

## **ANEJO III**

**ESTUDIO HIDRÁULICO PARA LA DEFENSA CONTRA  
INUNDACIONES DEL RÍO BERGANTES EN EL  
COMPLEJO DE LA FÁBRICA GINER EN MORELLA  
(CASTELLÓN). DIAGNÓSTICO HIDRÁULICO DE LA  
SITUACIÓN ACTUAL**



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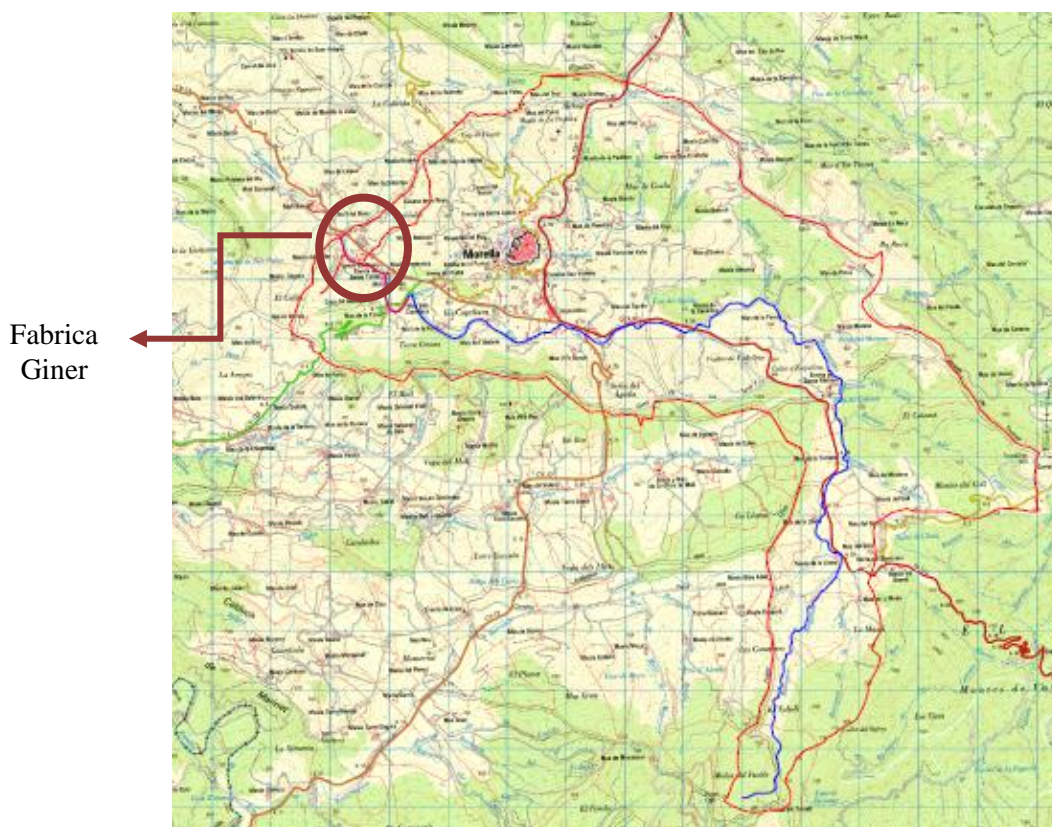
### A.3.1. INTRODUCCIÓN

En el presente capítulo se va a llevar a cabo una evaluación del funcionamiento hidráulico del cauce del río Bergantes, en su estado actual, es decir, se va a comprobar el comportamiento hidráulico para caudales asociados a diferentes periodos de retorno. Una vez expuestos los resultados, se escogerá el umbral de protección estructural más razonable.

El ámbito de este estudio, abarca el tramo de afección del río Bergantes a la Fábrica Giner. Se incluyen en el estudio tramos de aguas arriba y aguas abajo de este punto.

Se van a exponer una serie de consideraciones generales de la zona de estudio:

- El entorno de la Fábrica Giner corresponde al tramo de aguas bajas del río Bergantes.



*Figura A.3.1. Localización*

- Dicho entorno arquitectónico se encuentra ubicado por completo dentro del cauce de avenidas del río Bergantes.

- El cauce en el entorno de estudio, tiene problemas de inestabilidad en su margen izquierda llegando a producirse desprendimientos, como se observa en la siguiente imagen.



*Figura A.3.2. Desprendimientos*

Se va a tener muy en cuenta este aspecto, ya que en el entorno de la Fábrica se promueven numerosas actividades a lo largo del cauce, como son el senderismo, los paseos a caballo... Por ello es inaceptable que se produzcan desprendimientos en dicha zona.

- En los sistemas fluviales, durante un episodio hidráulico de carácter extraordinario, el flujo en el cauce adquiere calados y velocidades tales que las tensiones tangenciales que produce puede superar la tensión crítica, iniciándose la erosión. Por lo tanto para esta evaluación se va a tener en cuenta estos aspectos (calado, velocidad, y erosión).
- En el cauce del río Bergantes, encontramos una serie de irregularidades, tanto en el ancho del lecho, como en la forma y talud de los márgenes, como se muestra en la *figura A3.5*. Esto provoca una variación de las variables hidráulicas que definen el flujo en cada sección.

### A.3. 1.1 Metodología utilizada: Hec-Ras

Tanto para los cálculos, como para la visualización de los resultados, se ha utilizado el programa informático *Hec-Ras* del U.S Army of Corps of Engineers, programa de modelación hidráulica cuasibidimensional del flujo en cauces abiertos.

Este permite una simulación hidráulica en régimen permanente o transitorio, pudiendo obtener numerosos parámetros: la interacción del flujo con el contorno del cauce (siendo esta una de las características fundamentales), los perfiles de la superficie de agua, velocidad de flujo, calado medio, tensiones tangenciales, altura de la línea de energía...

Adicionalmente permite la inserción en el sistema fluvial de estructuras hidráulicas, puentes, confluencias, etc.

Para la obtención de estos parámetros hidráulicos, el programa utiliza una serie de algoritmos matemáticos:

- El cálculo se basa en la solución de la ecuación de energía unidimensional con pérdidas debidas a la fricción y las pérdidas localizadas en contracciones y expansiones gracias a un coeficiente multiplicador del cambio en la altura de la velocidad:

$$WS_2 + \frac{\alpha_2 V_2^2}{2g} = WS_1 + \frac{\alpha_1 V_1^2}{2g} + h_e$$

$$h_e = LS_f + C \left( \frac{\alpha_2 V_2^2}{2g} - \frac{\alpha_1 V_1^2}{2g} \right)$$

Donde:

$h_e$  = Pérdidas de energía

$WS_1, WS_2$  = Cotas de superficie libre

$V_1, V_2$  = Velocidades medias

$\alpha_1, \alpha_2$  = Coeficientes de Coriolis

$g$  = Constante gravitacional

$C$  = Coeficiente de contracción

o expansión



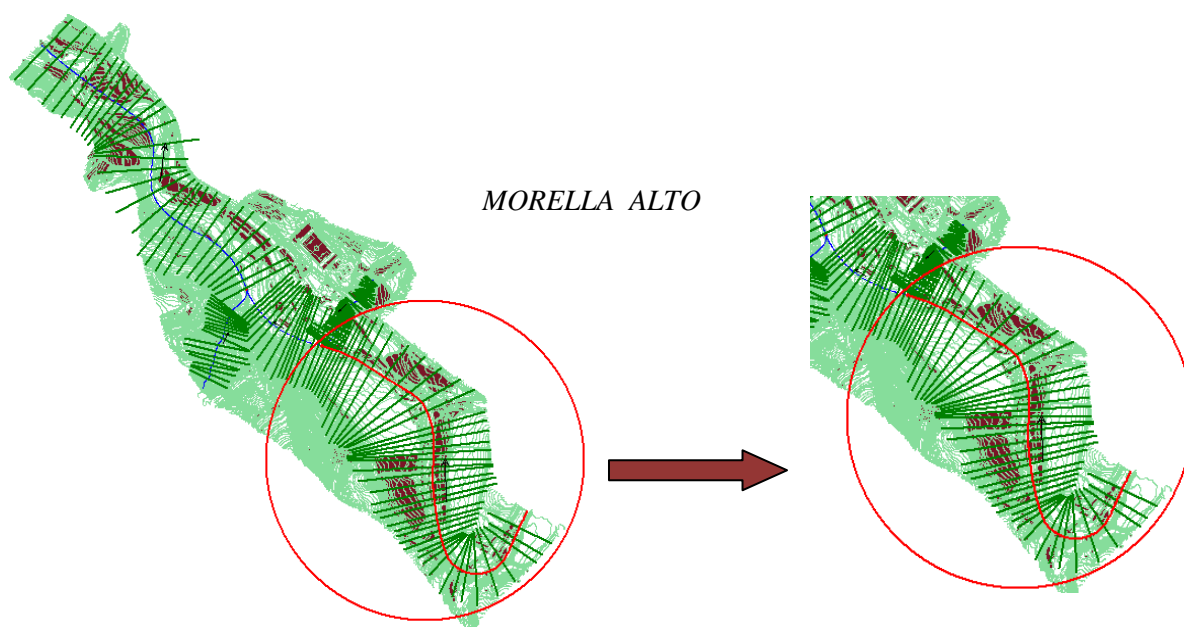
### A.3.2. GEOMORFOLOGÍA DEL CAUCE

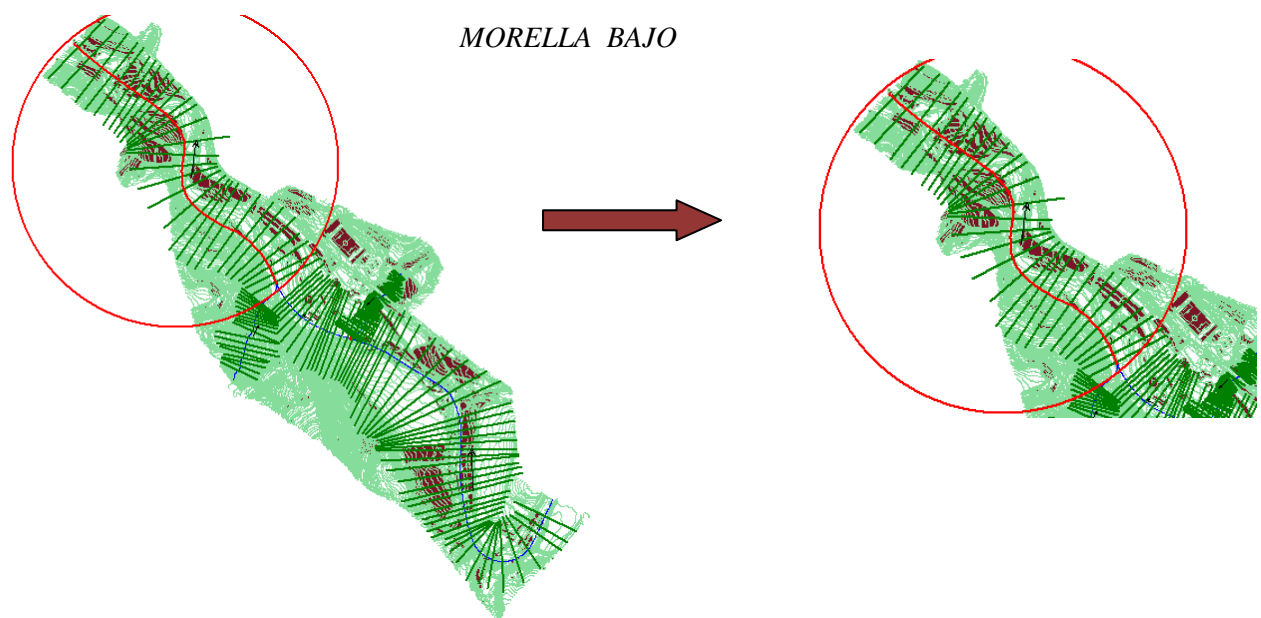
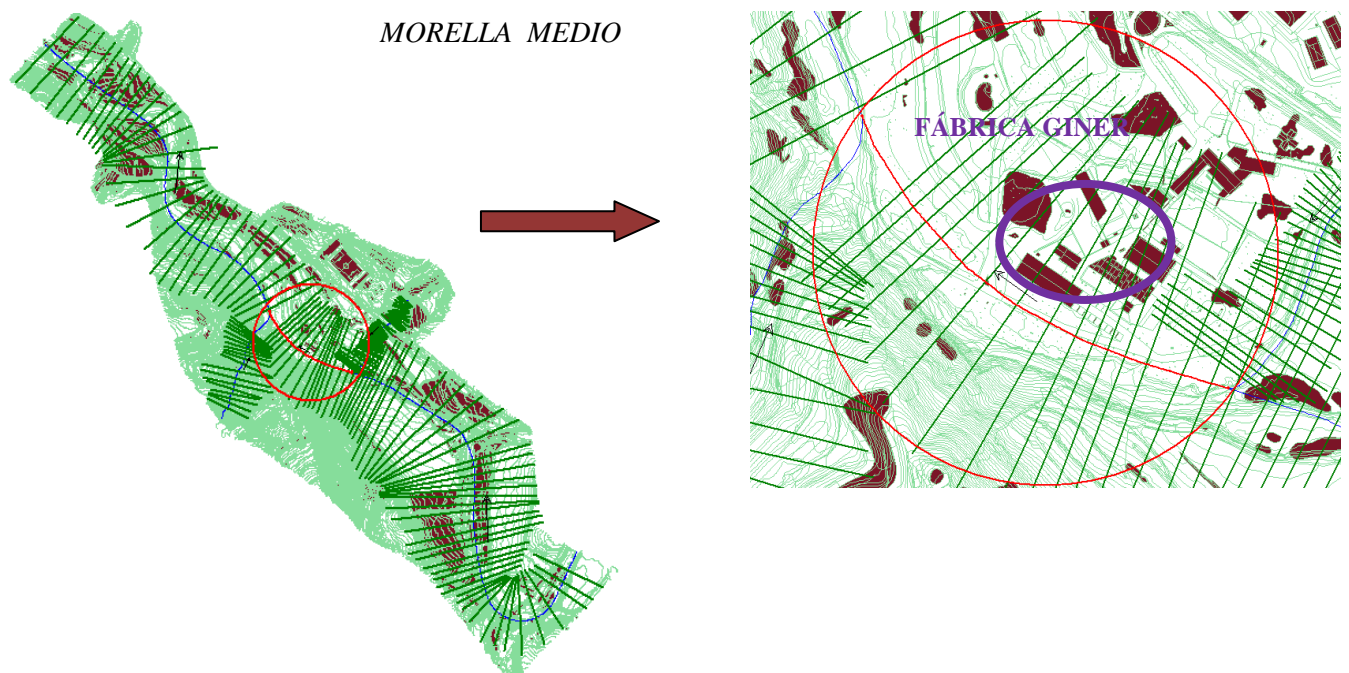
#### A.3.2.1 Delimitación de las zonas de estudio

Tanto para este, como para los posteriores estudios, se divide el cauce del río Bergantes, teniendo en cuenta la red fluvial, en 3 subtramos, como se muestra en la *figura A.3.3*, de forma general, y en las *figuras A.3.4* indicando tramo a tramo. De aguas arriba a aguas abajo encontramos: *Morella alto*, *Morella Medio* y *Morella Bajo*. A su vez, se llama al afluente que delimita *Morella Alto* con *Morella Medio*, afluente *Margen Derecha*, siendo el afluente *Tributar* el que determina el final de *Morella Medio* y el inicio de *Morella Bajo*.

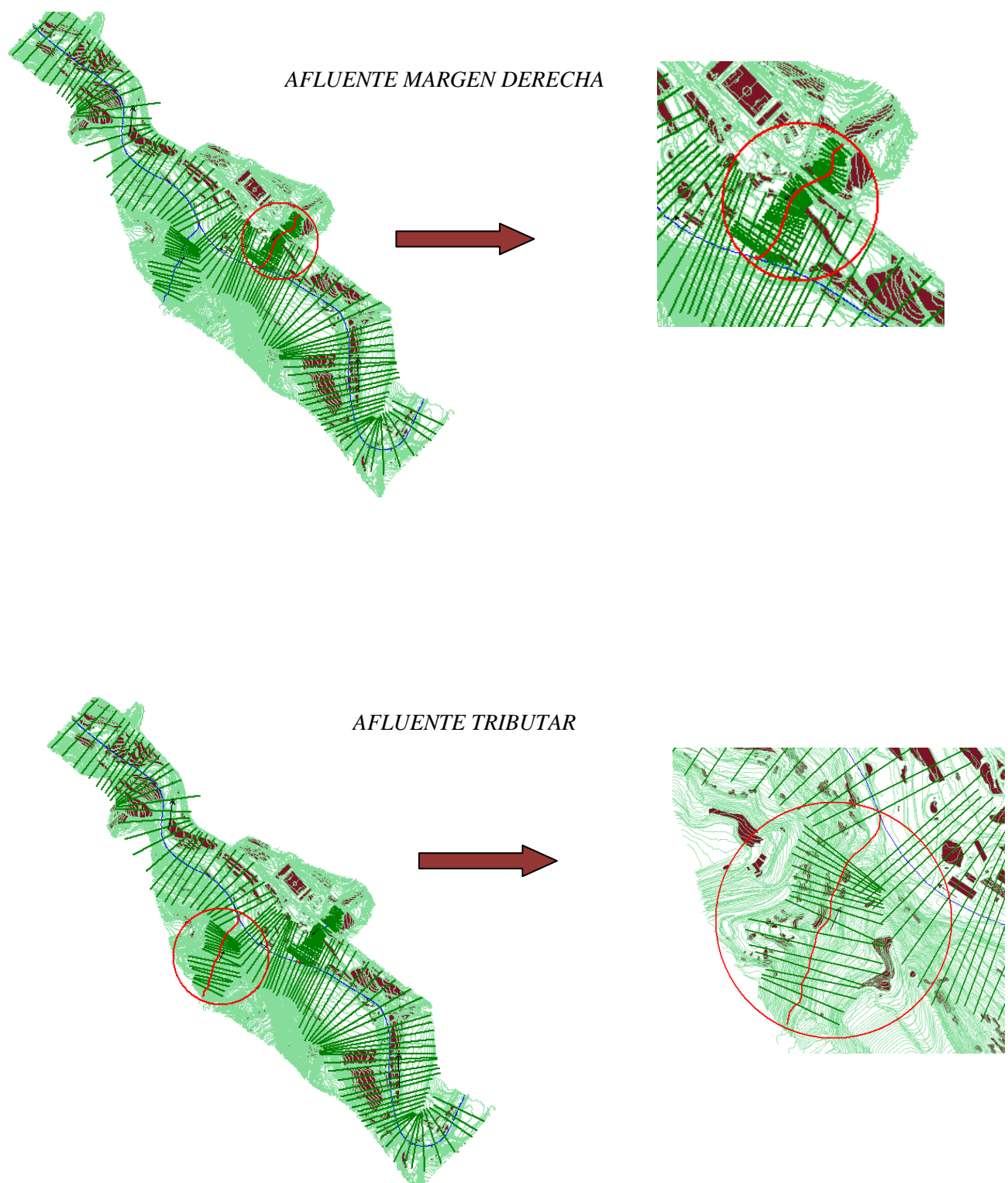


*Figura A.3.3. Delimitación conjunta de los tramos de estudio*









*Figuras A.3 .4.: Subtramos de estudio*

El tramo de *Morella Medio* será el principal objeto del estudio hidráulico, ya que la Fábrica Giner se encuentra localizada en la margen derecha de este tramo, abarcando una longitud de aproximadamente 300 m.

Un aspecto a tener en cuenta es que, aunque dicho tramo sea el principal objeto de estudio, el tramo de cauce modelado es mucho mayor, como se muestra en la *figura A3.4*. Esto tiene como objetivo representar fielmente el funcionamiento hidráulico de diseño del subtramo, con una afección nula de los posibles errores cometidos a la hora de establecer las condiciones de contorno.

#### A.3.2.2 Geomorfología del cauce: secciones transversales

A continuación se exponen una serie de perfiles perpendiculares a la dirección del flujo, mostrando, de manera representativa, el tipo de secciones transversales que encontramos en cada uno de los tramos. Se pueden observar las irregularidades entre ellas.

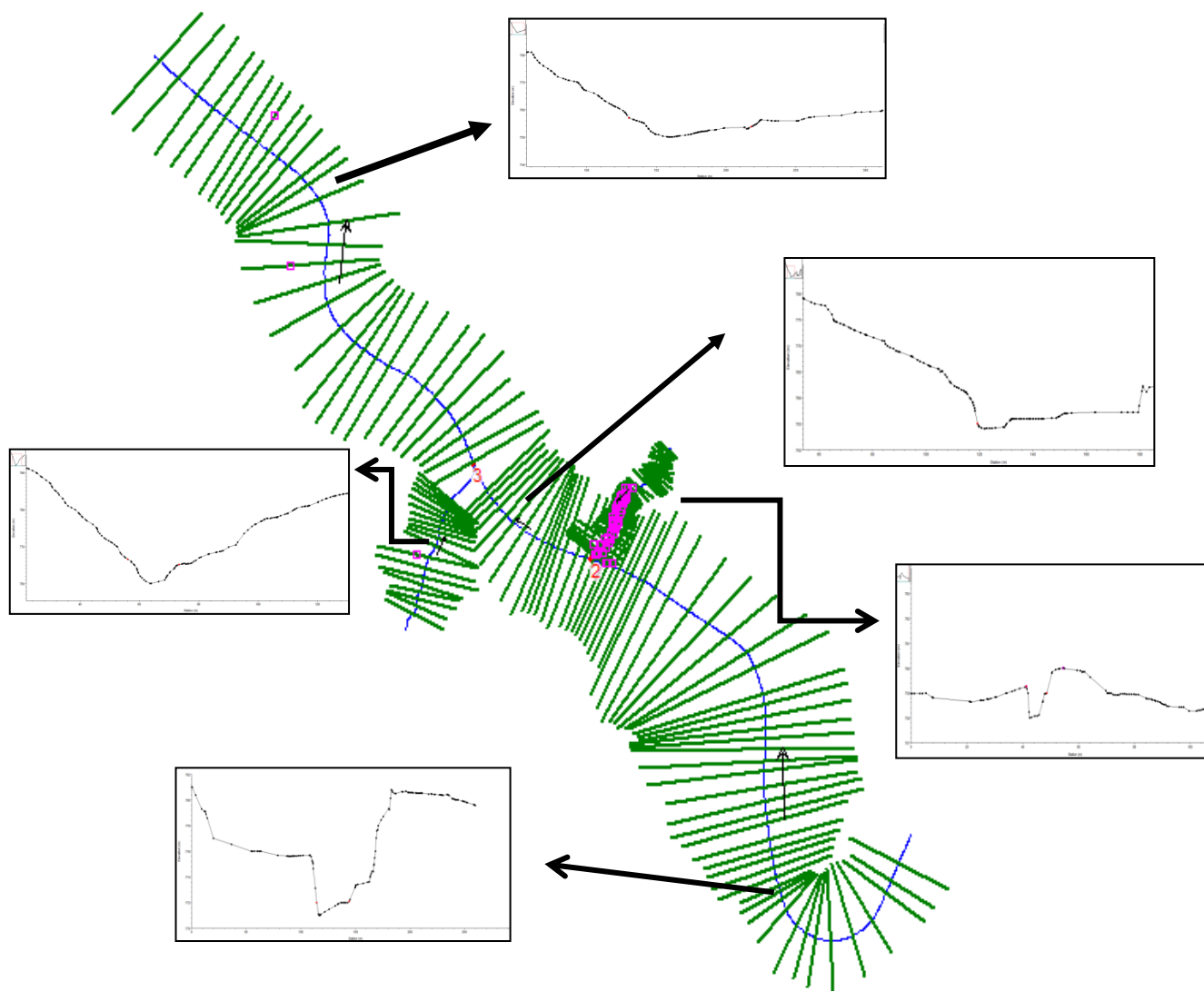


Figura A.3.5. Esquema de secciones transversales

### A.3.3. MODELACIONES HIDRÁULICAS DEL CAUCE EN SU ESTADO ACTUAL

#### A.3.3.1 Datos requeridos por el Hec – Ras

##### A.3.3.1.1 Datos hidrológicos

Para la evaluación de las capacidades máximas admisibles en el cauce del río Bergantes, en el entorno de la Fábrica Giner, se va a correr el modelo hidráulico para diferentes caudales asociados a distintos periodos de retorno y así poder ver el funcionamiento del cauce en dichas situaciones.

Se va a hacer uso de los caudales pico de avenida provenientes del estudio hidrológico, basado en el Método de Témez,: *Capítulo V: Estudio hidrológico*. Estos caudales serán distintos para el cauce del río Bergantes y para el afluente *Margen Derecha*, siendo los respectivos caudales pico los siguientes:

| T (años)              | 25         | 50         | 100         | 200        | 500         |
|-----------------------|------------|------------|-------------|------------|-------------|
| Q (m <sup>3</sup> /s) | 89.0397491 | 141.353371 | 214.3620569 | 314.023215 | 498.6180144 |

Tabla A.3.1. Caudales pico de avenida del río Bergantes

| T (años)              | 25         | 50         | 100         | 200        | 500         |
|-----------------------|------------|------------|-------------|------------|-------------|
| Q (m <sup>3</sup> /s) | 6.49729321 | 10.0953396 | 15.05418488 | 21.7445743 | 33.97967239 |

Tabla A.3.2. Caudales pico de avenida del afluente Margen Derecha

##### A.3.3.1.2 Estudio de rugosidades

Un parámetro hidráulico relevante para la modelización del cauce es la rugosidad del contorno del mismo, concepto utilizado en la evaluación de la resistencia al avance del flujo, problema muy complejo, aunque muy importante para estimar el perfil de la lámina libre en un cauce fluvial, siendo este parámetro el que más errores introduce en los resultados de la modelización de un cauce fluvial.

Las pérdidas de energía asociadas a la fricción del contorno, se calculan mediante la fórmula de manning, expuesta a continuación:

$$I = \frac{n^2}{R_h^{4/3}} * v^2$$

Donde:

*I* : Pendiente de la línea de energía

*n* : Coeficiente de rugosidad de manning

*R<sub>h</sub>* : Radio hidráulico

*v* : Velocidad del flujo

Los datos de rugosidades (número de manning) se han conseguido mediante dos estudios:

- El primero se basó en un inspección general in situ de la zona, comprobando la cantidad de cubierta vegetal, la granulometría aproximada tanto de lecho como de márgenes y la recopilación de esta información mediante un reportaje fotográfico de cada una de las secciones transversales.
- El segundo paso fue la comparación visual entre las fotografías tomadas, y una serie de referencias, también fotográficas, que asocian a un determinado paisaje, un número de manning aproximado, así como el cálculo de este a través de la granulometría.

Mediante la granulometría obtenida a partir de la inspección in situ de la zona, y utilizando la siguiente fórmula, propuesta por la U.S. FEDERAL HIGHWAY ADMINISTRATION, que relaciona el diámetro medio con el número de manning, se consiguen los números de manning aproximados para las diferentes secciones.

$$n = 0.0395 * (3.28083985 * D_m)^{1/6}$$

Para las secciones en donde el diámetro medio no era claro o donde la cubierta vegetal era muy densa en el cauce, se ha utilizado las series fotográficas citadas.

Este estudio fotográfico, así como los distintos números de manning, se adjuntan en el *Apéndice III.1. Estudio de rugosidades*.

### A.3.3.1.3 Condiciones de contorno

Para cada tramo de estudio, tanto del río Bergantes ( Morella Alto, Medio y Bajo), como de sus dos afluentes, se han definido como condiciones de contorno extremas el calado normal con las respectivas pendientes de cada tramo, como se indica a continuación:

- Para el tramo del Bergantes, denominado *Morella Alto*, se ha establecido como condición de contorno, aguas arriba, la del calado normal, con una pendiente de 0.016; siendo la condición de aguas abajo, la de la confluencia con el afluente *Margen Derecha*.
- Las condiciones de contorno de *Morella Medio* están impuestas por las dos confluencias con los afluentes *Margen derecha* y *Tributar*.
- En *Morella bajo*, la condición de aguas arriba esta impuesta por la confluencia con el *Tributar* y la de aguas abajo, por el calado normal con una pendiente de 0.013.
- Por último, tenemos los dos afluentes, en los que se tendrá unas condiciones aguas abajo determinadas por cada una de sus confluencias, siendo las de aguas arriba las de sus respectivos calados normales con pendientes de 0.028 en el afluente *Margen Derecha*, y de 0.1 en *el Tributar*.

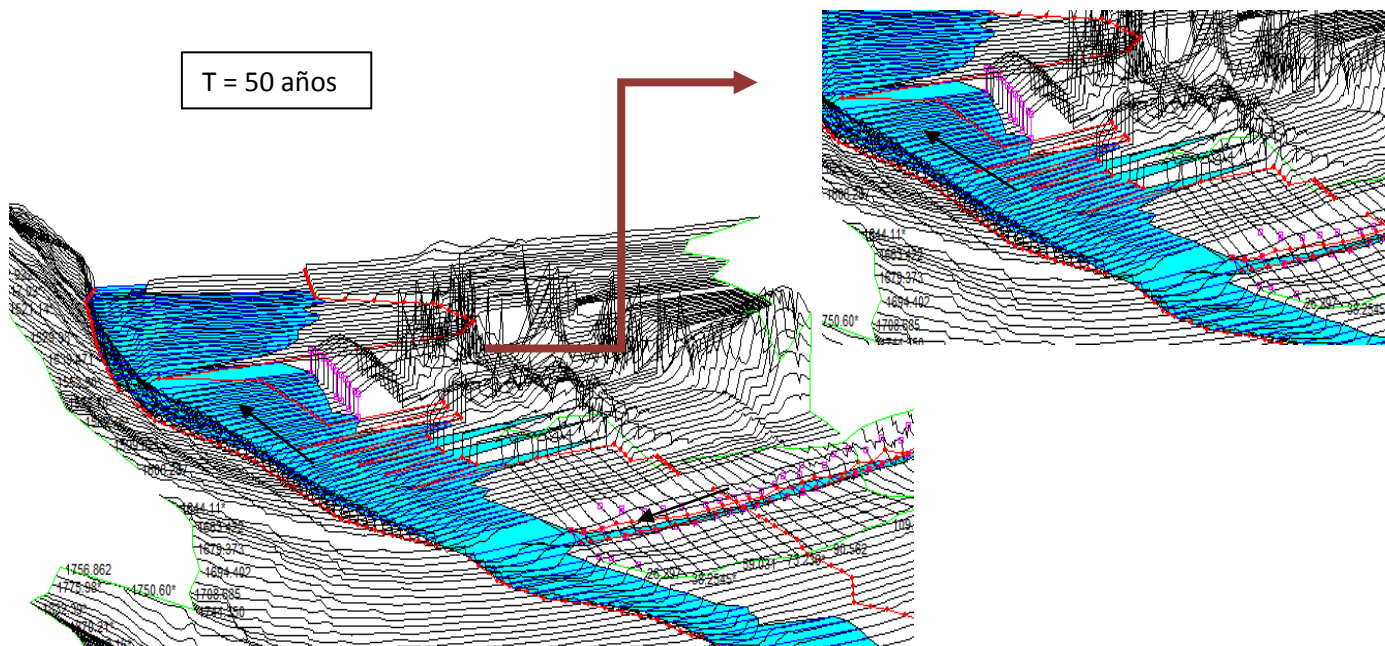
| Selected Boundary Condition Locations and Types |              |         |                        |                        |
|---|--------------|---------|------------------------|------------------------|
| River   | Reach        | Profile | Upstream               | Downstream             |
| AFLUENTE  | MARGEN DCHA  | all     | Normal Depth S = 0.028 | Junction=2             |
| BERGANTES                                       | MORELLALTO   | all     | Normal Depth S = 0.016 | Junction=2             |
| BERGANTES                                       | MORELLAMEDIO | all     | Junction=2             | Junction=3             |
| BERGANTES                                       | MORELLABAJO  | all     | Junction=3             | Normal Depth S = 0.013 |
| TRIBUTAR  | MI           | all     | Normal Depth S = 0.1   | Junction=3             |

