

**MEMORIA Y SUS ANEJOS.**

**ANEJO Nº 8: TRAZADO**

INDICE:

1.- DATOS DE PARTIDA .....3

1.1.- ALCANCE .....3

1.2.- CONDICIONANTES .....3

2.- NORMATIVA.....3

3.- DEFINICIÓN DE PARÁMETROS Y CRITERIOS DE DISEÑO .....3

3.1.-VIALES. ....3

3.2.- GLORIETA.....4

3.3.- RAMALES DE ENTRONQUE CON LA GLORIETA.....6

3.4. ESTUDIO DE VISIBILIDAD .....6

4. - APÉNDICE 1: LISTADOS DE REPLANTEO. ....8

5. REPLANTEO GENERAL.....23

6. LISTADO DE VÉRTICES .....33

## 1.- DATOS DE PARTIDA

### 1.1.- ALCANCE

En el presente Anejo se realiza el estudio del trazado de los distintos viales que conforman la urbanización proyectada y de la resolución de la glorieta de intersección entre dicha urbanización y la Ronda Norte de Cáceres.

### 1.2.- CONDICIONANTES

El encaje del trazado tanto de la glorieta como del nuevo viales se ha realizado básicamente a partir de los siguientes condicionantes:

- Diámetros recomendados por el Excelentísimo Ayuntamiento de Cáceres para la construcción de nuevas glorietas en vías urbanas.
- Parámetros mínimos establecidos por el Excelentísimo Ayuntamiento de Cáceres para la construcción de nuevos viales en urbanizaciones.
- Terrenos disponibles y encaje con el Plan General Municipal.

## 2.- NORMATIVA

Para el estudio y definición del trazado geométrico de la vía objeto de este proyecto se han considerado los siguientes documentos:

- Norma 3.1-IC Trazado de la Instrucción de Carreteras, aprobada por la Orden FOM/273/2016, de 19 de febrero.
- OC 32/2012 Guía de Nudos Viarios, de 14 de diciembre.
- TOMO I. Normas Urbanísticas de Revisión y Adaptación del Plan General Municipal del Excmo. Ayuntamiento de Cáceres, aprobado por Resolución del Consejero de Fomento de 15-02-2010.

## 3.- DEFINICIÓN DE PARÁMETROS Y CRITERIOS DE DISEÑO

### 3.1.-VIALES.

Se definen a continuación los parámetros utilizados en los distintos viales, tanto en planta como en alzado y sección tipo.

#### TRAZADO EN PLANTA

Para el trazado en planta se ha tenido en cuenta el Capítulo 4. Trazado en Planta de la Norma 3.1 – IC:

- Velocidad de Proyecto: 50 Km/h.
- Radio mínimo en planta recomendado: 85 m.
- Radio mínimo en planta utilizado: se añade en la Tabla 1. Hay algunos valores que no cumplen este valor mínimo de la Norma 3.1 – IC, que quedan justificados al ser conexiones con glorietas u otros viales y al formar parte del trazado de una urbanización, con parámetros menos exigentes que los de la Norma de Trazado.
- Peralte empleado: bombeo del 2 %. Salvo en los entronques con glorietas y con otros viales, que se ha adoptado la pendiente que dicho vial o glorieta tenga en ese punto.

#### TRAZADO EN ALZADO

Para el trazado en planta se ha tenido en cuenta el Capítulo 5. Trazado en Alzado de la Norma 3.1 – IC:

- Inclinación máxima recomendada: 6% (Norma 3.1 – IC).
- Inclinación máxima utilizada: se añade en la Tabla 1. No se cumple este valor máximo de la Norma 3.1 – IC en el vial 12, ya que está condicionado por el trazado de los viales con los que entronca. Además, al formar parte del trazado de una urbanización, se requieren parámetros menos exigentes que los de la Norma de Trazado.
- Parámetro de parada  $K_v$  acuerdos verticales cóncavos recomendados (Norma 3.1 – IC): **1650 m.** Se utilizan parámetros menos exigentes al tratarse del trazado de una urbanización.

