22 Profile: Q500

E.G. US. (m)	20.67	Element	Inside BR US	Inside BR DS
W.S. US. (m)	20.60	E.G. Elev (m)	20.56	20.47
Q Total (m3/s)	106.56	W.S. Elev (m)	19.53	19.50
Q Bridge (m3/s)	106.56	Crit W.S. (m)	18.34	18.21
Q Weir (m3/s)		Max Chl Dpth (m)	4.89	5.08
Weir Sta Lft (m)		Vel Total (m/s)	4.50	4.37
Weir Sta Rgt (m)		Flow Area (m2)	23.68	24.38
Weir Submerg		Froude # Chl	0.65	0.63
Weir Max Depth (m)		Specif Force (m3)	106.09	107.27
Min El Weir Flow (m)	24.95	Hydr Depth (m)	4.83	4.88
Min El Prs (m)	22.35	W.P. Total (m)	14.42	14.06
Delta EG (m)	0.44	Conv. Total (m3/s)	824.2	880.0
Delta WS (m)	0.61	Top Width (m)	4.90	5.00
BR Open Area (m2)	37.49	Frctn Loss (m)	0.08	0.01
BR Open Vel (m/s)	4.50	C & E Loss (m)	0.02	0.22
Coef of Q		Shear Total (N/m2)	269.24	249.43
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 625.22 Profile: AMP

E.G. US. (m)	21.27	Element	Inside BR US	Inside BR DS
W.S. US. (m)	21.20	E.G. Elev (m)	21.15	21.05
Q Total (m3/s)	123.50	W.S. Elev (m)	19.99	19.95
Q Bridge (m3/s)	123.50	Crit W.S. (m)	18.72	18.58
Q Weir (m3/s)		Max Chl Dpth (m)	5.35	5.53
Weir Sta Lft (m)		Vel Total (m/s)	4.76	4.63
Weir Sta Rgt (m)		Flow Area (m2)	25.94	26.67
Weir Submerg		Froude # Chl	0.66	0.64
Weir Max Depth (m)		Specif Force (m3)	128.58	129.77
Min El Weir Flow (m)	24.95	Hydr Depth (m)	5.29	5.33
Min El Prs (m)	22.35	W.P. Total (m)	15.34	14.97
Delta EG (m)	0.49	Conv. Total (m3/s)	920.4	979.7
Delta WS (m)	0.65	Top Width (m)	4.90	5.00
BR Open Area (m2)	37.49	Frctn Loss (m)	0.08	0.01
BR Open Vel (m/s)	4.76	C & E Loss (m)	0.02	0.26
Coef of Q		Shear Total (N/m2)	298.54	277.58
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 625.22 Profile: Q1000

E.G. US. (m)	22.67	Element	Inside BR US	Inside BR DS
W.S. US. (m)	22.60	E.G. Elev (m)	22.52	22.40
Q Total (m3/s)	167.37	W.S. Elev (m)	21.05	21.00
Q Bridge (m3/s)	167.37	Crit W.S. (m)	19.62	19.47
Q Weir (m3/s)		Max Chl Dpth (m)	6.41	6.58
Weir Sta Lft (m)		Vel Total (m/s)	5.38	5.25
Weir Sta Rgt (m)		Flow Area (m2)	31.12	31.91
Weir Submerg		Froude # Chl	0.68	0.66
Weir Max Depth (m)		Specif Force (m3)	190.54	191.63
Min El Weir Flow (m)	24.95	Hydr Depth (m)	6.35	6.38
Min El Prs (m)	22.35	W.P. Total (m)	17.45	17.07
Delta EG (m)	0.64	Conv. Total (m3/s)	1143.8	1210.6
Delta WS (m)	0.77	Top Width (m)	4.90	5.00
BR Open Area (m2)	37.49	Frctn Loss (m)	0.10	0.01
BR Open Vel (m/s)	5.38	C & E Loss (m)	0.02	0.36
Coef of Q		Shear Total (N/m2)	374.34	350.44
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 597.04 Profile: Q10

E.G. US. (m)	17.37	Element	Inside BR US	Inside BR DS
W.S. US. (m)	16.80	E.G. Elev (m)	17.22	15.40
Q Total (m3/s)	37.14	W.S. Elev (m)	16.27	15.09
Q Bridge (m3/s)	37.14	Crit W.S. (m)	16.27	14.74
Q Weir (m3/s)		Max Chl Dpth (m)	2.37	2.13
Weir Sta Lft (m)		Vel Total (m/s)	4.33	2.43
Weir Sta Rgt (m)		Flow Area (m2)	8.58	15.27
Weir Submerg		Froude # Chl	1.00	0.66
Weir Max Depth (m)		Specif Force (m3)	25.65	21.40
Min El Weir Flow (m)	28.20	Hydr Depth (m)	1.91	1.38
Min El Prs (m)	23.75	W.P. Total (m)	7.76	12.23
Delta EG (m)	2.09	Conv. Total (m3/s)	229.4	448.4
Delta WS (m)	2.06	Top Width (m)	4.49	11.06
BR Open Area (m2)	57.26	Frctn Loss (m)		
BR Open Vel (m/s)	4.33	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	284.30	84.01
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 597.04 Profile: Q100

E.G. US. (m)	18.99	Element	Inside BR US	Inside BR DS
W.S. US. (m)	18.02	E.G. Elev (m)	18.85	16.32
Q Total (m3/s)	74.65	W.S. Elev (m)	17.43	15.77
Q Bridge (m3/s)	74.65	Crit W.S. (m)	17.43	15.38
Q Weir (m3/s)		Max Chl Dpth (m)	3.53	2.80
Weir Sta Lft (m)		Vel Total (m/s)	5.24	3.28
Weir Sta Rgt (m)		Flow Area (m2)	14.23	22.76
Weir Submerg		Froude # Chl	0.99	0.73
Weir Max Depth (m)		Specif Force (m3)	62.60	50.11
Min El Weir Flow (m)	28.20	Hydr Depth (m)	2.70	2.06
Min El Prs (m)	23.75	W.P. Total (m)	10.20	13.58
Delta EG (m)	2.79	Conv. Total (m3/s)	485.6	835.8
Delta WS (m)	2.62	Top Width (m)	5.28	11.06
BR Open Area (m2)	57.26	Frctn Loss (m)		
BR Open Vel (m/s)	5.24	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	323.37	131.11
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 597.04 Profile: Q500

E.G. US. (m)	20.10	Element	Inside BR US	Inside BR DS
W.S. US. (m)	18.84	E.G. Elev (m)	19.98	16.97
Q Total (m3/s)	106.56	W.S. Elev (m)	18.23	16.18
Q Bridge (m3/s)	106.56	Crit W.S. (m)	18.23	15.83
Q Weir (m3/s)		Max Chl Dpth (m)	4.33	3.21
Weir Sta Lft (m)		Vel Total (m/s)	5.70	3.90
Weir Sta Rgt (m)		Flow Area (m2)	18.70	27.29
Weir Submerg		Froude # Chl	0.97	0.80
Weir Max Depth (m)		Specif Force (m3)	98.99	77.92
Min El Weir Flow (m)	28.20	Hydr Depth (m)	3.22	2.47
Min El Prs (m)	23.75	W.P. Total (m)	11.90	14.40
Delta EG (m)	3.26	Conv. Total (m3/s)	733.9	1104.9
Delta WS (m)	3.00	Top Width (m)	5.81	11.06
BR Open Area (m2)	57.26	Frctn Loss (m)		
BR Open Vel (m/s)	5.70	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	324.92	172.87
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 597.04 Profile: AMP

E.G. US. (m)	20.63	Element	Inside BR US	Inside BR DS
W.S. US. (m)	19.24	E.G. Elev (m)	20.51	17.27
Q Total (m3/s)	123.50	W.S. Elev (m)	18.63	16.34
Q Bridge (m3/s)	123.50	Crit W.S. (m)	18.63	16.05
Q Weir (m3/s)		Max Chl Dpth (m)	4.73	3.37
Weir Sta Lft (m)		Vel Total (m/s)	5.87	4.25
Weir Sta Rgt (m)		Flow Area (m2)	21.04	29.07
Weir Submerg		Froude # Chl	0.96	0.84
Weir Max Depth (m)		Specif Force (m3)	119.71	93.60
Min El Weir Flow (m)	28.20	Hydr Depth (m)	3.47	2.63
Min El Prs (m)	23.75	W.P. Total (m)	12.73	14.72
Delta EG (m)	3.48	Conv. Total (m3/s)	872.4	1216.7
Delta WS (m)	3.16	Top Width (m)	6.07	11.06
BR Open Area (m2)	57.26	Frctn Loss (m)		
BR Open Vel (m/s)	5.87	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	324.85	199.52
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 597.04 Profile: Q1000

E.G. US. (m)	21.86	Element	Inside BR US	Inside BR DS
W.S. US. (m)	20.17	E.G. Elev (m)	21.77	18.02
Q Total (m3/s)	167.37	W.S. Elev (m)	19.51	16.58
Q Bridge (m3/s)	167.37	Crit W.S. (m)	19.51	16.58
Q Weir (m3/s)		Max Chl Dpth (m)	5.62	3.61
Weir Sta Lft (m)		Vel Total (m/s)	6.29	5.28
Weir Sta Rgt (m)		Flow Area (m2)	26.63	31.70
Weir Submerg		Froude # Chl	0.96	1.00
Weir Max Depth (m)		Specif Force (m3)	177.11	137.64
Min El Weir Flow (m)	28.20	Hydr Depth (m)	4.12	2.87
Min El Prs (m)	23.75	W.P. Total (m)	14.56	15.20
Delta EG (m)	4.01	Conv. Total (m3/s)	1223.9	1387.4
Delta WS (m)	3.58	Top Width (m)	6.47	11.06
BR Open Area (m2)	57.26	Frctn Loss (m)		
BR Open Vel (m/s)	6.29	C & E Loss (m)		
Coef of Q		Shear Total (N/m2)	335.28	297.65
Br Sel Method	Momentum	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 489.840 Profile: Q10

E.G. US. (m)	12.20	Element	Inside BR US	Inside BR DS
W.S. US. (m)	11.92	E.G. Elev (m)	12.13	11.42
Q Total (m3/s)	37.14	W.S. Elev (m)	11.65	11.07
Q Bridge (m3/s)	37.14	Crit W.S. (m)	11.65	10.81
Q Weir (m3/s)		Max Chl Dpth (m)	2.04	2.32
Weir Sta Lft (m)		Vel Total (m/s)	3.08	2.61
Weir Sta Rgt (m)		Flow Area (m2)	12.07	14.21
Weir Submerg		Froude # Chl	1.00	0.73
Weir Max Depth (m)		Specif Force (m3)	20.12	21.37
Min El Weir Flow (m)	21.00	Hydr Depth (m)	0.97	1.24
Min El Prs (m)	20.00	W.P. Total (m)	13.40	12.57
Delta EG (m)	0.85	Conv. Total (m3/s)	281.4	401.9
Delta WS (m)	1.12	Top Width (m)	12.50	11.50
BR Open Area (m2)	228.59	Frctn Loss (m)	0.20	0.05
BR Open Vel (m/s)	3.08	C & E Loss (m)	0.04	0.02
Coef of Q		Shear Total (N/m2)	153.90	94.66
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 489.840 Profile: Q100

E.G. US. (m)	12.95	Element	Inside BR US	Inside BR DS
W.S. US. (m)	12.53	E.G. Elev (m)	12.89	12.34
Q Total (m3/s)	74.65	W.S. Elev (m)	12.26	11.80
Q Bridge (m3/s)	74.65	Crit W.S. (m)	12.26	11.49
Q Weir (m3/s)		Max Chl Dpth (m)	2.65	3.05
Weir Sta Lft (m)		Vel Total (m/s)	3.48	3.17
Weir Sta Rgt (m)		Flow Area (m2)	21.46	23.57
Weir Submerg		Froude # Chl	0.97	0.74
Weir Max Depth (m)		Specif Force (m3)	45.21	49.84
Min El Weir Flow (m)	21.00	Hydr Depth (m)	1.20	1.65
Min El Prs (m)	20.00	W.P. Total (m)	19.01	15.68
Delta EG (m)	0.67	Conv. Total (m3/s)	617.4	855.8
Delta WS (m)	1.05	Top Width (m)	17.93	14.25
BR Open Area (m2)	228.59	Frctn Loss (m)	0.17	0.04
BR Open Vel (m/s)	3.48	C & E Loss (m)	0.02	0.02
Coef of Q		Shear Total (N/m2)	161.83	112.10
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 489.840 Profile: Q500

E.G. US. (m)	13.45	Element	Inside BR US	Inside BR DS
W.S. US. (m)	12.93	E.G. Elev (m)	13.38	12.95
Q Total (m3/s)	106.56	W.S. Elev (m)	12.63	12.29
Q Bridge (m3/s)	106.56	Crit W.S. (m)	12.63	11.96
Q Weir (m3/s)		Max Chl Dpth (m)	3.02	3.54
Weir Sta Lft (m)		Vel Total (m/s)	3.75	3.43
Weir Sta Rgt (m)		Flow Area (m2)	28.41	31.09
Weir Submerg		Froude # Chl	0.95	0.74
Weir Max Depth (m)		Specif Force (m3)	69.26	77.36
Min El Weir Flow (m)	21.00	Hydr Depth (m)	1.40	1.95
Min El Prs (m)	20.00	W.P. Total (m)	21.45	17.67
Delta EG (m)	0.55	Conv. Total (m3/s)	938.0	1267.9
Delta WS (m)	0.98	Top Width (m)	20.23	15.96
BR Open Area (m2)	228.59	Frctn Loss (m)	0.16	0.04
BR Open Vel (m/s)	3.75	C & E Loss (m)	0.03	0.03
Coef of Q		Shear Total (N/m2)	167.64	121.84
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 489.840 Profile: AMP

E.G. US. (m)	13.67	Element	Inside BR US	Inside BR DS
W.S. US. (m)	13.11	E.G. Elev (m)	13.61	13.24
Q Total (m3/s)	123.50	W.S. Elev (m)	12.81	12.52
Q Bridge (m3/s)	123.50	Crit W.S. (m)	12.81	12.18
Q Weir (m3/s)		Max Chl Dpth (m)	3.20	3.77
Weir Sta Lft (m)		Vel Total (m/s)	3.84	3.55
Weir Sta Rgt (m)		Flow Area (m2)	32.14	34.76
Weir Submerg		Froude # Chl	0.94	0.74
Weir Max Depth (m)		Specif Force (m3)	82.74	92.77
Min El Weir Flow (m)	21.00	Hydr Depth (m)	1.56	2.08
Min El Prs (m)	20.00	W.P. Total (m)	22.08	18.53
Delta EG (m)	0.50	Conv. Total (m3/s)	1125.1	1483.0
Delta WS (m)	0.94	Top Width (m)	20.65	16.68
BR Open Area (m2)	228.59	Frctn Loss (m)	0.15	0.04
BR Open Vel (m/s)	3.84	C & E Loss (m)	0.02	0.03
Coef of Q		Shear Total (N/m2)	172.00	127.61
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 489.840 Profile: Q1000

E.G. US. (m)	14.21	Element	Inside BR US	Inside BR DS
W.S. US. (m)	13.57	E.G. Elev (m)	14.14	13.89
Q Total (m3/s)	167.37	W.S. Elev (m)	13.19	13.05
Q Bridge (m3/s)	167.37	Crit W.S. (m)	13.19	12.68
Q Weir (m3/s)		Max Chl Dpth (m)	3.58	4.30
Weir Sta Lft (m)		Vel Total (m/s)	4.16	3.81
Weir Sta Rgt (m)		Flow Area (m2)	40.27	43.94
Weir Submerg		Froude # Chl	0.94	0.75
Weir Max Depth (m)		Specif Force (m3)	120.04	135.13
Min El Weir Flow (m)	21.00	Hydr Depth (m)	1.84	2.47
Min El Prs (m)	20.00	W.P. Total (m)	24.26	20.20
Delta EG (m)	0.38	Conv. Total (m3/s)	1567.6	2061.1
Delta WS (m)	0.90	Top Width (m)	21.92	17.82
BR Open Area (m2)	228.59	Frctn Loss (m)	0.14	0.03
BR Open Vel (m/s)	4.16	C & E Loss (m)	0.03	0.03
Coef of Q		Shear Total (N/m2)	185.53	140.69
Br Sel Method	Energy only	Power Total (N/m s)	0.00	0.00