Tabla A.3.3. Condiciones de contorno extremas

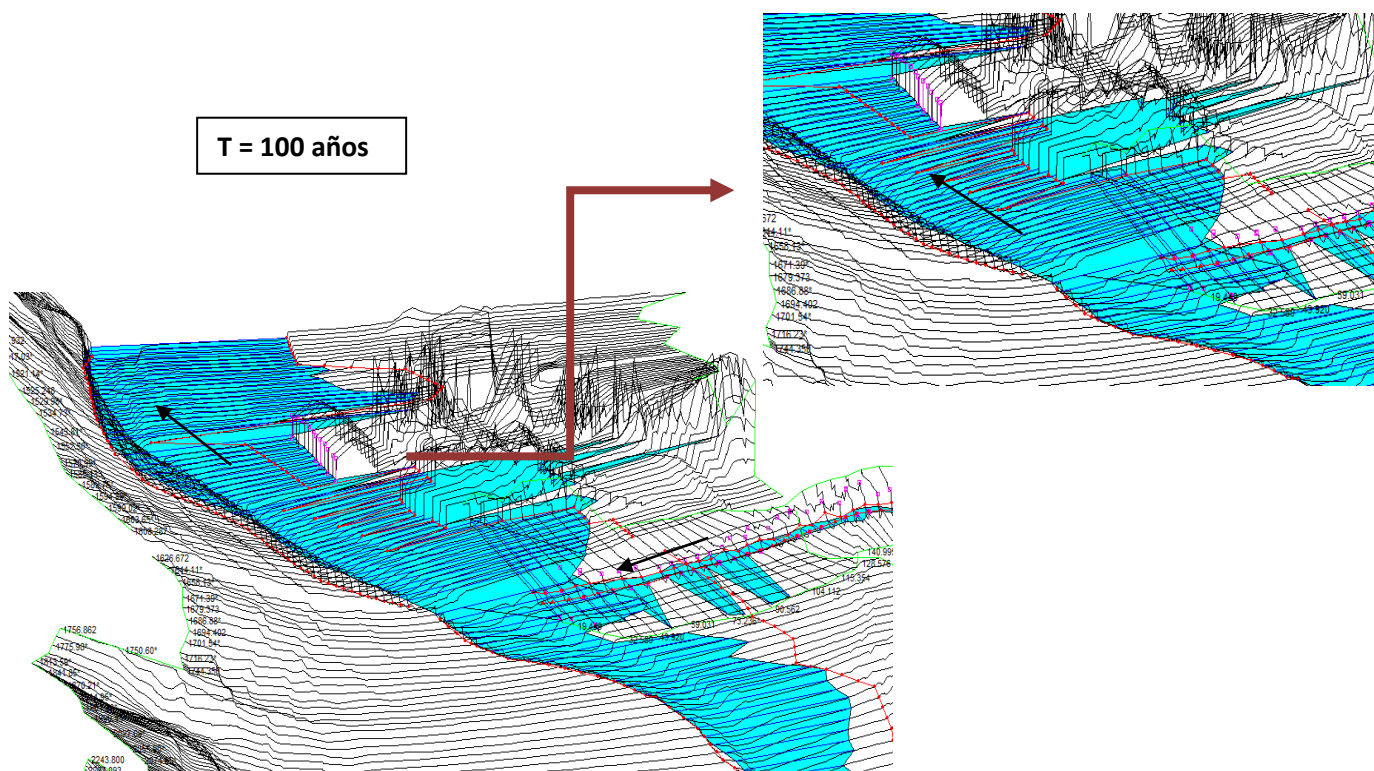




T = 50 años



T = 100 años



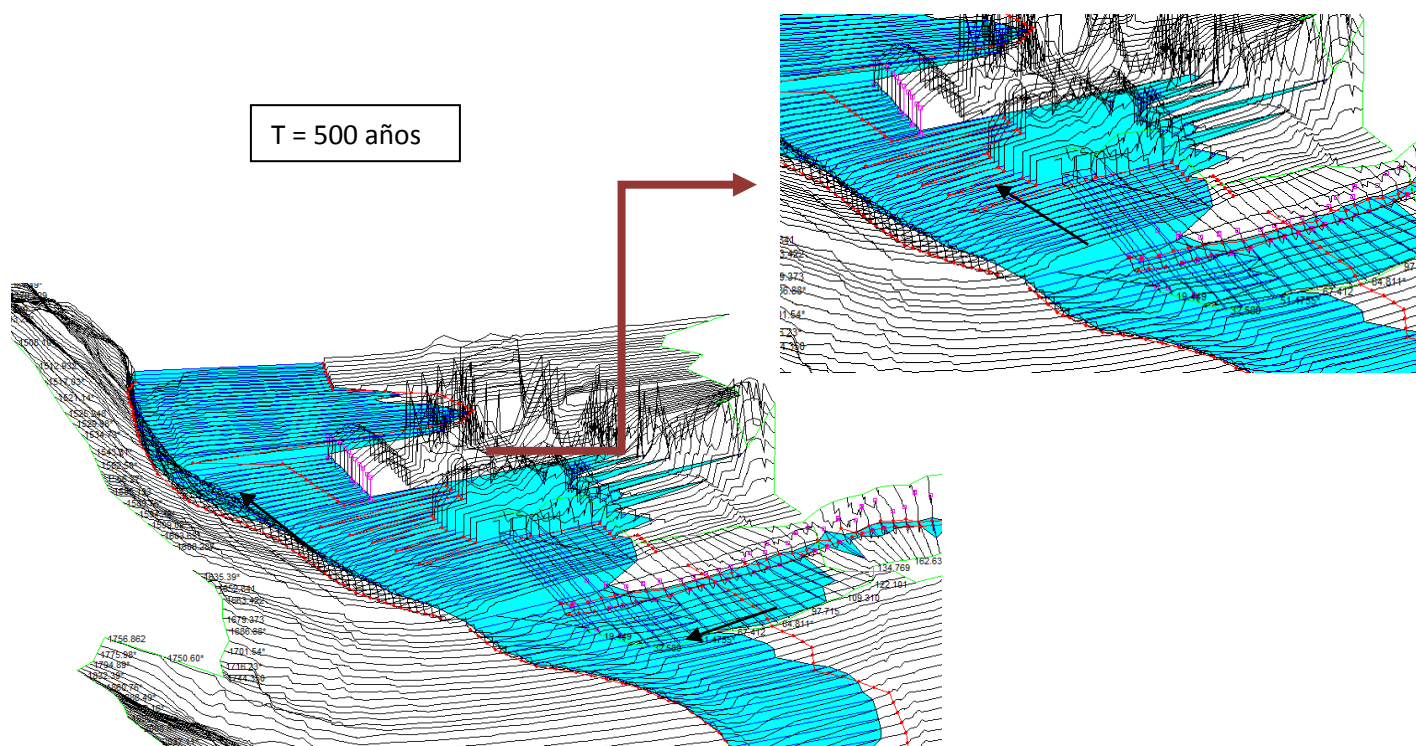
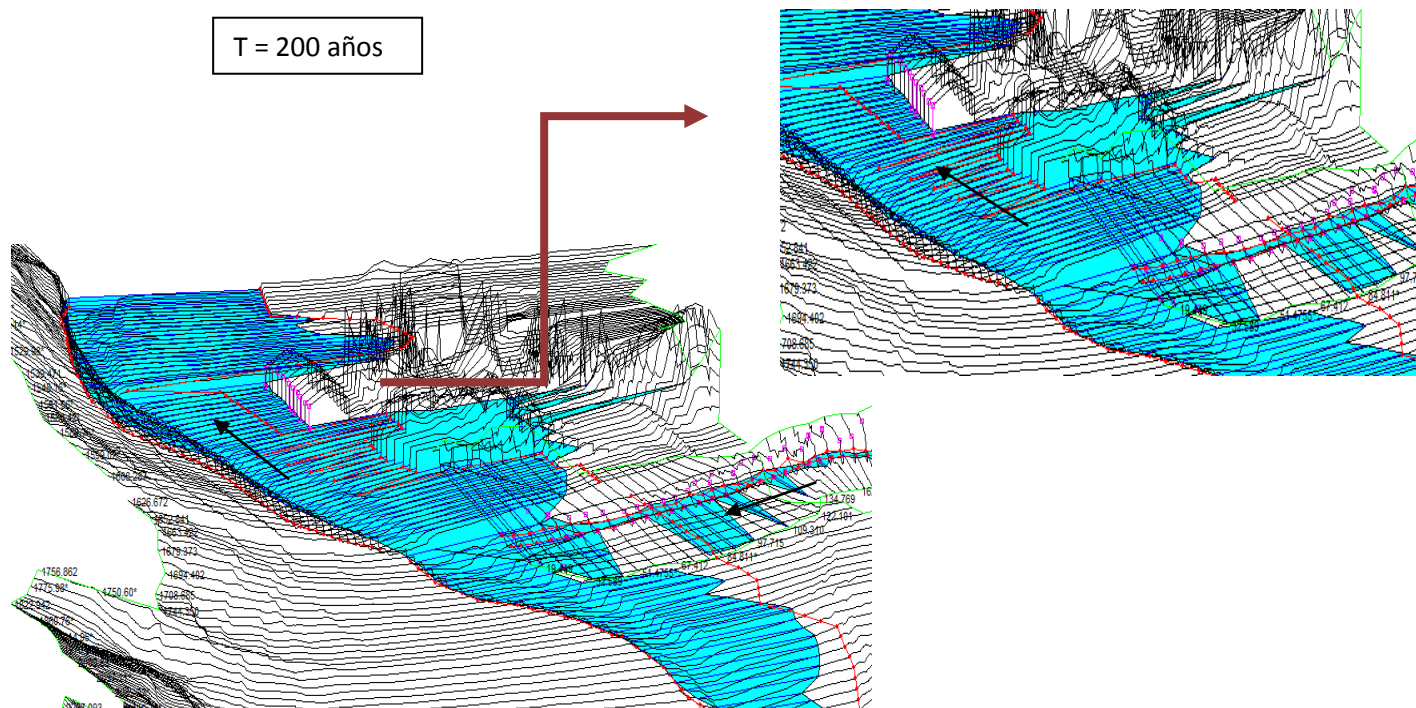


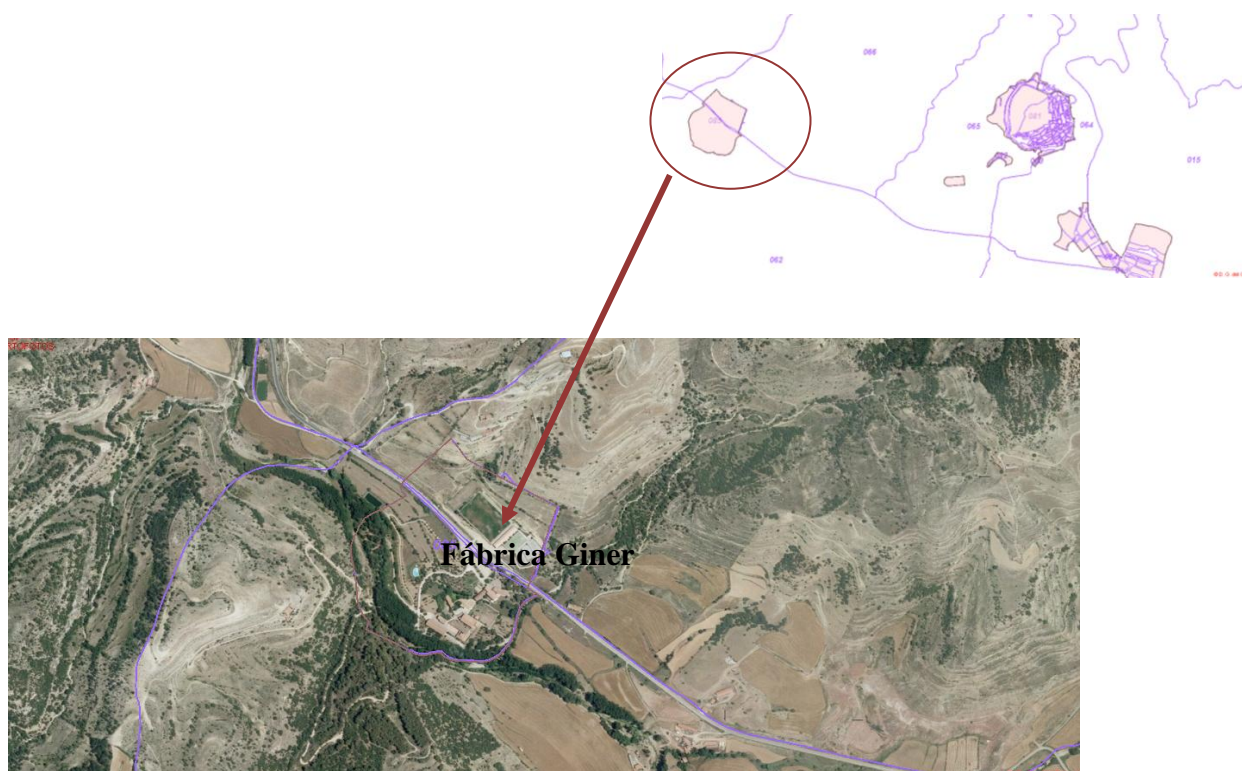
Tabla A.3.6. Áreas de inundación para diferentes caudales de avenida.



Mediante el análisis de estos resultados se observa que los problemas serios de desbordamiento del cauce, se presentan para caudales de avenida en torno a los 100-130 m<sup>3</sup>/s asociado al periodo de retorno de 60 años. Es decir, que en la situación actual, cabría esperar una inundación en el entorno arquitectónico de la Fábrica Giner una vez en media cada 60 años aproximadamente.

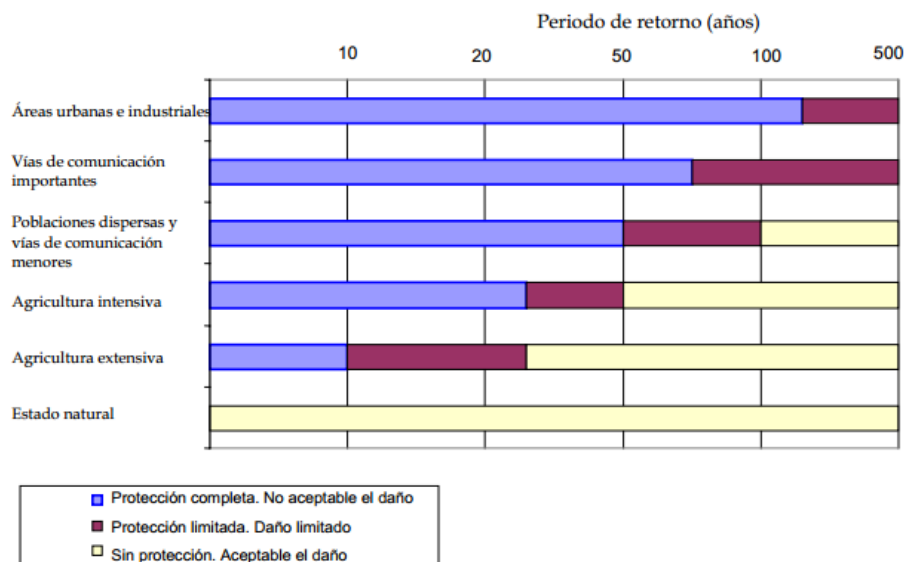
Estos resultados son inaceptables, ya que se considera que un umbral de protección estructural de 60 años de periodo de retorno sería insuficiente para la actuación arquitectónica que se propone, demostrándose por tanto la necesidad de una actuación fluvial.

Para determinar el umbral de protección estructural el primer aspecto a considerar, es que, la Fábrica Giner se encuentra emplazada en suelo urbano, como se muestra en la *figura A.3.7. Suelo urbano- Zona polígono parcela 085*, información obtenida de la base de datos del catastro. Además, mediante las actuaciones arquitectónicas propuestas, este entorno se convertirá en una zona lúdica (actividades, restaurante, museo, hotel...).



*Figura A.3.7. Suelo urbano- Zona polígono parcela 085. Fuente: Catastro.*

Una vez se ha conseguido esta información, se procede a establecer el rango de umbral de protección más adecuado para el tipo de actuación que se va a realizar. Para ello se recurre a una serie de información proporcionada por el CEDEX, en un estudio en el que se asocian unos rangos de periodos de retorno en función del tipo de suelo, como se muestra en la *Figura A.3.8*



*Figura A.3.8. Periodos de retorno asociados a diferentes usos del suelo.*

*Fuente: CEDEX*

Considerando la información anterior, se establece que un rango de umbral de protección estructural adecuado sería la elección de un periodo de retorno comprendido entre 100 y 200 años.

Analizando los resultados obtenidos del análisis del sistema hidráulico de la situación actual, expuestos en el *Apéndice III.2*, para el caso de la avenida extraordinaria correspondiente a 100 años de periodo de retorno, la velocidad del flujo llega a superar el valor de 1m/s, siendo la capacidad del cauce en el entorno inmediato a la Fábrica Giner insuficiente, presentándose problemas de inundación de la misma, como se observa en las *figuras A.3.9*.

En cuanto a la avenida de 200 años de periodo de retorno, la capacidad hidráulica es claramente insuficiente, con velocidades del flujo que rebasan los 2 m/s.



Sin embargo, la diferencia entre la lámina de agua para caudales asociados a estos periodos de retorno es mínima por ello, se van a diseñar las actuaciones fluviales para un umbral de protección estructural de 200 años de periodo de retorno.

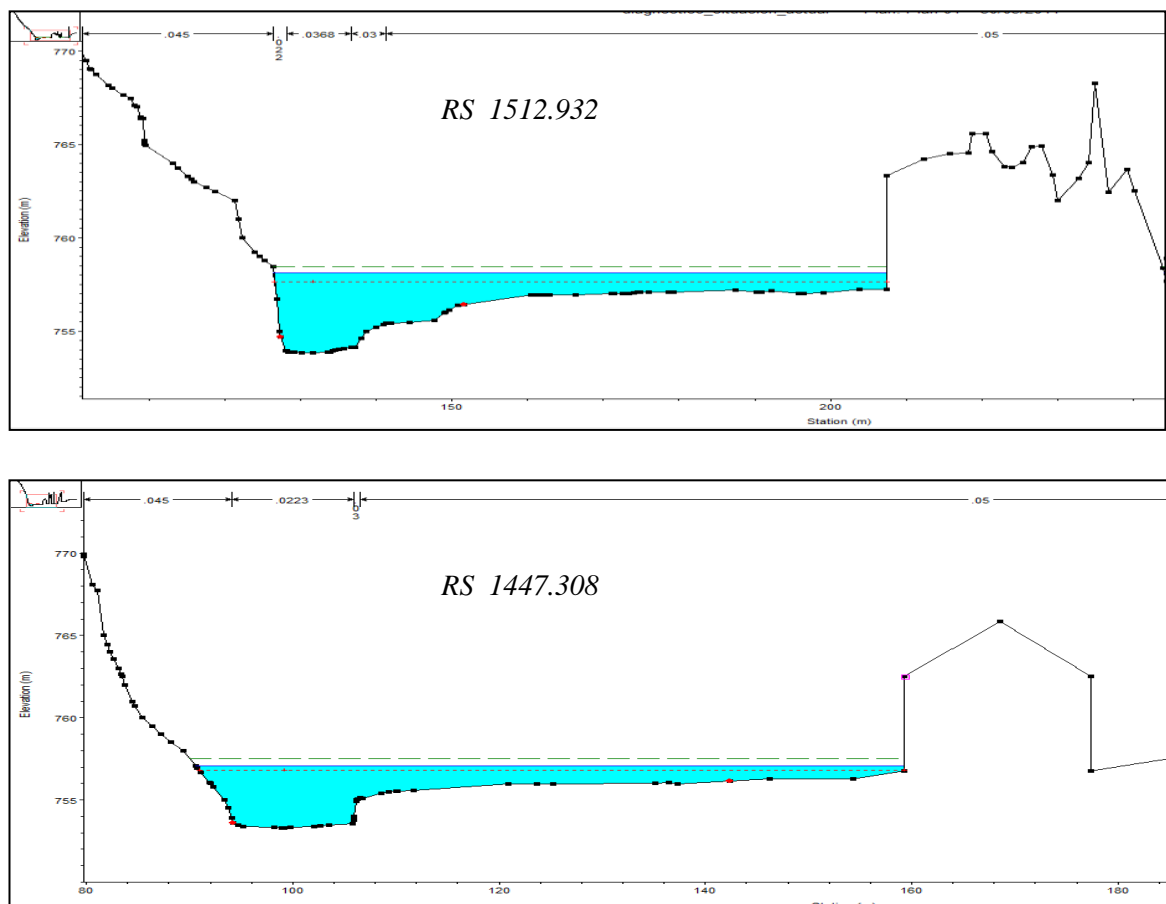
El análisis detallado del funcionamiento hidráulico del cauce en la situación actual para este periodo de retorno se detallará en el apartado A.3.3.3.

#### **A.3.3.3. Comportamiento hidráulico del cauce para las avenidas de 200 años de periodo de retorno y evaluación de su peligrosidad.**

Una vez se han conseguido los resultados hidráulicos, y se ha elegido el periodo de retorno que se considera más adecuado, se van a estudiar algunos aspectos para el caudal asociado a dicho periodo.

- CALADO

A continuación se representan los calados, en diferentes secciones transversales del entrono de la Fábrica Giner.



*Figura A.3.9: Calados de dos secciones de Morella Medio*

La capacidad hidráulica del cauce para este caudal, es claramente insuficiente, presentando problemas de inundación generalizada en la Fábrica Giner, con calados superiores a 50 cm en casi todo el complejo.

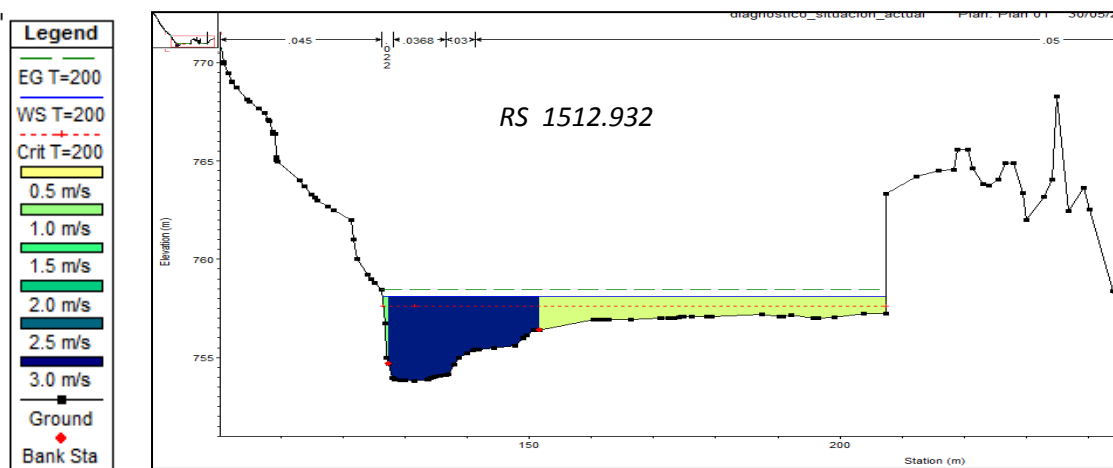
- VELOCIDADES

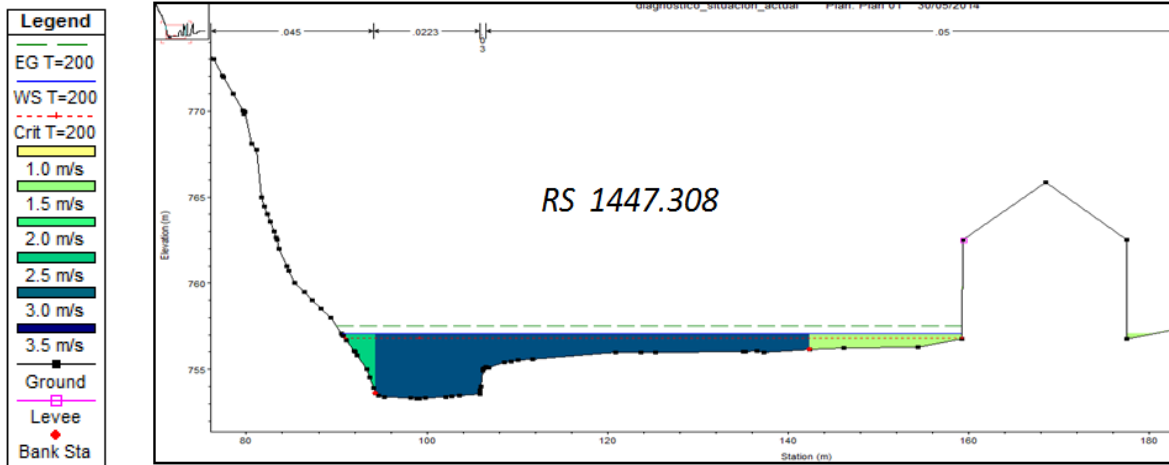
En la tabla inferior se exponen las velocidades en el cauce (Vel Chnl), en función de cada una de las secciones (River Sta). Las figuras A3.14 representan gráficamente estos valores para dos de las secciones.

Los resultados de las restantes secciones se adjuntan en el *Apéndice III.2*.

| Reach        | River Sta | Profile | Q Total<br>(m3/s) | Vel Chnl<br>(m/s) |
|--------------|-----------|---------|-------------------|-------------------|
| MORELLAMEDIO | 1608.287  | T=200   | 314.02            | 2.49              |
| MORELLAMEDIO | 1585.133  | T=200   | 314.02            | 2.08              |
| MORELLAMEDIO | 1556.852  | T=200   | 314.02            | 2.72              |
| MORELLAMEDIO | 1539.471  | T=200   | 314.02            | 2.93              |
| MORELLAMEDIO | 1525.248  | T=200   | 314.02            | 3.13              |
| MORELLAMEDIO | 1512.932  | T=200   | 314.02            | 2.94              |
| MORELLAMEDIO | 1498.456  | T=200   | 314.02            | 4.03              |
| MORELLAMEDIO | 1476.214  | T=200   | 314.02            | 3.79              |
| MORELLAMEDIO | 1447.308  | T=200   | 314.02            | 3.3               |
| MORELLAMEDIO | 1418.074  | T=200   | 314.02            | 3.91              |
| MORELLAMEDIO | 1394.002  | T=200   | 314.02            | 2.17              |
| MORELLAMEDIO | 1370.229  | T=200   | 314.02            | 2.37              |
| MORELLAMEDIO | 1353.036  | T=200   | 314.02            | 2.79              |
| MORELLAMEDIO | 1337.958  | T=200   | 314.02            | 3.41              |
| MORELLAMEDIO | 1323.549  | T=200   | 314.02            | 3.75              |

*Tabla A.3.4. Velocidades en Morella medio*





Figuras A.3.10: Representación gráfica de velocidades

En cuanto a las velocidades del flujo, éstas rebasan los 2m/s, llegando a los 4.03 m/s.

A esto hay que añadir que el régimen de funcionamiento hidráulico es inestable, con continuos cambios de supercrítico a subcrítico, con aparición de resaltos hidráulicos. En el Apéndice III.2, se adjuntan los perfiles longitudinales para los diferentes caudales de avenida, pudiendo comprobar que para el caudal asociado a periodo de retorno de 200 años, encontramos estas inestabilidades.

Para analizar el comportamiento hidráulico, vamos a tener en cuenta el tipo de riesgo de la avenida extraordinaria. Este tipo de riesgo se analiza mediante el calado y la velocidad, dividiéndose en alto y moderado, como se muestra en la figura siguiente:

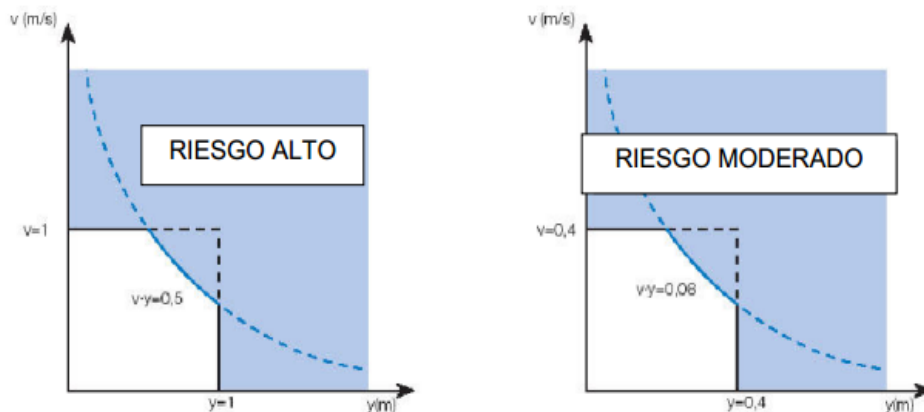


Figura A.3.11: Determinación del riesgo de la avenida

Con los resultados expuestos, se puede considerar un riesgo alto en la inundación del entorno.

#### **A.3.4 CONCLUSIÓN**

Teniendo en cuenta los resultados anteriores en cuanto a funcionamiento hidráulico y peligrosidad, y dada la actuación arquitectónica que se presenta en la Fábrica Giner, podemos considerar un riesgo que resulta altamente indeseable a las avenidas del Bergantes, reafirmando la necesidad de actuar, desde el punto de vista de la ingeniería fluvial, si se quiere garantizar un umbral de protección de 200 años de periodo de retorno.

# **APÉNDICES**

## **Anejo III**



## **ÍNDICE**

### **APÉNDICE III.1. ESTUDIO DE RUGOSIDADES**

### **APÉNDICE III.2. RESULTADOS DEL DIAGNÓSTICO HIDRÁULICO DE LA SITUACIÓN ACTUAL**

## **APÉNDICE III.1.**

### **ESTUDIO DE RUGOSIDADES**

En el siguiente apéndice se va a mostrar, en un primer apartado, un reportaje fotográfico del tramo de cauce de estudio, sección por sección, identificando en cada una de ellas margen izquierda, lecho y margen derecha. Estas imágenes se han obtenido mediante la inspección in situ de la zona.

Se expondrán, dichas fotografías, en función de los diferentes subtramos, realizando un examen más exhaustivo en el entorno de *Morella Medio*.

Esta información va a constituir la base para la obtención de los valores de rugosidades.

La segunda parte constará de los números de manning utilizados para en el *Capítulo III: Diagnóstico Hidráulico de la situación actual*.

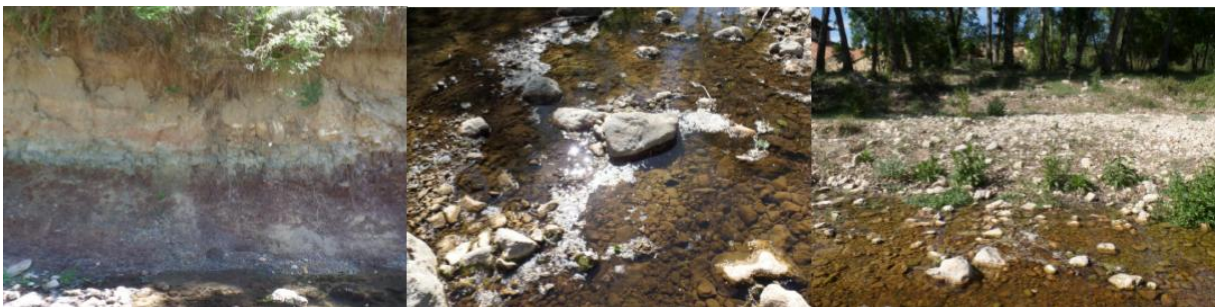
### **Ap.III.1.1. REPORTAJE FOTOGRÁFICO**