- Parámetro de parada  $K_v$  acuerdos verticales cóncavos utilizado: se añade en la Tabla 1.
- Parámetro de parada  $K_v$  acuerdos verticales convexos recomendado (Norma 3.1 – IC): **800 m**. Se utilizan parámetros menos exigentes al tratarse del trazado de una urbanización.
- Parámetro de parada  $K_v$  acuerdos verticales convexos utilizado: se añade en la Tabla 1.

|          | Nº     | PLANTA                               | ALZADO              |                    |                 |
|----------|--------|--------------------------------------|---------------------|--------------------|-----------------|
|          |        | RADIO MÍNIMO EN PLANTA UTILIZADO (m) | Kv PARADA UTILIZADO |                    | INCLINACIÓN (%) |
|          |        |                                      | ACUERO CÓNCAVO (m)  | ACUERO CONVEXO (m) |                 |
| VIALES   | 1      | Infinito                             | 900,00              | -                  | 2,000           |
|          | 2      | 850,00                               | 500,00              | 1000,00            | 3,022           |
|          | 3      | 300,00                               | 550,00              | 495,00             | 5,964           |
|          | 4      | 425,00                               | 600,00              | 500,00             | 5,977           |
|          | 5      | 820,00                               | 500,00              | 500,00             | 3,558           |
|          | 6      | Infinito                             | 650,00              | 750,00             | 3,477           |
|          | 7      | Infinito                             | 740,00              | 750,00             | 5,851           |
|          | 8      | Infinito                             | 800,00              | 700,00             | 5,719           |
|          | 9      | Infinito                             | 900,00              | 900,00             | 4,565           |
|          | 10     | Infinito                             | 1200,00             | 900,00             | 3,902           |
|          | 11     | 126,50                               | 0,00                | 1200,00            | 2,055           |
|          | 12     | 375,00                               | 600,00              | 600,00             | 6,557           |
|          | 13     | 500,00                               | 1200,00             | 500,00             | 5,326           |
|          | RN     | 740,00                               | 700,00              | -                  | 5,973           |
|          | M II   | Infinito                             | 400,00              | -                  | 6,083           |
| CONEXIÓN | 05--11 | 30,00                                | -                   | 475,00             | 3,558           |

Tabla 1. Parámetros utilizados en planta y alzado para los distintos viales.

**SECCIÓN TIPO**

Para el dimensionamiento de la sección tipo se ha tenido en cuenta el Capítulo 7. Sección Transversal de la Norma 3.1 – IC.

Las distintas secciones obtenidas se recogen en la Tabla 2.

**3.2.- GLORIETA**

Se definen a continuación los parámetros utilizados en las distintas glorietas, tanto en la de conexión con la ronda Norte existente, así como el cruce entre los viales 1 y 3; y 3 y 11.

Se tendrá en cuenta el punto 10.6. Intersecciones Tipo Glorieta de la Norma 3.1 – IC:

**TRAZADO EN PLANTA**

- El ángulo subtendido al centro de la glorieta por dos puntos de intersección de la circunferencia definida por el borde exterior de la calzada anular: uno con la trayectoria más desfavorable de entrada por una vía de acceso y otro con la trayectoria más desfavorable de salida por la vía de acceso siguiente, no será menor que sesenta (**≥60**) **gonios**.
- La separación entre accesos medidos sobre el borde exterior de la calzada anular entre puntas de isletas será mayor o igual que veinte metros (**≥ 20 m**).
- Peralte empleado: La calzada anular tendrá, en general, una inclinación transversal constante del dos por ciento (**2 %**) hacia su borde exterior sin que el valor absoluto de la inclinación longitudinal en ningún punto de dicho borde de la calzada anular rebase el tres por ciento (**≠ 3 %**).
- El diámetro exterior de una calzada anular de dos carriles concéntricos no regulada por semáforos:
  - No será menor que treinta y cinco metros (**≠ 35 m**), excepto donde se justifique que de lo contrario, los costes resultarán desproporcionados.
  - Se procurará que esté comprendido: En glorietas urbanas entre cuarenta y cinco metros (**45 m**) y cincuenta y cinco metros (**55 m**) y en glorietas periurbanas e interurbanas, entre cincuenta y cinco metros (55 m) y sesenta metros (60 m).
- Este valor es sobrepasado en el caso de la glorieta de conexión con la Ronda Norte, debido a que está formada por 3 carriles.