Plan: Plan 02 Lleria Lleria RS: 1173.62 Culv Group: Culvert #1 Profile: Q10

Q Culv Group (m3/s)	37.14	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.93
Q Barrel (m3/s)	37.14	Culv Vel DS (m/s)	6.74
E.G. US. (m)	32.03	Culv Inv El Up (m)	29.27
W.S. US. (m)	31.33	Culv Inv El Dn (m)	27.40
E.G. DS (m)	29.99	Culv Frctn Ls (m)	1.00
W.S. DS (m)	29.40	Culv Exit Loss (m)	0.64
Delta EG (m)	2.03	Culv Entr Loss (m)	0.39
Delta WS (m)	1.92	Q Weir (m3/s)	
E.G. IC (m)	31.73	Weir Sta Lft (m)	
E.G. OC (m)	32.03	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	30.84	Weir Max Depth (m)	
Culv WS Outlet (m)	28.32	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.84	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.57	Min El Weir Flow (m)	52.22

Plan: Plan 02 Lleria Lleria RS: 1173.62 Culv Group: Culvert #1 Profile: Q100

Q Culv Group (m3/s)	74.65	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.96
Q Barrel (m3/s)	74.65	Culv Vel DS (m/s)	7.94
E.G. US. (m)	33.66	Culv Inv El Up (m)	29.27
W.S. US. (m)	33.18	Culv Inv El Dn (m)	27.40
E.G. DS (m)	30.95	Culv Frctn Ls (m)	0.85
W.S. DS (m)	30.15	Culv Exit Loss (m)	1.23
Delta EG (m)	2.71	Culv Entr Loss (m)	0.63
Delta WS (m)	3.04	Q Weir (m3/s)	
E.G. IC (m)	33.27	Weir Sta Lft (m)	
E.G. OC (m)	33.66	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	31.78	Weir Max Depth (m)	
Culv WS Outlet (m)	28.97	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.34	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.51	Min El Weir Flow (m)	52.22

Plan: Plan 02 Lleria Lleria RS: 1173.62 Culv Group: Culvert #1 Profile: Q500

Q Culv Group (m3/s)	106.56	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	5.59
Q Barrel (m3/s)	106.56	Culv Vel DS (m/s)	8.59
E.G. US. (m)	34.83	Culv Inv El Up (m)	29.27
W.S. US. (m)	34.41	Culv Inv El Dn (m)	27.40
E.G. DS (m)	31.58	Culv Frctn Ls (m)	0.81
W.S. DS (m)	30.59	Culv Exit Loss (m)	1.65
Delta EG (m)	3.26	Culv Entr Loss (m)	0.79
Delta WS (m)	3.82	Q Weir (m3/s)	
E.G. IC (m)	34.55	Weir Sta Lft (m)	
E.G. OC (m)	34.83	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	32.45	Weir Max Depth (m)	
Culv WS Outlet (m)	29.47	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.71	Weir Flow Area (m2)	
Culv Crt Depth (m)	3.18	Min El Weir Flow (m)	52.22

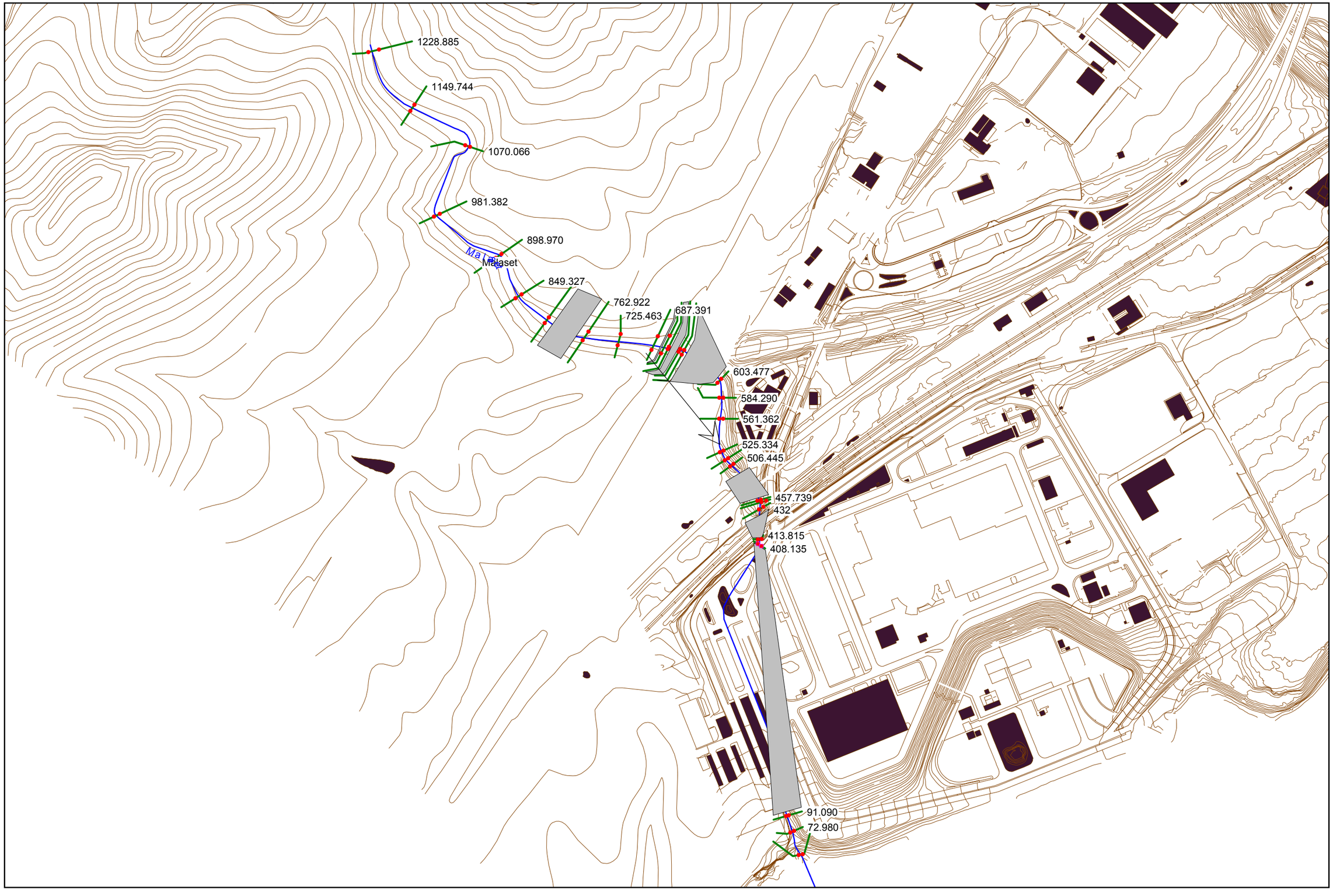
Plan: Plan 02 Lleria Lleria RS: 1173.62 Culv Group: Culvert #1 Profile: AMP

Q Culv Group (m3/s)	123.50	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	5.87
Q Barrel (m3/s)	123.50	Culv Vel DS (m/s)	8.87
E.G. US. (m)	35.55	Culv Inv El Up (m)	29.27
W.S. US. (m)	35.17	Culv Inv El Dn (m)	27.40
E.G. DS (m)	31.88	Culv Frctn Ls (m)	0.80
W.S. DS (m)	30.80	Culv Exit Loss (m)	1.85
Delta EG (m)	3.67	Culv Entr Loss (m)	1.01
Delta WS (m)	4.37	Q Weir (m3/s)	
E.G. IC (m)	35.55	Weir Sta Lft (m)	
E.G. OC (m)	35.41	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	32.78	Weir Max Depth (m)	
Culv WS Outlet (m)	29.72	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.90	Weir Flow Area (m2)	
Culv Crt Depth (m)	3.51	Min El Weir Flow (m)	52.22

Plan: Plan 02 Lleria Lleria RS: 1173.62 Culv Group: Culvert #1 Profile: Q1000

Q Culv Group (m3/s)	167.37	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	6.55
Q Barrel (m3/s)	167.37	Culv Vel DS (m/s)	10.34
E.G. US. (m)	37.77	Culv Inv El Up (m)	29.27
W.S. US. (m)	37.56	Culv Inv El Dn (m)	27.40
E.G. DS (m)	32.59	Culv Frctn Ls (m)	1.13
W.S. DS (m)	31.30	Culv Exit Loss (m)	2.96
Delta EG (m)	5.18	Culv Entr Loss (m)	1.09
Delta WS (m)	6.26	Q Weir (m3/s)	
E.G. IC (m)	37.77	Weir Sta Lft (m)	
E.G. OC (m)	36.81	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	33.53	Weir Max Depth (m)	
Culv WS Outlet (m)	30.10	Weir Avg Depth (m)	
Culv Nml Depth (m)	2.36	Weir Flow Area (m2)	
Culv Crt Depth (m)	4.26	Min El Weir Flow (m)	52.22

ANEJO 7: RESULTADOS DEL MODELO HEC-RAS. CAUDAL DE AFECCIÓN DEL MALASET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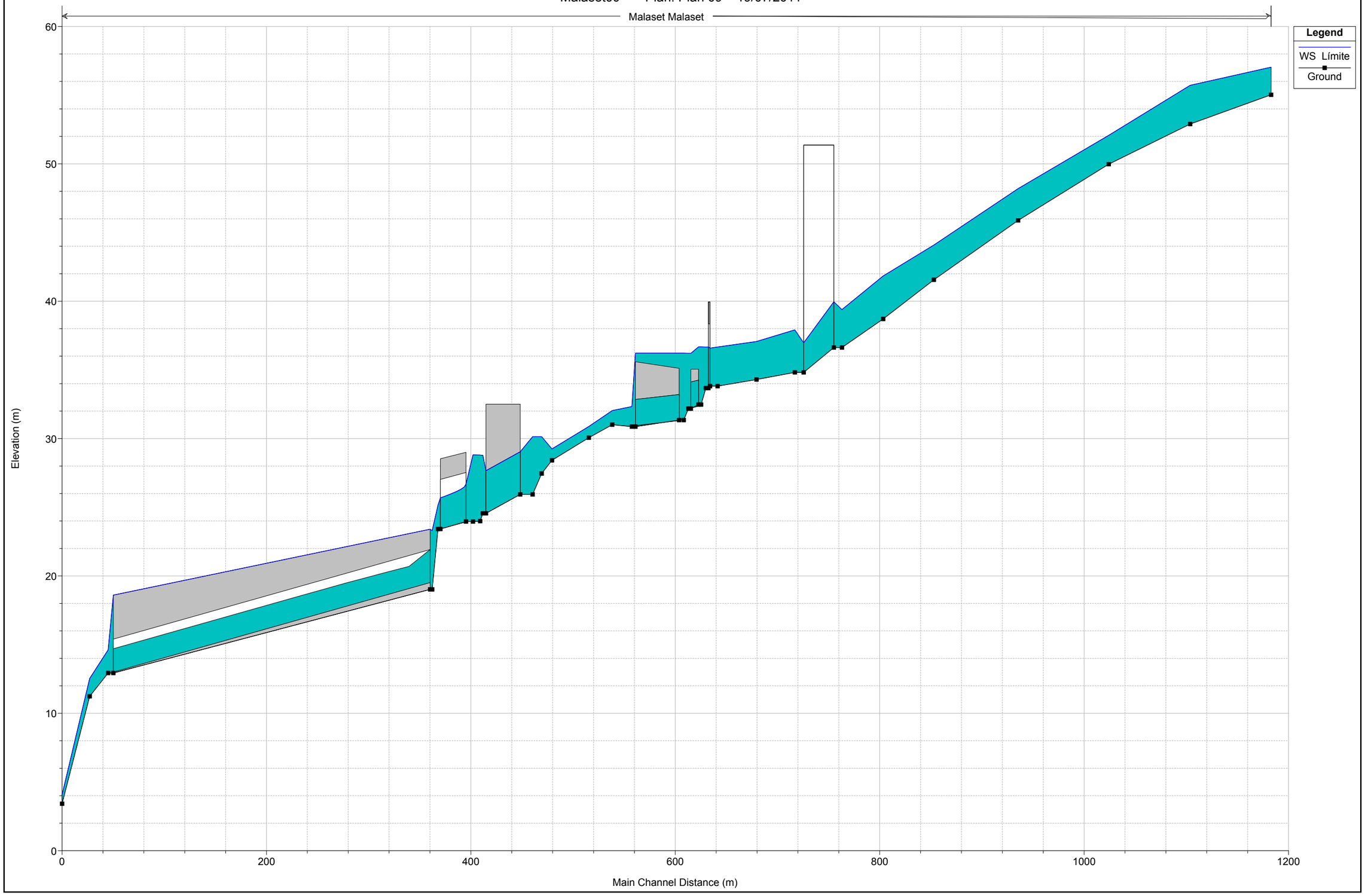

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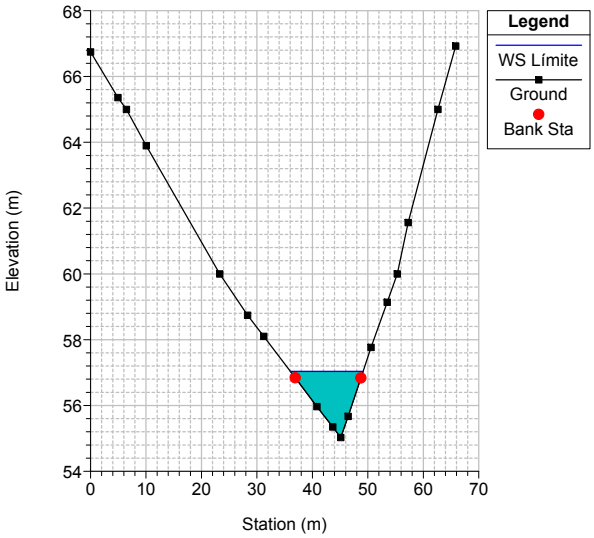

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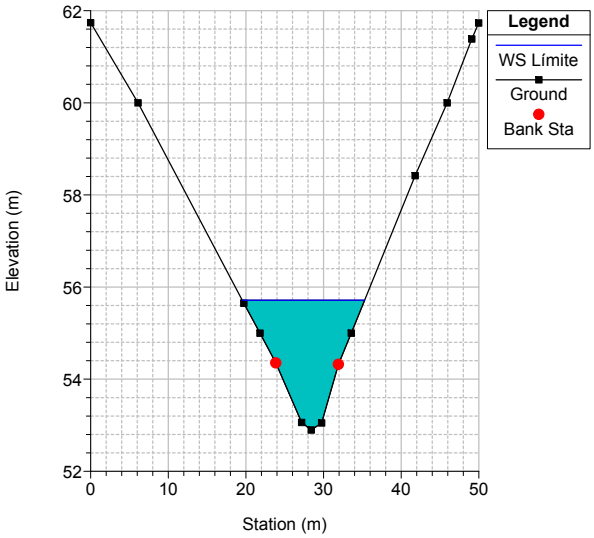

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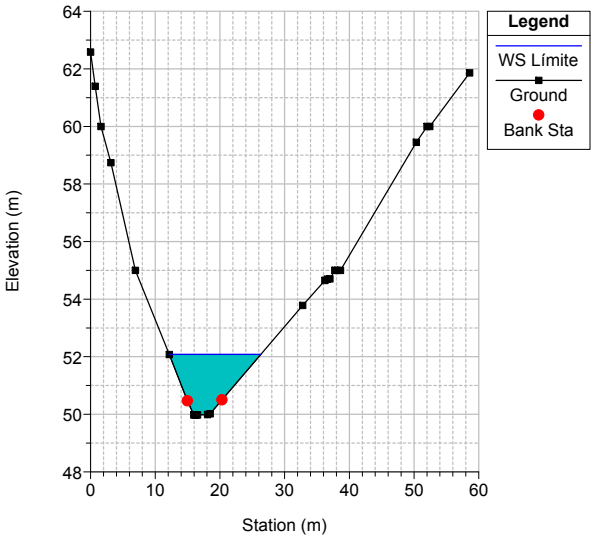

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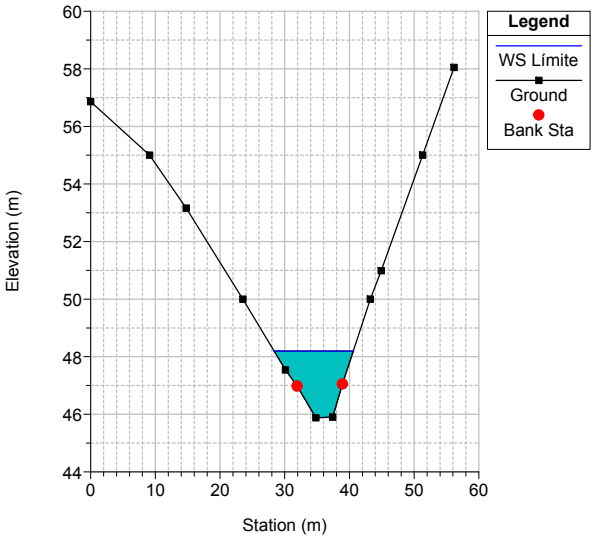