#### **Ap.III.1.1.1. MORELLA MEDIO**

*RS 1608.287*



*RS 1585.133*



*RS 1556.852*



*RS 1539.41*



*RS 1525.248*





*RS 1512.932*



*RS 1476.214*



*RS 1447.308*





*RS 1418.074*



*RS 1394.002*



*RS 1370.229*





*RS 1353.036*



*RS 11337.958*



*RS 1323.549*





### A.III.1.1.2. MORELLA BAJO

*RS 1250.764*



*RS 1221.555*



*RS 1189.277*



*CONTINUACIÓN DE MORELLA BAJO*





### **Ap.III.1.1.3 MORELLA ALTO**

*RS 1652.841*



*RS 1626.672*



#### **Ap.III.1.1.4. AFLUENTE MARGEN DERECHA**

*RS 182.911*



*RS 67.412*



*RS 15.411*





#### **Ap.III.1.1.5. AFLUENTE TRIBUTAR**

##### ***SECCIÓN TIPO DEL AFLUENTE TRIBUTAR***



### Ap.III.1.2. NÚMEROS DE MANNING

| MORELLA ALTO |       |       |       |      |
|--------------|-------|-------|-------|------|
| Sección      | n1    | n2    | n3    | n4   |
| 3010.624     | 0.045 | 0.035 | 0.045 |      |
| 2969.898     | 0.045 | 0.035 | 0.045 |      |
| 2939.593     | 0.045 | 0.035 | 0.045 |      |
| 2872.683     | 0.045 | 0.035 | 0.045 |      |
| 2814.464     | 0.045 | 0.035 | 0.045 |      |
| 2760.083     | 0.045 | 0.035 | 0.045 |      |
| 2723.041     | 0.045 | 0.035 | 0.045 |      |
| 2698.332     | 0.045 | 0.035 | 0.045 |      |
| 2668.283     | 0.045 | 0.035 | 0.045 |      |
| 2627.521     | 0.045 | 0.035 | 0.045 |      |
| 2600.858     | 0.045 | 0.035 | 0.045 |      |
| 2583.825     | 0.045 | 0.035 | 0.045 |      |
| 2570.241     | 0.045 | 0.035 | 0.045 |      |
| 2552.039     | 0.045 | 0.035 | 0.045 |      |
| 2529.884     | 0.045 | 0.035 | 0.045 |      |
| 2507.039     | 0.045 | 0.035 | 0.045 |      |
| 2490.032     | 0.045 | 0.035 | 0.045 |      |
| 2467.629     | 0.045 | 0.035 | 0.045 |      |
| 2431.791     | 0.045 | 0.035 | 0.045 |      |
| 2410.195     | 0.045 | 0.035 | 0.045 |      |
| 2382.362     | 0.045 | 0.035 | 0.045 |      |
| 2350.675     | 0.045 | 0.035 | 0.045 |      |
| 2316.747     | 0.045 | 0.035 | 0.045 |      |
| 2293.848     | 0.045 | 0.035 | 0.045 |      |
| 2267.093     | 0.045 | 0.035 | 0.045 |      |
| 2243.8       | 0.045 | 0.035 | 0.045 |      |
| 2222.517     | 0.045 | 0.035 | 0.045 |      |
| 2195.681     | 0.045 | 0.035 | 0.045 |      |
| 2168.338     | 0.045 | 0.035 | 0.045 |      |
| 2146.539     | 0.045 | 0.035 | 0.045 |      |
| 2084.025     | 0.045 | 0.035 | 0.045 |      |
| 2046.533     | 0.045 | 0.035 | 0.045 |      |
| 1990.019     | 0.045 | 0.035 | 0.045 |      |
| 1932.588     | 0.045 | 0.035 | 0.045 |      |
| 1879.673     | 0.045 | 0.035 | 0.045 |      |
| 1822.942     | 0.045 | 0.035 | 0.045 |      |
| 1785.543     | 0.045 | 0.035 | 0.045 |      |
| 1756.862     | 0.045 | 0.035 | 0.045 |      |
| 1744.35      | 0.045 | 0.035 | 0.045 |      |
| 1723.778     | 0.045 | 0.027 | 0.035 |      |
| 1708.685     | 0.045 | 0.027 | 0.035 |      |
| 1694.402     | 0.045 | 0.027 | 0.035 |      |
| 1679.373     | 0.045 | 0.027 | 0.045 |      |
| 1663.422     | 0.045 | 0.027 | 0.045 |      |
| 1652841      | 0.045 | 0.027 | 0.045 |      |
| 1626.672     | 0.045 | 0.025 | 0.03  | 0.05 |



| MORELLA MEDIO |       |        |        |       |      |
|---------------|-------|--------|--------|-------|------|
| Sección       | n1    | n2     | n3     | n4    | n5   |
| 1608.287      | 0.045 | 0.025  | 0.035  | 0.05  |      |
| 1585.133      | 0.045 | 0.025  | 0.035  | 0.05  |      |
| 1556.852      | 0.045 | 0.025  | 0.035  | 0.05  |      |
| 1539.471      | 0.045 | 0.0223 | 0.0368 | 0.05  |      |
| 1525.248      | 0.045 | 0.223  | 0.0343 | 0.03  | 0.05 |
| 1512.932      | 0.045 | 0.022  | 0.0368 | 0.03  | 0.05 |
| 1498.456      | 0.045 | 0.022  | 0.0368 | 0.03  | 0.05 |
| 1476.214      | 0.045 | 0.0223 | 0.03   | 0.05  |      |
| 1447.308      | 0.045 | 0.0223 | 0.03   | 0.05  |      |
| 1418.074      | 0.045 | 0.02   | 0.035  | 0.03  | 0.05 |
| 1394.002      | 0.045 | 0.03   | 0.036  | 0.033 | 0.05 |
| 1370.229      | 0.045 | 0.03   | 0.036  | 0.033 | 0.05 |
| 1353.036      | 0.045 | 0.03   | 0.036  | 0.033 | 0.05 |
| 1337.958      | 0.045 | 0.03   | 0.036  | 0.03  | 0.05 |
| 1323.549      | 0.045 | 0.04   | 0.0351 | 0.03  | 0.05 |

| MORELLA BAJO |       |       |       |
|--------------|-------|-------|-------|
| Sección      | n1    | n2    | n3    |
| 1250.764     | 0.045 | 0.382 | 0.045 |
| 1221.555     | 0.045 | 0.382 | 0.045 |
| 1189.277     | 0.045 | 0.382 | 0.045 |
| 1159.131     | 0.045 | 0.382 | 0.045 |
| 1119.613     | 0.045 | 0.382 | 0.045 |
| 1080.628     | 0.045 | 0.382 | 0.045 |
| 1046.059     | 0.045 | 0.382 | 0.045 |
| 996.576      | 0.045 | 0.382 | 0.045 |
| 950.974      | 0.045 | 0.382 | 0.045 |
| 913.674      | 0.045 | 0.382 | 0.045 |
| 882.552      | 0.045 | 0.382 | 0.045 |
| 854.465      | 0.045 | 0.382 | 0.045 |
| 808.923      | 0.045 | 0.382 | 0.045 |
| 745.564      | 0.045 | 0.382 | 0.045 |
| 695.776      | 0.045 | 0.382 | 0.045 |
| 655.942      | 0.045 | 0.382 | 0.045 |
| 613.402      | 0.045 | 0.382 | 0.045 |
| 567.073      | 0.045 | 0.382 | 0.045 |
| 508.645      | 0.045 | 0.382 | 0.045 |
| 467.757      | 0.045 | 0.382 | 0.045 |
| 443.346      | 0.045 | 0.382 | 0.045 |
| 406.528      | 0.045 | 0.382 | 0.045 |
| 374.786      | 0.045 | 0.382 | 0.045 |
| 348.086      | 0.045 | 0.382 | 0.045 |
| 316.306      | 0.045 | 0.382 | 0.045 |
| 292.552      | 0.045 | 0.382 | 0.045 |
| 264.24       | 0.045 | 0.382 | 0.045 |
| 222.046      | 0.045 | 0.382 | 0.045 |
| 185.338      | 0.045 | 0.382 | 0.045 |
| 138.968      | 0.045 | 0.382 | 0.045 |
| 80.632       | 0.045 | 0.382 | 0.045 |
| 20.181       | 0.045 | 0.382 | 0.045 |

| AFLUENTE MARGEN DERECHA |       |        |       |
|-------------------------|-------|--------|-------|
| Sección                 | n1    | n2     | n3    |
| 324.568                 | 0.045 | 0.0338 | 0.035 |
| 316.607                 | 0.045 | 0.0338 | 0.035 |
| 309.883                 | 0.045 | 0.0338 | 0.035 |
| 304.389                 | 0.045 | 0.0338 | 0.035 |
| 296.16                  | 0.045 | 0.0338 | 0.035 |
| 290.278                 | 0.045 | 0.0338 | 0.035 |
| 282.946                 | 0.045 | 0.0338 | 0.035 |
| 277.698                 | 0.045 | 0.0338 | 0.035 |
| 269.391                 | 0.045 | 0.0338 | 0.035 |
| 263.999                 | 0.045 | 0.0338 | 0.035 |
| 258.543                 | 0.045 | 0.0338 | 0.035 |
| 252.147                 | 0.045 | 0.0338 | 0.035 |
| 246.422                 | 0.045 | 0.0338 | 0.035 |
| 242.193                 | 0.045 | 0.0338 | 0.035 |
| 239.244                 | 0.045 | 0.0338 | 0.035 |
| 235.959                 | 0.045 | 0.0338 | 0.035 |
| 232.813                 | 0.045 | 0.0338 | 0.035 |
| 229.992                 | 0.045 | 0.0338 | 0.035 |
| 223.682                 | 0.045 | 0.0338 | 0.035 |
| 203.774                 | 0.045 | 0.0338 | 0.035 |
| 197.305                 | 0.045 | 0.0338 | 0.035 |
| 188.798                 | 0.04  | 0.038  | 0.04  |
| 182.911                 | 0.04  | 0.038  | 0.04  |
| 177.41                  | 0.04  | 0.038  | 0.04  |
| 172.631                 | 0.04  | 0.038  | 0.04  |
| 167.601                 | 0.04  | 0.038  | 0.04  |
| 162.637                 | 0.04  | 0.038  | 0.04  |
| 157.529                 | 0.04  | 0.038  | 0.04  |
| 152.542                 | 0.04  | 0.038  | 0.04  |
| 147.403                 | 0.04  | 0.038  | 0.04  |
| 140.995                 | 0.04  | 0.038  | 0.04  |
| 134.769                 | 0.04  | 0.038  | 0.04  |
| 128.576                 | 0.04  | 0.038  | 0.04  |
| 122.101                 | 0.04  | 0.038  | 0.04  |
| 115.354                 | 0.04  | 0.038  | 0.04  |
| 109.31                  | 0.04  | 0.038  | 0.04  |
| 104.112                 | 0.04  | 0.038  | 0.04  |
| 97.715                  | 0.04  | 0.038  | 0.04  |
| 90.562                  | 0.04  | 0.038  | 0.04  |
| 79.06                   | 0.04  | 0.038  | 0.04  |
| 67.412                  | 0.038 | 0.038  | 0.038 |
| 59.031                  | 0.038 | 0.038  | 0.038 |
| 43.92                   | 0.038 | 0.038  | 0.038 |
| 32.589                  | 0.038 | 0.038  | 0.038 |
| 26.297                  | 0.05  | 0.038  | 0.05  |
| 19.449                  | 0.05  | 0.038  | 0.05  |
| 15.411                  | 0.05  | 0.038  | 0.05  |

| AFLUENTE MARGEN DERECHA |       |      |       |
|-------------------------|-------|------|-------|
| Sección                 | n1    | n2   | n3    |
| 372.319                 | 0.045 | 0.03 | 0.045 |
| 351.527                 | 0.045 | 0.03 | 0.045 |
| 334.72                  | 0.045 | 0.03 | 0.045 |
| 319.46                  | 0.045 | 0.03 | 0.045 |
| 303.01                  | 0.045 | 0.03 | 0.045 |
| 285.428                 | 0.045 | 0.03 | 0.045 |
| 264.025                 | 0.045 | 0.03 | 0.045 |
| 239.361                 | 0.045 | 0.03 | 0.045 |
| 208.445                 | 0.045 | 0.03 | 0.045 |
| 189.4                   | 0.045 | 0.03 | 0.045 |
| 177.381                 | 0.045 | 0.03 | 0.045 |
| 166.255                 | 0.045 | 0.03 | 0.045 |
| 154.812                 | 0.045 | 0.03 | 0.045 |
| 143.153                 | 0.045 | 0.03 | 0.045 |
| 131.236                 | 0.045 | 0.03 | 0.045 |
| 121.734                 | 0.045 | 0.03 | 0.045 |
| 114.523                 | 0.045 | 0.03 | 0.045 |
| 105.911                 | 0.045 | 0.03 | 0.045 |
| 100.378                 | 0.045 | 0.03 | 0.045 |

## **APÉNDICE III.2.**

### **RESULTADOS DEL DIAGNÓSTICO HIDRÁULICO DE LA SITUACIÓN ACTUAL**

En el presente anejo se detallan en forma de tablas, en apartado 1, los resultados obtenidos mediante el Hec-Ras del diagnóstico de la situación actual. Dicho análisis se ha realizado para los caudales expuestos en el *Capítulo III: Diagnóstico hidráulico de la situación actual*, asociados a diferentes periodos de retorno.

Las variables incluidas en las tablas son las siguientes:

- *River Station*: Identificación-ubicación de la sección transversal.
- *Q Total*: caudal circulante por la sección.
- *Min Ch. El*: elevación mínima (cota del thalweg).
- *W. S. Elev*: elevación de la superficie de agua.
- *Crit. Elev*: elevación de la superf. de agua correspondiente al régimen crítico.
- *E. G. Elev*: elevación de la línea de energía.
- *E. G. Slope*: pendiente de la línea de energía.
- *Vel Total*: velocidad promedio de la sección mojada.
- *Flow area*: área de la sección mojada.
- *Top width*: anchura de la superficie libre.
- *Froude #XS*: número de Froude de la sección completa.
- *Shear LOB*: Tensión tangencial o de corte sobre la margen izquierda.
- *Shear Chan*: Tensión tangencial o de corte sobre el lecho del cauce.
- *Shear ROB*: Tensión tangencial o de corte sobre la margen derecha.
- *Shear Total*: Tensión tangencial promedio en la sección completa.

Como punto final de este anejo se presenta el perfil longitudinal en Hec-Ras de la lámina de agua en función de los caudales en los tramos de Morella Medio, Morella Alto y del Afluente Margen derecha, siendo estos en los que se realizarán las actuaciones a lo largo del estudio de soluciones.

## Ap.III.1.1. TABLAS DE RESULTADOS DE HEC-RAS EN LA SITUACIÓN ACTUAL

*25 AÑOS DE PERIODO DE RETORNO*

| River     | Reach        | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Total<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl | Shear LOB<br>(N/m2) | Shear Chan<br>(N/m2) | Shear ROB<br>(N/m2) | Shear Total<br>(N/m2) |
|-----------|--------------|-----------|---------|-------------------|------------------|------------------|------------------|------------------|---------------------|--------------------|-------------------|------------------|--------------|---------------------|----------------------|---------------------|-----------------------|
| BERGANTES | MORELLALTO   | 3010.624  | T=25    | 89.04             | 770.99           | 772.53           | 772.61           | 773.09           | 0.016007            | 3.28               | 27.15             | 32.49            | 1.13         | 30.54               | 139.19               | 34.24               | 129.17                |
| BERGANTES | MORELLALTO   | 2969.898  | T=25    | 89.04             | 770.34           | 772.29           | 772.17           | 772.59           | 0.008404            | 2.39               | 37.22             | 43.44            | 0.82         | 45.53               | 74.62                | 12.73               | 69.75                 |
| BERGANTES | MORELLALTO   | 2939.593  | T=25    | 89.04             | 769.67           | 771.83           | 771.83           | 772.29           | 0.012579            | 3                  | 29.72             | 32.83            | 1            | 45.34               | 113.71               |                     | 110                   |
| BERGANTES | MORELLALTO   | 2872.683  | T=25    | 89.04             | 767.96           | 770.22           | 770.48           | 771.29           | 0.017463            | 4.56               | 19.52             | 14.09            | 1.23         | 40.37               | 230.12               |                     | 219.38                |
| BERGANTES | MORELLALTO   | 2814.464  | T=25    | 89.04             | 767.63           | 769.66           | 769.79           | 770.37           | 0.016301            | 3.74               | 23.8              | 22.6             | 1.15         | 26.31               | 166.98               |                     | 162.56                |
| BERGANTES | MORELLALTO   | 2760.083  | T=25    | 89.04             | 766.68           | 768.74           | 768.32           | 769.05           | 0.004376            | 2.48               | 35.94             | 23.59            | 0.64         | 4.32                | 64.86                |                     | 60.21                 |
| BERGANTES | MORELLALTO   | 2723.041  | T=25    | 89.04             | 765.98           | 768.38           | 768.26           | 768.85           | 0.009368            | 3.05               | 29.21             | 24.44            | 0.89         |                     | 106.33               |                     | 106.33                |
| BERGANTES | MORELLALTO   | 2698.332  | T=25    | 89.04             | 765.89           | 767.95           | 767.95           | 768.59           | 0.011565            | 3.54               | 25.14             | 19.7             | 1            |                     | 140.33               |                     | 140.33                |
| BERGANTES | MORELLALTO   | 2668.283  | T=25    | 89.04             | 765.53           | 768.04           | 767.33           | 768.27           | 0.002884            | 2.09               | 42.67             | 26.16            | 0.53         | 22.58               | 46.94                | 0.46                | 44.09                 |
| BERGANTES | MORELLALTO   | 2627.521  | T=25    | 89.04             | 765.42           | 767.92           | 767.25           | 768.15           | 0.003072            | 2.11               | 42.17             | 27.57            | 0.54         | 7.02                | 46.77                |                     | 44.96                 |
| BERGANTES | MORELLALTO   | 2600.858  | T=25    | 89.04             | 765.17           | 767.36           | 767.26           | 767.97           | 0.009673            | 3.47               | 25.69             | 17.83            | 0.92         |                     | 129.91               |                     | 129.91                |
| BERGANTES | MORELLALTO   | 2583.825  | T=25    | 89.04             | 765.16           | 766.67           | 766.94           | 767.66           | 0.023749            | 4.39               | 20.28             | 20.44            | 1.4          |                     | 235.17               | 60.91               | 226.21                |
| BERGANTES | MORELLALTO   | 2570.241  | T=25    | 89.04             | 764.9            | 767              | 766.54           | 767.3            | 0.003838            | 2.38               | 37.38             | 25.39            | 0.61         | 11.8                | 61.13                | 14.18               | 53.8                  |
| BERGANTES | MORELLALTO   | 2552.039  | T=25    | 89.04             | 764.85           | 766.85           | 766.55           | 767.21           | 0.005733            | 2.64               | 33.75             | 24.9             | 0.72         | 9.37                | 76.14                |                     | 73.74                 |
| BERGANTES | MORELLALTO   | 2529.844  | T=25    | 89.04             | 764.74           | 766.6            | 766.49           | 767.04           | 0.008826            | 2.92               | 30.54             | 26.71            | 0.88         | 38.47               | 100.24               |                     | 96.25                 |
| BERGANTES | MORELLALTO   | 2507.039  | T=25    | 89.04             | 764.54           | 766.34           | 766.34           | 766.8            | 0.012676            | 3.02               | 29.48             | 32.4             | 1.01         | 14.15               | 113.32               |                     | 111.94                |
| BERGANTES | MORELLALTO   | 2490.032  | T=25    | 89.04             | 763.92           | 766.19           | 765.7            | 766.44           | 0.004326            | 2.24               | 39.75             | 30.1             | 0.62         |                     | 55.21                |                     | 55.21                 |
| BERGANTES | MORELLALTO   | 2467.629  | T=25    | 89.04             | 763.74           | 766.03           | 765.59           | 766.31           | 0.004764            | 2.33               | 38.17             | 29.03            | 0.65         |                     | 60.1                 |                     | 60.1                  |
| BERGANTES | MORELLALTO   | 2431.791  | T=25    | 89.04             | 763.61           | 765.91           | 765.46           | 766.12           | 0.004149            | 2.04               | 43.58             | 36.82            | 0.6          |                     | 47.59                |                     | 47.59                 |
| BERGANTES | MORELLALTO   | 2410.195  | T=25    | 89.04             | 763.48           | 765.58           | 765.4            | 765.98           | 0.008298            | 2.8                | 31.77             | 28.01            | 0.84         |                     | 90.94                |                     | 90.94                 |
| BERGANTES | MORELLALTO   | 2382.362  | T=25    | 89.04             | 763.27           | 765.42           | 765.27           | 765.71           | 0.008301            | 2.38               | 37.35             | 42.17            | 0.81         |                     | 71.35                |                     | 71.35                 |
| BERGANTES | MORELLALTO   | 2350.675  | T=25    | 89.04             | 763              | 765.23           | 764.88           | 765.4            | 0.005635            | 1.8                | 49.58             | 64.42            | 0.65         |                     | 42.35                |                     | 42.35                 |
| BERGANTES | MORELLALTO   | 2316.747  | T=25    | 89.04             | 762.95           | 764.72           | 764.72           | 765.12           | 0.013133            | 2.79               | 31.91             | 40.32            | 1            |                     | 101.34               |                     | 101.34                |
| BERGANTES | MORELLALTO   | 2293.848  | T=25    | 89.04             | 762.68           | 764.04           | 764.22           | 764.66           | 0.021878            | 3.49               | 25.49             | 33.61            | 1.28         |                     | 161.2                |                     | 161.2                 |
| BERGANTES | MORELLALTO   | 2267.093  | T=25    | 89.04             | 762.13           | 763.62           | 763.73           | 764.27           | 0.016368            | 3.59               | 24.81             | 25.18            | 1.15         |                     | 156.2                |                     | 156.2                 |
| BERGANTES | MORELLALTO   | 2243.8    | T=25    | 89.04             | 761.93           | 763.46           | 763.5            | 763.94           | 0.015531            | 3.08               | 28.89             | 35.63            | 1.09         |                     | 122.62               |                     | 122.62                |
| BERGANTES | MORELLALTO   | 2222.517  | T=25    | 89.04             | 761.23           | 763.45           | 763.09           | 763.67           | 0.004706            | 2.09               | 42.52             | 38.13            | 0.63         |                     | 50.97                |                     | 50.97                 |
| BERGANTES | MORELLALTO   | 2195.681  | T=25    | 89.04             | 761.09           | 763.26           | 763.06           | 763.52           | 0.006695            | 2.25               | 39.58             | 41.25            | 0.73         |                     | 61.99                |                     | 61.99                 |
| BERGANTES | MORELLALTO   | 2168.338  | T=25    | 89.04             | 760.93           | 762.74           | 762.71           | 763.27           | 0.011374            | 3.24               | 27.49             | 24.58            | 0.98         |                     | 122.23               |                     | 122.23                |
| BERGANTES | MORELLALTO   | 2146.539  | T=25    | 89.04             | 760.43           | 762.54           | 762.43           | 763.03           | 0.009535            | 3.1                | 28.7              | 23.92            | 0.9          |                     | 109.66               |                     | 109.66                |
| BERGANTES | MORELLALTO   | 2084.025  | T=25    | 89.04             | 760.35           | 762.06           | 761.98           | 762.39           | 0.01013             | 2.52               | 35.27             | 42.7             | 0.89         |                     | 81.72                |                     | 81.72                 |
| BERGANTES | MORELLALTO   | 2046.533  | T=25    | 89.04             | 759.74           | 761.16           | 761.3            | 761.82           | 0.019533            | 3.6                | 24.72             | 28.44            | 1.23         |                     | 164.06               |                     | 164.06                |
| BERGANTES | MORELLALTO   | 1990.019  | T=25    | 89.04             | 758.88           | 760.81           | 760.72           | 761.29           | 0.009739            | 3.08               | 28.89             | 24.63            | 0.91         |                     | 109.13               |                     | 109.13                |
| BERGANTES | MORELLALTO   | 1932.588  | T=25    | 89.04             | 758.27           | 760.53           | 759.9            | 760.73           | 0.003211            | 1.98               | 44.97             | 32.32            | 0.54         |                     | 42.58                |                     | 42.58                 |
| BERGANTES | MORELLALTO   | 1879.673  | T=25    | 89.04             | 757.99           | 759.64           | 759.72           | 760.26           | 0.015122            | 3.48               | 25.61             | 25.32            | 1.1          |                     | 145.95               |                     | 145.95                |
| BERGANTES | MORELLALTO   | 1822.942  | T=25    | 89.04             | 756.96           | 759.21           | 758.67           | 759.4            | 0.003394            | 1.97               | 45.26             | 34.58            | 0.55         |                     | 42.77                |                     | 42.77                 |
| BERGANTES | MORELLALTO   | 1785.543  | T=25    | 89.04             | 756.62           | 759              | 758.42           | 759.25           | 0.00366             | 2.22               | 40.18             | 26.97            | 0.58         |                     | 52.1                 |                     | 52.1                  |
| BERGANTES | MORELLALTO   | 1756.862  | T=25    | 89.04             | 756.44           | 758.64           | 758.34           | 759.06           | 0.007134            | 2.86               | 31.08             | 23.18            | 0.79         |                     | 90.49                |                     | 90.49                 |
| BERGANTES | MORELLALTO   | 1744.35   | T=25    | 89.04             | 756.22           | 758.38           | 758.31           | 758.94           | 0.010017            | 3.32               | 26.83             | 20.48            | 0.93         |                     | 122.78               |                     | 122.78                |
| BERGANTES | MORELLALTO   | 1723.778  | T=25    | 89.04             | 756.22           | 758.2            | 758.2            | 758.74           | 0.007425            | 3.24               | 27.51             | 25.88            | 1            |                     | 74.36                |                     | 74.36                 |
| BERGANTES | MORELLALTO   | 1708.685  | T=25    | 89.04             | 755.98           | 757.71           | 757.91           | 758.56           | 0.011604            | 4.09               | 21.76             | 20.08            | 1.26         |                     | 118.23               |                     | 118.23                |
| BERGANTES | MORELLALTO   | 1694.402  | T=25    | 89.04             | 755.69           | 757.6            | 757.8            | 758.39           | 0.011483            | 3.93               | 22.65             | 22.02            | 1.24         |                     | 111                  |                     | 111                   |
| BERGANTES | MORELLALTO   | 1679.373  | T=25    | 89.04             | 755.68           | 757.23           | 757.52           | 758.14           | 0.02341             | 4.21               | 21.16             | 32.48            | 1.66         |                     | 146.86               |                     | 146.86                |
| BERGANTES | MORELLALTO   | 1663.422  | T=25    | 89.04             | 755.3            | 757.32           | 757.36           | 757.78           | 0.009432            | 2.99               | 29.8              | 38.26            | 1.08         |                     | 70.02                |                     | 70.02                 |
| BERGANTES | MORELLALTO   | 1652.841  | T=25    | 89.04             | 755.03           | 756.74           | 757.04           | 757.6            | 0.014286            | 4.11               | 21.64             | 23.64            | 1.37         |                     | 125.5                |                     | 125.5                 |
| BERGANTES | MORELLALTO   | 1626.672  | T=25    | 89.04             | 754.86           | 756.87           | 756.67           | 757.21           | 0.00317             | 2.61               | 34.09             | 32.48            | 0.81         |                     | 31.56                |                     | 31.56                 |
| BERGANTES | MORELLAMEDIO | 1608.287  | T=25    | 89.04             | 754.82           | 756.89           | 756.44           | 757.2            | 0.004359            | 2.47               | 36.05             | 24.76            | 0.65         | 1.59                | 59.6                 |                     | 59.23                 |
| BERGANTES | MORELLAMEDIO | 1585.133  | T=25    | 89.04             | 754.48           | 756.8            | 756.28           | 757.11           | 0.001654            | 2.43               | 36.71             | 23.5             | 0.62         | 5.44                | 25.26                |                     | 23.72                 |
| BERGANTES | MORELLAMEDIO | 1556.852  | T=25    | 89.04             | 754.25           | 756.68           | 756.2            | 756.96           | 0.003442            | 2.32               | 38.38             | 31.92            | 0.64         | 4.13                | 45.44                | 3.08                | 37.79                 |
| BERGANTES | MORELLAMEDIO | 1539.471  | T=25    | 89.04             | 754.1            | 756.61           | 756.31           | 756.89           | 0.005533            | 2.33               | 38.27             | 31.79            | 0.68         | 15.35               | 64.11                |                     | 61.63                 |
| BERGANTES | MORELLAMEDIO | 1525.248  | T=25    | 89.04             | 753.98           | 756.58           | 756.04           | 756.8            | 0.003134            | 2.06               | 43.28             | 29.45            | 0.54         | 7.19                | 44.28                |                     | 42.33                 |
| BERGANTES | MORELLAMEDIO | 1512.932  | T=25    | 89.04             | 753.82           | 756.48           | 755.9            | 756.74           | 0.004787            | 2.26               | 39.43             | 25.92            | 0.57         | 13.77               | 72.85                | 1.56                | 66.07                 |
| BERGANTES | MORELLAMEDIO | 1498.456  | T=25    | 89.04             | 753.71           | 756.21           | 755.82           | 756.63           | 0.006973            | 2.82               | 31.54             | 23.79            | 0.72         | 10.7                | 105.15               | 6.8                 | 84.45                 |
| BERGANTES | MORELLAMEDIO | 1476.214  | T=25    | 89.04             | 753.53           | 756.04           | 755.47           | 756.45           | 0.008252            | 2.81               | 31.74             | 24.53            | 0.78         | 33.84               | 101.2                |                     | 96.44                 |
| BERGANTES | MORELLAMEDIO | 1447.308  | T=25    | 89.04             | 753.29           | 755.84           | 755.28           | 756.2            | 0.006887            | 2.62               | 34.01             | 25.76            | 0.73         | 39.98               | 87.22                |                     | 82.01                 |
| BERGANTES | MORELLAMEDIO | 1418.074  | T=25    | 89.04             | 753.12           | 755.23           | 755.23           | 755.94           | 0.011442            | 3.7                | 24.04             | 18.81            | 0.97         | 75.48               | 162.61               | 9.63                | 134.65                |
| BERGANTES | MORELLAMEDIO | 1394.002  | T=25    | 89.04             | 752.39           | 754.07           | 754.48           | 755.42           | 0.024129            | 5.16               | 17.26             | 14.15            | 1.49         |                     | 273.52               |                     | 273.52                |
| BERGANTES | MORELLAMEDIO | 1370.229  | T=25    | 89.04             | 751.84           | 754.77           | 754.02           | 755.04           | 0.006457            | 2.3                | 38.76             | 27.89            | 0.62         | 5.89                | 83.65                |                     | 82.29                 |
| BERGANTES | MORELLAMEDIO | 1353.036  | T=25    | 89.04             | 751.91           | 754.53           | 754.26           | 754.93           | 0.005458            | 2.8                | 31.79             | 22.41            | 0.76         | 10.83               | 73.66                |                     | 68.14                 |
| BERGANTES | MORELLAMEDIO | 1337.958  | T=25    | 89.04             | 751.97           | 754.2            | 754.2            | 754.81           | 0.010408            | 3.48               | 25.6              | 21               | 1.01         | 3.38                | 115.27               |                     | 111.59                |
| BERGANTES | MORELLAMEDIO | 1323.549  | T=25    | 89.04             | 751.94           | 753.17           | 753.53           | 754.42           | 0.033601            | 4.94               | 18.02             | 18.85            | 1.61         | 15.23               | 307.27               |                     | 301.19                |



DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA  
INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