|          | Nº     | SECCIÓN TIPO (m) |       |              |         |               |               |         |              |       |             |
|----------|--------|------------------|-------|--------------|---------|---------------|---------------|---------|--------------|-------|-------------|
|          |        | IZQUIERDA        |       |              |         |               | DERECHA       |         |              |       |             |
|          |        | CARRIL BICI      | ACERA | APARCAMIENTO | CALZADA | ACERA CENTRAL | ACERA CENTRAL | CALZADA | APARCAMIENTO | ACERA | CARRIL BICI |
| VIALES   | 1      | -                | 4,00  | 2,20         | 7,00    | 6,05          | 6,05          | 7,00    | 2,20         | 4,00  | 1,50        |
|          | 2      | -                | 3,00  | 5,00         | 7,00    | -             | -             | 7,00    | 2,20         | 3,00  | -           |
|          | 3      | -                | 4,00  | 2,20         | 7,00    | 1,00          | 1,00          | 7,00    | 2,20         | 4,00  | -           |
|          | 4      | -                | 3,00  | 2,20         | 3,50    | -             | 0,00          | 3,50    | 2,20         | 3,00  | -           |
|          | 5      | 1,50             | 4,00  | 2,20         | 7,00    | 1,00          | -             | -       | -            | -     | -           |
|          | 6      | -                | -     | -            | -       | -             | 0,75          | 4,25    | 5,20         | 3,00  | -           |
|          | 7      | -                | 3,00  | 2,20         | 3,50    | -             | -             | 3,50    | 2,20         | 3,00  | -           |
|          | 8      | -                | 3,00  | 2,20         | -       | -             | -             | 4,00    | 2,20         | 3,00  | -           |
|          | 9      | -                | 3,00  | -            | 4,00    | -             | -             | -       | 5,00         | 3,00  | -           |
|          | 10     | -                | 3,00  | 5,00         | -       | -             | -             | 4,00    | -            | 3,00  | -           |
|          | 11     | 1,50             | 3,50  | 2,20         | 6,40    | 0,15          | -             | -       | -            | -     | -           |
|          | 12     | -                | 3,00  | 2,20         | -       | -             | -             | 4,00    | -            | 3,00  | -           |
|          | 13     | -                | 3,00  | 2,20         | -       | -             | -             | 4,00    | -            | 3,00  | -           |
|          | RN     | 1,50             | 4,00  | -            | 10,00   | 2,00          | 2,00          | 10,00   | -            | 4,00  |             |
|          | M. II  | 1,50             | 2,50  | -            | 6,00    | 2,50          | 2,50          | 6,00    | -            | 2,50  | 1,50        |
| CONEXIÓN | 05--11 | 1,50             | 3,00  | 2,20         | 3,50    | -             | -             | 3,50    | -            | -     | -           |

Tabla 2. Sección Tipo utilizada en los distintos viales.

TRAZADO EN ALZADO

- Inclinación máxima recomendada: **+/- 3%** (Norma 3.1 – IC).