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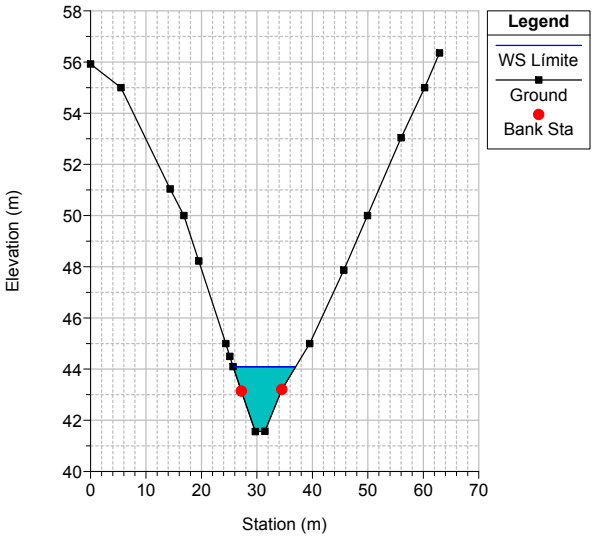

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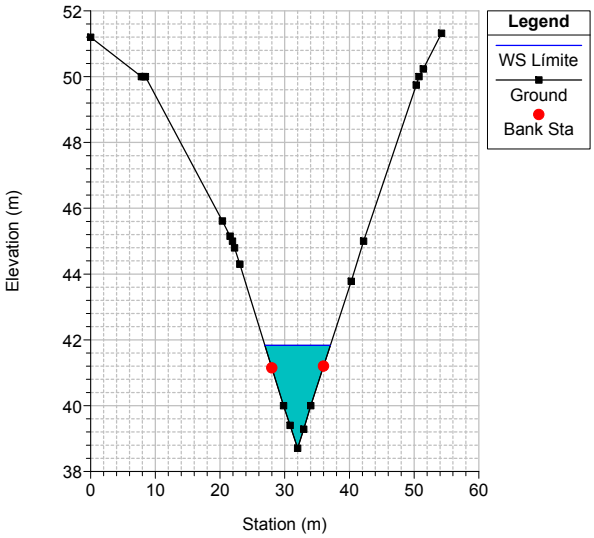

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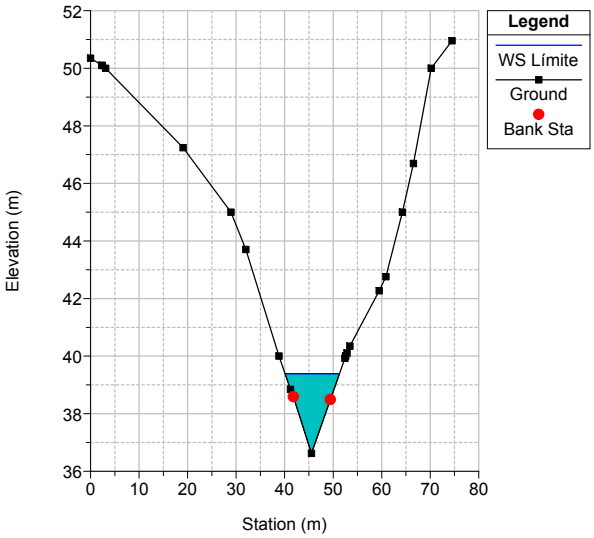

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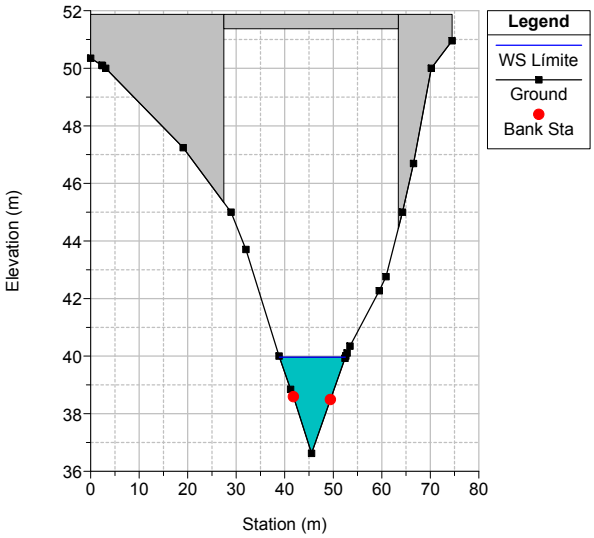

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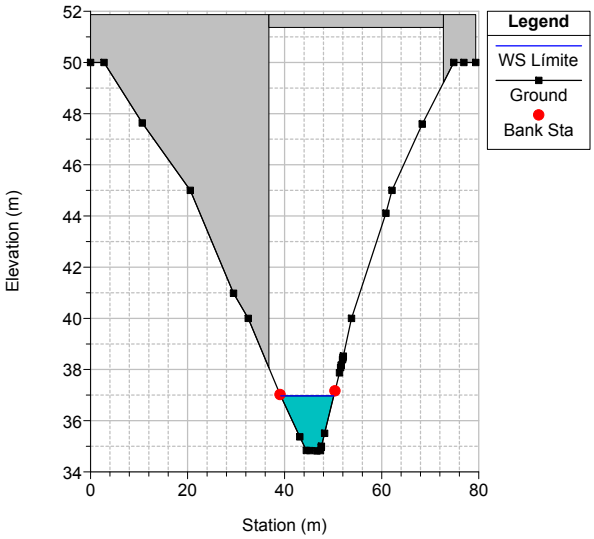

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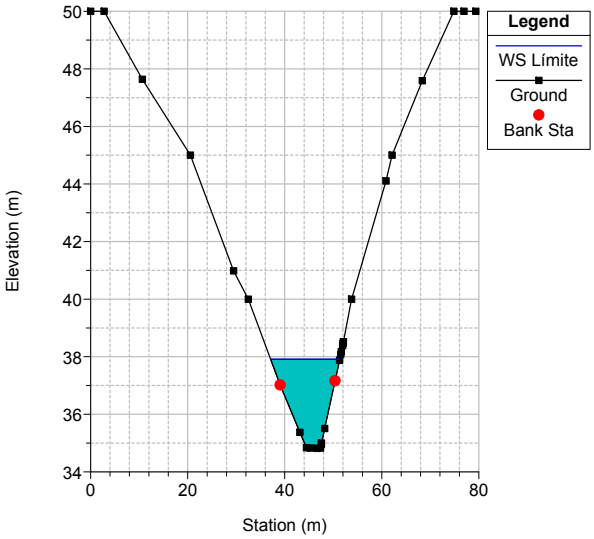

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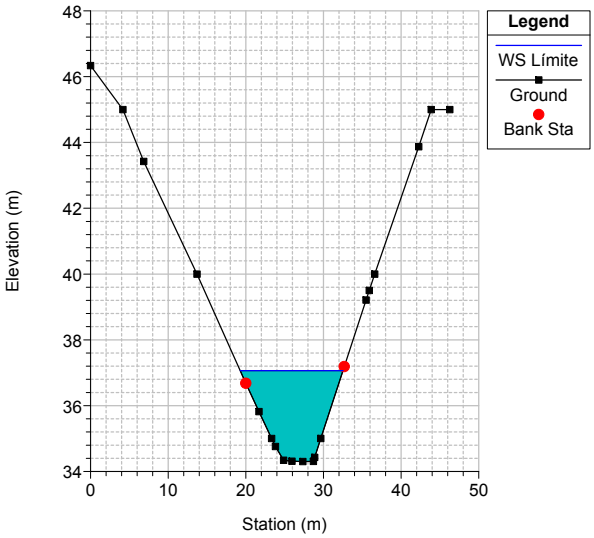

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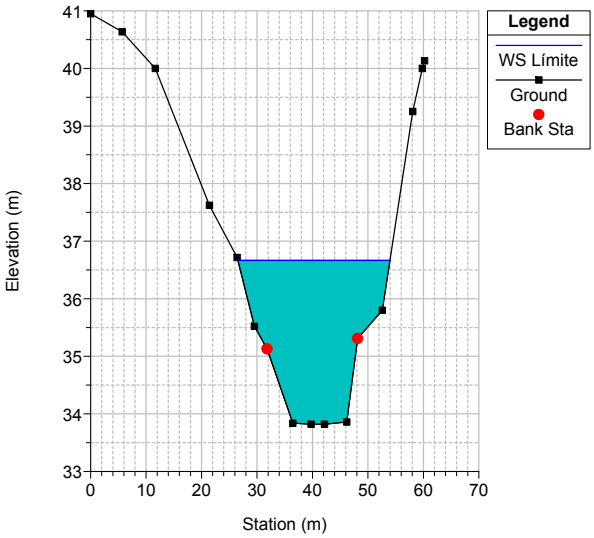

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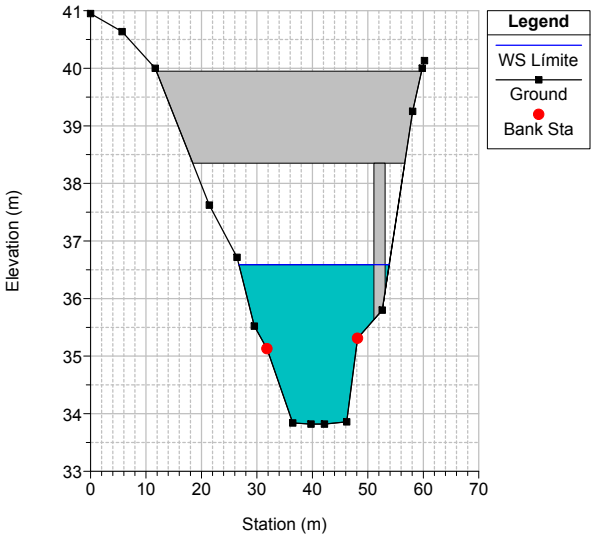

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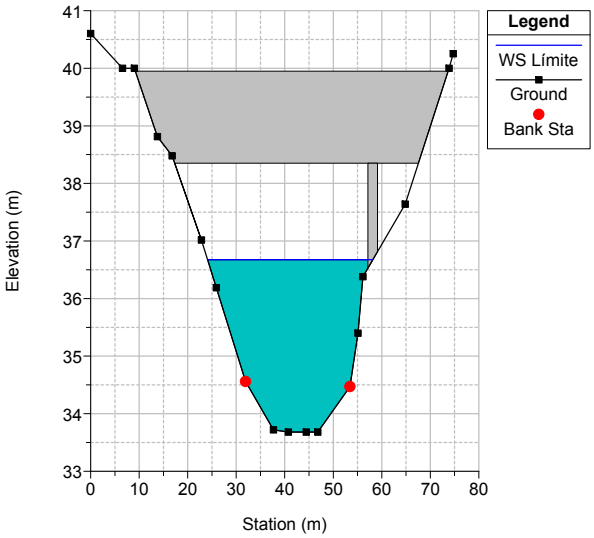

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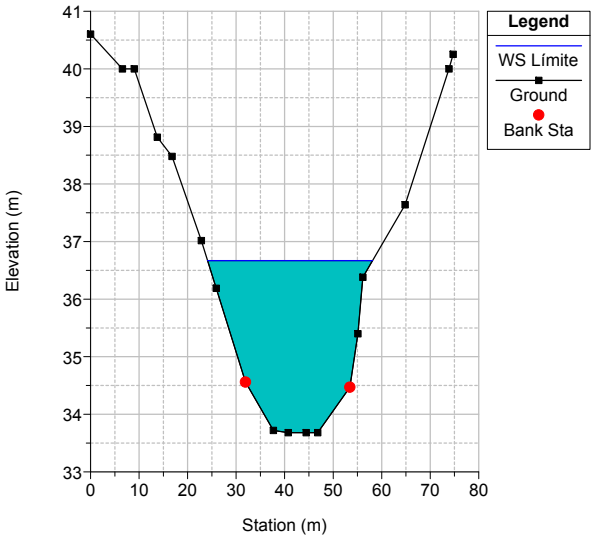

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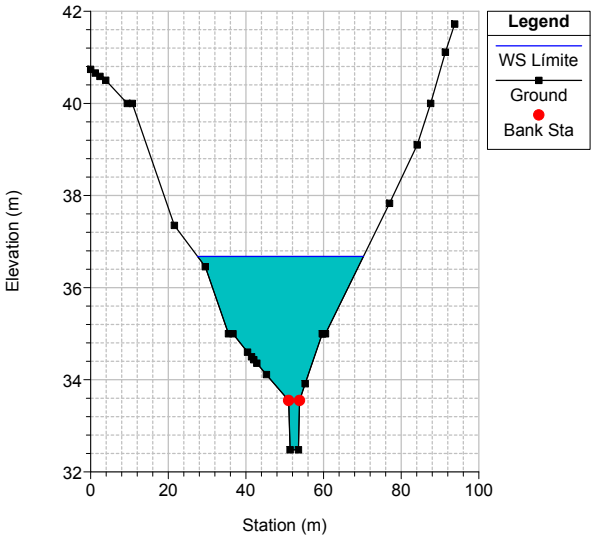

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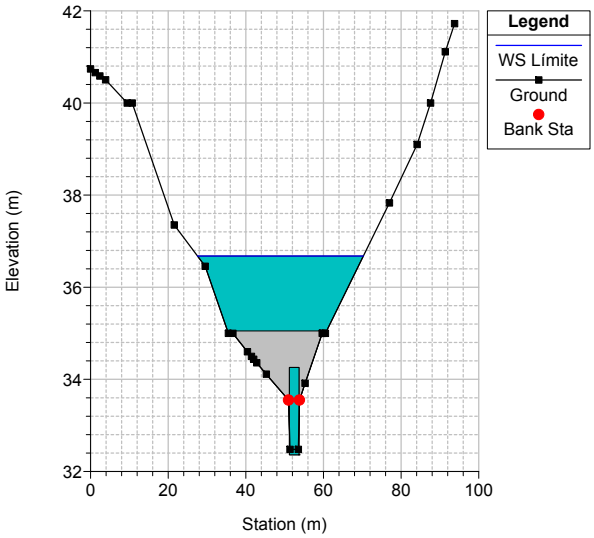

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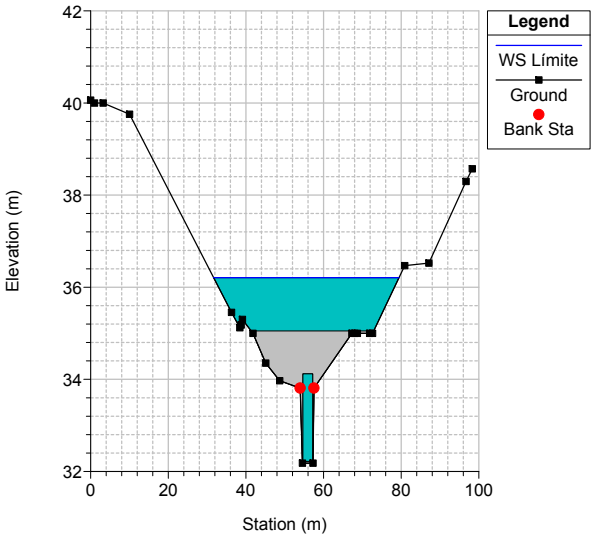

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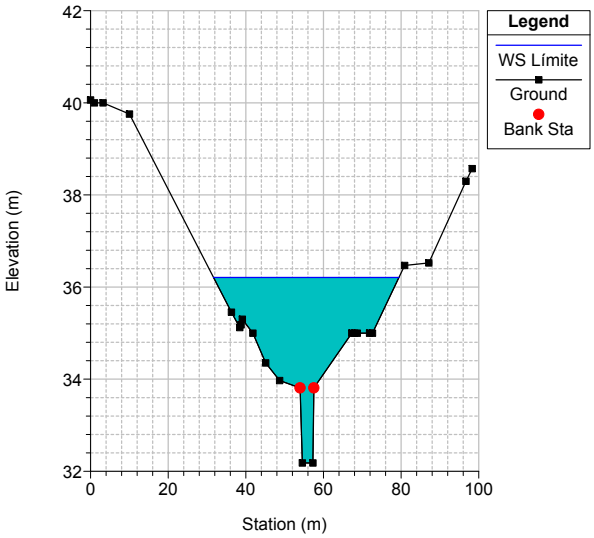