|           |             |          |      |       |        |        |        |        |          |        |       |        |      |       |        |       |        |
|-----------|-------------|----------|------|-------|--------|--------|--------|--------|----------|--------|-------|--------|------|-------|--------|-------|--------|
| BERGANTES | MORELLABAU  | 1250.764 | T=25 | 89.04 | 751.05 | 752.15 | 752.64 | 754.32 | 0.201465 | 6.54   | 13.62 | 32.22  | 3.21 |       | 819.84 |       | 819.84 |
| BERGANTES | MORELLABAU  | 1221.555 | T=25 | 89.04 | 750.66 | 752.66 | 752.16 | 752.85 | 0.003671 | 1.91   | 46.58 | 34.19  | 0.52 | 11.78 | 48.06  |       | 46.79  |
| BERGANTES | MORELLABAU  | 1189.277 | T=25 | 89.04 | 750.64 | 752.55 | 751.89 | 752.71 | 0.002587 | 1.76   | 50.54 | 32.92  | 0.45 | 10.82 | 39.19  |       | 37.67  |
| BERGANTES | MORELLABAU  | 1159.131 | T=25 | 89.04 | 750.66 | 752.48 | 751.74 | 752.63 | 0.00224  | 1.69   | 52.55 | 32.69  | 0.42 | 11.42 | 36.02  |       | 34.01  |
| BERGANTES | MORELLABAU  | 1119.613 | T=25 | 89.04 | 749.98 | 751.71 | 751.54 | 752.05 | 0.00908  | 2.58   | 34.51 | 32.56  | 0.8  |       | 93.66  |       | 93.66  |
| BERGANTES | MORELLABAU  | 1080.628 | T=25 | 89.04 | 749.39 | 751.24 | 751    | 751.58 | 0.007517 | 2.56   | 34.83 | 28.15  | 0.73 |       | 88.12  |       | 88.12  |
| BERGANTES | MORELLABAU  | 1046.059 | T=25 | 89.04 | 749.3  | 750.93 | 750.62 | 751.24 | 0.006306 | 2.45   | 36.27 | 27.53  | 0.68 |       | 79.36  |       | 79.36  |
| BERGANTES | MORELLABAU  | 996.576  | T=25 | 89.04 | 748.55 | 750.67 | 750.24 | 750.82 | 0.004136 | 1.66   | 53.73 | 55.79  | 0.53 |       | 44.82  | 22.57 | 37.34  |
| BERGANTES | MORELLABAU  | 950.974  | T=25 | 89.04 | 747.89 | 750.06 | 749.78 | 750.36 | 0.007688 | 2.4    | 37.08 | 33.92  | 0.73 |       | 80.68  |       | 80.68  |
| BERGANTES | MORELLABAU  | 913.674  | T=25 | 89.04 | 747.67 | 749.46 | 749.14 | 749.69 | 0.00607  | 2.1    | 42.34 | 39.56  | 0.65 |       | 62.33  |       | 62.33  |
| BERGANTES | MORELLABAU  | 882.552  | T=25 | 89.04 | 747.41 | 749.32 | 748.87 | 749.5  | 0.004047 | 1.87   | 47.59 | 39.5   | 0.54 |       | 47.26  |       | 47.26  |
| BERGANTES | MORELLABAU  | 854.465  | T=25 | 89.04 | 746.84 | 749.02 | 748.56 | 749.23 | 0.004592 | 2.02   | 44    | 35.3   | 0.58 |       | 54.87  |       | 54.87  |
| BERGANTES | MORELLABAU  | 808.923  | T=25 | 89.04 | 746.55 | 748.78 | 748.38 | 748.99 | 0.005403 | 2      | 44.47 | 40.67  | 0.61 |       | 56.25  |       | 56.25  |
| BERGANTES | MORELLABAU  | 745.564  | T=25 | 89.04 | 746.36 | 747.8  | 747.83 | 748.32 | 0.016192 | 3.18   | 27.96 | 29.69  | 1.05 | 30.33 | 149.72 |       | 144.94 |
| BERGANTES | MORELLABAU  | 695.776  | T=25 | 89.04 | 745.3  | 747.38 | 747.18 | 747.69 | 0.008087 | 2.44   | 36.46 | 33.98  | 0.76 |       | 85.55  | 42.36 | 83.05  |
| BERGANTES | MORELLABAU  | 655.942  | T=25 | 89.04 | 745    | 746.86 | 746.86 | 747.31 | 0.014821 | 2.97   | 29.94 | 33.03  | 1    |       | 131.89 | 29.14 | 128.93 |
| BERGANTES | MORELLABAU  | 613.402  | T=25 | 89.04 | 744.55 | 746.2  | 746.1  | 746.57 | 0.011055 | 2.72   | 32.78 | 33.36  | 0.87 |       | 106.57 | 15.33 | 105.02 |
| BERGANTES | MORELLABAU  | 567.073  | T=25 | 89.04 | 743.49 | 745.68 | 745.38 | 745.9  | 0.005825 | 2.05   | 43.51 | 41.51  | 0.64 |       | 59.22  |       | 59.22  |
| BERGANTES | MORELLABAU  | 508.645  | T=25 | 89.04 | 743.25 | 745.39 | 744.94 | 745.54 | 0.004307 | 1.69   | 52.64 | 53.37  | 0.54 |       | 41.27  |       | 41.27  |
| BERGANTES | MORELLABAU  | 467.757  | T=25 | 89.04 | 742.83 | 744.69 | 744.46 | 744.98 | 0.007723 | 2.38   | 37.48 | 35.32  | 0.73 |       | 79.62  | 9.15  | 78.67  |
| BERGANTES | MORELLABAU  | 443.346  | T=25 | 89.04 | 742.33 | 743.89 | 744.04 | 744.55 | 0.025507 | 3.61   | 24.66 | 30.2   | 1.28 |       | 200.81 |       | 200.81 |
| BERGANTES | MORELLABAU  | 406.528  | T=25 | 89.04 | 741.66 | 742.79 | 742.96 | 743.39 | 0.039466 | 3.44   | 25.85 | 47.8   | 1.5  |       | 208.61 |       | 208.61 |
| BERGANTES | MORELLABAU  | 374.786  | T=25 | 89.04 | 741.21 | 742.99 | 742.54 | 743.15 | 0.003965 | 1.77   | 50.31 | 44.99  | 0.53 |       | 43.26  |       | 43.26  |
| BERGANTES | MORELLABAU  | 348.086  | T=25 | 89.04 | 740.78 | 742.9  | 742.42 | 743.05 | 0.004101 | 1.72   | 51.9  | 49.89  | 0.54 |       | 41.64  |       | 41.64  |
| BERGANTES | MORELLABAU  | 316.306  | T=25 | 89.04 | 740.53 | 742.65 | 742.29 | 742.89 | 0.006247 | 2.15   | 41.48 | 38.83  | 0.66 |       | 64.73  |       | 64.73  |
| BERGANTES | MORELLABAU  | 292.552  | T=25 | 89.04 | 740.53 | 742.56 | 742.2  | 742.74 | 0.00533  | 1.88   | 47.32 | 48.58  | 0.61 | 13.79 | 51.5   |       | 50.27  |
| BERGANTES | MORELLABAU  | 264.24   | T=25 | 89.04 | 740.19 | 741.55 | 741.72 | 742.16 | 0.042852 | 3.44   | 25.89 | 50.22  | 1.53 |       | 212.41 |       | 212.41 |
| BERGANTES | MORELLABAU  | 222.046  | T=25 | 89.04 | 739.99 | 741.46 | 741.08 | 741.5  | 0.002122 | 0.95   | 93.66 | 133.25 | 0.36 |       | 14.57  |       | 14.57  |
| BERGANTES | MORELLABAU  | 185.338  | T=25 | 89.04 | 738.01 | 740.25 | 739.7  | 740.3  | 0.002409 | 1.04   | 85.32 | 115.23 | 0.39 |       | 17.29  |       | 17.29  |
| BERGANTES | MORELLABAU  | 138.968  | T=25 | 89.04 | 737.31 | 738.89 | 739.06 | 739.55 | 0.0254   | 3.58   | 24.87 | 31.06  | 1.28 |       | 197.95 |       | 197.95 |
| BERGANTES | MORELLABAU  | 80.632   | T=25 | 89.04 | 736.08 | 738.6  | 738.42 | 738.86 | 0.00876  | 2.26   | 39.36 | 42.74  | 0.75 | 14.92 | 76.46  |       | 75.5   |
| BERGANTES | MORELLABAU  | 20.181   | T=25 | 89.04 | 734.83 | 736.69 | 737.01 | 737.84 | 0.029166 | 4.76   | 18.69 | 16.18  | 1.41 |       | 314.67 |       | 314.67 |
| AFLUENTE  | MARGEN DCHA | 324.568  | T=25 | 6.5   | 766.83 | 767.86 | 767.98 | 768.37 | 0.028013 | 3.15   | 2.07  | 3.36   | 1.28 |       | 139.08 |       | 139.08 |
| AFLUENTE  | MARGEN DCHA | 316.607  | T=25 | 6.5   | 766.72 | 767.43 | 767.63 | 768.08 | 0.045243 | 3.57   | 1.82  | 3.84   | 1.65 |       | 189.26 |       | 189.26 |
| AFLUENTE  | MARGEN DCHA | 309.883  | T=25 | 6.5   | 766.53 | 767.5  | 767.51 | 767.81 | 0.016072 | 2.45   | 2.65  | 4.49   | 1.02 |       | 83.32  |       | 83.32  |
| AFLUENTE  | MARGEN DCHA | 304.389  | T=25 | 6.5   | 766.09 | 766.78 | 767.03 | 767.6  | 0.061399 | 4.02   | 1.61  | 3.47   | 1.88 |       | 244.91 |       | 244.91 |
| AFLUENTE  | MARGEN DCHA | 296.16   | T=25 | 6.5   | 765.92 | 767.01 | 766.8  | 767.17 | 0.006282 | 1.74   | 3.73  | 5.05   | 0.65 |       | 39.37  |       | 39.37  |
| AFLUENTE  | MARGEN DCHA | 290.278  | T=25 | 6.5   | 765.7  | 767.01 | 766.6  | 767.13 | 0.003905 | 1.52   | 4.26  | 4.47   | 0.5  |       | 28.66  | 0.68  | 28.19  |
| AFLUENTE  | MARGEN DCHA | 282.946  | T=25 | 6.5   | 765.9  | 766.76 | 766.76 | 767.06 | 0.016936 | 2.44   | 2.66  | 4.47   | 1.01 |       | 83.69  |       | 83.69  |
| AFLUENTE  | MARGEN DCHA | 277.698  | T=25 | 6.5   | 765.53 | 766.27 | 766.46 | 766.89 | 0.044644 | 3.48   | 1.87  | 4.14   | 1.61 |       | 181.97 |       | 181.97 |
| AFLUENTE  | MARGEN DCHA | 269.391  | T=25 | 6.5   | 765.42 | 765.89 | 766.08 | 766.5  | 0.049321 | 3.43   | 1.89  | 4.74   | 1.73 |       | 182.62 |       | 182.62 |
| AFLUENTE  | MARGEN DCHA | 263.999  | T=25 | 6.5   | 765.2  | 765.73 | 765.87 | 766.23 | 0.038556 | 3.15   | 2.06  | 4.72   | 1.53 |       | 151.31 |       | 151.31 |
| AFLUENTE  | MARGEN DCHA | 258.543  | T=25 | 6.5   | 764.99 | 765.85 | 765.76 | 766.03 | 0.009362 | 1.88   | 3.45  | 6.12   | 0.8  |       | 49.03  |       | 49.03  |
| AFLUENTE  | MARGEN DCHA | 252.147  | T=25 | 6.5   | 764.93 | 765.66 | 765.66 | 765.95 | 0.01642  | 2.38   | 2.73  | 4.81   | 1.01 |       | 79.88  |       | 79.88  |
| AFLUENTE  | MARGEN DCHA | 246.422  | T=25 | 6.5   | 764.83 | 765.61 | 765.52 | 765.82 | 0.010266 | 2.03   | 3.2   | 4.99   | 0.81 |       | 56.22  |       | 56.22  |
| AFLUENTE  | MARGEN DCHA | 242.193  | T=25 | 6.5   | 764.79 | 765.5  | 765.5  | 765.76 | 0.01587  | 2.25   | 2.89  | 5.71   | 1.01 |       | 72.82  |       | 72.82  |
| AFLUENTE  | MARGEN DCHA | 239.244  | T=25 | 6.5   | 764.69 | 765.34 | 765.44 | 765.69 | 0.024672 | 2.61   | 2.49  | 6.24   | 1.25 | 4.03  | 102.53 |       | 91.62  |
| AFLUENTE  | MARGEN DCHA | 235.959  | T=25 | 6.5   | 764.55 | 765.24 | 765.33 | 765.61 | 0.025765 | 2.69   | 2.42  | 5.68   | 1.27 | 3.55  | 107.91 |       | 100.85 |
| AFLUENTE  | MARGEN DCHA | 232.813  | T=25 | 6.5   | 764.43 | 764.85 | 765.03 | 765.45 | 0.073663 | 3.44   | 1.89  | 6.64   | 2.06 |       | 202.37 |       | 202.37 |
| AFLUENTE  | MARGEN DCHA | 229.992  | T=25 | 6.5   | 764.3  | 765.24 | 764.9  | 765.29 | 0.001808 | 0.92   | 7.06  | 10.81  | 0.36 |       | 11.1   |       | 11.1   |
| AFLUENTE  | MARGEN DCHA | 223.682  | T=25 | 6.5   | 764.11 | 764.98 | 764.98 | 765.24 | 0.015511 | 2.25   | 2.88  | 5.71   | 1.01 |       | 72.73  |       | 72.73  |
| AFLUENTE  | MARGEN DCHA | 203.774  | T=25 | 6.5   | 762.83 | 763.15 | 763.34 | 763.82 | 0.098838 | 3.62   | 1.79  | 7.19   | 2.32 |       | 235.7  |       | 235.7  |
| AFLUENTE  | MARGEN DCHA | 197.305  | T=25 | 6.5   | 762.1  | 762.63 | 762.82 | 763.25 | 0.074871 | 3.5    | 1.86  | 6.34   | 2.06 |       | 208.63 |       | 208.63 |
| AFLUENTE  | MARGEN DCHA | 188.798  | T=25 | 6.5   | 761.4  | 762.51 | 762.15 | 762.6  | 0.003437 | 1.39   | 4.66  | 5.46   | 0.48 |       | 24.31  |       | 24.31  |
| AFLUENTE  | MARGEN DCHA | 182.911  | T=25 | 6.5   | 761.04 | 762.17 | 762.17 | 762.54 | 0.017843 | 2.68   | 2.43  | 3.34   | 1    |       | 97.54  |       | 97.54  |
| AFLUENTE  | MARGEN DCHA | 177.41   | T=25 | 6.5   | 760.93 | 761.47 | 761.73 | 762.32 | 0.065744 | 4.08   | 1.59  | 3.46   | 1.92 |       | 254.02 |       | 254.02 |
| AFLUENTE  | MARGEN DCHA | 172.631  | T=25 | 6.5   | 760.79 | 762.05 | 761.6  | 762.17 | 0.00363  | 1.49   | 4.36  | 4.18   | 0.47 |       | 27.22  |       | 27.22  |
| AFLUENTE  | MARGEN DCHA | 167.601  | T=25 | 6.5   | 760.55 | 762.05 | 761.5  | 762.15 | 0.002826 | 1.38   | 4.71  | 4.24   | 0.42 |       | 22.73  |       | 22.73  |
| AFLUENTE  | MARGEN DCHA | 162.637  | T=25 | 6.5   | 760.8  | 762.02 | 761.61 | 762.13 | 0.003732 | 1.49   | 4.37  | 4.53   | 0.48 |       | 27.33  |       | 27.33  |
| AFLUENTE  | MARGEN DCHA | 157.529  | T=25 | 6.5   | 760.36 | 761.67 | 761.67 | 762.06 | 0.019222 | 2.78   | 2.34  | 2.95   | 1    |       | 104.91 |       | 104.91 |
| AFLUENTE  | MARGEN DCHA | 152.542  | T=25 | 6.5   | 760.25 | 760.6  | 760.91 | 761.78 | 0.132051 | 4.81   | 1.35  | 4.14   | 2.69 |       | 387.74 |       | 387.74 |
| AFLUENTE  | MARGEN DCHA | 147.403  | T=25 | 6.5   | 760    | 760.43 | 760.66 | 761.18 | 0.06871  | 3.84   | 1.69  | 4.43   | 1.99 |       | 235.03 |       | 235.03 |
| AFLUENTE  | MARGEN DCHA | 140.995  | T=25 | 6.5   | 759.81 | 760.41 | 760.51 | 760.78 | 0.031373 | 2.69   | 2.41  | 6.19   | 1.38 |       | 113.35 |       | 113.35 |
| AFLUENTE  | MARGEN DCHA | 134.769  | T=25 | 6.5   | 759.71 | 760.33 | 760.34 | 760.62 | 0.016461 | 2.37   | 2.74  | 4.94   | 1.02 |       | 79.87  |       | 79.87  |
| AFLUENTE  | MARGEN DCHA | 128.576  | T=25 | 6.5   | 759.51 | 760.31 | 760.21 | 760.51 | 0.009205 | 1.97   | 3.3   | 5.03   | 0.78 |       | 52.16  |       | 52.16  |
| AFLUENTE  | MARGEN DCHA | 122.101  | T=25 | 6.5   | 759.32 | 760.32 | 760.08 | 760.45 | 0.00475  | 1.56   | 4.17  | 5.59   | 0.57 |       | 31.07  | 0.79  | 30.71  |
| AFLUENTE  | MARGEN DCHA | 115.354  | T=25 | 6.5   | 759.18 | 760.28 | 760.04 | 760.41 | 0.005507 | 1.62   | 4.02  | 5.75   | 0.62 |       | 34.11  |       | 34.11  |
| AFLUENTE  | MARGEN DCHA | 109.31   | T=25 | 6.5   | 759.09 | 760.2  | 760.09 | 760.37 | 0.008766 | 1.82   | 3.58  | 6.22   | 0.76 |       | 45.61  |       | 45.61  |
| AFLUENTE  | MARGEN DCHA | 104.112  | T=25 | 6.5   | 759    | 760.24 | 759.74 | 760.32 | 0.002355 | 1.23   | 5.3   | 6.37   | 0.41 |       | 18.49  | 2.01  | 16.84  |
| AFLUENTE  | MARGEN DCHA | 97.715   | T=25 | 6.5   | 758.95 | 759.93 | 759.93 | 760.26 | 0.016405 | 2.55   | 2.55  | 3.9    | 1    |       | 88.55  |       | 88.55  |
| AFLUENTE  | MARGEN DCHA | 90.562   | T=25 | 6.5   | 758.92 | 759.43 | 759.62 | 760.04 | 0.050742 | 3.46</ |       |        |      |       |        |       |        |

## 50 AÑOS DE PERIODO DE RETORNO

| River     | Reach        | River Sta | Profile | Q Total<br>(m <sup>3</sup> /s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Total<br>(m/s) | Flow Area<br>(m <sup>2</sup> ) | Top Width<br>(m) | Froude # Chl | Shear LOB<br>(N/m <sup>2</sup> ) | Shear Chan<br>(N/m <sup>2</sup> ) | Shear ROB<br>(N/m <sup>2</sup> ) | Shear Total<br>(N/m <sup>2</sup> ) |
|-----------|--------------|-----------|---------|--------------------------------|------------------|------------------|------------------|------------------|---------------------|--------------------|--------------------------------|------------------|--------------|----------------------------------|-----------------------------------|----------------------------------|------------------------------------|
| BERGANTES | MORELLALTO   | 3010.624  | T=50    | 141.35                         | 770.99           | 772.81           | 772.96           | 773.61           | 0.016001            | 3.88               | 36.47                          | 34.23            | 1.18         | 46.67                            | 182.6                             | 55.85                            | 164.11                             |
| BERGANTES | MORELLALTO   | 2969.898  | T=50    | 141.35                         | 770.34           | 772.56           | 772.47           | 773              | 0.008955            | 2.88               | 49.01                          | 46.06            | 0.88         | 59.05                            | 102.47                            | 24.51                            | 92.16                              |
| BERGANTES | MORELLALTO   | 2939.593  | T=50    | 141.35                         | 769.67           | 772.22           | 772.22           | 772.7            | 0.012133            | 3.03               | 46.63                          | 50.86            | 1            | 68.19                            | 115.81                            | 12.57                            | 107.68                             |
| BERGANTES | MORELLALTO   | 2872.683  | T=50    | 141.35                         | 767.96           | 771.44           | 771.3            | 771.81           | 0.008406            | 2.67               | 52.91                          | 51.01            | 0.84         | 45.5                             | 86.61                             | 5.11                             | 82.29                              |
| BERGANTES | MORELLALTO   | 2814.464  | T=50    | 141.35                         | 767.63           | 770.03           | 770.23           | 770.96           | 0.017672            | 4.24               | 33.35                          | 27.99            | 1.23         | 56.99                            | 207.21                            |                                  | 199.8                              |
| BERGANTES | MORELLALTO   | 2760.083  | T=50    | 141.35                         | 766.68           | 769.21           | 768.75           | 769.67           | 0.004689            | 3                  | 47.17                          | 24.35            | 0.69         | 5.73                             | 87.92                             |                                  | 80.48                              |
| BERGANTES | MORELLALTO   | 2723.041  | T=50    | 141.35                         | 765.98           | 768.92           | 768.72           | 769.45           | 0.007917            | 3.24               | 43.67                          | 29.45            | 0.85         |                                  | 111.55                            |                                  | 111.55                             |
| BERGANTES | MORELLALTO   | 2698.332  | T=50    | 141.35                         | 765.89           | 768.54           | 768.49           | 769.22           | 0.010099            | 3.66               | 38.59                          | 25.96            | 0.96         |                                  | 142.68                            |                                  | 142.68                             |
| BERGANTES | MORELLALTO   | 2668.283  | T=50    | 141.35                         | 765.53           | 768.67           | 767.82           | 768.97           | 0.002481            | 2.36               | 59.83                          | 27.98            | 0.52         | 25.2                             | 55.54                             | 7.34                             | 49.14                              |
| BERGANTES | MORELLALTO   | 2627.521  | T=50    | 141.35                         | 765.42           | 768.59           | 767.74           | 768.86           | 0.002627            | 2.27               | 62.26                          | 32.41            | 0.52         | 14.78                            | 50.94                             |                                  | 48.1                               |
| BERGANTES | MORELLALTO   | 2600.858  | T=50    | 141.35                         | 765.17           | 767.83           | 767.83           | 768.67           | 0.010936            | 4.07               | 34.7                           | 20.71            | 1            |                                  | 170.72                            |                                  | 170.72                             |
| BERGANTES | MORELLALTO   | 2583.825  | T=50    | 141.35                         | 765.16           | 767.07           | 767.38           | 768.31           | 0.020694            | 4.86               | 29.07                          | 22.69            | 1.37         | 6.45                             | 267.49                            | 86.65                            | 252.74                             |
| BERGANTES | MORELLALTO   | 2570.241  | T=50    | 141.35                         | 764.9            | 766.58           | 766.98           | 767.98           | 0.026104            | 5.2                | 27.17                          | 23.39            | 1.51         | 28.7                             | 310.1                             | 56.47                            | 290.55                             |
| BERGANTES | MORELLALTO   | 2552.039  | T=50    | 141.35                         | 764.85           | 767.28           | 767.03           | 767.78           | 0.006312            | 3.11               | 45.46                          | 28.26            | 0.78         | 15.48                            | 100.17                            | 3.35                             | 95.3                               |
| BERGANTES | MORELLALTO   | 2529.844  | T=50    | 141.35                         | 764.74           | 766.89           | 766.89           | 767.59           | 0.010817            | 3.66               | 38.59                          | 28.58            | 1            | 57.38                            | 149.49                            | 8.8                              | 138.71                             |
| BERGANTES | MORELLALTO   | 2507.039  | T=50    | 141.35                         | 764.54           | 766.69           | 766.69           | 767.27           | 0.011726            | 3.34               | 42.34                          | 38.24            | 1.01         | 26.95                            | 129.8                             | 7.38                             | 125.58                             |
| BERGANTES | MORELLALTO   | 2490.032  | T=50    | 141.35                         | 763.92           | 766.68           | 766.16           | 766.97           | 0.004895            | 2.38               | 59.36                          | 45.3             | 0.66         | 3.04                             | 62.44                             |                                  | 62.11                              |
| BERGANTES | MORELLALTO   | 2467.629  | T=50    | 141.35                         | 763.74           | 766.49           | 766.06           | 766.84           | 0.005397            | 2.63               | 53.65                          | 38.32            | 0.7          | 11.38                            | 74.89                             |                                  | 72.71                              |
| BERGANTES | MORELLALTO   | 2431.791  | T=50    | 141.35                         | 763.61           | 766.4            | 765.86           | 766.63           | 0.004185            | 2.15               | 65.86                          | 52.45            | 0.61         | 5.91                             | 51.43                             |                                  | 50.94                              |
| BERGANTES | MORELLALTO   | 2410.195  | T=50    | 141.35                         | 763.48           | 766.03           | 766.03           | 766.48           | 0.012732            | 2.97               | 47.61                          | 53.49            | 1            | 3.93                             | 110.37                            |                                  | 110.11                             |
| BERGANTES | MORELLALTO   | 2382.362  | T=50    | 141.35                         | 763.27           | 765.58           | 765.64           | 766.04           | 0.016833            | 3.01               | 46.91                          | 63.54            | 1.12         |                                  | 120.97                            |                                  | 120.97                             |
| BERGANTES | MORELLALTO   | 2350.675  | T=50    | 141.35                         | 763              | 765.53           | 765.25           | 765.73           | 0.005294            | 2                  | 70.74                          | 74.71            | 0.66         |                                  | 48.93                             |                                  | 48.93                              |
| BERGANTES | MORELLALTO   | 2316.747  | T=50    | 141.35                         | 762.95           | 765.11           | 765.11           | 765.48           | 0.014049            | 2.68               | 52.72                          | 74.43            | 1.02         |                                  | 97.06                             |                                  | 97.06                              |
| BERGANTES | MORELLALTO   | 2293.848  | T=50    | 141.35                         | 762.68           | 764.74           | 764.53           | 765.05           | 0.006953            | 2.45               | 57.68                          | 54.91            | 0.76         |                                  | 71.14                             |                                  | 71.14                              |
| BERGANTES | MORELLALTO   | 2267.093  | T=50    | 141.35                         | 762.13           | 764.2            | 764.24           | 764.75           | 0.013559            | 3.27               | 43.26                          | 43.99            | 1.05         |                                  | 129.43                            |                                  | 129.43                             |
| BERGANTES | MORELLALTO   | 2243.8    | T=50    | 141.35                         | 761.93           | 763.72           | 763.85           | 764.4            | 0.016794            | 3.65               | 38.68                          | 39.12            | 1.17         |                                  | 161.51                            |                                  | 161.51                             |
| BERGANTES | MORELLALTO   | 2222.517  | T=50    | 141.35                         | 761.23           | 763.81           | 763.45           | 764.12           | 0.005603            | 2.47               | 57.3                           | 45.77            | 0.7          |                                  | 68.07                             |                                  | 68.07                              |
| BERGANTES | MORELLALTO   | 2195.681  | T=50    | 141.35                         | 761.09           | 763.62           | 763.36           | 763.96           | 0.006003            | 2.59               | 54.65                          | 42.86            | 0.73         | 5.23                             | 74.43                             |                                  | 73.61                              |
| BERGANTES | MORELLALTO   | 2168.338  | T=50    | 141.35                         | 760.93           | 763.46           | 763.23           | 763.79           | 0.006626            | 2.55               | 55.4                           | 47.59            | 0.75         |                                  | 74.66                             |                                  | 74.66                              |
| BERGANTES | MORELLALTO   | 2146.539  | T=50    | 141.35                         | 760.43           | 762.95           | 762.95           | 763.6            | 0.010614            | 3.56               | 39.68                          | 29.16            | 0.97         |                                  | 138.6                             |                                  | 138.6                              |
| BERGANTES | MORELLALTO   | 2084.025  | T=50    | 141.35                         | 760.35           | 762.33           | 762.29           | 762.79           | 0.010957            | 2.98               | 47.41                          | 47.41            | 0.95         |                                  | 106.96                            |                                  | 106.96                             |
| BERGANTES | MORELLALTO   | 2046.533  | T=50    | 141.35                         | 759.74           | 761.88           | 761.67           | 762.34           | 0.007378            | 3                  | 47.07                          | 33.97            | 0.81         |                                  | 97.92                             |                                  | 97.92                              |
| BERGANTES | MORELLALTO   | 1990.019  | T=50    | 141.35                         | 758.88           | 761.26           | 761.26           | 761.7            | 0.01331             | 2.92               | 48.4                           | 57.15            | 1.01         |                                  | 108.84                            |                                  | 108.84                             |
| BERGANTES | MORELLALTO   | 1932.588  | T=50    | 141.35                         | 758.27           | 760.98           | 760.37           | 761.26           | 0.003703            | 2.32               | 60.85                          | 38.31            | 0.59         |                                  | 56.08                             |                                  | 56.08                              |
| BERGANTES | MORELLALTO   | 1879.673  | T=50    | 141.35                         | 757.99           | 760.04           | 760.14           | 760.79           | 0.014464            | 3.84               | 36.81                          | 30.11            | 1.11         |                                  | 167.6                             |                                  | 167.6                              |
| BERGANTES | MORELLALTO   | 1822.942  | T=50    | 141.35                         | 756.96           | 759.79           | 759.07           | 760.02           | 0.002798            | 2.11               | 66.86                          | 39.6             | 0.52         |                                  | 45.4                              |                                  | 45.4                               |
| BERGANTES | MORELLALTO   | 1785.543  | T=50    | 141.35                         | 756.62           | 759.66           | 758.9            | 759.89           | 0.004154            | 2.13               | 66.49                          | 52.85            | 0.6          |                                  | 50.53                             |                                  | 50.53                              |
| BERGANTES | MORELLALTO   | 1756.862  | T=50    | 141.35                         | 756.44           | 759.46           | 758.97           | 759.74           | 0.005853            | 2.34               | 60.35                          | 53.25            | 0.7          |                                  | 63.66                             |                                  | 63.66                              |
| BERGANTES | MORELLALTO   | 1744.35   | T=50    | 141.35                         | 756.22           | 758.81           | 758.78           | 759.6            | 0.010688            | 3.93               | 35.93                          | 22.16            | 0.99         |                                  | 161.1                             |                                  | 161.1                              |
| BERGANTES | MORELLALTO   | 1723.778  | T=50    | 141.35                         | 756.22           | 758.41           | 758.68           | 759.32           | 0.013028            | 4.23               | 33.45                          | 32.4             | 1.33         |                                  | 127.67                            |                                  | 127.67                             |
| BERGANTES | MORELLALTO   | 1708.685  | T=50    | 141.35                         | 755.98           | 758.19           | 758.43           | 759.16           | 0.010166            | 4.36               | 32.38                          | 24.45            | 1.21         |                                  | 125.98                            |                                  | 125.98                             |
| BERGANTES | MORELLALTO   | 1694.402  | T=50    | 141.35                         | 755.69           | 757.95           | 758.24           | 758.99           | 0.013564            | 4.51               | 31.36                          | 28.13            | 1.36         |                                  | 142.09                            |                                  | 142.09                             |
| BERGANTES | MORELLALTO   | 1679.373  | T=50    | 141.35                         | 755.68           | 757.44           | 757.81           | 758.67           | 0.027109            | 4.9                | 28.83                          | 39.29            | 1.83         |                                  | 191.65                            |                                  | 191.65                             |
| BERGANTES | MORELLALTO   | 1663.422  | T=50    | 141.35                         | 755.3            | 757.56           | 757.66           | 758.23           | 0.010182            | 3.64               | 38.79                          | 39               | 1.17         |                                  | 96.16                             |                                  | 96.16                              |
| BERGANTES | MORELLALTO   | 1652.841  | T=50    | 141.35                         | 755.03           | 757.69           | 757.38           | 758.06           | 0.003353            | 2.7                | 52.43                          | 36.53            | 0.72         | 7.57                             | 46.58                             |                                  | 45.62                              |
| BERGANTES | MORELLALTO   | 1626.672  | T=50    | 141.35                         | 754.86           | 757.72           | 757.09           | 757.95           | 0.00135             | 2.12               | 66.68                          | 41.45            | 0.53         | 4.05                             | 21.1                              |                                  | 20.56                              |
| BERGANTES | MORELLAMEDIO | 1608.287  | T=50    | 141.35                         | 754.82           | 757.68           | 756.93           | 757.95           | 0.004029            | 2.29               | 61.64                          | 44.41            | 0.62         | 9.64                             | 53.74                             |                                  | 52.7                               |
| BERGANTES | MORELLAMEDIO | 1585.133  | T=50    | 141.35                         | 754.48           | 757.57           | 756.79           | 757.86           | 0.001952            | 2.35               | 60.23                          | 43.31            | 0.64         | 9.17                             | 26.42                             |                                  | 25.36                              |
| BERGANTES | MORELLAMEDIO | 1556.852  | T=50    | 141.35                         | 754.25           | 757.44           | 756.72           | 757.7            | 0.002324            | 2                  | 70.62                          | 70.21            | 0.52         | 4.44                             | 42.78                             | 5.53                             | 21.9                               |
| BERGANTES | MORELLAMEDIO | 1539.471  | T=50    | 141.35                         | 754.1            | 757.39           | 756.66           | 757.63           | 0.002689            | 2.02               | 70.12                          | 62.84            | 0.5          | 11.08                            | 49.8                              | 5.46                             | 28.17                              |
| BERGANTES | MORELLAMEDIO | 1525.248  | T=50    | 141.35                         | 753.98           | 757.32           | 756.42           | 757.55           | 0.002017            | 2                  | 70.85                          | 61.69            | 0.46         | 6.7                              | 42.55                             | 3.59                             | 21.73                              |
| BERGANTES | MORELLAMEDIO | 1512.932  | T=50    | 141.35                         | 753.82           | 757.18           | 756.36           | 757.47           | 0.0034              | 2.14               | 66.01                          | 72.4             | 0.51         | 12.17                            | 74.38                             | 6.48                             | 29.31                              |
| BERGANTES | MORELLAMEDIO | 1498.456  | T=50    | 141.35                         | 753.71           | 756.77           | 756.42           | 757.29           | 0.006096            | 2.91               | 48.6                           | 42.62            | 0.71         | 12.62                            | 123.96                            | 16.94                            | 64.77                              |
| BERGANTES | MORELLAMEDIO | 1476.214  | T=50    | 141.35                         | 753.53           | 756.71           | 756.43           | 757.02           | 0.008383            | 2.41               | 58.63                          | 51.4             | 0.69         | 58.13                            | 102.74                            | 10.25                            | 89.71                              |
| BERGANTES | MORELLAMEDIO | 1447.308  | T=50    | 141.35                         | 753.29           | 756.56           | 756.17           | 756.77           | 0.006076            | 2.01               | 70.43                          | 65.75            | 0.59         | 50.44                            | 75.89                             | 16.06                            | 61.49                              |
| BERGANTES | MORELLAMEDIO | 1418.074  | T=50    | 141.35                         | 753.12           | 756.01           | 756.01           | 756.6            | 0.005925            | 2.74               | 51.61                          | 68.75            | 0.75         | 54.34                            | 128.28                            | 16.43                            | 42.62                              |
| BERGANTES | MORELLAMEDIO | 1394.002  | T=50    | 141.35                         | 752.39           | 755.72           | 755.41           | 755.93           | 0.009716            | 2.05               | 69.12                          | 74.03            | 0.67         | 20.31                            | 87.13                             |                                  | 86.39                              |
| BERGANTES | MORELLAMEDIO | 1370.229  | T=50    | 141.35                         | 751.84           | 755.56           | 754.75           | 755.71           | 0.006931            | 1.71               | 82.43                          | 83.69            | 0.55         | 15.12                            | 65.6                              |                                  | 64.81                              |
| BERGANTES | MORELLAMEDIO | 1353.036  | T=50    | 141.35                         | 751.91           | 755.43           | 755.12           | 755.61           | 0.003623            | 1.84               | 76.69                          | 82.31            | 0.61         | 10.22                            | 32.6                              |                                  | 31.77                              |
| BERGANTES | MORELLAMEDIO | 1337.958  | T=50    | 141.35                         | 751.97           | 754.65           | 754.65           | 755.47           | 0.00942             | 4.01               | 35.25                          | 21.64            | 1            | 4.87                             | 138.95                            |                                  | 132.28                             |
| BERGANTES | MORELLAMEDIO | 1323.549  | T=50    | 141.35                         | 751.94           | 753.57           | 754              | 755.12           | 0.027529            | 5.49               | 25.73                          | 19.24            | 1.52         | 25.11                            | 349.6                             |                                  | 336.61                             |

DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

|           |             |          |      |        |        |        |        |        |          |      |        |        |      |       |        |        |
|-----------|-------------|----------|------|--------|--------|--------|--------|--------|----------|------|--------|--------|------|-------|--------|--------|
| BERGANTES | MORELLABAJO | 1250.764 | T=50 | 141.35 | 751.05 | 752.33 | 752.96 | 755.01 | 0.157931 | 7.25 | 19.49  | 32.78  | 3    |       | 901.35 | 901.35 |
| BERGANTES | MORELLABAJO | 1221.555 | T=50 | 141.35 | 750.66 | 753.08 | 752.49 | 753.36 | 0.003848 | 2.31 | 61.22  | 34.88  | 0.55 | 18.58 | 64.92  | 62.52  |
| BERGANTES | MORELLABAJO | 1189.277 | T=50 | 141.35 | 750.64 | 752.96 | 752.24 | 753.21 | 0.00307  | 2.2  | 64.13  | 33.79  | 0.51 | 18.28 | 57.66  | 54.79  |
| BERGANTES | MORELLABAJO | 1159.131 | T=50 | 141.35 | 750.66 | 752.87 | 752.09 | 753.12 | 0.002839 | 2.16 | 65.57  | 33.85  | 0.49 | 19.37 | 55.37  | 51.6   |
| BERGANTES | MORELLABAJO | 1119.613 | T=50 | 141.35 | 749.98 | 752.11 | 751.91 | 752.54 | 0.0092   | 2.91 | 48.55  | 38.53  | 0.83 |       | 112.66 | 112.66 |
| BERGANTES | MORELLABAJO | 1080.628 | T=50 | 141.35 | 749.39 | 751.66 | 751.38 | 752.13 | 0.007469 | 3.02 | 46.88  | 29.17  | 0.76 |       | 112.69 | 112.69 |
| BERGANTES | MORELLABAJO | 1046.059 | T=50 | 141.35 | 749.3  | 751.33 | 751    | 751.78 | 0.00686  | 2.98 | 47.5   | 28.53  | 0.74 |       | 108.15 | 108.15 |
| BERGANTES | MORELLABAJO | 996.576  | T=50 | 141.35 | 748.55 | 751.17 | 750.57 | 751.31 | 0.003965 | 1.63 | 86.51  | 81.87  | 0.52 |       | 43.87  | 30.01  |
| BERGANTES | MORELLABAJO | 950.974  | T=50 | 141.35 | 747.89 | 750.32 | 750.24 | 750.78 | 0.012965 | 3    | 47.07  | 45.74  | 0.94 |       | 128.57 | 128.57 |
| BERGANTES | MORELLABAJO | 913.674  | T=50 | 141.35 | 747.67 | 749.92 | 749.48 | 750.2  | 0.004901 | 2.31 | 61.26  | 42.21  | 0.61 |       | 67.89  | 67.89  |
| BERGANTES | MORELLABAJO | 882.552  | T=50 | 141.35 | 747.41 | 749.82 | 749.2  | 750.04 | 0.003458 | 2.08 | 68.08  | 42.74  | 0.53 |       | 53.12  | 53.12  |
| BERGANTES | MORELLABAJO | 854.465  | T=50 | 141.35 | 746.84 | 749.39 | 748.94 | 749.7  | 0.005033 | 2.47 | 57.34  | 36.41  | 0.63 |       | 75.49  | 75.49  |
| BERGANTES | MORELLABAJO | 808.923  | T=50 | 141.35 | 746.55 | 749.17 | 748.75 | 749.44 | 0.005753 | 2.3  | 61.48  | 47.91  | 0.65 |       | 70.3   | 70.3   |
| BERGANTES | MORELLABAJO | 745.564  | T=50 | 141.35 | 746.36 | 748.25 | 748.25 | 748.79 | 0.014288 | 3.26 | 43.41  | 40.44  | 1.01 | 36.29 | 150.28 | 145.67 |
| BERGANTES | MORELLABAJO | 695.776  | T=50 | 141.35 | 745.3  | 747.67 | 747.52 | 748.15 | 0.009713 | 3.05 | 46.42  | 35.55  | 0.86 |       | 125    | 120.85 |
| BERGANTES | MORELLABAJO | 655.942  | T=50 | 141.35 | 745    | 747.52 | 747.24 | 747.79 | 0.006088 | 2.28 | 61.97  | 52.55  | 0.67 | 11.89 | 71.38  | 20.93  |
| BERGANTES | MORELLABAJO | 613.402  | T=50 | 141.35 | 744.55 | 746.35 | 746.46 | 747.06 | 0.01816  | 3.72 | 37.96  | 34.92  | 1.14 |       | 193.99 | 33.93  |
| BERGANTES | MORELLABAJO | 567.073  | T=50 | 141.35 | 743.49 | 745.99 | 745.69 | 746.31 | 0.006723 | 2.5  | 56.51  | 44.39  | 0.71 |       | 82.94  | 82.94  |
| BERGANTES | MORELLABAJO | 508.645  | T=50 | 141.35 | 743.25 | 745.69 | 745.26 | 745.9  | 0.004632 | 2.05 | 68.9   | 55.31  | 0.59 |       | 56.14  | 2.75   |
| BERGANTES | MORELLABAJO | 467.757  | T=50 | 141.35 | 742.83 | 745.08 | 744.81 | 745.44 | 0.01197  | 2.63 | 53.79  | 60.73  | 0.89 |       | 103.67 | 31.37  |
| BERGANTES | MORELLABAJO | 443.346  | T=50 | 141.35 | 742.33 | 744.28 | 744.48 | 745.02 | 0.018403 | 3.81 | 37.11  | 32.7   | 1.14 |       | 200.47 | 200.47 |
| BERGANTES | MORELLABAJO | 406.528  | T=50 | 141.35 | 741.66 | 743.51 | 743.22 | 743.77 | 0.006038 | 2.24 | 63.11  | 54.27  | 0.66 |       | 68.42  | 68.42  |
| BERGANTES | MORELLABAJO | 374.786  | T=50 | 141.35 | 741.21 | 743.39 | 742.85 | 743.59 | 0.004551 | 1.98 | 71.41  | 59.94  | 0.58 |       | 52.96  | 52.96  |
| BERGANTES | MORELLABAJO | 348.086  | T=50 | 141.35 | 740.78 | 743.28 | 742.75 | 743.47 | 0.004698 | 1.91 | 74.1   | 67.25  | 0.58 |       | 50.5   | 50.5   |
| BERGANTES | MORELLABAJO | 316.306  | T=50 | 141.35 | 740.53 | 742.89 | 742.7  | 743.28 | 0.009135 | 2.76 | 51.27  | 43.84  | 0.81 |       | 103.63 | 103.63 |
| BERGANTES | MORELLABAJO | 292.552  | T=50 | 141.35 | 740.53 | 742.74 | 742.52 | 743.06 | 0.009652 | 2.46 | 57.39  | 61.22  | 0.81 | 33.14 | 89.69  | 87.74  |
| BERGANTES | MORELLABAJO | 264.24   | T=50 | 141.35 | 740.19 | 741.82 | 742.04 | 742.46 | 0.029331 | 3.56 | 39.73  | 54.94  | 1.34 |       | 203.37 | 203.37 |
| BERGANTES | MORELLABAJO | 222.046  | T=50 | 141.35 | 739.99 | 741.72 | 741.22 | 741.78 | 0.001957 | 1.08 | 130.44 | 143.32 | 0.36 |       | 17.37  | 17.37  |
| BERGANTES | MORELLABAJO | 185.338  | T=50 | 141.35 | 738.01 | 740.69 | 739.98 | 740.74 | 0.001428 | 0.99 | 142.18 | 139.62 | 0.31 |       | 14.11  | 14.11  |
| BERGANTES | MORELLABAJO | 138.968  | T=50 | 141.35 | 737.31 | 739.18 | 739.41 | 740.03 | 0.026153 | 4.07 | 34.72  | 36.55  | 1.33 |       | 241.84 | 241.84 |
| BERGANTES | MORELLABAJO | 80.632   | T=50 | 141.35 | 736.08 | 738.91 | 738.72 | 739.28 | 0.009125 | 2.66 | 53.12  | 46.73  | 0.8  | 25.37 | 98.82  | 97.12  |
| BERGANTES | MORELLABAJO | 20.181   | T=50 | 141.35 | 734.83 | 737.46 | 737.62 | 738.39 | 0.016287 | 4.26 | 33.15  | 22.35  | 1.11 | 28.39 | 231.36 | 225.13 |
| AFLUENTE  | MARGEN DCHA | 324.568  | T=50 | 10.1   | 766.83 | 768.07 | 768.32 | 768.72 | 0.028046 | 3.52 | 2.87   | 5.56   | 1.33 | 11.76 | 170.49 | 8.04   |
| AFLUENTE  | MARGEN DCHA | 316.607  | T=50 | 10.1   | 766.72 | 767.59 | 767.86 | 768.43 | 0.045973 | 4.05 | 2.49   | 4.32   | 1.7  |       | 229.76 | 229.76 |
| AFLUENTE  | MARGEN DCHA | 309.883  | T=50 | 10.1   | 766.53 | 767.64 | 767.73 | 768.12 | 0.021303 | 3.07 | 3.29   | 4.88   | 1.19 |       | 125.11 | 125.11 |
| AFLUENTE  | MARGEN DCHA | 304.389  | T=50 | 10.1   | 766.09 | 766.99 | 767.27 | 767.9  | 0.048546 | 4.25 | 2.38   | 3.83   | 1.72 |       | 250.23 | 250.23 |
| AFLUENTE  | MARGEN DCHA | 296.16   | T=50 | 10.1   | 765.92 | 767.26 | 767.01 | 767.47 | 0.0064   | 2.01 | 5.03   | 5.35   | 0.66 |       | 49.06  | 49.06  |
| AFLUENTE  | MARGEN DCHA | 290.278  | T=50 | 10.1   | 765.7  | 767.25 | 766.84 | 767.43 | 0.004605 | 1.81 | 5.58   | 8.61   | 0.55 | 2.51  | 40.95  | 2.9    |
| AFLUENTE  | MARGEN DCHA | 282.946  | T=50 | 10.1   | 765.9  | 766.98 | 766.98 | 767.35 | 0.016089 | 2.71 | 3.73   | 5.09   | 1.01 |       | 96.71  | 96.71  |
| AFLUENTE  | MARGEN DCHA | 277.698  | T=50 | 10.1   | 765.53 | 766.45 | 766.68 | 767.19 | 0.039331 | 3.8  | 2.66   | 4.6    | 1.6  |       | 200.99 | 200.99 |
| AFLUENTE  | MARGEN DCHA | 269.391  | T=50 | 10.1   | 765.42 | 766.03 | 766.29 | 766.82 | 0.047937 | 3.94 | 2.56   | 5.3    | 1.77 | 6.89  | 223.72 | 213.14 |
| AFLUENTE  | MARGEN DCHA | 263.999  | T=50 | 10.1   | 765.2  | 765.87 | 766.07 | 766.56 | 0.040085 | 3.68 | 2.74   | 5.04   | 1.59 |       | 192.76 | 192.76 |
| AFLUENTE  | MARGEN DCHA | 258.543  | T=50 | 10.1   | 764.99 | 766.12 | 765.95 | 766.31 | 0.006939 | 1.92 | 5.27   | 7.22   | 0.72 |       | 46.66  | 46.66  |
| AFLUENTE  | MARGEN DCHA | 252.147  | T=50 | 10.1   | 764.93 | 765.87 | 765.87 | 766.23 | 0.015749 | 2.67 | 3.78   | 5.27   | 1.01 |       | 94.39  | 94.39  |
| AFLUENTE  | MARGEN DCHA | 246.422  | T=50 | 10.1   | 764.83 | 765.62 | 765.72 | 766.11 | 0.023301 | 3.09 | 3.26   | 5.02   | 1.22 |       | 129.5  | 129.5  |
| AFLUENTE  | MARGEN DCHA | 242.193  | T=50 | 10.1   | 764.79 | 765.63 | 765.69 | 766.02 | 0.019232 | 2.78 | 3.63   | 5.93   | 1.13 |       | 105.08 | 105.08 |
| AFLUENTE  | MARGEN DCHA | 239.244  | T=50 | 10.1   | 764.69 | 765.47 | 765.62 | 765.95 | 0.025119 | 2.89 | 3.5    | 9.1    | 1.3  | 21.1  | 132.16 | 90.47  |
| AFLUENTE  | MARGEN DCHA | 235.959  | T=50 | 10.1   | 764.55 | 765.39 | 765.53 | 765.87 | 0.024282 | 2.92 | 3.46   | 8.53   | 1.28 | 18.7  | 131.18 | 91.45  |
| AFLUENTE  | MARGEN DCHA | 232.813  | T=50 | 10.1   | 764.43 | 764.95 | 765.18 | 765.72 | 0.070667 | 3.88 | 2.6    | 7.38   | 2.08 |       | 239.93 | 239.93 |
| AFLUENTE  | MARGEN DCHA | 229.992  | T=50 | 10.1   | 764.3  | 765.49 | 765.03 | 765.54 | 0.001591 | 1.04 | 9.75   | 11.11  | 0.35 |       | 12.83  | 12.83  |
| AFLUENTE  | MARGEN DCHA | 223.682  | T=50 | 10.1   | 764.11 | 765.16 | 765.16 | 765.49 | 0.014444 | 2.54 | 3.97   | 6.34   | 1.01 |       | 86.11  | 9.05   |
| AFLUENTE  | MARGEN DCHA | 203.774  | T=50 | 10.1   | 762.83 | 763.24 | 763.49 | 764.11 | 0.089113 | 4.14 | 2.44   | 7.34   | 2.29 |       | 280.09 | 280.09 |
| AFLUENTE  | MARGEN DCHA | 197.305  | T=50 | 10.1   | 762.1  | 762.72 | 762.98 | 763.57 | 0.076538 | 4.09 | 2.47   | 6.76   | 2.16 |       | 264.64 | 264.64 |
| AFLUENTE  | MARGEN DCHA | 188.798  | T=50 | 10.1   | 761.4  | 762.83 | 762.35 | 762.95 | 0.003158 | 1.56 | 6.49   | 5.91   | 0.47 |       | 28.07  | 0.48   |
| AFLUENTE  | MARGEN DCHA | 182.911  | T=50 | 10.1   | 761.04 | 762.46 | 762.46 | 762.88 | 0.016826 | 2.88 | 3.5    | 4.14   | 1    |       | 107.45 | 107.45 |
| AFLUENTE  | MARGEN DCHA | 177.41   | T=50 | 10.1   | 760.93 | 762.4  | 761.98 | 762.59 | 0.00514  | 1.89 | 5.35   | 4.73   | 0.57 |       | 42.27  | 42.27  |
| AFLUENTE  | MARGEN DCHA | 172.631  | T=50 | 10.1   | 760.79 | 762.4  | 761.84 | 762.55 | 0.003836 | 1.72 | 5.88   | 4.5    | 0.48 |       | 34.1   | 34.1   |
| AFLUENTE  | MARGEN DCHA | 167.601  | T=50 | 10.1   | 760.55 | 762.4  | 761.75 | 762.53 | 0.003147 | 1.61 | 6.26   | 4.62   | 0.44 |       | 29.53  | 29.53  |
| AFLUENTE  | MARGEN DCHA | 162.637  | T=50 | 10.1   | 760.8  | 762.37 | 761.84 | 762.51 | 0.003607 | 1.67 | 6.05   | 4.91   | 0.48 |       | 32.16  | 32.16  |
| AFLUENTE  | MARGEN DCHA | 157.529  | T=50 | 10.1   | 760.36 | 761.97 | 761.97 | 762.45 | 0.018417 | 3.04 | 3.32   | 3.49   | 0.99 |       | 118.99 | 118.99 |
| AFLUENTE  | MARGEN DCHA | 152.542  | T=50 | 10.1   | 760.25 | 760.73 | 761.13 | 762.16 | 0.110706 | 5.3  | 1.91   | 4.33   | 2.55 |       | 428.48 | 428.48 |
| AFLUENTE  | MARGEN DCHA | 147.403  | T=50 | 10.1   | 760    | 760.54 | 760.87 | 761.6  | 0.07234  | 4.55 | 2.22   | 4.61   | 2.09 |       | 306.34 | 306.34 |
| AFLUENTE  | MARGEN DCHA | 140.995  | T=50 | 10.1   | 759.81 | 760.48 | 760.68 | 761.11 | 0.04593  | 3.49 | 2.89   | 6.69   | 1.69 |       | 184.25 | 183.37 |
| AFLUENTE  | MARGEN DCHA | 134.769  | T=50 | 10.1   | 759.71 | 760.51 | 760.54 | 760.91 | 0.017012 | 2.78 | 3.63   | 5.14   | 1.06 |       | 102    | 102    |
| AFLUENTE  | MARGEN DCHA | 128.576  | T=50 | 10.1   | 759.51 | 760.55 | 760.4  | 760.8  | 0.008488 | 2.24 | 4.5    | 5.33   | 0.77 |       | 62.41  | 5.88   |
| AFLUENTE  | MARGEN DCHA | 122.101  | T=50 | 10.1   | 759.32 | 760.57 | 760.27 | 760.74 | 0.004717 | 1.8  | 5.6    | 6.02   | 0.59 |       | 38.91  | 3.82   |
| AFLUENTE  | MARGEN DCHA | 115.354  | T=50 | 10.1   | 759.18 | 760.54 | 760.26 | 760.7  | 0.005298 | 1.8  | 5.62   | 6.59   | 0.62 |       | 39.6   | 39.6   |
| AFLUENTE  | MARGEN DCHA | 109.31   | T=50 | 10.1   | 759.09 | 760.51 | 760.28 | 760.67 | 0.005789 | 1.78 | 5.67   | 7.37   | 0.65 |       | 39.93  | 39.93  |
| AFLUENTE  | MARGEN DCHA | 104.112  | T=50 | 10.1   | 759    | 760.53 | 759.95 | 760.63 | 0.002421 | 1.37 | 7.39   | 8.11   | 0.43 |       | 22.92  | 5.39   |
| AFLUENTE  | MARGEN DCHA | 97.715   | T=50 | 10.1   | 758.95 | 760.2  | 760.2  | 760.57 | 0.015315 | 2.7  | 3.74   | 5.03   | 1    |       | 95.17  | 95.17  |
| AFLUENTE  | MARGEN DCHA | 90.562   | T=50 | 10.1   | 758.92 | 759.58 | 759.82 | 760.36 | 0.046286 | 3.89 | 2.59   | 4.85   | 1.7  |       | 216.94 | 216.94 |
| AFLUENTE  | MARGEN DCHA | 79.06    | T=50 | 10.1   | 758.42 | 759.27 | 759.45 | 759.91 | 0.032632 | 3.54 | 2.85   | 4.81   | 1.47 |       |        |        |

## *100 AÑOS DE PERIODO DE RETORNO*

| River     | Reach        | River Sta | Profile | Q.Total<br>(m <sup>3</sup> /s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Total<br>(m/s) | Flow Area<br>(m <sup>2</sup> ) | Top Width<br>(m) | Froude # Chl | Shear LOB<br>(N/m <sup>2</sup> ) | Shear Chan<br>(N/m <sup>2</sup> ) | Shear ROB<br>(N/m <sup>2</sup> ) | Shear Total<br>(N/m <sup>2</sup> ) |
|-----------|--------------|-----------|---------|--------------------------------|------------------|------------------|------------------|------------------|---------------------|--------------------|--------------------------------|------------------|--------------|----------------------------------|-----------------------------------|----------------------------------|------------------------------------|
| BERGANTES | MORELLALTO   | 3010.624  | T=100   | 214.36                         | 770.99           | 773.13           | 773.35           | 774.23           | 0.016003            | 4.48               | 47.81                          | 36.23            | 1.23         | 65.24                            | 232.7                             | 80.7                             | 202.61                             |
| BERGANTES | MORELLALTO   | 2969.898  | T=100   | 214.36                         | 770.34           | 772.65           | 772.81           | 773.52           | 0.015781            | 4.01               | 53.41                          | 46.77            | 1.19         | 110.68                           | 195.2                             | 52                               | 174.2                              |
| BERGANTES | MORELLALTO   | 2939.593  | T=100   | 214.36                         | 769.67           | 772.54           | 772.54           | 773.15           | 0.010672            | 3.37               | 63.66                          | 55.57            | 0.98         | 77.39                            | 135.15                            | 27.71                            | 118.17                             |
| BERGANTES | MORELLALTO   | 2872.683  | T=100   | 214.36                         | 767.96           | 771.77           | 771.61           | 772.26           | 0.007776            | 3.05               | 70.31                          | 53.69            | 0.84         | 47.97                            | 105.14                            | 17.66                            | 95.82                              |
| BERGANTES | MORELLALTO   | 2814.464  | T=100   | 214.36                         | 767.63           | 770.5            | 770.69           | 771.58           | 0.014865            | 4.57               | 46.92                          | 30.65            | 1.18         | 80.37                            | 223.7                             |                                  | 214.68                             |
| BERGANTES | MORELLALTO   | 2760.083  | T=100   | 214.36                         | 766.68           | 768.84           | 769.26           | 770.45           | 0.020839            | 5.6                | 38.25                          | 23.75            | 1.41         | 21.57                            | 326.12                            |                                  | 301.83                             |
| BERGANTES | MORELLALTO   | 2723.041  | T=100   | 214.36                         | 765.98           | 769.42           | 769.21           | 770.09           | 0.007334            | 3.6                | 59.56                          | 33.88            | 0.85         |                                  | 129.48                            | 15.01                            | 122.56                             |
| BERGANTES | MORELLALTO   | 2698.332  | T=100   | 214.36                         | 765.89           | 769.19           | 769.03           | 769.89           | 0.007791            | 3.68               | 58.3                           | 35.41            | 0.87         | 5.97                             | 135.74                            | 8.18                             | 122.24                             |
| BERGANTES | MORELLALTO   | 2668.283  | T=100   | 214.36                         | 765.53           | 769.26           | 768.33           | 769.69           | 0.002661            | 2.78               | 77.07                          | 31.2             | 0.56         | 26.03                            | 74.67                             | 14.63                            | 60.64                              |
| BERGANTES | MORELLALTO   | 2627.521  | T=100   | 214.36                         | 765.42           | 769.22           | 768.26           | 769.56           | 0.00269             | 2.54               | 84.32                          | 37.31            | 0.54         | 23.5                             | 61.36                             |                                  | 57.76                              |
| BERGANTES | MORELLALTO   | 2600.858  | T=100   | 214.36                         | 765.17           | 768.53           | 768.53           | 769.38           | 0.010621            | 4.09               | 52.47                          | 31.58            | 1            | 24.3                             | 171.25                            |                                  | 166.21                             |
| BERGANTES | MORELLALTO   | 2583.825  | T=100   | 214.36                         | 765.16           | 767.59           | 767.9            | 769.03           | 0.015691            | 5.21               | 41.16                          | 23.92            | 1.26         | 39.46                            | 281.79                            | 98.91                            | 253.43                             |
| BERGANTES | MORELLALTO   | 2570.241  | T=100   | 214.36                         | 764.9            | 767              | 767.51           | 768.75           | 0.022377            | 5.75               | 37.31                          | 25.38            | 1.47         | 68.48                            | 355.76                            | 82.46                            | 313.23                             |
| BERGANTES | MORELLALTO   | 2552.039  | T=100   | 214.36                         | 764.85           | 767.76           | 767.47           | 768.44           | 0.006157            | 3.63               | 59.08                          | 28.71            | 0.81         | 20.74                            | 126.28                            | 9.76                             | 116.63                             |
| BERGANTES | MORELLALTO   | 2529.844  | T=100   | 214.36                         | 764.74           | 767.39           | 767.39           | 768.24           | 0.008798            | 3.87               | 55.34                          | 37.63            | 0.95         | 37.36                            | 164.65                            | 27.17                            | 120.6                              |
| BERGANTES | MORELLALTO   | 2507.039  | T=100   | 214.36                         | 764.54           | 766.93           | 767.13           | 767.83           | 0.014338            | 4.16               | 51.48                          | 39.44            | 1.15         | 44.3                             | 191.61                            | 24.79                            | 180.5                              |
| BERGANTES | MORELLALTO   | 2490.032  | T=100   | 214.36                         | 763.92           | 767.08           | 766.68           | 767.47           | 0.004815            | 2.76               | 77.74                          | 47.09            | 0.68         | 9.32                             | 77.63                             |                                  | 76.58                              |
| BERGANTES | MORELLALTO   | 2467.629  | T=100   | 214.36                         | 763.74           | 766.82           | 766.57           | 767.33           | 0.007614            | 3.12               | 68.67                          | 49.3             | 0.84         | 27.16                            | 105.99                            |                                  | 102.25                             |
| BERGANTES | MORELLALTO   | 2431.791  | T=100   | 214.36                         | 763.61           | 766.72           | 766.32           | 767.05           | 0.00487             | 2.61               | 82.29                          | 54.96            | 0.68         | 12.11                            | 71.58                             |                                  | 70.5                               |
| BERGANTES | MORELLALTO   | 2410.195  | T=100   | 214.36                         | 763.48           | 766.33           | 766.33           | 766.88           | 0.011843            | 3.3                | 64.96                          | 59.23            | 1            | 17.75                            | 127.21                            |                                  | 126.03                             |
| BERGANTES | MORELLALTO   | 2382.362  | T=100   | 214.36                         | 763.27           | 765.8            | 765.9            | 766.43           | 0.017364            | 3.51               | 61.03                          | 67.23            | 1.18         |                                  | 153.43                            |                                  | 153.43                             |
| BERGANTES | MORELLALTO   | 2350.675  | T=100   | 214.36                         | 763              | 765.8            | 765.51           | 766.08           | 0.005705            | 2.34               | 91.33                          | 80.56            | 0.7          |                                  | 63.25                             |                                  | 63.25                              |
| BERGANTES | MORELLALTO   | 2316.747  | T=100   | 214.36                         | 762.95           | 765.41           | 765.35           | 765.82           | 0.010601            | 2.85               | 75.33                          | 78.6             | 0.93         |                                  | 98.91                             |                                  | 98.91                              |
| BERGANTES | MORELLALTO   | 2293.848  | T=100   | 214.36                         | 762.68           | 765.08           | 764.86           | 765.47           | 0.006922            | 2.78               | 77.25                          | 60.91            | 0.79         | 1.94                             | 85.63                             |                                  | 85.47                              |
| BERGANTES | MORELLALTO   | 2267.093  | T=100   | 214.36                         | 762.13           | 764.59           | 764.59           | 765.21           | 0.011256            | 3.5                | 61.25                          | 49.07            | 1            | 5.83                             | 137                               |                                  | 136.24                             |
| BERGANTES | MORELLALTO   | 2243.8    | T=100   | 214.36                         | 761.93           | 764.11           | 764.22           | 764.88           | 0.014042            | 3.89               | 55.12                          | 44.38            | 1.11         |                                  | 169.51                            |                                  | 169.51                             |
| BERGANTES | MORELLALTO   | 2222.517  | T=100   | 214.36                         | 761.23           | 764.22           | 763.87           | 764.61           | 0.005236            | 2.79               | 76.92                          | 48.71            | 0.71         | 3.9                              | 80.4                              |                                  | 79.91                              |
| BERGANTES | MORELLALTO   | 2195.681  | T=100   | 214.36                         | 761.09           | 764              | 763.71           | 764.46           | 0.005979            | 3.02               | 70.95                          | 44.3             | 0.76         | 15.38                            | 94.39                             |                                  | 91.74                              |
| BERGANTES | MORELLALTO   | 2168.338  | T=100   | 214.36                         | 760.93           | 763.89           | 763.57           | 764.29           | 0.005529            | 2.81               | 76.29                          | 50.33            | 0.72         | 9.98                             | 82.78                             |                                  | 80.96                              |
| BERGANTES | MORELLALTO   | 2146.539  | T=100   | 214.36                         | 760.43           | 763.42           | 763.42           | 764.11           | 0.011141            | 3.66               | 58.5                           | 43.87            | 1            | 19.45                            | 147                               |                                  | 143.33                             |
| BERGANTES | MORELLALTO   | 2084.025  | T=100   | 214.36                         | 760.35           | 762.54           | 762.63           | 763.25           | 0.014059            | 3.71               | 57.71                          | 50.01            | 1.1          |                                  | 158.29                            |                                  | 158.29                             |
| BERGANTES | MORELLALTO   | 2046.533  | T=100   | 214.36                         | 759.74           | 762.27           | 762.24           | 762.81           | 0.011115            | 3.27               | 65.64                          | 57.13            | 0.97         |                                  | 123.05                            |                                  | 123.05                             |
| BERGANTES | MORELLALTO   | 1990.019  | T=100   | 214.36                         | 758.88           | 761.69           | 761.55           | 762.12           | 0.008248            | 2.89               | 74.16                          | 61.98            | 0.84         |                                  | 95.1                              |                                  | 95.1                               |
| BERGANTES | MORELLALTO   | 1932.588  | T=100   | 214.36                         | 758.27           | 761.49           | 760.83           | 761.85           | 0.003607            | 2.65               | 80.8                           | 40.69            | 0.6          |                                  | 68                                |                                  | 68                                 |
| BERGANTES | MORELLALTO   | 1879.673  | T=100   | 214.36                         | 757.99           | 760.44           | 760.61           | 761.37           | 0.015324            | 4.27               | 50.24                          | 36.58            | 1.16         |                                  | 199.11                            |                                  | 199.11                             |
| BERGANTES | MORELLALTO   | 1822.942  | T=100   | 214.36                         | 756.96           | 760.17           | 759.5            | 760.51           | 0.003747            | 2.59               | 82.88                          | 45.22            | 0.61         |                                  | 66.08                             |                                  | 66.08                              |
| BERGANTES | MORELLALTO   | 1785.543  | T=100   | 214.36                         | 756.62           | 760.05           | 759.55           | 760.34           | 0.004662            | 2.39               | 89.6                           | 65.49            | 0.65         | 3.98                             | 62.12                             |                                  | 61.76                              |
| BERGANTES | MORELLALTO   | 1756.862  | T=100   | 214.36                         | 756.44           | 759.84           | 759.53           | 760.18           | 0.006188            | 2.58               | 83.11                          | 66.36            | 0.74         |                                  | 74.61                             |                                  | 74.61                              |
| BERGANTES | MORELLALTO   | 1744.35   | T=100   | 214.36                         | 756.22           | 759.51           | 759.51           | 760.06           | 0.012141            | 3.3                | 65.05                          | 59.44            | 1.01         | 2.75                             | 127.51                            |                                  | 127.3                              |
| BERGANTES | MORELLALTO   | 1723.778  | T=100   | 214.36                         | 756.22           | 758.84           | 759.08           | 759.76           | 0.012189            | 4.27               | 50.24                          | 46.02            | 1.3          |                                  | 127.41                            |                                  | 127.41                             |
| BERGANTES | MORELLALTO   | 1708.685  | T=100   | 214.36                         | 755.98           | 759.1            | 759.1            | 759.64           | 0.007393            | 3.25               | 65.93                          | 62.61            | 1.01         | 15.8                             | 75.06                             |                                  | 74.23                              |
| BERGANTES | MORELLALTO   | 1694.402  | T=100   | 214.36                         | 755.69           | 758.49           | 758.65           | 759.47           | 0.009099            | 4.37               | 49                             | 34.79            | 1.16         | 13.4                             | 123.54                            |                                  | 119.96                             |
| BERGANTES | MORELLALTO   | 1679.373  | T=100   | 214.36                         | 755.68           | 757.71           | 758.14           | 759.19           | 0.02288             | 5.38               | 39.84                          | 41.68            | 1.75         | 12.06                            | 211.31                            |                                  | 210.04                             |
| BERGANTES | MORELLALTO   | 1663.422  | T=100   | 214.36                         | 755.3            | 757.83           | 758.08           | 758.78           | 0.010653            | 4.32               | 49.64                          | 39.86            | 1.24         |                                  | 125.43                            |                                  | 125.43                             |
| BERGANTES | MORELLALTO   | 1652.841  | T=100   | 214.36                         | 755.03           | 758.27           | 757.77           | 758.65           | 0.003957            | 2.71               | 79.19                          | 61.87            | 0.77         | 16.91                            | 49.06                             |                                  | 48.23                              |
| BERGANTES | MORELLALTO   | 1626.672  | T=100   | 214.36                         | 754.86           | 758.27           | 757.47           | 758.54           | 0.001412            | 2.29               | 93.68                          | 59.03            | 0.58         | 7.94                             | 21.83                             |                                  | 21.33                              |
| BERGANTES | MORELLAMEDIO | 1608.287  | T=100   | 214.36                         | 754.82           | 758.27           | 757.6            | 758.54           | 0.003906            | 2.3                | 93.09                          | 60.01            | 0.59         | 15.3                             | 58.52                             |                                  | 57.31                              |
| BERGANTES | MORELLAMEDIO | 1585.133  | T=100   | 214.36                         | 754.48           | 758.21           | 757.53           | 758.43           | 0.002358            | 2.09               | 102.78                         | 99.99            | 0.66         | 13.81                            | 23.5                              |                                  | 23.17                              |
| BERGANTES | MORELLAMEDIO | 1566.852  | T=100   | 214.36                         | 754.25           | 758.02           | 757.2            | 758.27           | 0.002033            | 1.86               | 115.27                         | 79.82            | 0.48         | 5.49                             | 48.76                             | 14.48                            | 27.25                              |
| BERGANTES | MORELLAMEDIO | 1539.471  | T=100   | 214.36                         | 754.1            | 757.94           | 757.08           | 758.21           | 0.002347            | 2.04               | 104.92                         | 65.07            | 0.49         | 11.87                            | 55.69                             | 15.83                            | 34.75                              |
| BERGANTES | MORELLAMEDIO | 1525.248  | T=100   | 214.36                         | 753.98           | 757.85           | 756.87           | 758.13           | 0.001984            | 2.06               | 103.95                         | 63.38            | 0.48         | 7.97                             | 51.87                             | 12.92                            | 29.87                              |
| BERGANTES | MORELLAMEDIO | 1512.932  | T=100   | 214.36                         | 753.82           | 757.8            | 756.9            | 758.06           | 0.002522            | 1.84               | 116.37                         | 81.35            | 0.46         | 10.73                            | 70.21                             | 18.79                            | 33.45                              |
| BERGANTES | MORELLAMEDIO | 1498.456  | T=100   | 214.36                         | 753.71           | 756.99           | 756.99           | 757.89           | 0.009405            | 3.64               | 58.83                          | 48.37            | 0.9          | 21.43                            | 211.18                            | 39.6                             | 106.83                             |
| BERGANTES | MORELLAMEDIO | 1476.214  | T=100   | 214.36                         | 753.53           | 756.98           | 756.78           | 757.44           | 0.009935            | 2.9                | 73.88                          | 58.56            | 0.78         | 80.81                            | 147.34                            | 26.45                            | 117.64                             |
| BERGANTES | MORELLAMEDIO | 1447.308  | T=100   | 214.36                         | 753.29           | 756.83           | 756.51           | 757.15           | 0.007039            | 2.41               | 89.13                          | 68.37            | 0.65         | 65.74                            | 106.63                            | 34.13                            | 86.61                              |
| BERGANTES | MORELLAMEDIO | 1418.074  | T=100   | 214.36                         | 753.12           | 756.56           | 756.56           | 756.99           | 0.003998            | 1.95               | 109.94                         | 121.25           | 0.64         | 42.8                             | 107.82                            | 23.92                            | 35.01                              |
| BERGANTES | MORELLAMEDIO | 1394.002  | T=100   | 214.36                         | 752.39           | 756.04           | 755.72           | 756.29           | 0.015941            | 2.21               | 96.81                          | 126.47           | 0.81         | 50.02                            | 118.14                            |                                  | 117.47                             |
| BERGANTES | MORELLAMEDIO | 1370.229  | T=100   | 214.36                         | 751.84           | 755.8            | 755.43           | 756.02           | 0.008227            | 2.08               | 102.89                         | 88.36            | 0.62         | 19.68                            | 92.12                             |                                  | 90.87                              |
| BERGANTES | MORELLAMEDIO | 1353.036  | T=100   | 214.36                         | 751.91           | 755.6            | 755.38           | 755.89           | 0.004893            | 2.38               | 89.97                          | 82.5             | 0.73         | 14.53                            | 51.67                             | 3.11                             | 50.11                              |
| BERGANTES | MORELLAMEDIO | 1337.958  | T=100   | 214.36                         | 751.97           | 755.32           | 755.32           | 755.79           | 0.010524            | 3.03               | 70.85                          | 80.88            | 1.03         | 8.42                             | 88.25                             |                                  | 86.47                              |
| BERGANTES | MORELLAMEDIO | 1323.549  | T=100   | 214.36                         | 751.94           | 755.05           | 755.05           | 755.52           | 0.022728            | 3.02               | 71.05                          | 77               | 1.01         | 57.35                            | 201.93                            |                                  | 197.62                             |

DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA  
INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

|           |             |          |       |        |        |        |        |        |          |      |        |        |      |       |        |        |
|-----------|-------------|----------|-------|--------|--------|--------|--------|--------|----------|------|--------|--------|------|-------|--------|--------|
| BERGANTES | MORELLABAJO | 1250.764 | T=100 | 214.36 | 751.05 | 752.63 | 753.36 | 755.3  | 0.093819 | 7.24 | 29.62  | 33.59  | 2.46 |       | 788.98 | 788.98 |
| BERGANTES | MORELLABAJO | 1221.555 | T=100 | 214.36 | 750.66 | 753.58 | 752.88 | 753.97 | 0.004548 | 2.71 | 79.12  | 39.95  | 0.61 | 30.9  | 86.5   | 83.06  |
| BERGANTES | MORELLABAJO | 1189.277 | T=100 | 214.36 | 750.64 | 753.44 | 752.64 | 753.78 | 0.005275 | 2.56 | 83.9   | 52.65  | 0.65 | 42.36 | 82.47  | 79.93  |
| BERGANTES | MORELLABAJO | 1159.131 | T=100 | 214.36 | 750.66 | 753.29 | 752.51 | 753.59 | 0.006056 | 2.42 | 88.48  | 66.34  | 0.68 | 54.18 | 78.89  | 77.24  |
| BERGANTES | MORELLABAJO | 1119.613 | T=100 | 214.36 | 749.98 | 752.65 | 752.34 | 753.11 | 0.007702 | 2.99 | 71.63  | 47.66  | 0.78 |       | 112.29 | 112.29 |
| BERGANTES | MORELLABAJO | 1080.628 | T=100 | 214.36 | 749.39 | 752.39 | 752.03 | 752.78 | 0.006659 | 2.77 | 77.34  | 50.77  | 0.72 |       | 96.51  | 96.51  |
| BERGANTES | MORELLABAJO | 1046.059 | T=100 | 214.36 | 749.3  | 751.84 | 751.59 | 752.38 | 0.010796 | 3.24 | 66.12  | 49.59  | 0.9  |       | 137.77 | 137.77 |
| BERGANTES | MORELLABAJO | 996.576  | T=100 | 214.36 | 748.55 | 751.59 | 750.94 | 751.75 | 0.00343  | 1.75 | 122.63 | 91.14  | 0.5  |       | 45.24  | 43.2   |
| BERGANTES | MORELLABAJO | 950.974  | T=100 | 214.36 | 747.89 | 750.73 | 750.66 | 751.19 | 0.011853 | 3.03 | 70.68  | 63.46  | 0.92 |       | 127.59 | 127.59 |
| BERGANTES | MORELLABAJO | 913.674  | T=100 | 214.36 | 747.67 | 750.46 | 749.84 | 750.78 | 0.004429 | 2.53 | 84.73  | 47.04  | 0.6  |       | 76.01  | 76.01  |
| BERGANTES | MORELLABAJO | 882.552  | T=100 | 214.36 | 747.41 | 750.37 | 749.58 | 750.64 | 0.003094 | 2.33 | 91.98  | 44.29  | 0.52 |       | 61.43  | 61.43  |
| BERGANTES | MORELLABAJO | 854.465  | T=100 | 214.36 | 746.84 | 749.78 | 749.34 | 750.24 | 0.005766 | 2.99 | 71.76  | 37.61  | 0.69 |       | 104.16 | 104.16 |
| BERGANTES | MORELLABAJO | 808.923  | T=100 | 214.36 | 746.55 | 749.56 | 749.14 | 749.91 | 0.006169 | 2.62 | 81.88  | 55.41  | 0.69 |       | 86.92  | 86.92  |
| BERGANTES | MORELLABAJO | 745.564  | T=100 | 214.36 | 746.36 | 748.66 | 748.66 | 749.27 | 0.013627 | 3.43 | 62.42  | 51.73  | 1    | 42.16 | 160.89 | 156.2  |
| BERGANTES | MORELLABAJO | 695.776  | T=100 | 214.36 | 745.3  | 748.03 | 747.92 | 748.71 | 0.009951 | 3.6  | 59.58  | 36.64  | 0.9  | 14.32 | 162.39 | 153.14 |
| BERGANTES | MORELLABAJO | 655.942  | T=100 | 214.36 | 745    | 748.05 | 747.54 | 748.34 | 0.004118 | 2.37 | 90.37  | 55.2   | 0.59 | 14.21 | 69.54  | 64.08  |
| BERGANTES | MORELLABAJO | 613.402  | T=100 | 214.36 | 744.55 | 746.67 | 746.86 | 747.62 | 0.019369 | 4.31 | 49.71  | 38.54  | 1.21 |       | 246.34 | 240.53 |
| BERGANTES | MORELLABAJO | 567.073  | T=100 | 214.36 | 743.49 | 746.3  | 746.04 | 746.77 | 0.00791  | 3.03 | 70.79  | 47.12  | 0.79 |       | 115.07 | 115.07 |
| BERGANTES | MORELLABAJO | 508.645  | T=100 | 214.36 | 743.25 | 745.97 | 745.58 | 746.3  | 0.005456 | 2.53 | 84.79  | 56.38  | 0.66 |       | 80.11  | 79.29  |
| BERGANTES | MORELLABAJO | 467.757  | T=100 | 214.36 | 742.83 | 745.28 | 745.35 | 745.79 | 0.018311 | 3.17 | 67.62  | 79.24  | 1.1  |       | 152.87 | 151.3  |
| BERGANTES | MORELLABAJO | 443.346  | T=100 | 214.36 | 742.33 | 744.82 | 744.93 | 745.37 | 0.020072 | 3.3  | 64.97  | 76.39  | 1.14 |       | 165.18 | 165.18 |
| BERGANTES | MORELLABAJO | 406.528  | T=100 | 214.36 | 741.66 | 743.91 | 743.51 | 744.23 | 0.006231 | 2.51 | 85.4   | 63.34  | 0.69 |       | 81.81  | 81.81  |
| BERGANTES | MORELLABAJO | 374.786  | T=100 | 214.36 | 741.21 | 743.78 | 743.26 | 744.03 | 0.004565 | 2.22 | 96.61  | 68.47  | 0.6  |       | 62.9   | 62.9   |
| BERGANTES | MORELLABAJO | 348.086  | T=100 | 214.36 | 740.78 | 743.68 | 743.15 | 743.9  | 0.004542 | 2.08 | 103.23 | 80.25  | 0.58 |       | 56.88  | 56.88  |
| BERGANTES | MORELLABAJO | 316.306  | T=100 | 214.36 | 740.53 | 743.3  | 743.19 | 743.68 | 0.010398 | 2.73 | 78.66  | 75.78  | 0.85 | 11.65 | 105.28 | 104.71 |
| BERGANTES | MORELLABAJO | 292.552  | T=100 | 214.36 | 740.53 | 743.02 | 743.02 | 743.36 | 0.01748  | 2.59 | 82.8   | 126.68 | 1.03 | 83.21 | 111.76 | 111.11 |
| BERGANTES | MORELLABAJO | 264.24   | T=100 | 214.36 | 740.19 | 742.11 | 742.28 | 742.75 | 0.029143 | 3.55 | 60.42  | 84.02  | 1.34 |       | 202.14 | 202.14 |
| BERGANTES | MORELLABAJO | 222.046  | T=100 | 214.36 | 739.99 | 741.94 | 741.39 | 742.03 | 0.002308 | 1.32 | 162.74 | 150.87 | 0.4  |       | 24.26  | 24.26  |
| BERGANTES | MORELLABAJO | 185.338  | T=100 | 214.36 | 738.01 | 741.1  | 740.2  | 741.16 | 0.001069 | 1.07 | 200.82 | 142.59 | 0.29 |       | 14.6   | 14.6   |
| BERGANTES | MORELLABAJO | 138.968  | T=100 | 214.36 | 737.31 | 739.51 | 739.79 | 740.55 | 0.024754 | 4.51 | 47.58  | 41.25  | 1.34 |       | 277.76 | 277.76 |
| BERGANTES | MORELLABAJO | 80.632   | T=100 | 214.36 | 736.08 | 739.26 | 739.13 | 739.7  | 0.01041  | 2.95 | 72.78  | 60.98  | 0.86 | 41.96 | 119.15 | 117.22 |
| BERGANTES | MORELLABAJO | 20.181   | T=100 | 214.36 | 734.83 | 738.2  | 738.26 | 738.87 | 0.016843 | 3.61 | 59.36  | 53.11  | 1.09 | 75.73 | 183.1  | 179.44 |
| AFLUENTE  | MARGEN DCHA | 324.568  | T=100 | 15.05  | 766.83 | 768.24 | 768.56 | 769.08 | 0.028024 | 3.58 | 4.21   | 9.42   | 1.37 | 36.38 | 210.61 | 29.67  |
| AFLUENTE  | MARGEN DCHA | 316.607  | T=100 | 15.05  | 766.72 | 767.79 | 768.19 | 768.79 | 0.043538 | 4.43 | 3.4    | 4.84   | 1.69 |       | 259.24 | 259.24 |
| AFLUENTE  | MARGEN DCHA | 309.883  | T=100 | 15.05  | 766.53 | 767.81 | 767.98 | 768.48 | 0.0245   | 3.61 | 4.17   | 5.32   | 1.3  |       | 165.51 | 165.51 |
| AFLUENTE  | MARGEN DCHA | 304.389  | T=100 | 15.05  | 766.09 | 767.22 | 767.54 | 768.27 | 0.041311 | 4.52 | 3.33   | 4.17   | 1.61 |       | 264.21 | 264.21 |
| AFLUENTE  | MARGEN DCHA | 296.16   | T=100 | 15.05  | 765.92 | 766.97 | 767.25 | 767.9  | 0.039516 | 4.26 | 3.54   | 4.99   | 1.61 |       | 238.7  | 238.7  |
| AFLUENTE  | MARGEN DCHA | 290.278  | T=100 | 15.05  | 765.7  | 767.5  | 767.11 | 767.72 | 0.004709 | 1.79 | 8.43   | 14.06  | 0.58 | 9.35  | 50.86  | 5.24   |
| AFLUENTE  | MARGEN DCHA | 282.946  | T=100 | 15.05  | 765.9  | 767.27 | 767.27 | 767.66 | 0.010994 | 2.55 | 5.9    | 9.82   | 0.88 | 14.99 | 91.88  | 14.03  |
| AFLUENTE  | MARGEN DCHA | 277.698  | T=100 | 15.05  | 765.53 | 766.66 | 766.95 | 767.52 | 0.032177 | 4.04 | 3.73   | 5.89   | 1.5  | 22.24 | 214.83 | 181.13 |
| AFLUENTE  | MARGEN DCHA | 269.391  | T=100 | 15.05  | 765.42 | 766.18 | 766.52 | 767.19 | 0.043399 | 4.33 | 3.48   | 6.68   | 1.76 | 38.36 | 263.61 | 37.22  |
| AFLUENTE  | MARGEN DCHA | 263.999  | T=100 | 15.05  | 765.2  | 766.02 | 766.32 | 766.94 | 0.041664 | 4.24 | 3.55   | 5.53   | 1.66 | 4.05  | 240.86 | 3.88   |
| AFLUENTE  | MARGEN DCHA | 258.543  | T=100 | 15.05  | 764.99 | 765.93 | 766.16 | 766.68 | 0.035311 | 3.84 | 3.92   | 6.48   | 1.57 |       | 198.43 | 198.43 |
| AFLUENTE  | MARGEN DCHA | 252.147  | T=100 | 15.05  | 764.93 | 766.1  | 766.1  | 766.55 | 0.014673 | 2.95 | 5.1    | 5.96   | 1    |       | 107.76 | 6.79   |
| AFLUENTE  | MARGEN DCHA | 246.422  | T=100 | 15.05  | 764.83 | 765.84 | 765.96 | 766.44 | 0.021522 | 3.41 | 4.41   | 5.39   | 1.2  |       | 146.98 | 146.98 |
| AFLUENTE  | MARGEN DCHA | 242.193  | T=100 | 15.05  | 764.79 | 765.85 | 765.89 | 766.32 | 0.01696  | 3.04 | 4.95   | 6.24   | 1.09 |       | 116.51 | 116.51 |
| AFLUENTE  | MARGEN DCHA | 239.244  | T=100 | 15.05  | 764.69 | 765.59 | 765.8  | 766.24 | 0.027395 | 3.24 | 4.65   | 10.14  | 1.41 | 46.63 | 174.14 | 7.78   |
| AFLUENTE  | MARGEN DCHA | 235.959  | T=100 | 15.05  | 764.55 | 765.53 | 765.72 | 766.15 | 0.025353 | 3.16 | 4.76   | 10.04  | 1.34 | 43.1  | 167.4  | 111.65 |
| AFLUENTE  | MARGEN DCHA | 232.813  | T=100 | 15.05  | 764.43 | 765.08 | 765.35 | 766    | 0.062522 | 4.25 | 3.54   | 7.9    | 2.03 |       | 264.24 | 267.24 |
| AFLUENTE  | MARGEN DCHA | 229.992  | T=100 | 15.05  | 764.3  | 765.71 | 765.17 | 765.79 | 0.001669 | 1.22 | 12.34  | 12.24  | 0.37 | 1.25  | 16.75  | 0.75   |
| AFLUENTE  | MARGEN DCHA | 223.682  | T=100 | 15.05  | 764.11 | 765.41 | 765.41 | 765.74 | 0.013506 | 2.52 | 5.97   | 9.36   | 1    | 2.21  | 84.67  | 21.68  |
| AFLUENTE  | MARGEN DCHA | 203.774  | T=100 | 15.05  | 762.83 | 763.33 | 763.66 | 764.51 | 0.090422 | 4.81 | 3.13   | 7.52   | 2.38 |       | 352.53 | 352.53 |
| AFLUENTE  | MARGEN DCHA | 197.305  | T=100 | 15.05  | 762.1  | 762.83 | 763.15 | 763.95 | 0.079092 | 4.69 | 3.21   | 7.3    | 2.25 |       | 327.75 | 327.75 |
| AFLUENTE  | MARGEN DCHA | 188.798  | T=100 | 15.05  | 761.4  | 763.16 | 762.58 | 763.32 | 0.00319  | 1.76 | 8.54   | 6.56   | 0.49 |       | 34.06  | 1.85   |
| AFLUENTE  | MARGEN DCHA | 182.911  | T=100 | 15.05  | 761.04 | 762.76 | 762.76 | 763.25 | 0.015697 | 3.09 | 4.88   | 4.98   | 0.99 |       | 116.99 | 1.26   |
| AFLUENTE  | MARGEN DCHA | 177.41   | T=100 | 15.05  | 760.93 | 762.8  | 762.27 | 763.01 | 0.00467  | 2.05 | 7.35   | 5.38   | 0.56 |       | 46.75  | 1.86   |
| AFLUENTE  | MARGEN DCHA | 172.631  | T=100 | 15.05  | 760.79 | 762.79 | 762.12 | 762.99 | 0.004129 | 1.96 | 7.69   | 4.85   | 0.5  |       | 42.29  | 42.29  |
| AFLUENTE  | MARGEN DCHA | 167.601  | T=100 | 15.05  | 760.55 | 762.79 | 762.02 | 762.96 | 0.003463 | 1.85 | 8.14   | 5.26   | 0.47 | 0.13  | 37.17  | 36.22  |
| AFLUENTE  | MARGEN DCHA | 162.637  | T=100 | 15.05  | 760.8  | 762.81 | 762.1  | 762.93 | 0.002541 | 1.39 | 10.86  | 11.08  | 0.41 | 10.58 | 27.48  | 20     |
| AFLUENTE  | MARGEN DCHA | 157.529  | T=100 | 15.05  | 760.36 | 762.3  | 762.3  | 762.86 | 0.01783  | 3.31 | 4.55   | 4.06   | 1    |       | 134.04 | 134.04 |
| AFLUENTE  | MARGEN DCHA | 152.542  | T=100 | 15.05  | 760.25 | 760.9  | 761.36 | 762.57 | 0.094342 | 5.74 | 2.62   | 4.57   | 2.42 |       | 464.09 | 464.09 |
| AFLUENTE  | MARGEN DCHA | 147.403  | T=100 | 15.05  | 760    | 760.69 | 761.11 | 762.05 | 0.074613 | 5.17 | 2.91   | 5.05   | 2.17 |       | 374.12 | 374.12 |
| AFLUENTE  | MARGEN DCHA | 140.995  | T=100 | 15.05  | 759.81 | 760.58 | 760.87 | 761.51 | 0.054594 | 4.28 | 3.52   | 6.94   | 1.89 |       | 261.94 | 253.41 |
| AFLUENTE  | MARGEN DCHA | 134.769  | T=100 | 15.05  | 759.71 | 760.75 | 760.77 | 761.23 | 0.016077 | 3.1  | 4.86   | 5.4    | 1.04 |       | 118.32 | 118.32 |
| AFLUENTE  | MARGEN DCHA | 128.576  | T=100 | 15.05  | 759.51 | 760.55 | 760.64 | 761.12 | 0.018633 | 3.33 | 4.52   | 5.33   | 1.14 |       | 137.49 | 13.12  |
| AFLUENTE  | MARGEN DCHA | 122.101  | T=100 | 15.05  | 759.32 | 760.71 | 760.49 | 760.99 | 0.006946 | 2.34 | 6.44   | 6.25   | 0.73 |       | 63.62  | 8.11   |
| AFLUENTE  | MARGEN DCHA | 115.354  | T=100 | 15.05  | 759.18 | 760.66 | 760.49 | 760.94 | 0.008143 | 2.34 | 6.43   | 6.98   | 0.78 |       | 65.55  | 65.55  |
| AFLUENTE  | MARGEN DCHA | 109.31   | T=100 | 15.05  | 759.09 | 760.49 | 760.49 | 760.86 | 0.013702 | 2.71 | 5.55   | 7.31   | 0.99 |       | 93.26  | 93.26  |
| AFLUENTE  | MARGEN DCHA | 104.112  | T=100 | 15.05  | 759    | 760.01 | 760.22 | 760.73 | 0.0269   | 3.75 | 4.02   | 5.1    | 1.35 |       | 179.09 | 179.09 |
| AFLUENTE  | MARGEN DCHA | 97.715   | T=100 | 15.05  | 758.95 | 760.55 | 760.48 | 760.57 | 0.000873 | 0.52 | 28.71  | 51.01  | 0.25 | 4.37  | 6.56   | 4.69   |
| AFLUENTE  | MARGEN DCHA | 90.562   | T=100 | 15.05  | 758.92 | 760.05 | 760.05 | 760.51 | 0.013804 | 2.97 |        |        |      |       |        |        |



## 200 AÑOS DE PERIODO DE RETORNO

| River     | Reach        | River Sta | Profile | Q Total<br>(m <sup>3</sup> /s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Total<br>(m/s) | Flow Area<br>(m <sup>2</sup> ) | Top Width<br>(m) | Froude # Chl | Shear LOB<br>(N/m <sup>2</sup> ) | Shear Chan<br>(N/m <sup>2</sup> ) | Shear ROB<br>(N/m <sup>2</sup> ) | Shear Total<br>(N/m <sup>2</sup> ) |
|-----------|--------------|-----------|---------|--------------------------------|------------------|------------------|------------------|------------------|---------------------|--------------------|--------------------------------|------------------|--------------|----------------------------------|-----------------------------------|----------------------------------|------------------------------------|
| BERGANTES | MORELLALTO   | 3010.624  | T=200   | 314.02                         | 770.99           | 773.51           | 773.93           | 774.98           | 0.016004            | 5.04               | 62.34                          | 45.3             | 1.27         | 86.18                            | 291.6                             | 62.16                            | 211.46                             |
| BERGANTES | MORELLALTO   | 2969.898  | T=200   | 314.02                         | 770.34           | 772.92           | 773.22           | 774.16           | 0.017607            | 4.75               | 66.08                          | 48.78            | 1.3          | 143.93                           | 263.37                            | 83.89                            | 230.27                             |
| BERGANTES | MORELLALTO   | 2939.593  | T=200   | 314.02                         | 769.67           | 772.78           | 772.92           | 773.69           | 0.012908            | 4.07               | 77.12                          | 59.03            | 1.11         | 107.77                           | 192.99                            | 48.34                            | 162.83                             |
| BERGANTES | MORELLALTO   | 2872.683  | T=200   | 314.02                         | 767.96           | 772.12           | 771.98           | 772.78           | 0.007944            | 3.5                | 89.78                          | 59.8             | 0.88         | 55.1                             | 133.66                            | 26.29                            | 112.28                             |
| BERGANTES | MORELLALTO   | 2814.464  | T=200   | 314.02                         | 767.63           | 771.24           | 771.34           | 772.2            | 0.012598            | 4.28               | 73.33                          | 46.06            | 1.09         | 103.93                           | 195.46                            |                                  | 189.83                             |
| BERGANTES | MORELLALTO   | 2760.083  | T=200   | 314.02                         | 766.68           | 769.42           | 769.87           | 771.27           | 0.016731            | 6                  | 52.33                          | 24.7             | 1.32         | 22.22                            | 342.52                            |                                  | 311.7                              |
| BERGANTES | MORELLALTO   | 2723.041  | T=200   | 314.02                         | 765.98           | 769.92           | 769.73           | 770.79           | 0.007101            | 4.05               | 77.57                          | 38.05            | 0.87         | 12                               | 156.99                            | 31.58                            | 137.68                             |
| BERGANTES | MORELLALTO   | 2698.332  | T=200   | 314.02                         | 765.89           | 769.74           | 769.56           | 770.59           | 0.006869            | 3.97               | 79.06                          | 40.29            | 0.86         | 19.87                            | 155.01                            | 32.34                            | 128.21                             |
| BERGANTES | MORELLALTO   | 2668.283  | T=200   | 314.02                         | 765.53           | 769.72           | 768.9            | 770.4            | 0.00343             | 3.39               | 92.65                          | 36.03            | 0.65         | 31.3                             | 111.58                            | 25.44                            | 81.77                              |
| BERGANTES | MORELLALTO   | 2627.521  | T=200   | 314.02                         | 765.42           | 769.74           | 768.83           | 770.21           | 0.003173            | 3                  | 104.81                         | 41.61            | 0.6          | 35.93                            | 82.36                             | 2.11                             | 75.68                              |
| BERGANTES | MORELLALTO   | 2600.858  | T=200   | 314.02                         | 765.17           | 769.2            | 769.1            | 770.05           | 0.008268            | 4.02               | 78.16                          | 42.76            | 0.91         | 43.81                            | 160.55                            | 17.63                            | 143.17                             |
| BERGANTES | MORELLALTO   | 2583.825  | T=200   | 314.02                         | 765.16           | 768.61           | 768.61           | 769.84           | 0.00761             | 4.58               | 68.58                          | 33.98            | 0.94         | 49.6                             | 211.43                            | 37.69                            | 143.97                             |
| BERGANTES | MORELLALTO   | 2570.241  | T=200   | 314.02                         | 764.9            | 767.54           | 768.11           | 769.58           | 0.018073            | 6.09               | 51.58                          | 27.58            | 1.38         | 105.79                           | 381.6                             | 103.2                            | 319.44                             |
| BERGANTES | MORELLALTO   | 2552.039  | T=200   | 314.02                         | 764.85           | 768.33           | 768              | 769.23           | 0.005905            | 4.15               | 75.73                          | 29.32            | 0.82         | 26.24                            | 154.05                            | 16.85                            | 137.52                             |
| BERGANTES | MORELLALTO   | 2529.844  | T=200   | 314.02                         | 764.74           | 767.63           | 767.99           | 769.01           | 0.012419            | 4.85               | 64.73                          | 40.77            | 1.15         | 56.91                            | 261.39                            | 56.21                            | 181.71                             |
| BERGANTES | MORELLALTO   | 2507.039  | T=200   | 314.02                         | 764.54           | 767.13           | 767.51           | 768.57           | 0.0192              | 5.13               | 61.23                          | 56               | 1.36         | 24.68                            | 294.73                            | 46.79                            | 203.28                             |
| BERGANTES | MORELLALTO   | 2490.032  | T=200   | 314.02                         | 763.92           | 766.63           | 767.07           | 768.16           | 0.027057            | 5.48               | 57.28                          | 45.07            | 1.55         | 12.49                            | 334.38                            |                                  | 333.05                             |
| BERGANTES | MORELLALTO   | 2467.629  | T=200   | 314.02                         | 763.74           | 767.16           | 767.04           | 767.86           | 0.008224            | 3.67               | 85.5                           | 51.19            | 0.9          | 40.92                            | 139.1                             |                                  | 132.16                             |
| BERGANTES | MORELLALTO   | 2431.791  | T=200   | 314.02                         | 763.61           | 767.06           | 766.69           | 767.54           | 0.005984            | 3.04               | 103.17                         | 63.67            | 0.76         | 22.25                            | 95.41                             |                                  | 93.66                              |
| BERGANTES | MORELLALTO   | 2410.195  | T=200   | 314.02                         | 763.48           | 766.65           | 766.65           | 767.36           | 0.011094            | 3.72               | 84.4                           | 61.3             | 1.01         | 30.82                            | 150.23                            |                                  | 147.94                             |
| BERGANTES | MORELLALTO   | 2382.362  | T=200   | 314.02                         | 763.27           | 766.03           | 766.21           | 766.87           | 0.018861            | 4.06               | 77.27                          | 72.78            | 1.26         |                                  | 194.94                            |                                  | 194.94                             |
| BERGANTES | MORELLALTO   | 2350.675  | T=200   | 314.02                         | 763              | 766.1            | 765.8            | 766.47           | 0.005937            | 2.69               | 116.79                         | 86.1             | 0.74         |                                  | 78.58                             |                                  | 78.58                              |
| BERGANTES | MORELLALTO   | 2316.747  | T=200   | 314.02                         | 762.95           | 765.76           | 765.63           | 766.23           | 0.008465            | 3.04               | 103.17                         | 82.86            | 0.87         | 1.56                             | 103.45                            |                                  | 102.49                             |
| BERGANTES | MORELLALTO   | 2293.848  | T=200   | 314.02                         | 762.68           | 765.42           | 765.21           | 765.94           | 0.007091            | 3.18               | 98.82                          | 64.98            | 0.82         | 10.63                            | 105.68                            |                                  | 104.8                              |
| BERGANTES | MORELLALTO   | 2267.093  | T=200   | 314.02                         | 762.13           | 765.05           | 765.01           | 765.69           | 0.010038            | 3.54               | 88.82                          | 64.67            | 0.96         | 27.33                            | 135.75                            |                                  | 133.46                             |
| BERGANTES | MORELLALTO   | 2243.8    | T=200   | 314.02                         | 761.93           | 764.83           | 764.65           | 765.41           | 0.007905            | 3.36               | 93.58                          | 61.07            | 0.86         | 4.15                             | 117.71                            |                                  | 117.3                              |
| BERGANTES | MORELLALTO   | 2222.517  | T=200   | 314.02                         | 761.23           | 764.79           | 764.25           | 765.23           | 0.005002            | 2.94               | 106.95                         | 60.61            | 0.7          | 12.41                            | 86.17                             |                                  | 84.92                              |
| BERGANTES | MORELLALTO   | 2195.681  | T=200   | 314.02                         | 761.09           | 764.56           | 764.13           | 765.07           | 0.007939            | 3.15               | 99.78                          | 72.29            | 0.85         | 40.74                            | 108.55                            |                                  | 105.75                             |
| BERGANTES | MORELLALTO   | 2168.338  | T=200   | 314.02                         | 760.93           | 764.48           | 764.02           | 764.87           | 0.004819            | 2.72               | 115.3                          | 72.15            | 0.68         | 22.2                             | 77.05                             |                                  | 74.6                               |
| BERGANTES | MORELLALTO   | 2146.539  | T=200   | 314.02                         | 760.43           | 763.84           | 763.84           | 764.68           | 0.010661            | 4.04               | 77.74                          | 49.12            | 1.01         | 39.49                            | 169.85                            |                                  | 162.82                             |
| BERGANTES | MORELLALTO   | 2084.025  | T=200   | 314.02                         | 760.35           | 762.93           | 763.04           | 763.75           | 0.012966            | 4.02               | 78.19                          | 56.69            | 1.09         |                                  | 174.39                            |                                  | 174.39                             |
| BERGANTES | MORELLALTO   | 2046.533  | T=200   | 314.02                         | 759.74           | 762.6            | 762.6            | 763.29           | 0.01127             | 3.68               | 85.34                          | 62.69            | 1.01         |                                  | 147.68                            |                                  | 147.68                             |
| BERGANTES | MORELLALTO   | 1990.019  | T=200   | 314.02                         | 758.88           | 762.32           | 761.87           | 762.71           | 0.004404            | 2.76               | 113.67                         | 64.21            | 0.66         | 5.56                             | 76.1                              | 6.16                             | 74.77                              |
| BERGANTES | MORELLALTO   | 1932.588  | T=200   | 314.02                         | 758.27           | 762.03           | 761.31           | 762.5            | 0.003641            | 3.03               | 103.63                         | 43.35            | 0.62         | 0.48                             | 83.21                             |                                  | 82.33                              |
| BERGANTES | MORELLALTO   | 1879.673  | T=200   | 314.02                         | 757.99           | 760.84           | 761.05           | 762              | 0.016025            | 4.77               | 65.8                           | 41.82            | 1.21         |                                  | 238.19                            |                                  | 238.19                             |
| BERGANTES | MORELLALTO   | 1822.942  | T=200   | 314.02                         | 756.96           | 760.54           | 759.97           | 761.03           | 0.005331            | 3.11               | 101.05                         | 54.68            | 0.73         |                                  | 95.04                             |                                  | 95.04                              |
| BERGANTES | MORELLALTO   | 1785.543  | T=200   | 314.02                         | 756.62           | 760.41           | 759.99           | 760.8            | 0.004728            | 2.74               | 114.41                         | 68.83            | 0.68         | 11.84                            | 76.74                             |                                  | 75.92                              |
| BERGANTES | MORELLALTO   | 1756.862  | T=200   | 314.02                         | 756.44           | 760.22           | 759.91           | 760.64           | 0.005888            | 2.86               | 109.8                          | 73.64            | 0.74         |                                  | 86.2                              | 6.18                             | 84.57                              |
| BERGANTES | MORELLALTO   | 1744.35   | T=200   | 314.02                         | 756.22           | 759.86           | 759.86           | 760.51           | 0.0113              | 3.59               | 87.49                          | 69.12            | 1            | 12.85                            | 142.72                            | 4.75                             | 137.1                              |
| BERGANTES | MORELLALTO   | 1723.778  | T=200   | 314.02                         | 756.22           | 759.23           | 759.48           | 760.23           | 0.011062            | 4.43               | 70.92                          | 57.67            | 1.27         | 10.79                            | 131.58                            |                                  | 130.68                             |
| BERGANTES | MORELLALTO   | 1708.685  | T=200   | 314.02                         | 755.98           | 759.46           | 759.46           | 760.08           | 0.00692             | 3.47               | 90.56                          | 74.44            | 1            | 25.11                            | 81.56                             |                                  | 80.48                              |
| BERGANTES | MORELLALTO   | 1694.402  | T=200   | 314.02                         | 755.69           | 759.09           | 759.29           | 759.92           | 0.011276            | 4.01               | 78.36                          | 74.47            | 1.25         | 52.47                            | 115.87                            |                                  | 113.27                             |
| BERGANTES | MORELLALTO   | 1679.373  | T=200   | 314.02                         | 755.68           | 758.1            | 758.56           | 759.69           | 0.015771            | 5.56               | 56.48                          | 42.69            | 1.53         | 37.2                             | 203.24                            |                                  | 199.14                             |
| BERGANTES | MORELLALTO   | 1663.422  | T=200   | 314.02                         | 755.3            | 758.18           | 758.56           | 759.37           | 0.012789            | 4.83               | 64.95                          | 50.74            | 1.36         | 1.68                             | 155.55                            |                                  | 155.01                             |
| BERGANTES | MORELLALTO   | 1652.841  | T=200   | 314.02                         | 755.03           | 758              | 758.42           | 759.25           | 0.008807            | 4.92               | 63.82                          | 37.14            | 1.19         | 28.97                            | 146.73                            |                                  | 142.59                             |
| BERGANTES | MORELLALTO   | 1626.672  | T=200   | 314.02                         | 754.86           | 758.7            | 757.94           | 759.05           | 0.001621            | 2.62               | 119.68                         | 63.12            | 0.61         | 12.2                             | 29.9                              |                                  | 29.17                              |
| BERGANTES | MORELLAMEDIO | 1608.287  | T=200   | 314.02                         | 754.82           | 758.72           | 758.1            | 759.04           | 0.006645            | 2.48               | 126.44                         | 89.81            | 0.67         | 32.34                            | 90.55                             |                                  | 89.16                              |
| BERGANTES | MORELLAMEDIO | 1585.133  | T=200   | 314.02                         | 754.48           | 758.68           | 758.18           | 758.9            | 0.001494            | 2.07               | 151.57                         | 109.33           | 0.56         | 8.31                             | 20.39                             |                                  | 19.81                              |
| BERGANTES | MORELLAMEDIO | 1556.852  | T=200   | 314.02                         | 754.25           | 758.46           | 757.83           | 758.77           | 0.002279            | 2.08               | 150.81                         | 81.3             | 0.51         | 7.77                             | 64.43                             | 24.83                            | 38.74                              |
| BERGANTES | MORELLAMEDIO | 1539.471  | T=200   | 314.02                         | 754.1            | 758.32           | 757.68           | 758.7            | 0.002854            | 2.41               | 130.11                         | 67.58            | 0.55         | 16.23                            | 78.11                             | 26.85                            | 49.56                              |
| BERGANTES | MORELLAMEDIO | 1525.248  | T=200   | 314.02                         | 753.98           | 758.16           | 757.57           | 758.61           | 0.002738            | 2.53               | 124.05                         | 64.6             | 0.57         | 12.05                            | 79.8                              | 24.5                             | 47.38                              |
| BERGANTES | MORELLAMEDIO | 1512.932  | T=200   | 314.02                         | 753.82           | 758.16           | 757.67           | 758.51           | 0.003075            | 2.15               | 146.17                         | 88.06            | 0.52         | 14.31                            | 96.1                              | 29.47                            | 46.48                              |
| BERGANTES | MORELLAMEDIO | 1498.456  | T=200   | 314.02                         | 753.71           | 757.71           | 757.71           | 758.36           | 0.005713            | 2.75               | 114.02                         | 83.41            | 0.73         | 16.72                            | 166.7                             | 46.47                            | 73.27                              |
| BERGANTES | MORELLAMEDIO | 1476.214  | T=200   | 314.02                         | 753.53           | 757.23           | 757.18           | 757.93           | 0.012607            | 3.55               | 88.42                          | 58.8             | 0.9          | 117.66                           | 216.35                            | 62.53                            | 176.95                             |
| BERGANTES | MORELLAMEDIO | 1447.308  | T=200   | 314.02                         | 753.29           | 757.03           | 756.86           | 757.55           | 0.009935            | 3.06               | 102.46                         | 68.63            | 0.79         | 99.97                            | 169                               | 66.29                            | 139.53                             |
| BERGANTES | MORELLAMEDIO | 1418.074  | T=200   | 314.02                         | 753.12           | 756.82           | 756.82           | 757.35           | 0.004834            | 2.22               | 141.7                          | 123.49           | 0.71         | 55.22                            | 142.34                            | 40.59                            | 53.54                              |
| BERGANTES | MORELLAMEDIO | 1394.002  | T=200   | 314.02                         | 752.39           | 756.42           | 756.12           | 756.65           | 0.009442            | 2.16               | 145.08                         | 132.12           | 0.66         | 40.97                            | 100.55                            |                                  | 99.76                              |
| BERGANTES | MORELLAMEDIO | 1370.229  | T=200   | 314.02                         | 751.84           | 756.12           | 755.71           | 756.41           | 0.008281            | 2.37               | 132.66                         | 94.13            | 0.64         | 21.64                            | 112.33                            |                                  | 110.55                             |
| BERGANTES | MORELLAMEDIO | 1353.036  | T=200   | 314.02                         | 751.91           | 755.88           | 755.65           | 756.27           | 0.004855            | 2.77               | 113.44                         | 82.83            | 0.76         | 15.68                            | 64.64                             | 7.81                             | 62.2                               |
| BERGANTES | MORELLAMEDIO | 1337.958  | T=200   | 314.02                         | 751.97           | 755.58           | 755.58           | 756.17           | 0.009488            | 3.4                | 92.3                           | 81.87            | 1.02         | 8.65                             | 102.52                            | 2.51                             | 100.03                             |
| BERGANTES | MORELLAMEDIO | 1323.549  | T=200   | 314.02                         | 751.94           | 755.22           | 755.32           | 755.94           | 0.02789             | 3.74               | 84.03                          | 77.1             | 1.15         | 74.7                             | 293.12                            | 11.95                            | 285.53                             |



DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA  
INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

|           |             |          |       |        |        |        |        |        |          |      |        |        |      |        |        |       |        |
|-----------|-------------|----------|-------|--------|--------|--------|--------|--------|----------|------|--------|--------|------|--------|--------|-------|--------|
| BERGANTES | MORELLABAJA | 1250.764 | T=200 | 314.02 | 751.05 | 753.03 | 754.1  | 755.74 | 0.059682 | 7.29 | 43.08  | 34.46  | 2.07 | 63.36  | 713.33 |       | 705    |
| BERGANTES | MORELLABAJA | 1221.555 | T=200 | 314.02 | 750.66 | 754.12 | 753.36 | 754.53 | 0.007335 | 2.83 | 110.99 | 75.61  | 0.75 | 63.63  | 103.62 |       | 101.86 |
| BERGANTES | MORELLABAJA | 1189.277 | T=200 | 314.02 | 750.64 | 753.88 | 753.36 | 754.28 | 0.00722  | 2.81 | 111.72 | 76.76  | 0.75 | 69.31  | 102.6  |       | 100.75 |
| BERGANTES | MORELLABAJA | 1159.131 | T=200 | 314.02 | 750.66 | 753.72 | 753.27 | 754.08 | 0.005561 | 2.65 | 118.5  | 72.83  | 0.67 | 61.25  | 88.52  |       | 86.55  |
| BERGANTES | MORELLABAJA | 1119.613 | T=200 | 314.02 | 749.98 | 753.1  | 752.8  | 753.67 | 0.007826 | 3.34 | 94.1   | 53.68  | 0.8  |        | 132.76 |       | 132.76 |
| BERGANTES | MORELLABAJA | 1080.628 | T=200 | 314.02 | 749.39 | 752.87 | 752.43 | 753.34 | 0.006291 | 3.04 | 103.27 | 56.64  | 0.72 |        | 109.34 |       | 109.34 |
| BERGANTES | MORELLABAJA | 1046.059 | T=200 | 314.02 | 749.3  | 751.96 | 752.19 | 752.91 | 0.021315 | 4.32 | 72.73  | 59.33  | 1.24 |        | 251.01 |       | 251.01 |
| BERGANTES | MORELLABAJA | 996.576  | T=200 | 314.02 | 748.55 | 751.99 | 751.31 | 752.19 | 0.009458 | 1.93 | 162.63 | 105.18 | 0.52 |        | 53.55  | 42.94 | 50.08  |
| BERGANTES | MORELLABAJA | 950.974  | T=200 | 314.02 | 747.89 | 751.23 | 750.97 | 751.7  | 0.00752  | 3.04 | 103.44 | 65.71  | 0.77 |        | 114.04 |       | 114.04 |
| BERGANTES | MORELLABAJA | 913.674  | T=200 | 314.02 | 747.67 | 751.08 | 750.27 | 751.45 | 0.003963 | 2.72 | 115.58 | 53.03  | 0.59 |        | 82.27  |       | 82.27  |
| BERGANTES | MORELLABAJA | 882.552  | T=200 | 314.02 | 747.41 | 750.97 | 750    | 751.32 | 0.002956 | 2.64 | 119.01 | 45.51  | 0.52 |        | 73.17  |       | 73.17  |
| BERGANTES | MORELLABAJA | 854.465  | T=200 | 314.02 | 746.84 | 749.45 | 749.8  | 750.87 | 0.022242 | 5.29 | 59.4   | 36.57  | 1.32 |        | 343.71 |       | 343.71 |
| BERGANTES | MORELLABAJA | 808.923  | T=200 | 314.02 | 746.55 | 749.97 | 749.56 | 750.41 | 0.00722  | 2.95 | 106.41 | 67.94  | 0.75 |        | 108.2  |       | 108.2  |
| BERGANTES | MORELLABAJA | 745.564  | T=200 | 314.02 | 746.36 | 749.09 | 749.07 | 749.76 | 0.01251  | 3.61 | 86.95  | 62.73  | 0.99 | 44.67  | 169.85 | 4.38  | 164.56 |
| BERGANTES | MORELLABAJA | 695.776  | T=200 | 314.02 | 745.3  | 748.36 | 748.35 | 749.37 | 0.01182  | 4.39 | 71.57  | 37.55  | 1.02 | 35.81  | 230.22 | 90.07 | 212.11 |
| BERGANTES | MORELLABAJA | 655.942  | T=200 | 314.02 | 745    | 748.55 | 747.89 | 748.92 | 0.003686 | 2.61 | 120.5  | 62.23  | 0.58 | 19.75  | 80.41  | 17.43 | 67.88  |
| BERGANTES | MORELLABAJA | 613.402  | T=200 | 314.02 | 744.55 | 747.04 | 747.32 | 748.25 | 0.019487 | 4.86 | 64.55  | 41.96  | 1.25 |        | 296.66 | 77.35 | 287.79 |
| BERGANTES | MORELLABAJA | 567.073  | T=200 | 314.02 | 743.49 | 746.21 | 746.46 | 747.34 | 0.020352 | 4.72 | 66.56  | 46.29  | 1.26 |        | 283.38 |       | 283.38 |
| BERGANTES | MORELLABAJA | 508.645  | T=200 | 314.02 | 743.25 | 746.27 | 745.94 | 746.72 | 0.007818 | 2.97 | 105.81 | 72.58  | 0.78 |        | 111.65 | 20.98 | 110.3  |
| BERGANTES | MORELLABAJA | 467.757  | T=200 | 314.02 | 742.83 | 745.52 | 745.62 | 746.17 | 0.018917 | 3.54 | 88.58  | 89.93  | 1.14 |        | 182.42 | 80.56 | 180.47 |
| BERGANTES | MORELLABAJA | 443.346  | T=200 | 314.02 | 742.33 | 745.08 | 745.2  | 745.73 | 0.021698 | 3.57 | 87.96  | 99.53  | 1.2  | 16.97  | 190.1  |       | 185.81 |
| BERGANTES | MORELLABAJA | 406.528  | T=200 | 314.02 | 741.66 | 743.53 | 743.93 | 744.76 | 0.028581 | 4.91 | 63.96  | 54.38  | 1.45 |        | 327.53 |       | 327.53 |
| BERGANTES | MORELLABAJA | 374.786  | T=200 | 314.02 | 741.21 | 744.12 | 743.63 | 744.46 | 0.00536  | 2.59 | 121.21 | 76.79  | 0.66 |        | 82.61  |       | 82.61  |
| BERGANTES | MORELLABAJA | 348.086  | T=200 | 314.02 | 740.78 | 744.02 | 743.52 | 744.31 | 0.00491  | 2.37 | 132.46 | 89.37  | 0.62 | 1.28   | 70.75  |       | 70.66  |
| BERGANTES | MORELLABAJA | 316.306  | T=200 | 314.02 | 740.53 | 743.51 | 743.48 | 744.07 | 0.012784 | 3.32 | 94.58  | 79.07  | 0.97 | 24.2   | 149.21 |       | 147.99 |
| BERGANTES | MORELLABAJA | 292.552  | T=200 | 314.02 | 740.53 | 743.1  | 743.22 | 743.68 | 0.025436 | 3.35 | 93.84  | 129.28 | 1.26 | 133.27 | 180.43 |       | 179.32 |
| BERGANTES | MORELLABAJA | 264.24   | T=200 | 314.02 | 740.19 | 742.42 | 742.57 | 743.05 | 0.024909 | 3.52 | 89.3   | 112.01 | 1.26 |        | 191.82 |       | 191.82 |
| BERGANTES | MORELLABAJA | 222.046  | T=200 | 314.02 | 739.99 | 742.16 | 741.59 | 742.29 | 0.003046 | 1.59 | 197.34 | 169.6  | 0.47 |        | 34.53  |       | 34.53  |
| BERGANTES | MORELLABAJA | 185.338  | T=200 | 314.02 | 738.01 | 741.56 | 740.44 | 741.63 | 0.000926 | 1.18 | 266.53 | 146.47 | 0.28 |        | 16.33  |       | 16.33  |
| BERGANTES | MORELLABAJA | 138.988  | T=200 | 314.02 | 737.31 | 739.94 | 740.23 | 741.08 | 0.021024 | 4.73 | 66.36  | 47.26  | 1.27 |        | 286.99 |       | 286.99 |
| BERGANTES | MORELLABAJA | 80.632   | T=200 | 314.02 | 736.08 | 739.6  | 739.45 | 740.17 | 0.00988  | 3.34 | 94.04  | 62.78  | 0.87 | 50.55  | 142.26 |       | 139.37 |
| BERGANTES | MORELLABAJA | 20.181   | T=200 | 314.02 | 734.83 | 738.52 | 738.61 | 739.38 | 0.015908 | 4.1  | 76.67  | 54.38  | 1.1  | 90.8   | 218.65 |       | 213.25 |
| AFLUENTE  | MARGEN DCHA | 324.568  | T=200 | 21.74  | 766.83 | 768.42 | 768.73 | 769.39 | 0.028039 | 3.54 | 6.14   | 13.26  | 1.41 | 59     | 249.47 | 50.51 | 119    |
| AFLUENTE  | MARGEN DCHA | 316.607  | T=200 | 21.74  | 766.72 | 768.03 | 768.42 | 769.12 | 0.035933 | 4.46 | 4.87   | 8.09   | 1.59 | 28.56  | 264.76 | 4.84  | 192.5  |
| AFLUENTE  | MARGEN DCHA | 309.883  | T=200 | 21.74  | 766.53 | 768.04 | 768.34 | 768.84 | 0.023524 | 3.83 | 5.68   | 11.66  | 1.31 | 8.71   | 188.85 |       | 104.3  |
| AFLUENTE  | MARGEN DCHA | 304.389  | T=200 | 21.74  | 766.09 | 767.52 | 768.09 | 768.65 | 0.034709 | 4.72 | 4.61   | 4.58   | 1.5  |        | 269.49 |       | 269.49 |
| AFLUENTE  | MARGEN DCHA | 296.16   | T=200 | 21.74  | 765.92 | 767.17 | 767.53 | 768.34 | 0.039796 | 4.79 | 4.54   | 5.24   | 1.64 |        | 285.21 |       | 285.21 |
| AFLUENTE  | MARGEN DCHA | 290.278  | T=200 | 21.74  | 765.7  | 767.75 | 767.65 | 767.99 | 0.00455  | 1.79 | 12.16  | 15.48  | 0.58 | 18.45  | 57.63  | 7.13  | 31.09  |
| AFLUENTE  | MARGEN DCHA | 282.946  | T=200 | 21.74  | 765.9  | 767.56 | 767.56 | 767.93 | 0.008418 | 2.36 | 9.22   | 12.91  | 0.8  | 27.41  | 89.79  | 21.92 | 54.11  |
| AFLUENTE  | MARGEN DCHA | 277.698  | T=200 | 21.74  | 765.53 | 766.93 | 767.26 | 767.81 | 0.022646 | 3.87 | 5.62   | 8.1    | 1.33 | 45.32  | 205.33 | 35.67 | 142.08 |
| AFLUENTE  | MARGEN DCHA | 269.391  | T=200 | 21.74  | 765.42 | 766.37 | 766.76 | 767.55 | 0.037592 | 4.48 | 4.85   | 8.33   | 1.7  | 66.46  | 291.51 | 64.69 | 204.31 |
| AFLUENTE  | MARGEN DCHA | 263.999  | T=200 | 21.74  | 765.2  | 766.22 | 766.6  | 767.33 | 0.03609  | 4.54 | 4.79   | 7.25   | 1.62 | 37.37  | 270    | 36.61 | 212.82 |
| AFLUENTE  | MARGEN DCHA | 258.543  | T=200 | 21.74  | 764.99 | 766.06 | 766.38 | 767.09 | 0.04106  | 4.49 | 4.84   | 7.02   | 1.73 |        | 261.32 |       | 261.32 |
| AFLUENTE  | MARGEN DCHA | 252.147  | T=200 | 21.74  | 764.93 | 766.4  | 766.4  | 766.9  | 0.011607 | 3    | 7.24   | 9.18   | 0.93 | 11.33  | 111.45 | 20.69 | 79.45  |
| AFLUENTE  | MARGEN DCHA | 246.422  | T=200 | 21.74  | 764.83 | 766.12 | 766.33 | 766.8  | 0.018563 | 3.65 | 5.96   | 6      | 1.15 |        | 157.11 | 9.7   | 151.27 |
| AFLUENTE  | MARGEN DCHA | 242.193  | T=200 | 21.74  | 764.79 | 765.97 | 766.23 | 766.71 | 0.023153 | 3.8  | 5.72   | 6.4    | 1.28 |        | 176.32 |       | 176.32 |
| AFLUENTE  | MARGEN DCHA | 239.244  | T=200 | 21.74  | 764.69 | 765.7  | 766.04 | 766.61 | 0.032917 | 3.78 | 5.75   | 10.67  | 1.58 | 82.99  | 240.94 | 15.79 | 164.81 |
| AFLUENTE  | MARGEN DCHA | 235.959  | T=200 | 21.74  | 764.55 | 765.65 | 765.92 | 766.48 | 0.028895 | 3.6  | 6.05   | 11.05  | 1.47 | 72.06  | 219.16 | 6.08  | 146.46 |
| AFLUENTE  | MARGEN DCHA | 232.813  | T=200 | 21.74  | 764.43 | 765.21 | 765.56 | 766.33 | 0.05705  | 4.69 | 4.64   | 8.23   | 1.99 |        | 302.51 |       | 302.51 |
| AFLUENTE  | MARGEN DCHA | 229.992  | T=200 | 21.74  | 764.3  | 765.96 | 765.33 | 766.06 | 0.001744 | 1.4  | 15.57  | 13.86  | 0.4  | 3.44   | 21.45  | 1.79  | 17.79  |
| AFLUENTE  | MARGEN DCHA | 223.682  | T=200 | 21.74  | 764.11 | 765.6  | 765.6  | 766.01 | 0.012089 | 2.79 | 7.79   | 9.87   | 0.98 | 11.09  | 97.29  | 28.37 | 87.57  |
| AFLUENTE  | MARGEN DCHA | 203.774  | T=200 | 21.74  | 762.83 | 763.46 | 763.87 | 764.91 | 0.083553 | 5.35 | 4.06   | 7.75   | 2.36 |        | 405.49 |       | 405.49 |
| AFLUENTE  | MARGEN DCHA | 197.305  | T=200 | 21.74  | 762.1  | 762.95 | 763.36 | 764.37 | 0.080554 | 5.29 | 4.11   | 7.86   | 2.33 |        | 394.97 |       | 394.97 |
| AFLUENTE  | MARGEN DCHA | 188.798  | T=200 | 21.74  | 761.4  | 763.45 | 762.85 | 763.65 | 0.003237 | 1.81 | 12.04  | 15.29  | 0.51 | 5.61   | 41.49  | 3.12  | 22.13  |
| AFLUENTE  | MARGEN DCHA | 182.911  | T=200 | 21.74  | 761.04 | 763.23 | 763.23 | 763.61 | 0.008379 | 2.4  | 9.07   | 15.83  | 0.77 | 13.26  | 86.03  | 10.42 | 42.25  |
| AFLUENTE  | MARGEN DCHA | 177.41   | T=200 | 21.74  | 760.93 | 762.2  | 762.59 | 763.43 | 0.039934 | 4.92 | 4.42   | 4.4    | 1.57 |        | 297.06 |       | 297.06 |
| AFLUENTE  | MARGEN DCHA | 172.631  | T=200 | 21.74  | 760.79 | 762.15 | 762.44 | 763.21 | 0.032005 | 4.58 | 4.75   | 4.27   | 1.38 |        | 252.39 |       | 252.39 |
| AFLUENTE  | MARGEN DCHA | 167.601  | T=200 | 21.74  | 760.55 | 762.69 | 762.35 | 763.1  | 0.008571 | 2.85 | 7.64   | 4.95   | 0.73 |        | 89.01  |       | 89.01  |
| AFLUENTE  | MARGEN DCHA | 162.637  | T=200 | 21.74  | 760.8  | 762.48 | 762.41 | 763.03 | 0.013347 | 3.31 | 6.57   | 5.02   | 0.92 |        | 124.73 |       | 124.73 |
| AFLUENTE  | MARGEN DCHA | 157.529  | T=200 | 21.74  | 760.36 | 762.56 | 762.56 | 762.91 | 0.010978 | 2.36 | 9.2    | 11.96  | 0.8  | 48.29  | 96.67  | 4.99  | 68.9   |
| AFLUENTE  | MARGEN DCHA | 152.542  | T=200 | 21.74  | 760.25 | 761.19 | 761.64 | 762.69 | 0.05633  | 5.43 | 4      | 4.91   | 1.92 |        | 375.68 |       | 374    |
| AFLUENTE  | MARGEN DCHA | 147.403  | T=200 | 21.74  | 760    | 760.9  | 761.36 | 762.38 | 0.06342  | 5.39 | 4.03   | 5.76   | 2.06 |        | 382.58 |       | 382.58 |
| AFLUENTE  | MARGEN DCHA | 140.995  | T=200 | 21.74  | 759.81 | 760.71 | 761.1  | 761.92 | 0.053152 | 4.83 | 4.5    | 7.33   | 1.92 |        | 315.89 | 58.38 | 295.78 |
| AFLUENTE  | MARGEN DCHA | 134.769  | T=200 | 21.74  | 759.71 | 761.05 | 761.05 | 761.61 | 0.014171 | 3.31 | 6.57   | 5.78   | 0.99 |        | 126.72 |       | 126.72 |
| AFLUENTE  | MARGEN DCHA | 128.576  | T=200 | 21.74  | 759.51 | 760.82 | 760.91 | 761.5  | 0.016814 | 3.63 | 5.99   | 5.68   | 1.11 |        | 154.67 | 25.56 | 142.81 |
| AFLUENTE  | MARGEN DCHA | 122.101  | T=200 | 21.74  | 759.32 | 760.55 | 760.75 | 761.36 | 0.023589 | 3.98 | 5.46   | 5.97   | 1.32 |        | 190.83 | 17.67 | 182.37 |
| AFLUENTE  | MARGEN DCHA | 115.354  | T=200 | 21.74  | 759.18 | 760.85 | 760.74 | 761.24 | 0.010048 | 2.79 | 7.8    | 7.59   | 0.88 |        | 89.76  |       | 89.76  |
| AFLUENTE  | MARGEN DCHA | 109.31   | T=200 | 21.74  | 759.09 | 760.72 | 760.72 | 761.17 | 0.01293  | 2.97 | 7.31   | 8.13</ |      |        |        |       |        |

## 500 AÑOS DE PERIODO DE RETORNO

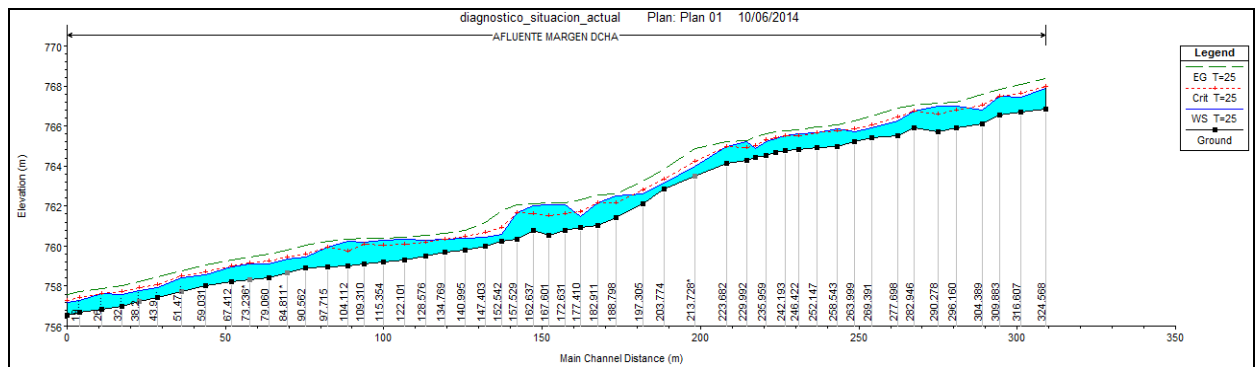
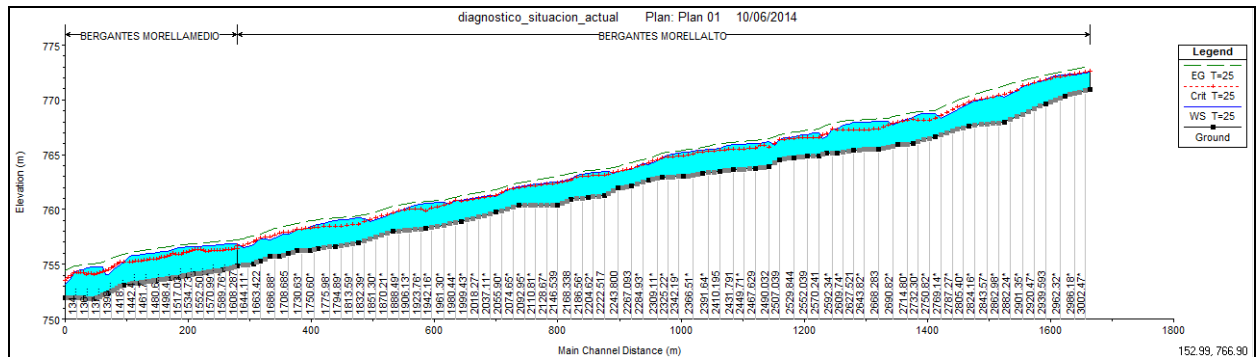
| River     | Reach        | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Total<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl | Shear LOB<br>(N/m2) | Shear Chan<br>(N/m2) | Shear ROB<br>(N/m2) | Shear Total<br>(N/m2) |
|-----------|--------------|-----------|---------|-------------------|------------------|------------------|------------------|------------------|---------------------|--------------------|-------------------|------------------|--------------|---------------------|----------------------|---------------------|-----------------------|
| BERGANTES | MORELLALTO   | 3010.624  | T=500   | 498.62            | 770.99           | 774.03           | 774.62           | 775.99           | 0.016008            | 5.63               | 88.56             | 51.44            | 1.33         | 116.62              | 373.15               | 121.46              | 263.89                |
| BERGANTES | MORELLALTO   | 2969.898  | T=500   | 498.62            | 770.34           | 773.29           | 773.77           | 775.22           | 0.020771            | 5.87               | 85                | 52.24            | 1.46         | 173.38              | 386.63               | 139.69              | 323.94                |
| BERGANTES | MORELLALTO   | 2939.593  | T=500   | 498.62            | 769.67           | 773.2            | 773.51           | 774.54           | 0.013888            | 4.8                | 103.81            | 68.52            | 1.2          | 141.84              | 265.02               | 69.74               | 202.99                |
| BERGANTES | MORELLALTO   | 2872.683  | T=500   | 498.62            | 767.96           | 772.31           | 772.58           | 773.64           | 0.013792            | 4.89               | 101.95            | 62.36            | 1.18         | 101.65              | 258.4                | 61.33               | 212.2                 |
| BERGANTES | MORELLALTO   | 2814.464  | T=500   | 498.62            | 767.63           | 772.08           | 772.08           | 773.05           | 0.009621            | 4.31               | 115.74            | 65.02            | 0.99         | 106.5               | 186.04               | 7.53                | 162.56                |
| BERGANTES | MORELLALTO   | 2760.083  | T=500   | 498.62            | 766.68           | 770.67           | 771.01           | 772.35           | 0.011864            | 5.69               | 87.6              | 34.5             | 1.15         | 23.27               | 291.12               |                     | 263.96                |
| BERGANTES | MORELLALTO   | 2723.041  | T=500   | 498.62            | 765.98           | 770.74           | 770.53           | 771.86           | 0.006257            | 4.46               | 111.71            | 45.38            | 0.86         | 37.56               | 187.26               | 47.35               | 146.47                |
| BERGANTES | MORELLALTO   | 2698.332  | T=500   | 498.62            | 765.89           | 770.72           | 770.39           | 771.67           | 0.004953            | 4                  | 124.58            | 50.57            | 0.77         | 27.24               | 158.39               | 55.38               | 115.85                |
| BERGANTES | MORELLALTO   | 2668.283  | T=500   | 498.62            | 765.53           | 770.42           | 769.88           | 771.51           | 0.004413            | 4.11               | 121.36            | 50.82            | 0.76         | 45.57               | 173.13               | 24.36               | 99.05                 |
| BERGANTES | MORELLALTO   | 2627.521  | T=500   | 498.62            | 765.42           | 770.57           | 769.65           | 771.24           | 0.003166            | 3.41               | 146.23            | 61.5             | 0.63         | 47.4                | 107.53               | 11.46               | 71.63                 |
| BERGANTES | MORELLALTO   | 2600.858  | T=500   | 498.62            | 765.17           | 770.2            | 769.82           | 771.11           | 0.00531             | 4.02               | 123.95            | 51.94            | 0.78         | 53.45               | 153.41               | 29.94               | 119.75                |
| BERGANTES | MORELLALTO   | 2583.825  | T=500   | 498.62            | 765.16           | 770.04           | 769.71           | 771              | 0.003817            | 3.66               | 136.36            | 53.1             | 0.71         | 51.52               | 159.29               | 49.37               | 92.4                  |
| BERGANTES | MORELLALTO   | 2570.241  | T=500   | 498.62            | 764.9            | 768.49           | 769              | 770.77           | 0.01282             | 6.28               | 79.45             | 31.09            | 1.24         | 141.18              | 388.29               | 116.17              | 306.12                |
| BERGANTES | MORELLALTO   | 2552.039  | T=500   | 498.62            | 764.85           | 769.18           | 768.85           | 770.48           | 0.005948            | 4.94               | 100.89            | 30.34            | 0.86         | 37.51               | 203.88               | 28.05               | 173.75                |
| BERGANTES | MORELLALTO   | 2529.844  | T=500   | 498.62            | 764.74           | 768.15           | 768.74           | 770.19           | 0.014247            | 5.63               | 88.64             | 50.99            | 1.28         | 83.43               | 371.76               | 92.07               | 225.33                |
| BERGANTES | MORELLALTO   | 2507.039  | T=500   | 498.62            | 764.54           | 767.46           | 768.24           | 769.74           | 0.024296            | 6.21               | 80.32             | 60.77            | 1.58         | 98.51               | 450.45               | 90.05               | 311.03                |
| BERGANTES | MORELLALTO   | 2490.032  | T=500   | 498.62            | 763.92           | 767.02           | 767.74           | 769.28           | 0.02923             | 6.65               | 74.93             | 46.82            | 1.68         | 51.4                | 456.67               |                     | 450.98                |
| BERGANTES | MORELLALTO   | 2467.629  | T=500   | 498.62            | 763.74           | 767.76           | 767.76           | 768.67           | 0.009634            | 4.16               | 119.85            | 70.76            | 0.99         | 82.21               | 176.73               | 8.14                | 157.32                |
| BERGANTES | MORELLALTO   | 2431.791  | T=500   | 498.62            | 763.61           | 767.61           | 767.28           | 768.27           | 0.005943            | 3.6                | 138.64            | 66.33            | 0.79         | 33.36               | 122.85               |                     | 119.62                |
| BERGANTES | MORELLALTO   | 2410.195  | T=500   | 498.62            | 763.48           | 767.18           | 767.18           | 768.1            | 0.010111            | 4.24               | 117.66            | 65.73            | 1.01         | 47.57               | 179.25               |                     | 174.94                |
| BERGANTES | MORELLALTO   | 2382.362  | T=500   | 498.62            | 763.27           | 766.33           | 766.67           | 767.6            | 0.021797            | 4.98               | 100.22            | 78.18            | 1.4          | 26.89               | 274.09               |                     | 271.92                |
| BERGANTES | MORELLALTO   | 2350.675  | T=500   | 498.62            | 763              | 766.59           | 766.25           | 767.08           | 0.005736            | 3.1                | 160.72            | 93.12            | 0.75         |                     | 96.56                |                     | 96.56                 |
| BERGANTES | MORELLALTO   | 2316.747  | T=500   | 498.62            | 762.95           | 766.24           | 766.06           | 766.86           | 0.00738             | 3.46               | 144.25            | 86.83            | 0.85         | 20.01               | 121.53               |                     | 119.02                |
| BERGANTES | MORELLALTO   | 2293.848  | T=500   | 498.62            | 762.68           | 766.03           | 765.74           | 766.67           | 0.006334            | 3.54               | 140.98            | 72.68            | 0.81         | 23.07               | 121.03               |                     | 118.99                |
| BERGANTES | MORELLALTO   | 2267.093  | T=500   | 498.62            | 762.13           | 765.5            | 765.5            | 766.42           | 0.010077            | 4.22               | 118.07            | 65.73            | 1            | 51.52               | 178.11               |                     | 174.35                |
| BERGANTES | MORELLALTO   | 2243.8    | T=500   | 498.62            | 761.93           | 765.4            | 765.22           | 766.14           | 0.007794            | 3.8                | 131.06            | 70.51            | 0.89         | 21.76               | 141.99               |                     | 140.08                |
| BERGANTES | MORELLALTO   | 2222.517  | T=500   | 498.62            | 761.23           | 765.36           | 765.05           | 765.93           | 0.006523            | 3.33               | 149.93            | 85.88            | 0.8          | 27.38               | 111.25               |                     | 109.56                |
| BERGANTES | MORELLALTO   | 2195.681  | T=500   | 498.62            | 761.09           | 765.13           | 764.89           | 765.75           | 0.00707             | 3.45               | 144.39            | 82.95            | 0.84         | 58.46               | 121.81               |                     | 118.68                |
| BERGANTES | MORELLALTO   | 2168.338  | T=500   | 498.62            | 760.93           | 765.03           | 764.58           | 765.54           | 0.005807            | 3.16               | 157.98            | 90.61            | 0.76         | 42.29               | 101.39               |                     | 98.19                 |
| BERGANTES | MORELLALTO   | 2146.539  | T=500   | 498.62            | 760.43           | 764.57           | 764.57           | 765.37           | 0.010255            | 3.93               | 127.03            | 80.23            | 1            | 74.67               | 162.72               |                     | 157.31                |
| BERGANTES | MORELLALTO   | 2084.025  | T=500   | 498.62            | 760.35           | 763.53           | 763.6            | 764.45           | 0.01161             | 4.25               | 117.34            | 71.97            | 1.06         |                     | 184.63               |                     | 184.63                |
| BERGANTES | MORELLALTO   | 2046.533  | T=500   | 498.62            | 759.74           | 763.24           | 763.13           | 764.02           | 0.008455            | 3.9                | 127.77            | 69.93            | 0.92         | 9.3                 | 150.24               | 5.4                 | 148.32                |
| BERGANTES | MORELLALTO   | 1990.019  | T=500   | 498.62            | 758.88           | 763.19           | 762.38           | 763.64           | 0.002943            | 2.92               | 171.04            | 67.25            | 0.58         | 13.85               | 75.6                 | 14.23               | 71.34                 |
| BERGANTES | MORELLALTO   | 1932.588  | T=500   | 498.62            | 758.27           | 762.78           | 762              | 763.45           | 0.003894            | 3.53               | 141.07            | 56.06            | 0.67         | 15.28               | 110.47               |                     | 93.22                 |
| BERGANTES | MORELLALTO   | 1879.673  | T=500   | 498.62            | 757.99           | 761.44           | 761.76           | 762.95           | 0.013914            | 5.37               | 92.9              | 49.95            | 1.19         | 28.62               | 279.73               | 17.43               | 244.46                |
| BERGANTES | MORELLALTO   | 1822.942  | T=500   | 498.62            | 756.96           | 760.37           | 760.78           | 761.86           | 0.016256            | 5.99               | 92.44             | 50.41            | 1.27         |                     | 287.23               |                     | 287.23                |
| BERGANTES | MORELLALTO   | 1785.543  | T=500   | 498.62            | 756.62           | 760.92           | 760.49           | 761.49           | 0.005187            | 3.31               | 150.69            | 73.46            | 0.74         | 21.94               | 104.23               |                     | 102.52                |
| BERGANTES | MORELLALTO   | 1756.862  | T=500   | 498.62            | 756.44           | 760.74           | 760.39           | 761.32           | 0.005558            | 3.33               | 149.92            | 78.51            | 0.75         |                     | 107.89               | 20.09               | 102.16                |
| BERGANTES | MORELLALTO   | 1744.35   | T=500   | 498.62            | 756.22           | 760.35           | 760.35           | 761.21           | 0.009679            | 4.02               | 124               | 77.22            | 0.98         | 23.81               | 168.17               | 33.69               | 148.9                 |
| BERGANTES | MORELLALTO   | 1723.778  | T=500   | 498.62            | 756.22           | 759.72           | 760.04           | 760.93           | 0.010979            | 4.86               | 102.59            | 72.47            | 1.3          | 33.17               | 151.58               |                     | 149.57                |
| BERGANTES | MORELLALTO   | 1708.685  | T=500   | 498.62            | 755.98           | 759.79           | 759.94           | 760.72           | 0.008946            | 4.26               | 116.93            | 85.54            | 1.17         | 43.42               | 118.86               |                     | 117.14                |
| BERGANTES | MORELLALTO   | 1694.402  | T=500   | 498.62            | 755.69           | 759.46           | 759.74           | 760.56           | 0.012081            | 4.59               | 108.67            | 88.36            | 1.33         | 82.76               | 144.97               |                     | 142.28                |
| BERGANTES | MORELLALTO   | 1679.373  | T=500   | 498.62            | 755.68           | 759.01           | 759.42           | 760.33           | 0.015325            | 5.06               | 98.61             | 83.29            | 1.49         | 98.4                | 176.83               |                     | 174.38                |
| BERGANTES | MORELLALTO   | 1663.422  | T=500   | 498.62            | 755.3            | 758.66           | 759.14           | 760.09           | 0.014622            | 5.3                | 94.11             | 71.41            | 1.47         | 6.97                | 184.58               |                     | 182.98                |
| BERGANTES | MORELLALTO   | 1652.841  | T=500   | 498.62            | 755.03           | 759.49           | 758.92           | 759.88           | 0.002416            | 2.76               | 180.95            | 94.89            | 0.64         | 17.52               | 44.66                |                     | 43.85                 |
| BERGANTES | MORELLALTO   | 1626.672  | T=500   | 498.62            | 754.86           | 759.32           | 758.65           | 759.81           | 0.001862            | 3.1                | 160.75            | 68.12            | 0.65         | 18.3                | 42.67                |                     | 41.52                 |
| BERGANTES | MORELLAMEDIO | 1608.287  | T=500   | 498.62            | 754.82           | 759.43           | 758.77           | 759.77           | 0.00489             | 2.56               | 194.55            | 100.89           | 0.59         | 29.45               | 91.36                |                     | 89.62                 |
| BERGANTES | MORELLAMEDIO | 1585.133  | T=500   | 498.62            | 754.48           | 759.43           | 758.56           | 759.65           | 0.000915            | 2.07               | 241.3             | 136.56           | 0.47         | 7.34                | 18.35                | 1.85                | 15.51                 |
| BERGANTES | MORELLAMEDIO | 1556.852  | T=500   | 498.62            | 754.25           | 759.17           | 758.38           | 759.56           | 0.002383            | 2.27               | 219.65            | 128.72           | 0.52         | 11.14               | 83.78                | 23.88               | 37.56                 |
| BERGANTES | MORELLAMEDIO | 1539.471  | T=500   | 498.62            | 754.1            | 758.93           | 758.3            | 759.48           | 0.003301            | 2.82               | 177.02            | 97.78            | 0.61         | 22.48               | 109.76               | 28.1                | 53.04                 |
| BERGANTES | MORELLAMEDIO | 1525.248  | T=500   | 498.62            | 753.98           | 758.63           | 758.24           | 759.36           | 0.003859            | 3.2                | 155.99            | 76.87            | 0.69         | 18.14               | 129.71               | 38.69               | 69.75                 |
| BERGANTES | MORELLAMEDIO | 1512.992  | T=500   | 498.62            | 753.82           | 758.78           | 758.21           | 759.22           | 0.003291            | 2.4                | 207.55            | 107.87           | 0.55         | 15.82               | 122.47               | 40.32               | 56.66                 |
| BERGANTES | MORELLAMEDIO | 1498.456  | T=500   | 498.62            | 753.71           | 758.54           | 758.21           | 759.09           | 0.004072            | 2.59               | 192.32            | 116.39           | 0.64         | 15.08               | 150.92               | 45.93               | 62.1                  |
| BERGANTES | MORELLAMEDIO | 1476.214  | T=500   | 498.62            | 753.53           | 757.59           | 757.74           | 758.74           | 0.016538            | 4.54               | 109.76            | 59.14            | 1.06         | 181.72              | 340.1                | 135.02              | 284.18                |
| BERGANTES | MORELLAMEDIO | 1447.308  | T=500   | 498.62            | 753.29           | 757.47           | 757.35           | 758.25           | 0.01115             | 3.74               | 133.27            | 69.21            | 0.87         | 130.99              | 237.35               | 119.31              | 200.34                |
| BERGANTES | MORELLAMEDIO | 1418.074  | T=500   | 498.62            | 753.12           | 756.97           | 757.23           | 757.97           | 0.009008            | 3.11               | 160.2             | 124.64           | 0.98         | 108.31              | 278.01               | 87.93               | 111.66                |
| BERGANTES | MORELLAMEDIO | 1394.002  | T=500   | 498.62            | 752.39           | 756.94           | 756.45           | 757.21           | 0.00663             | 2.3                | 217.26            | 138.51           | 0.58         | 39.55               | 100.92               |                     | 99.83                 |
| BERGANTES | MORELLAMEDIO | 1370.229  | T=500   | 498.62            | 751.84           | 756.66           | 756.12           | 757.02           | 0.008895            | 2.66               | 187.69            | 116.81           | 0.67         | 25.61               | 137.94               |                     | 135.66                |
| BERGANTES | MORELLAMEDIO | 1353.036  | T=500   | 498.62            | 751.91           | 756.32           | 756.05           | 756.89           | 0.004886            | 3.33               | 149.87            | 91.58            | 0.8          | 17.7                |                      |                     |                       |

DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA  
INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

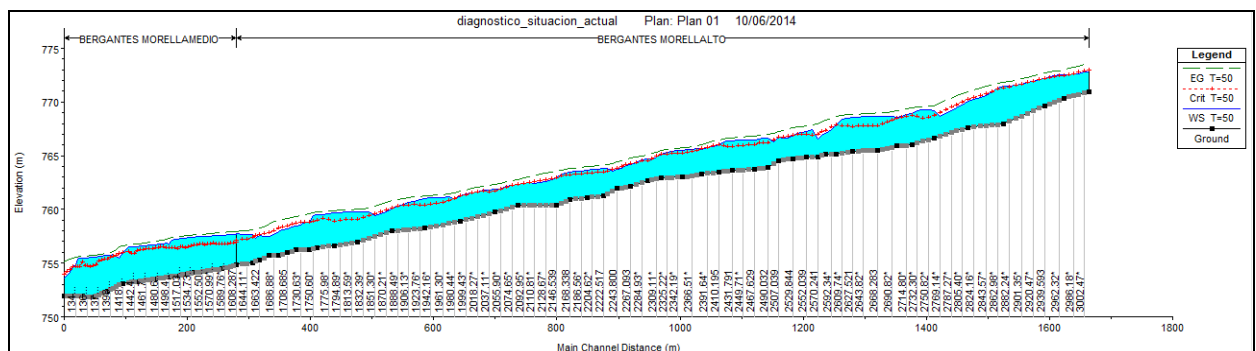
|           |             |          |       |        |        |        |        |        |          |      |        |        |      |        |        |        |        |
|-----------|-------------|----------|-------|--------|--------|--------|--------|--------|----------|------|--------|--------|------|--------|--------|--------|--------|
| BERGANTES | MORELLABAJA | 1250.764 | T=500 | 498.62 | 751.05 | 753.8  | 754.65 | 756.39 | 0.034035 | 7.1  | 70.26  | 38.14  | 1.66 | 137.34 | 599.96 |        | 582.75 |
| BERGANTES | MORELLABAJA | 1221.555 | T=500 | 498.62 | 750.66 | 754.7  | 754.36 | 755.2  | 0.006693 | 3.11 | 160.27 | 89.97  | 0.74 | 70.06  | 117.22 | 10.49  | 113.19 |
| BERGANTES | MORELLABAJA | 1189.277 | T=500 | 498.62 | 750.64 | 754.55 | 754.17 | 754.96 | 0.006053 | 2.83 | 176.35 | 106.74 | 0.7  | 78.32  | 99.17  | 15.45  | 96.03  |
| BERGANTES | MORELLABAJA | 1159.131 | T=500 | 498.62 | 750.66 | 754.38 | 753.78 | 754.78 | 0.005533 | 2.78 | 179.54 | 103.71 | 0.68 | 76.91  | 94.66  | 12.75  | 92.1   |
| BERGANTES | MORELLABAJA | 1119.613 | T=500 | 498.62 | 749.98 | 753.77 | 753.56 | 754.44 | 0.008698 | 3.63 | 137.52 | 74.87  | 0.85 |        | 154.38 |        | 154.36 |
| BERGANTES | MORELLABAJA | 1080.628 | T=500 | 498.62 | 749.39 | 753.52 | 753.05 | 754.15 | 0.006217 | 3.51 | 141.9  | 62.06  | 0.74 |        | 135.41 |        | 135.41 |
| BERGANTES | MORELLABAJA | 1046.059 | T=500 | 498.62 | 749.3  | 752.37 | 752.73 | 753.64 | 0.024267 | 4.99 | 99.83  | 72.36  | 1.36 |        | 322.56 |        | 322.56 |
| BERGANTES | MORELLABAJA | 996.576  | T=500 | 498.62 | 748.55 | 752.66 | 751.7  | 752.89 | 0.003143 | 2.1  | 237.39 | 124.97 | 0.51 |        | 58.56  | 51.2   | 56.14  |
| BERGANTES | MORELLABAJA | 950.974  | T=500 | 498.62 | 747.89 | 752.05 | 751.47 | 752.55 | 0.004934 | 3.14 | 158.64 | 69.39  | 0.66 |        | 108.12 |        | 108.12 |
| BERGANTES | MORELLABAJA | 913.674  | T=500 | 498.62 | 747.67 | 751.88 | 750.95 | 752.37 | 0.003789 | 3.09 | 161.32 | 58.75  | 0.6  |        | 98.72  |        | 98.72  |
| BERGANTES | MORELLABAJA | 882.552  | T=500 | 498.62 | 747.41 | 751.74 | 750.64 | 752.2  | 0.003971 | 3    | 166.35 | 66.03  | 0.6  |        | 95.38  |        | 95.38  |
| BERGANTES | MORELLABAJA | 854.465  | T=500 | 498.62 | 746.84 | 750.28 | 750.66 | 751.77 | 0.019488 | 5.4  | 92.26  | 49.46  | 1.26 |        | 343.72 |        | 343.72 |
| BERGANTES | MORELLABAJA | 808.923  | T=500 | 498.62 | 746.55 | 750.56 | 750.19 | 751.12 | 0.007422 | 3.29 | 151.54 | 84.19  | 0.78 |        | 128.26 |        | 128.26 |
| BERGANTES | MORELLABAJA | 745.564  | T=500 | 498.62 | 746.36 | 750.18 | 749.57 | 750.71 | 0.004589 | 3.2  | 155.87 | 64.39  | 0.66 | 21.11  | 111.03 | 20.64  | 103.6  |
| BERGANTES | MORELLABAJA | 695.776  | T=500 | 498.62 | 745.3  | 749.12 | 749.12 | 750.42 | 0.00996  | 4.91 | 101.5  | 40.4   | 0.98 | 58.97  | 267.98 | 93.32  | 233.45 |
| BERGANTES | MORELLABAJA | 655.942  | T=500 | 498.62 | 745    | 749.39 | 748.48 | 749.84 | 0.003024 | 2.76 | 180.41 | 84.59  | 0.55 | 19.97  | 90.71  | 19.38  | 61.41  |
| BERGANTES | MORELLABAJA | 613.402  | T=500 | 498.62 | 744.55 | 747.56 | 747.96 | 749.22 | 0.02018  | 5.67 | 87.9   | 46.85  | 1.32 |        | 379.31 | 108.31 | 362.96 |
| BERGANTES | MORELLABAJA | 567.073  | T=500 | 498.62 | 743.49 | 746.68 | 747.09 | 748.26 | 0.021585 | 5.57 | 89.51  | 50.66  | 1.34 |        | 368.98 |        | 368.98 |
| BERGANTES | MORELLABAJA | 508.645  | T=500 | 498.62 | 743.25 | 746.7  | 746.51 | 747.37 | 0.008922 | 3.61 | 138.15 | 78.42  | 0.86 |        | 155.2  | 31.48  | 151.93 |
| BERGANTES | MORELLABAJA | 467.757  | T=500 | 498.62 | 742.83 | 745.85 | 746.02 | 746.75 | 0.019226 | 4.2  | 118.71 | 94.55  | 1.2  |        | 236.55 | 105.91 | 233.56 |
| BERGANTES | MORELLABAJA | 443.346  | T=500 | 498.62 | 742.33 | 745.38 | 745.57 | 746.29 | 0.020854 | 4.19 | 118.87 | 104.21 | 1.23 | 47.93  | 242.3  |        | 230.48 |
| BERGANTES | MORELLABAJA | 406.528  | T=500 | 498.62 | 741.66 | 744.12 | 744.47 | 745.36 | 0.026305 | 4.92 | 101.3  | 80.62  | 1.4  |        | 322.01 |        | 322.01 |
| BERGANTES | MORELLABAJA | 374.786  | T=500 | 498.62 | 741.21 | 744.62 | 744.16 | 745.1  | 0.005966 | 3.08 | 161.94 | 85.93  | 0.72 | 1.93   | 109.95 |        | 109.65 |
| BERGANTES | MORELLABAJA | 348.086  | T=500 | 498.62 | 740.78 | 744.55 | 744    | 744.93 | 0.00491  | 2.73 | 182.43 | 99.37  | 0.64 | 4.69   | 87.92  |        | 87.08  |
| BERGANTES | MORELLABAJA | 316.306  | T=500 | 498.62 | 740.53 | 743.93 | 743.93 | 744.68 | 0.01246  | 3.83 | 130.3  | 86.31  | 0.99 | 43.73  | 183.85 |        | 181.56 |
| BERGANTES | MORELLABAJA | 292.552  | T=500 | 498.62 | 740.53 | 743.32 | 743.52 | 744.18 | 0.02711  | 4.09 | 122    | 130.3  | 1.35 | 173.48 | 247.81 |        | 245.81 |
| BERGANTES | MORELLABAJA | 264.24   | T=500 | 498.62 | 740.19 | 742.74 | 742.91 | 743.48 | 0.023804 | 3.83 | 130.32 | 138.82 | 1.26 |        | 215.23 |        | 215.23 |
| BERGANTES | MORELLABAJA | 222.046  | T=500 | 498.62 | 739.99 | 742.47 | 741.89 | 742.67 | 0.003688 | 1.98 | 252.33 | 180.78 | 0.53 |        | 50.12  |        | 50.12  |
| BERGANTES | MORELLABAJA | 185.338  | T=500 | 498.62 | 738.01 | 742.24 | 740.75 | 742.33 | 0.00084  | 1.35 | 368.31 | 152.59 | 0.28 |        | 19.64  |        | 19.64  |
| BERGANTES | MORELLABAJA | 138.968  | T=500 | 498.62 | 737.31 | 740.58 | 740.85 | 741.83 | 0.01821  | 4.96 | 100.63 | 60.07  | 1.22 |        | 296.66 |        | 296.66 |
| BERGANTES | MORELLABAJA | 80.632   | T=500 | 498.62 | 736.08 | 740.16 | 739.96 | 740.92 | 0.009027 | 3.83 | 130.18 | 66.09  | 0.87 | 63.62  | 171.42 |        | 167.01 |
| BERGANTES | MORELLABAJA | 20.181   | T=500 | 498.62 | 734.83 | 739.05 | 739.17 | 740.19 | 0.014182 | 4.69 | 106.4  | 56.51  | 1.09 | 110.14 | 261.15 |        | 252.92 |
| AFLUENTE  | MARGEN DCHA | 324.568  | T=500 | 33.98  | 766.83 | 768.63 | 768.97 | 769.71 | 0.028029 | 3.63 | 9.35   | 16.2   | 1.45 | 99.65  | 297.49 | 76.14  | 149.7  |
| AFLUENTE  | MARGEN DCHA | 316.607  | T=500 | 33.98  | 766.72 | 768.31 | 768.67 | 769.48 | 0.028818 | 4.04 | 8.4    | 15.26  | 1.49 | 64.94  | 281.01 | 36.3   | 146.62 |
| AFLUENTE  | MARGEN DCHA | 309.883  | T=500 | 33.98  | 766.53 | 768.3  | 768.6  | 769.25 | 0.021717 | 3.68 | 9.24   | 15.92  | 1.31 | 48.25  | 222.31 | 9.54   | 115.69 |
| AFLUENTE  | MARGEN DCHA | 304.389  | T=500 | 33.98  | 766.09 | 768.02 | 768.39 | 769.11 | 0.023287 | 4.13 | 8.23   | 16.43  | 1.27 | 22.86  | 240.33 |        | 103.86 |
| AFLUENTE  | MARGEN DCHA | 296.16   | T=500 | 33.98  | 765.92 | 767.56 | 768.06 | 768.87 | 0.031142 | 5.01 | 6.78   | 8.15   | 1.49 | 8.94   | 291.57 | 4.69   | 217.99 |
| AFLUENTE  | MARGEN DCHA | 290.278  | T=500 | 33.98  | 765.7  | 767.48 | 767.87 | 768.67 | 0.025234 | 4.14 | 8.2    | 13.7   | 1.34 | 47.92  | 269.38 | 27.26  | 131.64 |
| AFLUENTE  | MARGEN DCHA | 282.946  | T=500 | 33.98  | 765.9  | 767.62 | 767.84 | 768.4  | 0.016727 | 3.39 | 10.04  | 13.15  | 1.14 | 63.6   | 186.99 | 48.39  | 114.75 |
| AFLUENTE  | MARGEN DCHA | 277.698  | T=500 | 33.98  | 765.53 | 767.24 | 767.58 | 768.28 | 0.020229 | 3.88 | 8.76   | 12.56  | 1.31 | 62.96  | 237.57 | 47.25  | 130.55 |
| AFLUENTE  | MARGEN DCHA | 269.391  | T=500 | 33.98  | 765.42 | 766.62 | 767.08 | 768.03 | 0.03335  | 4.65 | 7.31   | 10.97  | 1.68 | 100.85 | 336.84 | 87.6   | 208.73 |
| AFLUENTE  | MARGEN DCHA | 263.999  | T=500 | 33.98  | 765.2  | 766.5  | 766.97 | 767.83 | 0.005073 | 4.66 | 7.29   | 10.34  | 1.56 | 74.18  | 305.72 | 58.83  | 196.7  |
| AFLUENTE  | MARGEN DCHA | 258.543  | T=500 | 33.98  | 764.99 | 766.31 | 766.76 | 767.64 | 0.005079 | 5.12 | 6.64   | 7.78   | 1.77 |        | 316.4  |        | 316.4  |
| AFLUENTE  | MARGEN DCHA | 252.147  | T=500 | 33.98  | 764.93 | 766.75 | 766.82 | 767.33 | 0.010302 | 3.01 | 11.3   | 13.23  | 0.92 | 32.26  | 128.34 | 34.23  | 78.57  |
| AFLUENTE  | MARGEN DCHA | 246.422  | T=500 | 33.98  | 764.83 | 766.48 | 766.69 | 767.24 | 0.015023 | 3.46 | 9.82   | 12.85  | 1.08 | 37.07  | 169.31 | 32.15  | 101.81 |
| AFLUENTE  | MARGEN DCHA | 242.193  | T=500 | 33.98  | 764.79 | 766.3  | 766.56 | 767.16 | 0.019739 | 3.81 | 8.92   | 13.07  | 1.24 | 30.68  | 193.99 | 18.37  | 121.42 |
| AFLUENTE  | MARGEN DCHA | 239.244  | T=500 | 33.98  | 764.69 | 765.92 | 766.29 | 767.06 | 0.030958 | 4.09 | 8.3    | 12.7   | 1.59 | 110.69 | 290.8  | 27.9   | 187.1  |
| AFLUENTE  | MARGEN DCHA | 235.959  | T=500 | 33.98  | 764.55 | 765.85 | 766.24 | 766.95 | 0.029978 | 4.01 | 8.48   | 12.89  | 1.55 | 108.65 | 282.04 | 16.33  | 181.95 |
| AFLUENTE  | MARGEN DCHA | 232.813  | T=500 | 33.98  | 764.43 | 765.45 | 765.87 | 766.8  | 0.046435 | 5.13 | 6.62   | 9.86   | 1.88 | 26.09  | 333.91 | 8.3    | 289.99 |
| AFLUENTE  | MARGEN DCHA | 229.992  | T=500 | 33.98  | 764.3  | 766.35 | 765.59 | 766.49 | 0.001755 | 1.58 | 21.44  | 16.62  | 0.41 | 6.63   | 27.78  | 3.47   | 20.57  |
| AFLUENTE  | MARGEN DCHA | 223.682  | T=500 | 33.98  | 764.11 | 765.89 | 765.89 | 766.43 | 0.010833 | 3.15 | 10.79  | 10.66  | 0.98 | 22.42  | 116.81 | 37.77  | 99.36  |
| AFLUENTE  | MARGEN DCHA | 203.774  | T=500 | 33.98  | 762.83 | 763.66 | 764.19 | 765.47 | 0.071866 | 5.95 | 5.71   | 8.13   | 2.27 |        | 458    |        | 458    |
| AFLUENTE  | MARGEN DCHA | 197.305  | T=500 | 33.98  | 762.1  | 763.13 | 763.66 | 764.98 | 0.077683 | 6.02 | 5.65   | 8.6    | 2.37 |        | 474.75 |        | 474.75 |
| AFLUENTE  | MARGEN DCHA | 188.798  | T=500 | 33.98  | 761.4  | 762.72 | 763.42 | 764.42 | 0.04804  | 5.78 | 5.88   | 5.77   | 1.83 |        | 396.01 |        | 395.25 |
| AFLUENTE  | MARGEN DCHA | 182.911  | T=500 | 33.98  | 761.04 | 763.45 | 763.57 | 763.95 | 0.01002  | 2.59 | 13.1   | 20.72  | 0.87 | 28.97  | 119.76 | 17.94  | 56.81  |
| AFLUENTE  | MARGEN DCHA | 177.41   | T=500 | 33.98  | 760.93 | 763.61 | 763.32 | 763.8  | 0.002996 | 1.49 | 22.84  | 33.99  | 0.48 | 11.66  | 46.95  | 4.42   | 18.2   |
| AFLUENTE  | MARGEN DCHA | 172.631  | T=500 | 33.98  | 760.79 | 763.67 | 763.36 | 763.76 | 0.001714 | 1.03 | 33.04  | 43.65  | 0.33 | 9.28   | 25.34  | 2.98   | 11.86  |
| AFLUENTE  | MARGEN DCHA | 167.601  | T=500 | 33.98  | 760.55 | 762.9  | 762.9  | 763.67 | 0.014304 | 3.83 | 8.86   | 7.35   | 0.95 | 9.01   | 161.69 |        | 126.81 |
| AFLUENTE  | MARGEN DCHA | 162.637  | T=500 | 33.98  | 760.8  | 762.9  | 762.9  | 763.4  | 0.010458 | 2.87 | 11.83  | 11.31  | 0.83 | 50.47  | 117.74 |        | 87.66  |
| AFLUENTE  | MARGEN DCHA | 157.529  | T=500 | 33.98  | 760.36 | 762.66 | 762.81 | 763.31 | 0.019092 | 3.27 | 10.39  | 12.18  | 1.07 | 99.56  | 180.64 | 14.31  | 132.51 |
| AFLUENTE  | MARGEN DCHA | 152.542  | T=500 | 33.98  | 760.25 | 761.66 | 762.09 | 763.11 | 0.032776 | 5.33 | 6.37   | 5.12   | 1.52 |        | 320    | 6.99   | 297.27 |
| AFLUENTE  | MARGEN DCHA | 147.403  | T=500 | 33.98  | 760    | 761.19 | 761.73 | 762.87 | 0.054839 | 5.74 | 5.92   | 6.85   | 1.97 |        | 405.78 |        | 405.78 |
| AFLUENTE  | MARGEN DCHA | 140.995  | T=500 | 33.98  | 759.81 | 760.94 | 761.45 | 762.51 | 0.048495 | 5.43 | 6.26   | 7.96   | 1.9  |        | 376.98 | 103.49 | 339.43 |
| AFLUENTE  | MARGEN DCHA | 134.769  | T=500 | 33.98  | 759.71 | 761.49 | 761.49 | 761.81 | 0.007636 | 2.05 | 16.6   | 27.63  | 0.74 | 25.67  | 84.24  |        | 42.01  |
| AFLUENTE  | MARGEN DCHA | 128.576  | T=500 | 33.98  | 759.51 | 761.27 | 761.41 | 761.74 | 0.009777 | 2.32 | 14.68  | 30.69  | 0.87 | 23.41  | 116.52 | 28.52  | 43.28  |
| AFLUENTE  | MARGEN DCHA | 122.101  | T=500 | 33.98  | 759.32 | 761.18 | 761.33 | 761.68 | 0.008987 | 2.47 | 13.78  | 31.06  | 0.87 | 15.2   | 111.35 | 21.75  | 37.3   |
| AFLUENTE  | MARGEN DCHA | 115.354  | T=500 | 33.98  | 759.18 | 761.11 | 761.27 | 761.62 | 0.010719 | 2.63 | 12.94  |        |      |        |        |        |        |

## Ap.III.2.2. PERFILES LONGITUDINALES SITUACIÓN ACTUAL

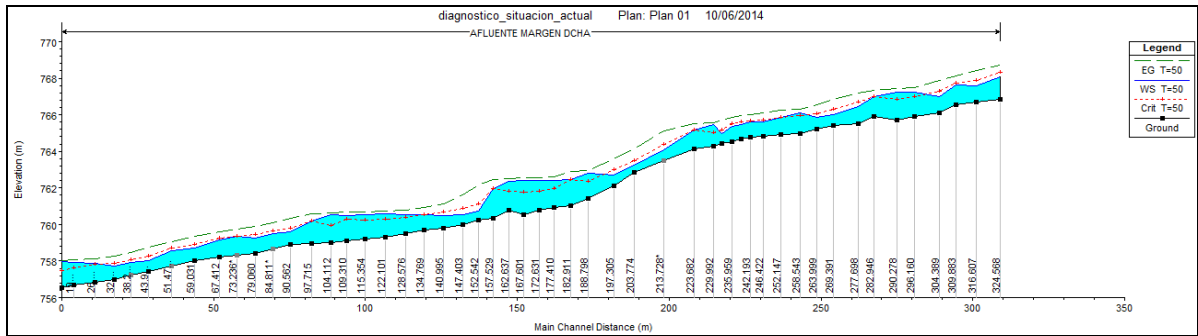
### PERIODO DE RETORNO DE 25 AÑOS



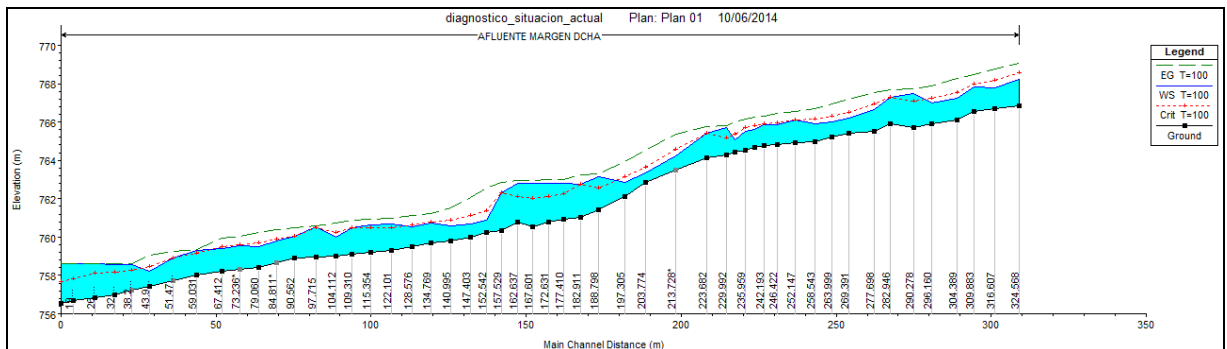
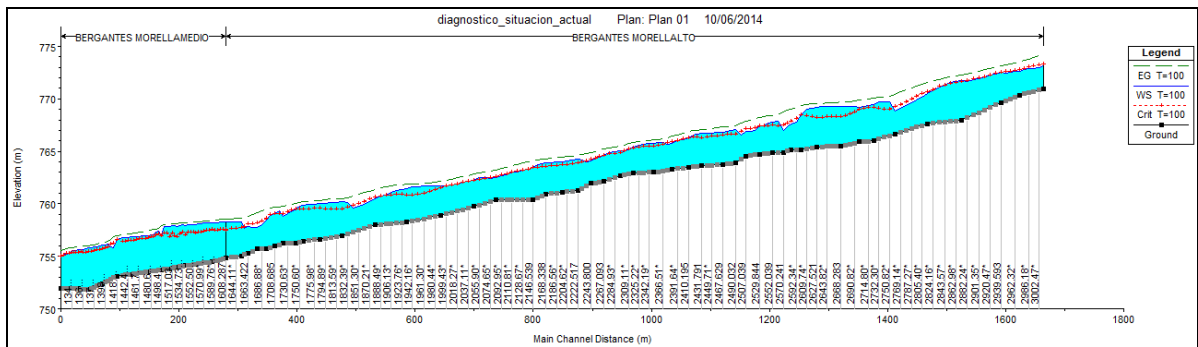
### PERIODO DE RETORNO DE 50 AÑOS



DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

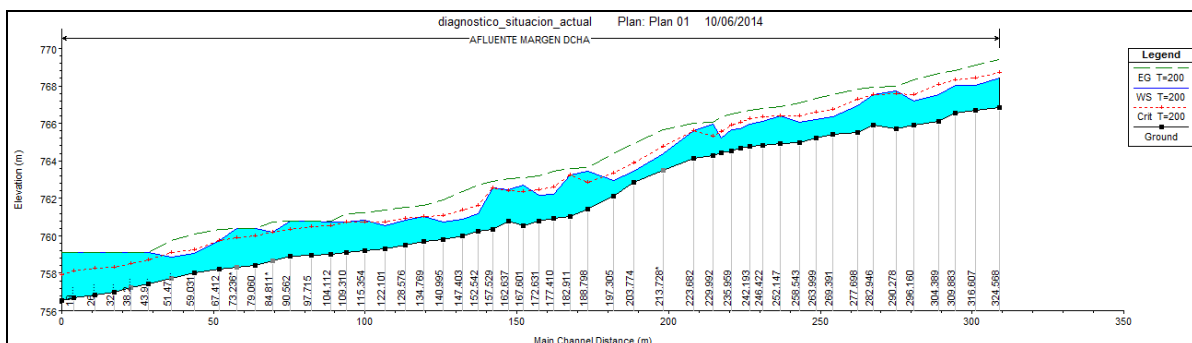
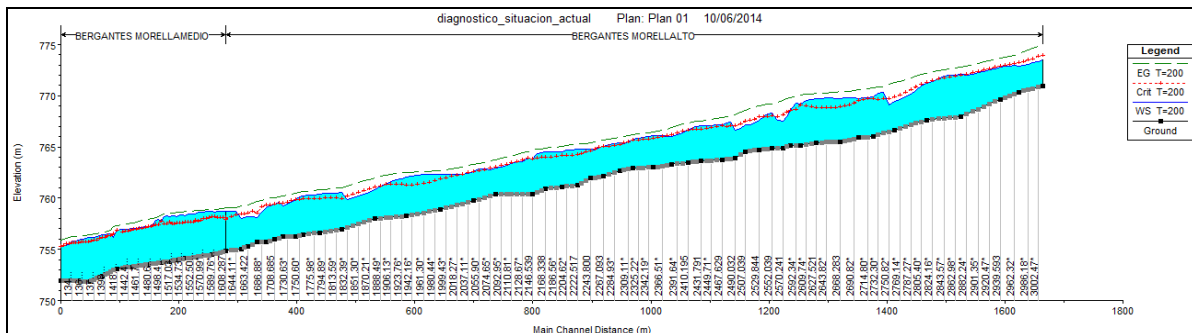


*PERIODO DE RETORNO DE 100 AÑOS*

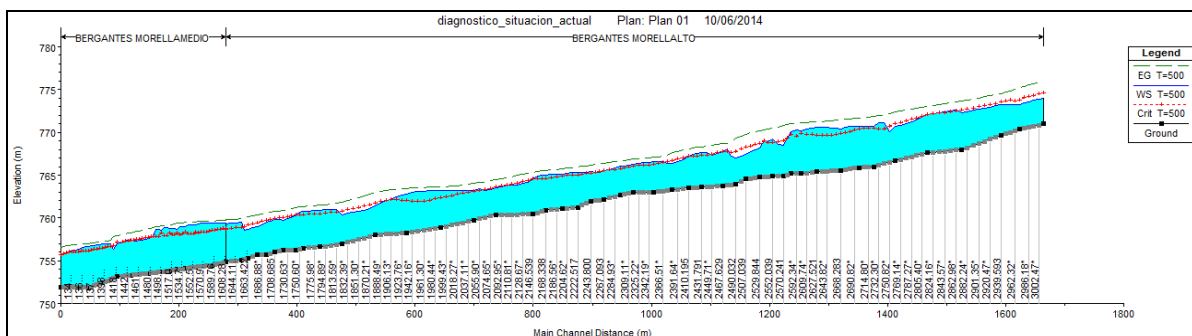




## PERIODO DE RETORNO DE 200 AÑOS



## PERIODO DE RETORNO DE 500 AÑOS



DISEÑO DE LAS ACTUACIONES DE INGENIERÍA FLUVIAL EN EL RÍO BERGANTES PARA LA DEFENSA CONTRA INUNDACIONES DEL COMPLEJO DE LA FÁBRICA GINER EN MORELLA (CASTELLÓN)