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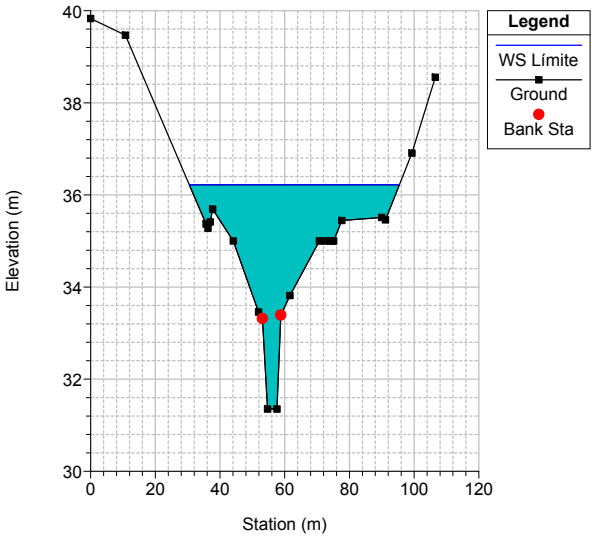

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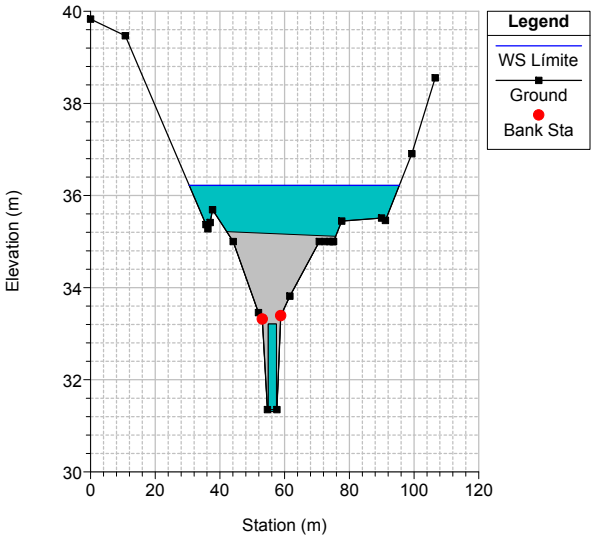

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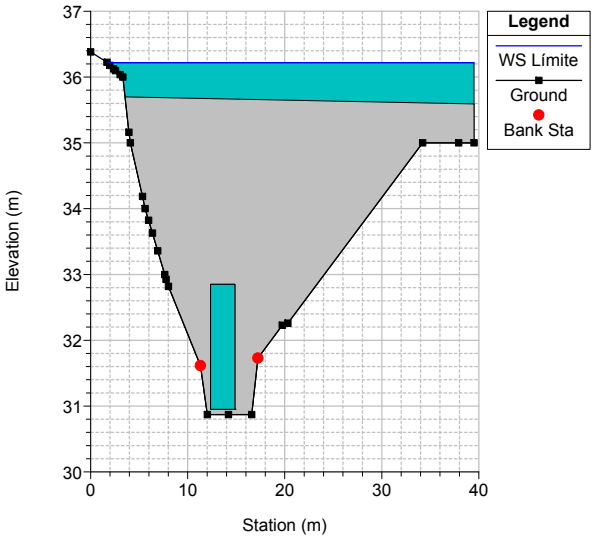

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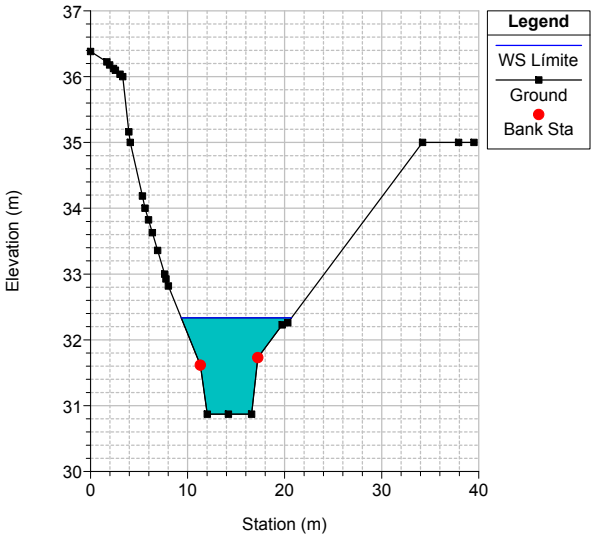

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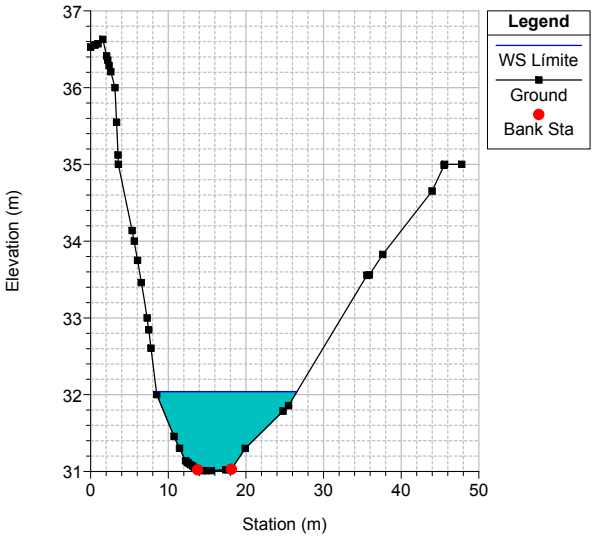
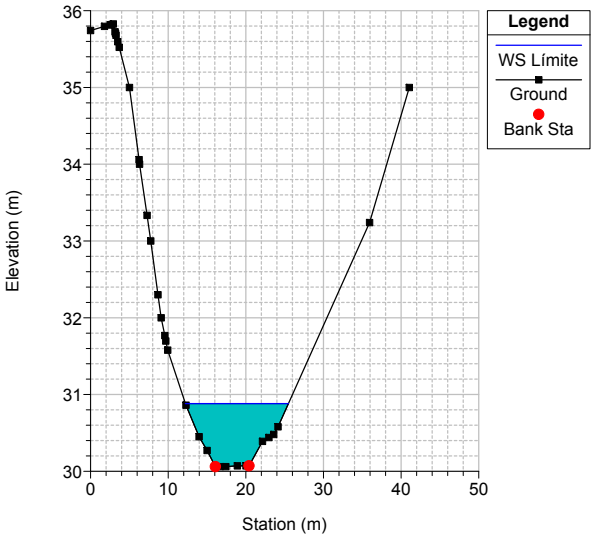
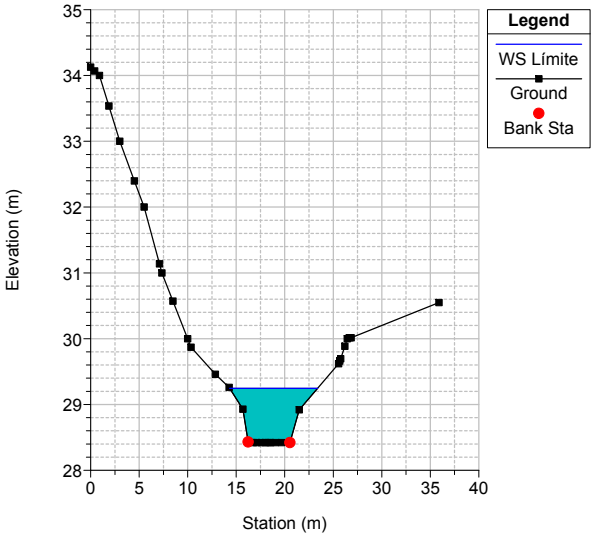


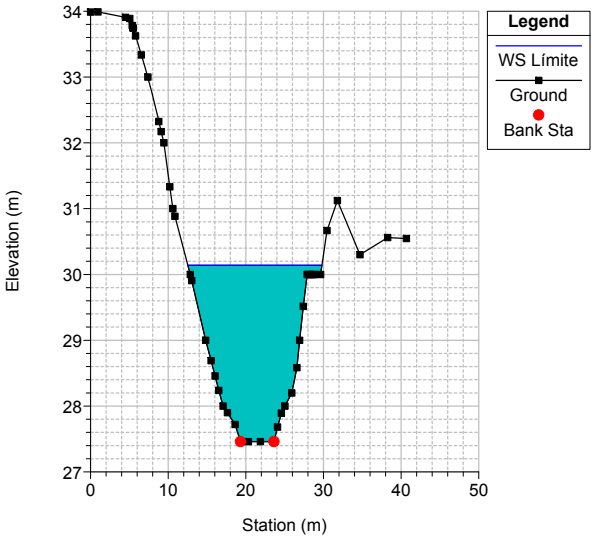
Malaset00 Plan: Plan 09 19/07/2011
RS = 561.362



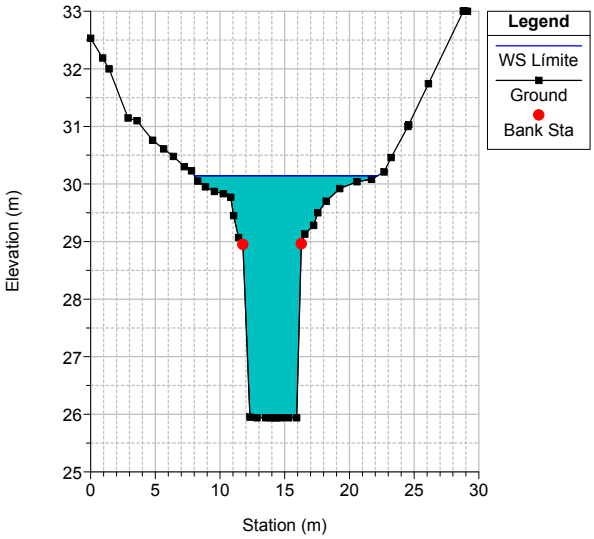
Malaset00 Plan: Plan 09 19/07/2011
RS = 525.334



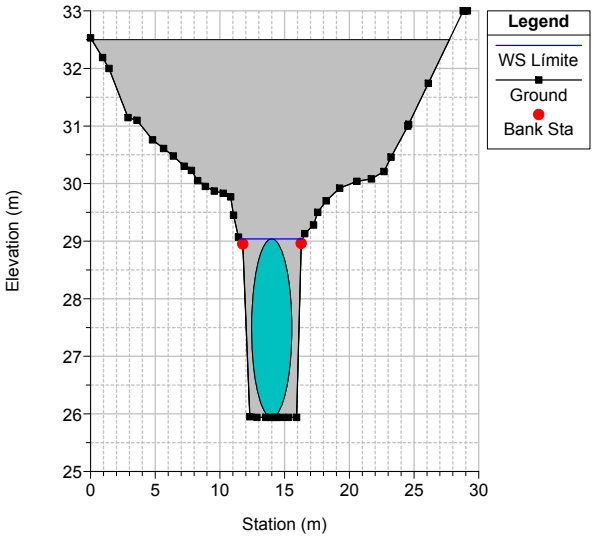
Malaset00 Plan: Plan 09 19/07/2011
RS = 515.257



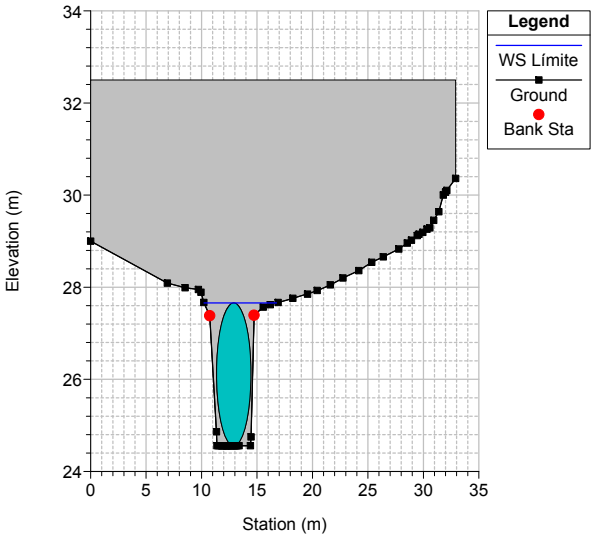
Malaset00 Plan: Plan 09 19/07/2011
RS = 506.445



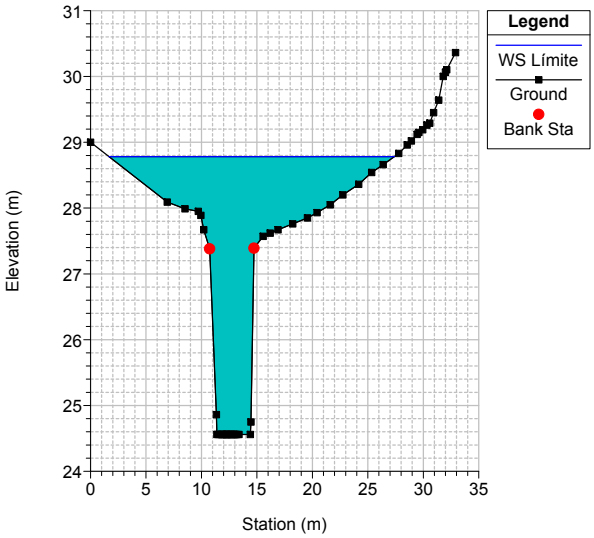
Malaset00 Plan: Plan 09 19/07/2011
RS = 494.2 Culv



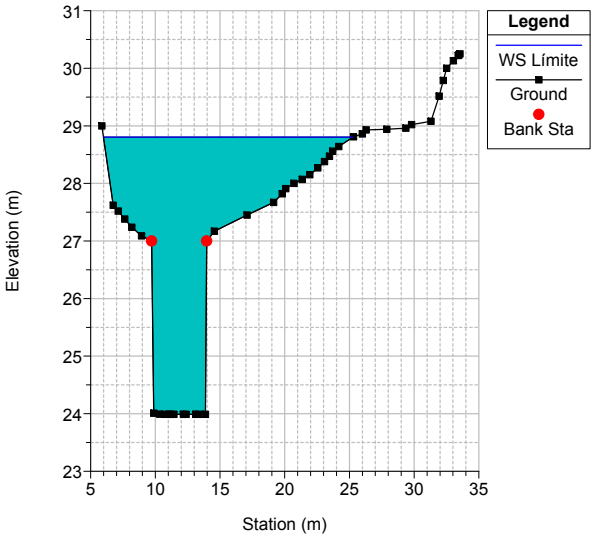
Malaset00 Plan: Plan 09 19/07/2011
RS = 494.2 Culv



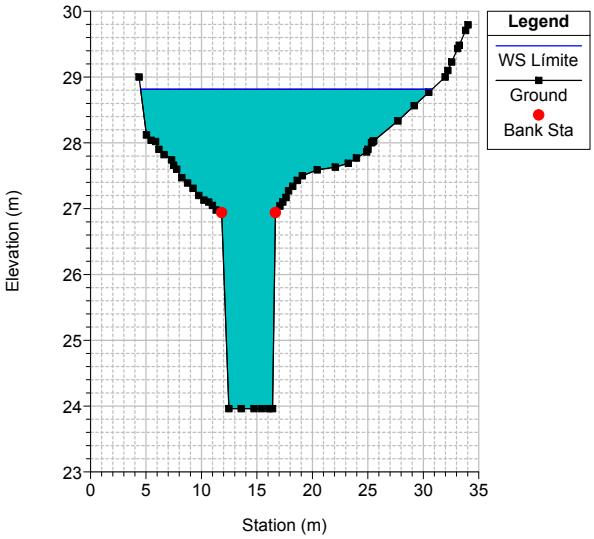
Malaset00 Plan: Plan 09 19/07/2011
RS = 457.739



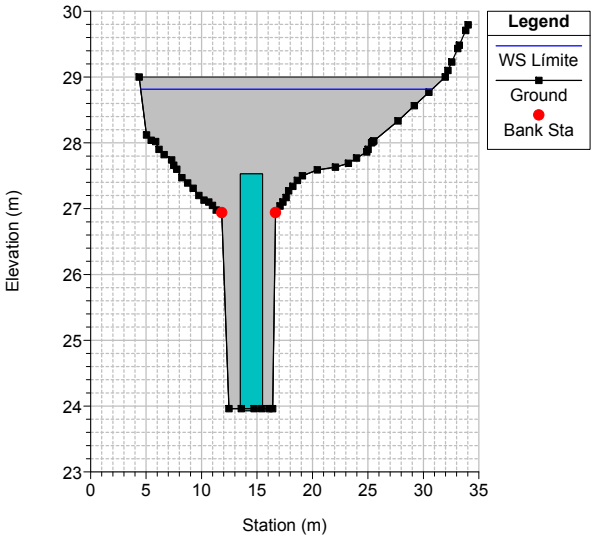
Malaset00 Plan: Plan 09 19/07/2011
RS = 455.014



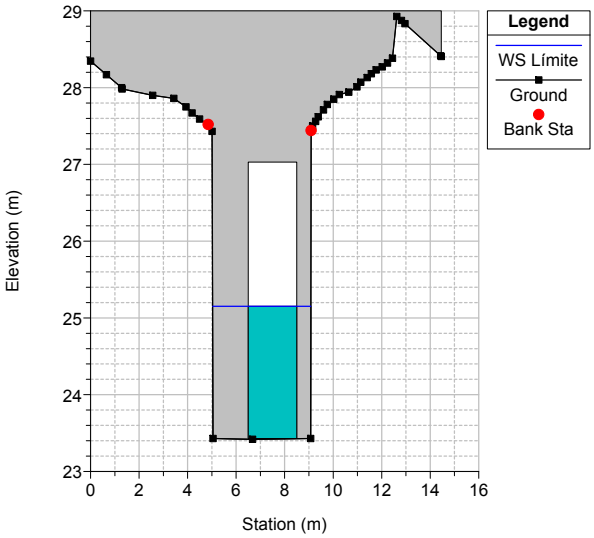
Malaset00 Plan: Plan 09 19/07/2011
RS = 448.070



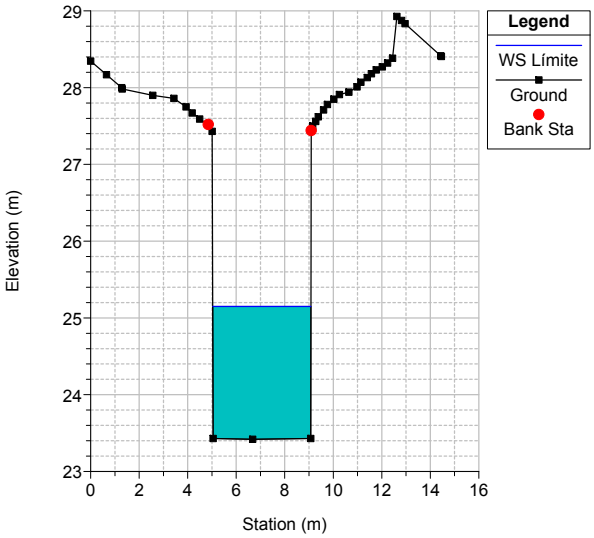
Malaset00 Plan: Plan 09 19/07/2011
RS = 432 Culv



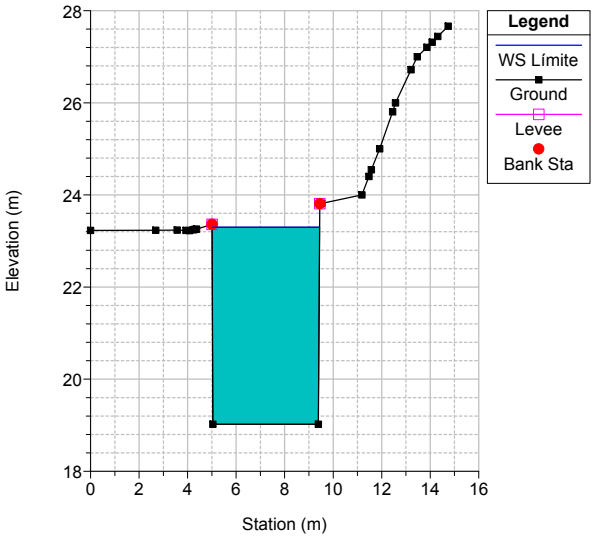
Malaset00 Plan: Plan 09 19/07/2011
RS = 432 Culv



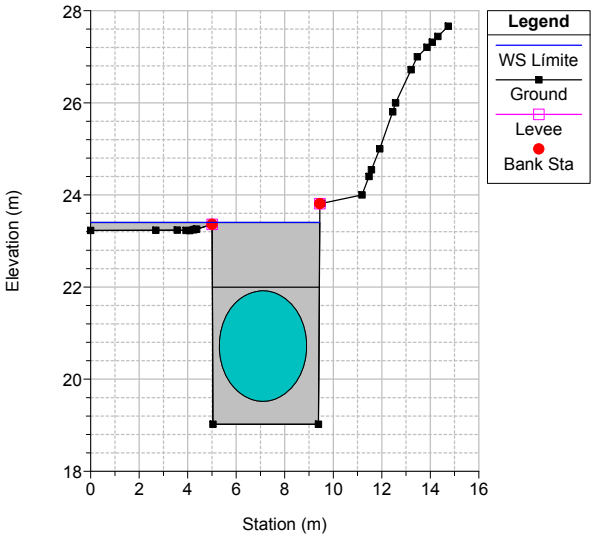
Malaset00 Plan: Plan 09 19/07/2011
RS = 413.815



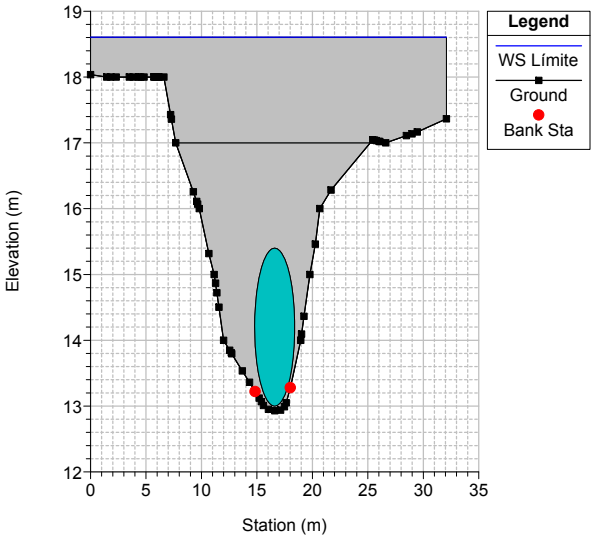
Malaset00 Plan: Plan 09 19/07/2011
RS = 408.135



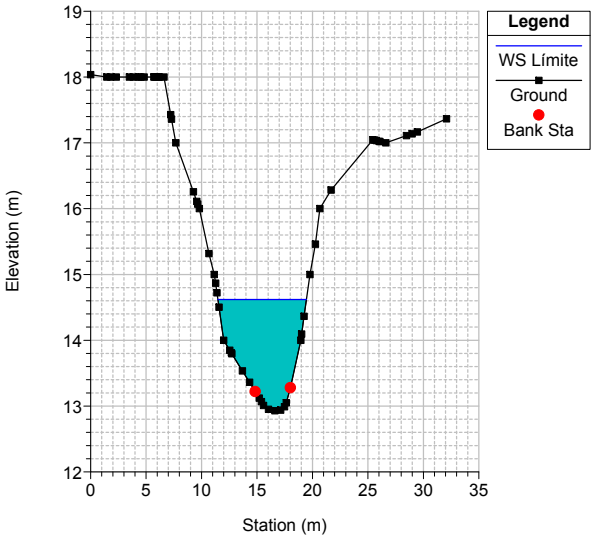
Malaset00 Plan: Plan 09 19/07/2011
RS = 406 Culv



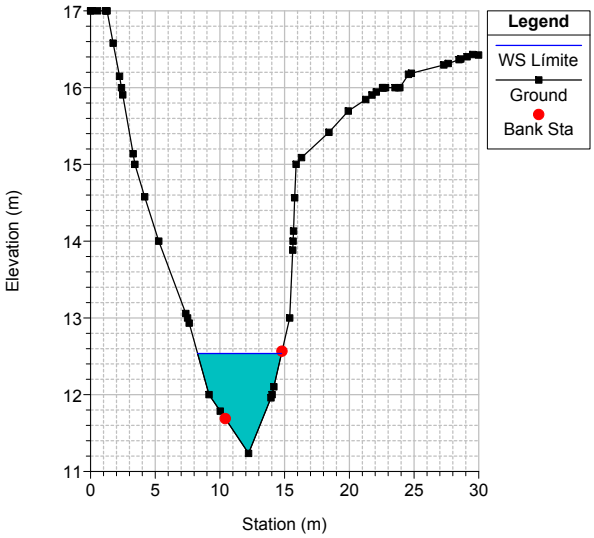
Malaset00 Plan: Plan 09 19/07/2011
RS = 406 Culv



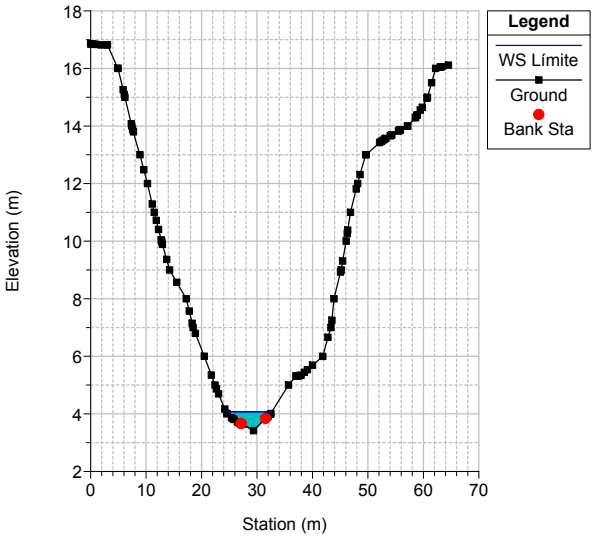
Malaset00 Plan: Plan 09 19/07/2011
RS = 91.090



Malaset00 Plan: Plan 09 19/07/2011
RS = 72.980



Malaset00 Plan: Plan 09 19/07/2011
RS = 45.986



HEC-RAS Plan: Plan 05 River: Malaset Reach: Malaset Profile: Límite

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)	
Malaset	1228.885	Límite	116.00	55.03	57.04	58.09	60.98	0.115335	8.80	13.28	13.13	2.67
Malaset	1149.744	Límite	116.00	52.90	55.72	56.14	57.19	0.019059	5.64	23.43	15.77	1.20
Malaset	1070.066	Límite	116.00	49.98	52.08	52.94	54.83	0.045396	8.15	17.48	14.16	1.86
Malaset	981.382	Límite	116.00	45.88	48.20	49.07	50.94	0.042355	7.63	16.95	12.24	1.74
Malaset	898.970	Límite	116.00	41.56	44.09	45.07	47.15	0.049084	7.92	15.76	11.26	1.83
Malaset	849.327	Límite	116.00	38.71	41.83	42.76	44.68	0.047833	7.53	15.90	10.13	1.74
Malaset	809.017	Límite	116.00	36.63	39.39	40.39	42.58	0.054820	8.06	15.34	11.23	1.91
Malaset	786		Bridge									
Malaset	762.922	Límite	116.00	34.82	37.91	37.91	38.93	0.012522	4.49	26.70	14.25	0.95
Malaset	725.463	Límite	116.00	34.30	37.07	37.25	38.29	0.019059	4.90	23.76	13.24	1.14
Malaset	687.391	Límite	116.00	33.82	36.67	35.91	36.95	0.002933	2.47	52.10	27.42	0.49
Malaset	679		Bridge									
Malaset	675.898	Límite	116.00	33.68	36.67		36.82	0.001343	1.79	71.12	33.98	0.34
Malaset	671.200	Límite	116.00	32.48	36.68	35.54	36.80	0.001657	1.93	77.54	42.72	0.30
Malaset	668.5		Culvert									
Malaset	658.870	Límite	116.00	32.18	36.21		36.34	0.002308	2.05	73.66	47.74	0.33
Malaset	654.216	Límite	116.00	31.35	36.22	34.97	36.32	0.001182	1.86	96.61	64.94	0.28
Malaset	649.75		Culvert									
Malaset	603.477	Límite	28.60	30.87	32.34	32.34	32.91	0.002010	3.41	9.81	11.37	0.93
Malaset	584.290	Límite	28.60	31.01	32.04	32.26	32.80	0.004509	4.55	11.98	18.12	1.43
Malaset	561.362	Límite	28.60	30.06	30.88	31.36	32.55	0.012022	6.39	7.40	13.27	2.26
Malaset	525.334	Límite	28.60	28.42	29.25	29.94	31.94	0.016420	7.52	4.94	9.07	2.64
Malaset	515.257	Límite	28.60	27.46	30.14	28.89	30.27	0.000203	1.83	29.48	17.28	0.36
Malaset	506.445	Límite	28.60	25.94	30.14	27.75	30.27	0.000254	1.58	21.30	14.14	0.26
Malaset	494.2		Culvert									
Malaset	457.739	Límite	28.60	24.56	28.78		28.89	0.000258	1.57	29.78	25.74	0.25
Malaset	455.014	Límite	28.60	23.99	28.80		28.87	0.000128	1.20	35.88	19.28	0.18
Malaset	448.070	Límite	28.60	23.96	28.81	25.67	28.86	0.000086	1.05	44.59	26.28	0.16
Malaset	432		Culvert									
Malaset	413.815	Límite	28.60	23.42	25.15	25.15	26.01	0.004171	4.11	6.96	4.05	1.00
Malaset	408.135	Límite	28.60	19.02	23.30	20.66	23.42	0.000316	1.52	18.78	4.43	0.24
Malaset	406		Culvert									
Malaset	91.090	Límite	28.60	12.93	14.62	14.62	15.20	0.012789	3.78	9.18	7.97	0.95
Malaset	72.980	Límite	28.60	11.23	12.54	13.07	14.35	0.083450	6.24	4.91	6.49	2.13
Malaset	45.986	Límite	28.60	3.42	4.07	4.80	9.43	0.504114	10.90	2.95	8.25	4.99

Plan: Plan 05 Malaset Malaset RS: 1228.885 Profile: Límite

E.G. Elev (m)	60.98	Element	Left OB	Channel	Right OB
Vel Head (m)	3.94	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	57.04	Reach Len. (m)	74.63	79.14	83.67
Crit W.S. (m)	58.09	Flow Area (m2)	0.09	13.15	0.04
E.G. Slope (m/m)	0.115335	Area (m2)	0.09	13.15	0.04
Q Total (m3/s)	116.00	Flow (m3/s)	0.16	115.77	0.07
Top Width (m)	13.13	Top Width (m)	0.89	11.84	0.40
Vel Total (m/s)	8.73	Avg. Vel. (m/s)	1.79	8.80	1.71
Max Chl Dpth (m)	2.01	Hydr. Depth (m)	0.10	1.11	0.10
Conv. Total (m3/s)	341.6	Conv. (m3/s)	0.5	340.9	0.2
Length Wtd. (m)	79.11	Wetted Per. (m)	0.91	12.46	0.45
Min Ch El (m)	55.03	Shear (N/m2)	109.21	1193.82	102.17
Alpha	1.01	Stream Power (N/m s)	3153.09	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	1.50	17.17	1.57
C & E Loss (m)		Cum SA (1000 m2)	3.95	7.08	4.35

Plan: Plan 05 Malaset Malaset RS: 1149.744 Profile: Límite

E.G. Elev (m)	57.19	Element	Left OB	Channel	Right OB
Vel Head (m)	1.47	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	55.72	Reach Len. (m)	87.64	79.68	71.68
Crit W.S. (m)	56.14	Flow Area (m2)	2.94	18.12	2.37
E.G. Slope (m/m)	0.019059	Area (m2)	2.94	18.12	2.37
Q Total (m3/s)	116.00	Flow (m3/s)	7.59	102.27	6.14
Top Width (m)	15.77	Top Width (m)	4.32	8.06	3.39
Vel Total (m/s)	4.95	Avg. Vel. (m/s)	2.58	5.64	2.58
Max Chl Dpth (m)	2.82	Hydr. Depth (m)	0.68	2.25	0.70
Conv. Total (m3/s)	840.3	Conv. (m3/s)	55.0	740.8	44.4
Length Wtd. (m)	79.32	Wetted Per. (m)	4.53	8.67	3.66
Min Ch El (m)	52.90	Shear (N/m2)	121.10	390.78	121.12
Alpha	1.18	Stream Power (N/m s)	2392.60	0.00	0.00
Frctn Loss (m)	3.05	Cum Volume (1000 m3)	1.39	15.93	1.47
C & E Loss (m)	0.74	Cum SA (1000 m2)	3.76	6.29	4.19

Plan: Plan 05 Malaset Malaset RS: 1070.066 Profile: Límite

E.G. Elev (m)	54.83	Element	Left OB	Channel	Right OB
Vel Head (m)	2.75	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	52.08	Reach Len. (m)	84.08	88.68	93.22
Crit W.S. (m)	52.94	Flow Area (m2)	2.26	10.47	4.75
E.G. Slope (m/m)	0.045396	Area (m2)	2.26	10.47	4.75
Q Total (m3/s)	116.00	Flow (m3/s)	9.50	85.35	21.15
Top Width (m)	14.16	Top Width (m)	2.81	5.35	6.00
Vel Total (m/s)	6.64	Avg. Vel. (m/s)	4.19	8.15	4.45
Max Chl Dpth (m)	2.10	Hydr. Depth (m)	0.81	1.96	0.79
Conv. Total (m3/s)	544.4	Conv. (m3/s)	44.6	400.6	99.3
Length Wtd. (m)	88.80	Wetted Per. (m)	3.24	5.53	6.21
Min Ch El (m)	49.98	Shear (N/m2)	311.06	843.08	340.46
Alpha	1.23	Stream Power (N/m s)	2805.03	0.00	0.00
Frctn Loss (m)	2.23	Cum Volume (1000 m3)	1.16	14.79	1.22
C & E Loss (m)	0.13	Cum SA (1000 m2)	3.44	5.76	3.86

Plan: Plan 05 Malaset Malaset RS: 981.382 Profile: Límite

E.G. Elev (m)	50.94	Element	Left OB	Channel	Right OB
Vel Head (m)	2.74	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	48.20	Reach Len. (m)	81.27	82.41	83.05
Crit W.S. (m)	49.07	Flow Area (m2)	2.26	13.73	0.96
E.G. Slope (m/m)	0.042355	Area (m2)	2.26	13.73	0.96
Q Total (m3/s)	116.00	Flow (m3/s)	8.28	104.73	2.99

Plan: Plan 05 Malaset Malaset RS: 981.382 Profile: Límite (Continued)

Top Width (m)	12.24	Top Width (m)	3.55	7.02	1.67
Vel Total (m/s)	6.85	Avg. Vel. (m/s)	3.67	7.63	3.12
Max Chl Dpth (m)	2.32	Hydr. Depth (m)	0.64	1.96	0.57
Conv. Total (m3/s)	563.6	Conv. (m3/s)	40.2	508.9	14.5
Length Wtd. (m)	82.38	Wetted Per. (m)	3.76	7.60	2.03
Min Ch El (m)	45.88	Shear (N/m2)	249.71	749.85	196.32
Alpha	1.15	Stream Power (N/m s)	2688.78	0.00	0.00
Frctn Loss (m)	3.89	Cum Volume (1000 m3)	0.97	13.72	0.95
C & E Loss (m)	0.00	Cum SA (1000 m2)	3.18	5.21	3.50

Plan: Plan 05 Malaset Malaset RS: 898.970 Profile: Límite

E.G. Elev (m)	47.15	Element	Left OB	Channel	Right OB
Vel Head (m)	3.06	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	44.09	Reach Len. (m)	49.93	49.64	49.72
Crit W.S. (m)	45.07	Flow Area (m2)	0.70	13.96	1.10
E.G. Slope (m/m)	0.049084	Area (m2)	0.70	13.96	1.10
Q Total (m3/s)	116.00	Flow (m3/s)	2.09	110.51	3.41
Top Width (m)	11.26	Top Width (m)	1.47	7.31	2.48
Vel Total (m/s)	7.36	Avg. Vel. (m/s)	3.00	7.92	3.10
Max Chl Dpth (m)	2.53	Hydr. Depth (m)	0.47	1.91	0.44
Conv. Total (m3/s)	523.6	Conv. (m3/s)	9.4	498.8	15.4
Length Wtd. (m)	49.65	Wetted Per. (m)	1.75	8.17	2.63
Min Ch El (m)	41.56	Shear (N/m2)	191.80	822.33	201.15
Alpha	1.11	Stream Power (N/m s)	3012.57	0.00	0.00
Frctn Loss (m)	3.75	Cum Volume (1000 m3)	0.85	12.58	0.87
C & E Loss (m)	0.03	Cum SA (1000 m2)	2.97	4.62	3.33

Plan: Plan 05 Malaset Malaset RS: 849.327 Profile: Límite

E.G. Elev (m)	44.68	Element	Left OB	Channel	Right OB
Vel Head (m)	2.85	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	41.83	Reach Len. (m)	38.01	40.31	42.58
Crit W.S. (m)	42.76	Flow Area (m2)	0.37	15.20	0.33
E.G. Slope (m/m)	0.047833	Area (m2)	0.37	15.20	0.33
Q Total (m3/s)	116.00	Flow (m3/s)	0.88	114.36	0.75
Top Width (m)	10.13	Top Width (m)	1.08	8.01	1.05
Vel Total (m/s)	7.30	Avg. Vel. (m/s)	2.39	7.53	2.29
Max Chl Dpth (m)	3.13	Hydr. Depth (m)	0.34	1.90	0.32
Conv. Total (m3/s)	530.4	Conv. (m3/s)	4.0	522.9	3.4
Length Wtd. (m)	40.31	Wetted Per. (m)	1.28	9.41	1.22
Min Ch El (m)	38.71	Shear (N/m2)	135.75	757.47	126.74
Alpha	1.05	Stream Power (N/m s)	2596.27	0.00	0.00
Frctn Loss (m)	2.41	Cum Volume (1000 m3)	0.83	11.85	0.83
C & E Loss (m)	0.06	Cum SA (1000 m2)	2.91	4.24	3.24

Plan: Plan 05 Malaset Malaset RS: 809.017 Profile: Límite

E.G. Elev (m)	42.58	Element	Left OB	Channel	Right OB
Vel Head (m)	3.19	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	39.39	Reach Len. (m)	7.90	7.90	7.90
Crit W.S. (m)	40.39	Flow Area (m2)	0.72	13.78	0.85
E.G. Slope (m/m)	0.054820	Area (m2)	0.72	13.78	0.85
Q Total (m3/s)	116.00	Flow (m3/s)	2.19	111.08	2.73
Top Width (m)	11.23	Top Width (m)	1.73	7.61	1.88
Vel Total (m/s)	7.56	Avg. Vel. (m/s)	3.05	8.06	3.21
Max Chl Dpth (m)	2.77	Hydr. Depth (m)	0.41	1.81	0.45
Conv. Total (m3/s)	495.4	Conv. (m3/s)	9.3	474.4	11.7
Length Wtd. (m)	7.90	Wetted Per. (m)	1.91	8.52	2.09
Min Ch El (m)	36.63	Shear (N/m2)	201.95	869.06	218.80

Plan: Plan 05 Malaset Malaset RS: 809.017 Profile: Límite (Continued)

Alpha	1.10	Stream Power (N/m s)	3565.95	0.00	0.00
Frctn Loss (m)	2.06	Cum Volume (1000 m3)	0.81	11.27	0.81
C & E Loss (m)	0.03	Cum SA (1000 m2)	2.86	3.93	3.18

Plan: Plan 05 Malaset Malaset RS: 786 BR U Profile: Límite

E.G. Elev (m)	41.53	Element	Left OB	Channel	Right OB
Vel Head (m)	1.57	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	39.96	Reach Len. (m)			
Crit W.S. (m)	40.39	Flow Area (m2)	2.04	18.12	2.26
E.G. Slope (m/m)	0.019535	Area (m2)	2.04	18.12	2.26
Q Total (m3/s)	116.00	Flow (m3/s)	5.27	104.71	6.02
Top Width (m)	13.60	Top Width (m)	2.91	7.61	3.08
Vel Total (m/s)	5.17	Avg. Vel. (m/s)	2.58	5.78	2.66
Max Chl Dpth (m)	3.34	Hydr. Depth (m)	0.70	2.38	0.74
Conv. Total (m3/s)	829.9	Conv. (m3/s)	37.7	749.2	43.1
Length Wtd. (m)		Wetted Per. (m)	3.22	8.52	3.41
Min Ch El (m)	36.63	Shear (N/m2)	121.65	407.35	127.09
Alpha	1.15	Stream Power (N/m s)	3565.95	0.00	0.00
Frctn Loss (m)	0.24	Cum Volume (1000 m3)	0.79	11.14	0.79
C & E Loss (m)	0.81	Cum SA (1000 m2)	2.84	3.87	3.16

Plan: Plan 05 Malaset Malaset RS: 786 BR D Profile: Límite

E.G. Elev (m)	40.10	Element	Left OB	Channel	Right OB
Vel Head (m)	3.13	Wt. n-Val.		0.040	
W.S. Elev (m)	36.97	Reach Len. (m)			
Crit W.S. (m)	37.92	Flow Area (m2)		14.81	
E.G. Slope (m/m)	0.074904	Area (m2)		14.81	
Q Total (m3/s)	116.00	Flow (m3/s)		116.00	
Top Width (m)	10.94	Top Width (m)		10.94	
Vel Total (m/s)	7.83	Avg. Vel. (m/s)		7.83	
Max Chl Dpth (m)	2.15	Hydr. Depth (m)		1.35	
Conv. Total (m3/s)	423.8	Conv. (m3/s)		423.8	
Length Wtd. (m)		Wetted Per. (m)		12.09	
Min Ch El (m)	34.82	Shear (N/m2)		899.75	
Alpha	1.00	Stream Power (N/m s)	3800.84	0.00	0.00
Frctn Loss (m)	1.01	Cum Volume (1000 m3)	0.79	11.14	0.79
C & E Loss (m)	0.46	Cum SA (1000 m2)	2.84	3.87	3.16

Plan: Plan 05 Malaset Malaset RS: 762.922 Profile: Límite

E.G. Elev (m)	38.93	Element	Left OB	Channel	Right OB
Vel Head (m)	1.01	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	37.91	Reach Len. (m)	35.26	37.46	39.68
Crit W.S. (m)	37.91	Flow Area (m2)	0.88	25.45	0.37
E.G. Slope (m/m)	0.012522	Area (m2)	0.88	25.45	0.37
Q Total (m3/s)	116.00	Flow (m3/s)	1.36	114.19	0.46
Top Width (m)	14.25	Top Width (m)	1.97	11.31	0.97
Vel Total (m/s)	4.34	Avg. Vel. (m/s)	1.54	4.49	1.25
Max Chl Dpth (m)	3.09	Hydr. Depth (m)	0.45	2.25	0.38
Conv. Total (m3/s)	1036.6	Conv. (m3/s)	12.1	1020.4	4.1
Length Wtd. (m)	37.45	Wetted Per. (m)	2.17	12.53	1.23
Min Ch El (m)	34.82	Shear (N/m2)	50.01	249.36	36.60
Alpha	1.05	Stream Power (N/m s)	3800.84	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	0.79	11.14	0.79
C & E Loss (m)		Cum SA (1000 m2)	2.84	3.87	3.16

Plan: Plan 05 Malaset Malaset RS: 725.463 Profile: Límite

E.G. Elev (m)	38.29	Element	Left OB	Channel	Right OB
Vel Head (m)	1.22	Wt. n-Val.	0.040	0.040	
W.S. Elev (m)	37.07	Reach Len. (m)	38.51	38.07	37.06
Crit W.S. (m)	37.25	Flow Area (m2)	0.14	23.62	
E.G. Slope (m/m)	0.019059	Area (m2)	0.14	23.62	
Q Total (m3/s)	116.00	Flow (m3/s)	0.15	115.85	
Top Width (m)	13.24	Top Width (m)	0.73	12.51	
Vel Total (m/s)	4.88	Avg. Vel. (m/s)	1.06	4.90	
Max Chl Dpth (m)	2.77	Hydr. Depth (m)	0.19	1.89	
Conv. Total (m3/s)	840.2	Conv. (m3/s)	1.1	839.2	
Length Wtd. (m)	38.05	Wetted Per. (m)	0.82	13.95	
Min Ch El (m)	34.30	Shear (N/m2)	31.70	316.60	
Alpha	1.01	Stream Power (N/m s)	2215.17	0.00	0.00
Frctn Loss (m)	0.57	Cum Volume (1000 m3)	0.78	10.22	0.79
C & E Loss (m)	0.06	Cum SA (1000 m2)	2.79	3.42	3.14

Plan: Plan 05 Malaset Malaset RS: 687.391 Profile: Límite

E.G. Elev (m)	36.95	Element	Left OB	Channel	Right OB
Vel Head (m)	0.28	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.67	Reach Len. (m)	7.41	7.41	7.41
Crit W.S. (m)	35.91	Flow Area (m2)	4.77	41.78	5.54
E.G. Slope (m/m)	0.002933	Area (m2)	4.77	41.78	5.54
Q Total (m3/s)	116.00	Flow (m3/s)	5.87	103.09	7.04
Top Width (m)	27.42	Top Width (m)	5.27	16.33	5.83
Vel Total (m/s)	2.23	Avg. Vel. (m/s)	1.23	2.47	1.27
Max Chl Dpth (m)	2.85	Hydr. Depth (m)	0.91	2.56	0.95
Conv. Total (m3/s)	2142.1	Conv. (m3/s)	108.4	1903.7	130.0
Length Wtd. (m)	7.41	Wetted Per. (m)	5.51	16.98	6.10
Min Ch El (m)	33.82	Shear (N/m2)	24.90	70.76	26.12
Alpha	1.13	Stream Power (N/m s)	2882.68	0.00	0.00
Frctn Loss (m)	0.02	Cum Volume (1000 m3)	0.68	8.98	0.68
C & E Loss (m)	0.01	Cum SA (1000 m2)	2.67	2.87	3.03

Plan: Plan 05 Malaset Malaset RS: 679 BR U Profile: Límite

E.G. Elev (m)	36.92	Element	Left OB	Channel	Right OB
Vel Head (m)	0.33	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.59	Reach Len. (m)	1.60	1.60	1.60
Crit W.S. (m)	35.89	Flow Area (m2)	4.37	40.52	3.48
E.G. Slope (m/m)	0.003433	Area (m2)	4.37	40.52	3.48
Q Total (m3/s)	116.00	Flow (m3/s)	5.64	106.00	4.37
Top Width (m)	25.10	Top Width (m)	5.07	16.33	3.70
Vel Total (m/s)	2.40	Avg. Vel. (m/s)	1.29	2.62	1.26
Max Chl Dpth (m)	2.77	Hydr. Depth (m)	0.86	2.48	0.94
Conv. Total (m3/s)	1979.7	Conv. (m3/s)	96.2	1808.9	74.5
Length Wtd. (m)	1.60	Wetted Per. (m)	5.30	16.98	5.29
Min Ch El (m)	33.82	Shear (N/m2)	27.80	80.34	22.12
Alpha	1.11	Stream Power (N/m s)	2882.68	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.65	8.67	0.65
C & E Loss (m)	0.09	Cum SA (1000 m2)	2.64	2.75	3.00

Plan: Plan 05 Malaset Malaset RS: 679 BR D Profile: Límite

E.G. Elev (m)	36.82	Element	Left OB	Channel	Right OB
Vel Head (m)	0.15	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.67	Reach Len. (m)	2.48	2.48	2.48
Crit W.S. (m)	35.38	Flow Area (m2)	8.28	59.02	3.92
E.G. Slope (m/m)	0.001328	Area (m2)	8.28	59.02	3.92
Q Total (m3/s)	116.00	Flow (m3/s)	7.64	105.11	3.25

Plan: Plan 05 Malaset Malaset RS: 679 BR D Profile: Límite (Continued)

Top Width (m)	33.03	Top Width (m)	7.84	21.49	3.70
Vel Total (m/s)	1.63	Avg. Vel. (m/s)	0.92	1.78	0.83
Max Chl Dpth (m)	2.99	Hydr. Depth (m)	1.06	2.75	1.06
Conv. Total (m3/s)	3182.9	Conv. (m3/s)	209.6	2884.1	89.3
Length Wtd. (m)	2.48	Wetted Per. (m)	8.12	21.60	4.50
Min Ch El (m)	33.68	Shear (N/m2)	13.28	35.59	11.35
Alpha	1.11	Stream Power (N/m s)	3577.58	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.64	8.59	0.64
C & E Loss (m)	0.00	Cum SA (1000 m2)	2.63	2.72	2.99

Plan: Plan 05 Malaset Malaset RS: 675.898 Profile: Límite

E.G. Elev (m)	36.82	Element	Left OB	Channel	Right OB
Vel Head (m)	0.15	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.67	Reach Len. (m)	4.74	4.70	4.87
Crit W.S. (m)		Flow Area (m2)	8.24	58.91	3.97
E.G. Slope (m/m)	0.001343	Area (m2)	8.24	58.91	3.97
Q Total (m3/s)	116.00	Flow (m3/s)	7.63	105.38	2.98
Top Width (m)	33.98	Top Width (m)	7.82	21.49	4.67
Vel Total (m/s)	1.63	Avg. Vel. (m/s)	0.93	1.79	0.75
Max Chl Dpth (m)	2.99	Hydr. Depth (m)	1.05	2.74	0.85
Conv. Total (m3/s)	3165.0	Conv. (m3/s)	208.2	2875.3	81.4
Length Wtd. (m)	4.74	Wetted Per. (m)	8.10	21.60	5.33
Min Ch El (m)	33.68	Shear (N/m2)	13.40	35.93	9.80
Alpha	1.12	Stream Power (N/m s)	3577.58	0.00	0.00
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	0.62	8.45	0.63
C & E Loss (m)	0.02	Cum SA (1000 m2)	2.61	2.67	2.98

Plan: Plan 05 Malaset Malaset RS: 671.200 Profile: Límite

E.G. Elev (m)	36.80	Element	Left OB	Channel	Right OB
Vel Head (m)	0.12	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.68	Reach Len. (m)	12.62	12.33	12.13
Crit W.S. (m)	35.54	Flow Area (m2)	42.44	11.41	23.69
E.G. Slope (m/m)	0.001657	Area (m2)	42.44	11.41	23.69
Q Total (m3/s)	116.00	Flow (m3/s)	63.68	21.97	30.34
Top Width (m)	42.72	Top Width (m)	23.45	2.80	16.46
Vel Total (m/s)	1.50	Avg. Vel. (m/s)	1.50	1.93	1.28
Max Chl Dpth (m)	4.20	Hydr. Depth (m)	1.81	4.07	1.44
Conv. Total (m3/s)	2849.3	Conv. (m3/s)	1564.2	539.8	745.3
Length Wtd. (m)	12.33	Wetted Per. (m)	23.71	4.38	16.78
Min Ch El (m)	32.48	Shear (N/m2)	29.09	42.32	22.94
Alpha	1.06	Stream Power (N/m s)	4488.98	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	0.50	8.28	0.57
C & E Loss (m)		Cum SA (1000 m2)	2.53	2.61	2.93

Plan: Plan 05 Malaset Malaset RS: 658.870 Profile: Límite

E.G. Elev (m)	36.34	Element	Left OB	Channel	Right OB
Vel Head (m)	0.14	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.21	Reach Len. (m)	4.58	4.65	4.72
Crit W.S. (m)		Flow Area (m2)	31.92	13.59	28.15
E.G. Slope (m/m)	0.002308	Area (m2)	31.92	13.59	28.15
Q Total (m3/s)	116.00	Flow (m3/s)	48.36	27.87	39.77
Top Width (m)	47.74	Top Width (m)	22.31	3.54	21.90
Vel Total (m/s)	1.57	Avg. Vel. (m/s)	1.52	2.05	1.41
Max Chl Dpth (m)	4.03	Hydr. Depth (m)	1.43	3.84	1.29
Conv. Total (m3/s)	2414.5	Conv. (m3/s)	1006.7	580.1	827.7
Length Wtd. (m)	4.65	Wetted Per. (m)	22.52	6.09	22.08
Min Ch El (m)	32.18	Shear (N/m2)	32.08	50.49	28.87

Plan: Plan 05 Malaset Malaset RS: 658.870 Profile: Límite (Continued)

Alpha	1.07	Stream Power (N/m s)	4707.73	0.00	0.00
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	0.50	7.44	0.57
C & E Loss (m)	0.02	Cum SA (1000 m2)	2.24	2.57	2.70

Plan: Plan 05 Malaset Malaset RS: 654.216 Profile: Límite

E.G. Elev (m)	36.32	Element	Left OB	Channel	Right OB
Vel Head (m)	0.10	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	36.22	Reach Len. (m)	51.77	50.74	49.94
Crit W.S. (m)	34.97	Flow Area (m2)	28.40	24.91	43.31
E.G. Slope (m/m)	0.001182	Area (m2)	28.40	24.91	43.31
Q Total (m3/s)	116.00	Flow (m3/s)	28.14	46.42	41.45
Top Width (m)	64.94	Top Width (m)	22.62	5.68	36.65
Vel Total (m/s)	1.20	Avg. Vel. (m/s)	0.99	1.86	0.96
Max Chl Dpth (m)	4.87	Hydr. Depth (m)	1.26	4.39	1.18
Conv. Total (m3/s)	3373.4	Conv. (m3/s)	818.2	1349.8	1205.4
Length Wtd. (m)	50.74	Wetted Per. (m)	22.95	7.81	36.86
Min Ch El (m)	31.35	Shear (N/m2)	14.35	37.00	13.62
Alpha	1.36	Stream Power (N/m s)	5100.33	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	0.36	7.35	0.40
C & E Loss (m)		Cum SA (1000 m2)	2.14	2.55	2.56

Plan: Plan 05 Malaset Malaset RS: 603.477 Profile: Límite

E.G. Elev (m)	32.91	Element	Left OB	Channel	Right OB
Vel Head (m)	0.58	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	32.34	Reach Len. (m)	22.50	19.19	15.64
Crit W.S. (m)	32.34	Flow Area (m2)	0.71	8.13	0.96
E.G. Slope (m/m)	0.002010	Area (m2)	0.71	8.13	0.96
Q Total (m3/s)	28.60	Flow (m3/s)	0.39	27.76	0.45
Top Width (m)	11.37	Top Width (m)	1.98	5.92	3.47
Vel Total (m/s)	2.92	Avg. Vel. (m/s)	0.54	3.41	0.47
Max Chl Dpth (m)	1.47	Hydr. Depth (m)	0.36	1.37	0.28
Conv. Total (m3/s)	637.9	Conv. (m3/s)	8.6	619.1	10.1
Length Wtd. (m)	19.13	Wetted Per. (m)	2.11	6.67	3.53
Min Ch El (m)	30.87	Shear (N/m2)	6.67	24.05	5.37
Alpha	1.33	Stream Power (N/m s)	1891.17	0.00	0.00
Frctn Loss (m)	0.04	Cum Volume (1000 m3)	0.36	3.74	0.40
C & E Loss (m)	0.07	Cum SA (1000 m2)	1.50	2.25	1.56

Plan: Plan 05 Malaset Malaset RS: 584.290 Profile: Límite

E.G. Elev (m)	32.80	Element	Left OB	Channel	Right OB
Vel Head (m)	0.76	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	32.04	Reach Len. (m)	22.91	22.93	22.95
Crit W.S. (m)	32.26	Flow Area (m2)	3.31	4.43	4.25
E.G. Slope (m/m)	0.004509	Area (m2)	3.31	4.43	4.25
Q Total (m3/s)	28.60	Flow (m3/s)	3.99	20.14	4.48
Top Width (m)	18.12	Top Width (m)	5.34	4.32	8.46
Vel Total (m/s)	2.39	Avg. Vel. (m/s)	1.20	4.55	1.05
Max Chl Dpth (m)	1.03	Hydr. Depth (m)	0.62	1.02	0.50
Conv. Total (m3/s)	425.9	Conv. (m3/s)	59.4	299.9	66.7
Length Wtd. (m)	22.93	Wetted Per. (m)	5.45	4.32	8.53
Min Ch El (m)	31.01	Shear (N/m2)	26.84	45.30	22.02
Alpha	2.62	Stream Power (N/m s)	2287.85	0.00	0.00
Frctn Loss (m)	0.06	Cum Volume (1000 m3)	0.31	3.62	0.36
C & E Loss (m)	0.06	Cum SA (1000 m2)	1.42	2.16	1.46

Plan: Plan 05 Malaset Malaset RS: 561.362 Profile: Límite

E.G. Elev (m)	32.55	Element	Left OB	Channel	Right OB
Vel Head (m)	1.67	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	30.88	Reach Len. (m)	34.30	36.03	37.72
Crit W.S. (m)	31.36	Flow Area (m2)	1.69	3.54	2.16
E.G. Slope (m/m)	0.012022	Area (m2)	1.69	3.54	2.16
Q Total (m3/s)	28.60	Flow (m3/s)	2.63	22.63	3.34
Top Width (m)	13.27	Top Width (m)	3.87	4.34	5.06
Vel Total (m/s)	3.86	Avg. Vel. (m/s)	1.56	6.39	1.54
Max Chl Dpth (m)	0.82	Hydr. Depth (m)	0.44	0.82	0.43
Conv. Total (m3/s)	260.8	Conv. (m3/s)	24.0	206.4	30.4
Length Wtd. (m)	36.06	Wetted Per. (m)	3.96	4.34	5.13
Min Ch El (m)	30.06	Shear (N/m2)	50.40	96.27	49.72
Alpha	2.19	Stream Power (N/m s)	1965.86	0.00	0.00
Frctn Loss (m)	0.16	Cum Volume (1000 m3)	0.26	3.53	0.28
C & E Loss (m)	0.09	Cum SA (1000 m2)	1.32	2.06	1.31

Plan: Plan 05 Malaset Malaset RS: 525.334 Profile: Límite

E.G. Elev (m)	31.94	Element	Left OB	Channel	Right OB
Vel Head (m)	2.70	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	29.25	Reach Len. (m)	9.52	10.08	10.66
Crit W.S. (m)	29.94	Flow Area (m2)	0.53	3.56	0.86
E.G. Slope (m/m)	0.016420	Area (m2)	0.53	3.56	0.86
Q Total (m3/s)	28.60	Flow (m3/s)	0.66	26.75	1.19
Top Width (m)	9.07	Top Width (m)	1.91	4.31	2.85
Vel Total (m/s)	5.79	Avg. Vel. (m/s)	1.26	7.52	1.39
Max Chl Dpth (m)	0.83	Hydr. Depth (m)	0.28	0.83	0.30
Conv. Total (m3/s)	223.2	Conv. (m3/s)	5.2	208.7	9.3
Length Wtd. (m)	10.07	Wetted Per. (m)	2.14	4.31	3.00
Min Ch El (m)	28.42	Shear (N/m2)	39.59	132.93	46.00
Alpha	1.58	Stream Power (N/m s)	1718.10	0.00	0.00
Frctn Loss (m)	0.50	Cum Volume (1000 m3)	0.22	3.40	0.23
C & E Loss (m)	0.10	Cum SA (1000 m2)	1.22	1.90	1.16

Plan: Plan 05 Malaset Malaset RS: 515.257 Profile: Límite

E.G. Elev (m)	30.27	Element	Left OB	Channel	Right OB
Vel Head (m)	0.13	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	30.14	Reach Len. (m)	8.54	8.81	9.06
Crit W.S. (m)	28.89	Flow Area (m2)	10.27	11.55	7.66
E.G. Slope (m/m)	0.000203	Area (m2)	10.27	11.55	7.66
Q Total (m3/s)	28.60	Flow (m3/s)	4.57	21.16	2.87
Top Width (m)	17.28	Top Width (m)	6.79	4.31	6.18
Vel Total (m/s)	0.97	Avg. Vel. (m/s)	0.45	1.83	0.37
Max Chl Dpth (m)	2.68	Hydr. Depth (m)	1.51	2.68	1.24
Conv. Total (m3/s)	2009.3	Conv. (m3/s)	321.3	1486.4	201.6
Length Wtd. (m)	8.80	Wetted Per. (m)	7.34	4.31	7.08
Min Ch El (m)	27.46	Shear (N/m2)	2.78	5.33	2.15
Alpha	2.68	Stream Power (N/m s)	1947.91	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.17	3.33	0.18
C & E Loss (m)	0.00	Cum SA (1000 m2)	1.18	1.86	1.11

Plan: Plan 05 Malaset Malaset RS: 506.445 Profile: Límite

E.G. Elev (m)	30.27	Element	Left OB	Channel	Right OB
Vel Head (m)	0.12	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	30.14	Reach Len. (m)	50.18	48.71	47.21
Crit W.S. (m)	27.75	Flow Area (m2)	1.48	17.62	2.20
E.G. Slope (m/m)	0.000254	Area (m2)	1.48	17.62	2.20
Q Total (m3/s)	28.60	Flow (m3/s)	0.30	27.86	0.45

Plan: Plan 05 Malaset Malaset RS: 506.445 Profile: Límite (Continued)

Top Width (m)	14.14	Top Width (m)	3.73	4.52	5.89
Vel Total (m/s)	1.34	Avg. Vel. (m/s)	0.20	1.58	0.20
Max Chl Dpth (m)	4.20	Hydr. Depth (m)	0.40	3.90	0.37
Conv. Total (m3/s)	1794.6	Conv. (m3/s)	18.7	1747.9	27.9
Length Wtd. (m)	48.71	Wetted Per. (m)	4.11	9.70	6.08
Min Ch El (m)	25.94	Shear (N/m2)	0.90	4.52	0.90
Alpha	1.35	Stream Power (N/m s)	1394.10	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	0.12	3.20	0.14
C & E Loss (m)		Cum SA (1000 m2)	1.13	1.82	1.06

Plan: Plan 05 Malaset Malaset RS: 457.739 Profile: Límite

E.G. Elev (m)	28.89	Element	Left OB	Channel	Right OB
Vel Head (m)	0.11	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	28.78	Reach Len. (m)	2.72	2.73	2.83
Crit W.S. (m)		Flow Area (m2)	5.12	15.49	9.17
E.G. Slope (m/m)	0.000258	Area (m2)	5.12	15.49	9.17
Q Total (m3/s)	28.60	Flow (m3/s)	1.38	24.26	2.96
Top Width (m)	25.74	Top Width (m)	9.09	3.99	12.67
Vel Total (m/s)	0.96	Avg. Vel. (m/s)	0.27	1.57	0.32
Max Chl Dpth (m)	4.22	Hydr. Depth (m)	0.56	3.88	0.72
Conv. Total (m3/s)	1779.6	Conv. (m3/s)	85.9	1509.8	183.9
Length Wtd. (m)	2.74	Wetted Per. (m)	9.30	8.76	12.75
Min Ch El (m)	24.56	Shear (N/m2)	1.39	4.48	1.82
Alpha	2.27	Stream Power (N/m s)	1575.32	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.12	2.59	0.14
C & E Loss (m)	0.02	Cum SA (1000 m2)	0.81	1.61	0.62

Plan: Plan 05 Malaset Malaset RS: 455.014 Profile: Límite

E.G. Elev (m)	28.87	Element	Left OB	Channel	Right OB
Vel Head (m)	0.06	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	28.80	Reach Len. (m)	5.95	6.94	8.11
Crit W.S. (m)		Flow Area (m2)	5.02	20.09	10.76
E.G. Slope (m/m)	0.000128	Area (m2)	5.02	20.09	10.76
Q Total (m3/s)	28.60	Flow (m3/s)	1.54	24.14	2.92
Top Width (m)	19.28	Top Width (m)	3.72	4.26	11.30
Vel Total (m/s)	0.80	Avg. Vel. (m/s)	0.31	1.20	0.27
Max Chl Dpth (m)	4.81	Hydr. Depth (m)	1.35	4.72	0.95
Conv. Total (m3/s)	2527.8	Conv. (m3/s)	136.3	2133.6	257.9
Length Wtd. (m)	6.99	Wetted Per. (m)	4.44	10.00	11.47
Min Ch El (m)	23.99	Shear (N/m2)	1.42	2.52	1.18
Alpha	1.94	Stream Power (N/m s)	1605.59	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.10	2.54	0.11
C & E Loss (m)	0.00	Cum SA (1000 m2)	0.79	1.60	0.58

Plan: Plan 05 Malaset Malaset RS: 448.070 Profile: Límite

E.G. Elev (m)	28.86	Element	Left OB	Channel	Right OB
Vel Head (m)	0.05	Wt. n-Val.	0.040	0.015	0.040
W.S. Elev (m)	28.81	Reach Len. (m)	31.97	34.25	31.26
Crit W.S. (m)	25.67	Flow Area (m2)	9.19	22.19	13.21
E.G. Slope (m/m)	0.000086	Area (m2)	9.19	22.19	13.21
Q Total (m3/s)	28.60	Flow (m3/s)	2.38	23.32	2.90
Top Width (m)	26.28	Top Width (m)	7.31	4.85	14.11
Vel Total (m/s)	0.64	Avg. Vel. (m/s)	0.26	1.05	0.22
Max Chl Dpth (m)	4.85	Hydr. Depth (m)	1.26	4.58	0.94
Conv. Total (m3/s)	3090.0	Conv. (m3/s)	256.7	2519.7	313.6
Length Wtd. (m)	34.25	Wetted Per. (m)	7.78	9.98	14.28
Min Ch El (m)	23.96	Shear (N/m2)	0.99	1.87	0.78

Plan: Plan 05 Malaset Malaset RS: 448.070 Profile: Límite (Continued)

Alpha	2.22	Stream Power (N/m s)	1629.72	0.00	0.00
Frctn Loss (m)		Cum Volume (1000 m3)	0.06	2.40	0.01
C & E Loss (m)		Cum SA (1000 m2)	0.76	1.57	0.48

Plan: Plan 05 Malaset Malaset RS: 413.815 Profile: Límite

E.G. Elev (m)	26.01	Element	Left OB	Channel	Right OB
Vel Head (m)	0.86	Wt. n-Val.		0.015	
W.S. Elev (m)	25.15	Reach Len. (m)	12.50	5.68	3.94
Crit W.S. (m)	25.15	Flow Area (m2)		6.96	
E.G. Slope (m/m)	0.004171	Area (m2)		6.96	
Q Total (m3/s)	28.60	Flow (m3/s)		28.60	
Top Width (m)	4.05	Top Width (m)		4.05	
Vel Total (m/s)	4.11	Avg. Vel. (m/s)		4.11	
Max Chl Dpth (m)	1.73	Hydr. Depth (m)		1.72	
Conv. Total (m3/s)	442.8	Conv. (m3/s)		442.8	
Length Wtd. (m)	5.68	Wetted Per. (m)		7.46	
Min Ch El (m)	23.42	Shear (N/m2)		38.15	
Alpha	1.00	Stream Power (N/m s)	692.17	0.00	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	0.06	1.93	0.01
C & E Loss (m)	0.37	Cum SA (1000 m2)	0.64	1.42	0.26

Plan: Plan 05 Malaset Malaset RS: 408.135 Profile: Límite

E.G. Elev (m)	23.42	Element	Left OB	Channel	Right OB
Vel Head (m)	0.12	Wt. n-Val.		0.015	
W.S. Elev (m)	23.30	Reach Len. (m)	313.40	317.05	320.59
Crit W.S. (m)	20.66	Flow Area (m2)		18.78	
E.G. Slope (m/m)	0.000316	Area (m2)		18.78	
Q Total (m3/s)	28.60	Flow (m3/s)		28.60	
Top Width (m)	4.43	Top Width (m)		4.43	
Vel Total (m/s)	1.52	Avg. Vel. (m/s)		1.52	
Max Chl Dpth (m)	4.28	Hydr. Depth (m)		4.24	
Conv. Total (m3/s)	1607.7	Conv. (m3/s)		1607.7	
Length Wtd. (m)	317.05	Wetted Per. (m)		12.91	
Min Ch El (m)	19.02	Shear (N/m2)		4.52	
Alpha	1.00	Stream Power (N/m s)	705.73	239.87	452.30
Frctn Loss (m)		Cum Volume (1000 m3)	0.06	1.86	0.01
C & E Loss (m)		Cum SA (1000 m2)	0.64	1.39	0.26

Plan: Plan 05 Malaset Malaset RS: 91.090 Profile: Límite

E.G. Elev (m)	15.20	Element	Left OB	Channel	Right OB
Vel Head (m)	0.58	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	14.62	Reach Len. (m)	17.58	18.11	18.71
Crit W.S. (m)	14.62	Flow Area (m2)	3.03	5.07	1.08
E.G. Slope (m/m)	0.012789	Area (m2)	3.03	5.07	1.08
Q Total (m3/s)	28.60	Flow (m3/s)	7.43	19.14	2.03
Top Width (m)	7.97	Top Width (m)	3.36	3.17	1.44
Vel Total (m/s)	3.12	Avg. Vel. (m/s)	2.45	3.78	1.88
Max Chl Dpth (m)	1.69	Hydr. Depth (m)	0.90	1.60	0.75
Conv. Total (m3/s)	252.9	Conv. (m3/s)	65.7	169.3	17.9
Length Wtd. (m)	18.02	Wetted Per. (m)	3.75	3.29	1.98
Min Ch El (m)	12.93	Shear (N/m2)	101.27	193.56	68.14
Alpha	1.17	Stream Power (N/m s)	1536.44	0.00	0.00
Frctn Loss (m)	0.25	Cum Volume (1000 m3)	0.06	0.16	0.01
C & E Loss (m)	0.00	Cum SA (1000 m2)	0.12	0.19	0.03

Plan: Plan 05 Malaset Malaset RS: 72.980 Profile: Límite

E.G. Elev (m)	14.35	Element	Left OB	Channel	Right OB
Vel Head (m)	1.81	Wt. n-Val.	0.040	0.040	
W.S. Elev (m)	12.54	Reach Len. (m)	27.50	26.99	25.90
Crit W.S. (m)	13.07	Flow Area (m2)	1.11	3.80	
E.G. Slope (m/m)	0.083450	Area (m2)	1.11	3.80	
Q Total (m3/s)	28.60	Flow (m3/s)	4.91	23.69	
Top Width (m)	6.49	Top Width (m)	2.15	4.34	
Vel Total (m/s)	5.82	Avg. Vel. (m/s)	4.40	6.24	
Max Chl Dpth (m)	1.30	Hydr. Depth (m)	0.52	0.87	
Conv. Total (m3/s)	99.0	Conv. (m3/s)	17.0	82.0	
Length Wtd. (m)	27.07	Wetted Per. (m)	2.34	4.73	
Min Ch El (m)	11.23	Shear (N/m2)	389.72	657.25	
Alpha	1.05	Stream Power (N/m s)	1435.57	0.00	0.00
Frctn Loss (m)	0.48	Cum Volume (1000 m3)	0.02	0.08	0.00
C & E Loss (m)	0.37	Cum SA (1000 m2)	0.07	0.12	0.01

Plan: Plan 05 Malaset Malaset RS: 45.986 Profile: Límite

E.G. Elev (m)	9.43	Element	Left OB	Channel	Right OB
Vel Head (m)	5.36	Wt. n-Val.	0.040	0.040	0.040
W.S. Elev (m)	4.07	Reach Len. (m)			
Crit W.S. (m)	4.80	Flow Area (m2)	0.66	2.15	0.14
E.G. Slope (m/m)	0.504114	Area (m2)	0.66	2.15	0.14
Q Total (m3/s)	28.60	Flow (m3/s)	4.54	23.42	0.64
Top Width (m)	8.25	Top Width (m)	2.69	4.42	1.14
Vel Total (m/s)	9.68	Avg. Vel. (m/s)	6.88	10.90	4.42
Max Chl Dpth (m)	0.65	Hydr. Depth (m)	0.24	0.49	0.13
Conv. Total (m3/s)	40.3	Conv. (m3/s)	6.4	33.0	0.9
Length Wtd. (m)		Wetted Per. (m)	2.73	4.47	1.16
Min Ch El (m)	3.42	Shear (N/m2)	1193.91	2377.65	614.68
Alpha	1.12	Stream Power (N/m s)	3088.70	0.00	0.00
Frctn Loss (m)	4.56	Cum Volume (1000 m3)			
C & E Loss (m)	0.35	Cum SA (1000 m2)			

Plan: Plan 05 Malaset Malaset RS: 668.5 Culv Group: Culvert #1 Profile: Límite

Q Culv Group (m3/s)	12.88	Culv Full Len (m)	7.50
# Barrels	1	Culv Vel US (m/s)	2.71
Q Barrel (m3/s)	12.88	Culv Vel DS (m/s)	2.71
E.G. US. (m)	36.80	Culv Inv El Up (m)	32.36
W.S. US. (m)	36.68	Culv Inv El Dn (m)	32.22
E.G. DS (m)	36.34	Culv Frctn Ls (m)	0.03
W.S. DS (m)	36.21	Culv Exit Loss (m)	0.24
Delta EG (m)	0.45	Culv Entr Loss (m)	0.19
Delta WS (m)	0.47	Q Weir (m3/s)	103.12
E.G. IC (m)	36.71	Weir Sta Lft (m)	26.48
E.G. OC (m)	36.80	Weir Sta Rgt (m)	70.96
Culvert Control	Outlet	Weir Submerg	0.60
Culv WS Inlet (m)	34.26	Weir Max Depth (m)	1.75
Culv WS Outlet (m)	34.12	Weir Avg Depth (m)	1.35
Culv Nml Depth (m)		Weir Flow Area (m2)	59.96
Culv Crt Depth (m)	1.39	Min El Weir Flow (m)	35.05

Plan: Plan 05 Malaset Malaset RS: 649.75 Culv Group: Culvert #1 Profile: Límite

Q Culv Group (m3/s)	28.21	Culv Full Len (m)	42.77
# Barrels	1	Culv Vel US (m/s)	5.94
Q Barrel (m3/s)	28.21	Culv Vel DS (m/s)	5.94
E.G. US. (m)	36.32	Culv Inv El Up (m)	31.31
W.S. US. (m)	36.22	Culv Inv El Dn (m)	30.95
E.G. DS (m)	32.91	Culv Frctn Ls (m)	0.77
W.S. DS (m)	32.34	Culv Exit Loss (m)	1.73
Delta EG (m)	3.41	Culv Entr Loss (m)	0.90
Delta WS (m)	3.88	Q Weir (m3/s)	87.86
E.G. IC (m)	36.35	Weir Sta Lft (m)	29.90
E.G. OC (m)	36.32	Weir Sta Rgt (m)	96.01
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	33.21	Weir Max Depth (m)	1.20
Culv WS Outlet (m)	32.85	Weir Avg Depth (m)	0.95
Culv Nml Depth (m)	1.90	Weir Flow Area (m2)	62.60
Culv Crt Depth (m)	1.90	Min El Weir Flow (m)	35.59

Plan: Plan 05 Malaset Malaset RS: 494.2 Culv Group: Culvert #1 Profile: Límite

Q Culv Group (m3/s)	28.60	Culv Full Len (m)	33.55
# Barrels	1	Culv Vel US (m/s)	3.79
Q Barrel (m3/s)	28.60	Culv Vel DS (m/s)	3.79
E.G. US. (m)	30.27	Culv Inv El Up (m)	25.94
W.S. US. (m)	30.14	Culv Inv El Dn (m)	24.56
E.G. DS (m)	28.89	Culv Frctn Ls (m)	0.39
W.S. DS (m)	28.78	Culv Exit Loss (m)	0.62
Delta EG (m)	1.38	Culv Entr Loss (m)	0.37
Delta WS (m)	1.36	Q Weir (m3/s)	
E.G. IC (m)	29.82	Weir Sta Lft (m)	
E.G. OC (m)	30.27	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	29.04	Weir Max Depth (m)	
Culv WS Outlet (m)	27.66	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	2.32	Min El Weir Flow (m)	32.50

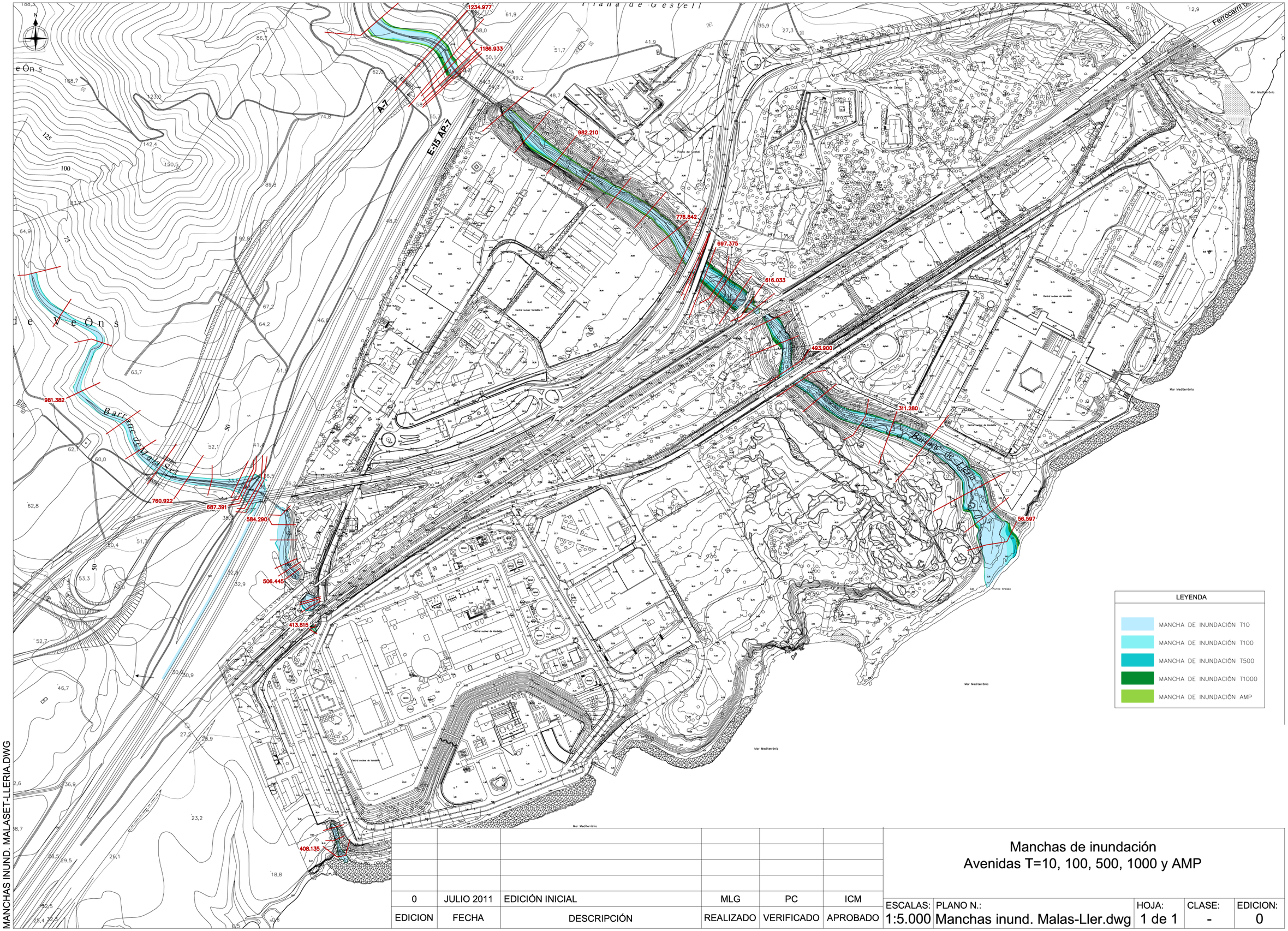
Plan: Plan 05 Malaset Malaset RS: 432 Culv Group: Culvert #1 Profile: Límite

Q Culv Group (m3/s)	28.60	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	5.20
Q Barrel (m3/s)	28.60	Culv Vel DS (m/s)	6.34
E.G. US. (m)	28.86	Culv Inv El Up (m)	23.93
W.S. US. (m)	28.81	Culv Inv El Dn (m)	23.43
E.G. DS (m)	26.01	Culv Frctn Ls (m)	0.32
W.S. DS (m)	25.15	Culv Exit Loss (m)	1.72
Delta EG (m)	2.85	Culv Entr Loss (m)	0.80
Delta WS (m)	3.66	Q Weir (m3/s)	
E.G. IC (m)	28.86	Weir Sta Lft (m)	
E.G. OC (m)	28.75	Weir Sta Rgt (m)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (m)	26.68	Weir Max Depth (m)	
Culv WS Outlet (m)	25.68	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.99	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.75	Min El Weir Flow (m)	29.00

Plan: Plan 05 Malaset Malaset RS: 406 Culv Group: Culvert #1 Profile: Límite

Q Culv Group (m3/s)	28.57	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.21
Q Barrel (m3/s)	28.57	Culv Vel DS (m/s)	5.56
E.G. US. (m)	23.42	Culv Inv El Up (m)	19.52
W.S. US. (m)	23.30	Culv Inv El Dn (m)	13.00
E.G. DS (m)	15.20	Culv Frctn Ls (m)	6.69
W.S. DS (m)	14.62	Culv Exit Loss (m)	1.08
Delta EG (m)	8.22	Culv Entr Loss (m)	0.45
Delta WS (m)	8.68	Q Weir (m3/s)	0.03
E.G. IC (m)	23.42	Weir Sta Lft (m)	0.00
E.G. OC (m)	23.23	Weir Sta Rgt (m)	9.44
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (m)	21.92	Weir Max Depth (m)	0.02
Culv WS Outlet (m)	14.70	Weir Avg Depth (m)	0.02
Culv Nml Depth (m)	1.70	Weir Flow Area (m2)	0.15
Culv Crt Depth (m)	2.00	Min El Weir Flow (m)	23.40

ANEJO 8: MANCHAS DE INUNDACIÓN



MANCHAS INUND. MALASET-LLERIA.DWG

EDICION	FECHA	DESCRIPCIÓN	REALIZADO	VERIFICADO	APROBADO
0	JULIO 2011	EDICIÓN INICIAL	MLG	PC	ICM

Manchas de inundación
Avenidas T=10, 100, 500, 1000 y AMP

ESCALAS:	PLANO N.:	HOJA:	CLASE:	EDICION:
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