Se añade una Tabla 3 con los parámetros utilizados en planta y alzado para las glorietas.

|           | Nº        | PLANTA                               | ALZADO              |                    |                 |
|-----------|-----------|--------------------------------------|---------------------|--------------------|-----------------|
|           |           | DIÁMETRO EXTERIOR CALZADA ANULAR (m) | Kv PARADA UTILIZADO |                    | INCLINACIÓN (%) |
|           |           |                                      | ACUERO CÓNCAVO (m)  | ACUERO CONVEXO (m) |                 |
| GLORIETAS | R. NORTE  | 80,54                                | 470,00              | 470,00             | 3,746           |
|           | VIAL 1-3  | 49,00                                | 800,00              | 800,00             | 1,138           |
|           | VIAL 3-11 | 36,98                                | 310,00              | 310,00             | 2,715           |

Tabla 3. Parámetros utilizados en planta y alzado para las distintas glorietas.

SECCIÓN TIPO

Las distintas secciones de glorieta se recogen en la Tabla 4.

3.3.- RAMALES DE ENTRONQUE CON LA GLORIETA.

Bajo esta denominación se recogen los ramales que proceden de la Ronda Norte y entroncan con la glorieta de nueva construcción que de acceso a la urbanización proyectada.

- Los radios con los que se han resuelto los ramales de entronque con la glorieta han sido **20 m**.
- Los ramales se han diseñado de manera que el ángulo de ataque carril de entrada-rotonda se encuentre **entre 20 y 60 º**, para facilitar el acceso fluido, sin penalizar la visibilidad.
- El bombeo se ha diseñado ajustado al entronque con la glorieta.

Se recogen sus características en planta y alzado en la Tabla 5 y sus secciones tipos en la Tabla 6.

|         | Nº     | PLANTA                               | ALZADO              |                    |                 |
|---------|--------|--------------------------------------|---------------------|--------------------|-----------------|
|         |        | RADIO MÍNIMO EN PLANTA UTILIZADO (m) | Kv PARADA UTILIZADO |                    | INCLINACIÓN (%) |
|         |        |                                      | ACUERO CÓNCAVO (m)  | ACUERO CONVEXO (m) |                 |
| RAMALES | GRN-R1 | 20,00                                | -                   | -                  | 1,693           |
|         | GRN-R2 | 20,00                                | -                   | -                  | 3,612           |
|         | GRN-R3 | 20,00                                | -                   | -                  | 1,953           |
|         | GRN-R4 | 20,00                                | -                   | -                  | 2,646           |
|         | GRN-R5 | 20,00                                | -                   | -                  | 2,725           |
|         | GRN-R6 | 20,00                                | -                   | -                  | 1,017           |
|         | GRN-R7 | 20,00                                | -                   | -                  | 2,021           |
|         | GRN-R8 | 20,00                                | -                   | -                  | 0,732           |

Tabla 5. Parámetros utilizados en planta y alzado para los distintos ramales.

3.4. ESTUDIO DE VISIBILIDAD

Se ha seguido las recomendaciones sobre glorieta en lo referente a visibilidad, garantizando la misma.

|           | Nº        | SECCIÓN TIPO (m) |       |              |         |               |               |         |              |       |             |
|-----------|-----------|------------------|-------|--------------|---------|---------------|---------------|---------|--------------|-------|-------------|
|           |           | IZQUIERDA        |       |              |         |               | DERECHA       |         |              |       |             |
|           |           | CARRIL BICI      | ACERA | APARCAMIENTO | CALZADA | ACERA CENTRAL | ACERA CENTRAL | CALZADA | APARCAMIENTO | ACERA | CARRIL BICI |
| GLORIETAS | R. NORTE  | -                | 26,85 | -            | 13,50   | -             | -             | -       | -            | 3,00  | 1,50        |
|           | VIAL 1-3  | -                | 32,00 | -            | 8,50    | -             | -             | -       | -            | 2,50  | 1,50        |
|           | VIAL 3-11 | -                | 10,00 | -            | 8,50    | -             | -             | -       | -            | 5,70  | 1,50        |

Tabla 4. Sección Tipo utilizada en las distintas glorietas.

|         | Nº     | SECCIÓN TIPO (m) |       |              |         |               |               |         |              |       |             |
|---------|--------|------------------|-------|--------------|---------|---------------|---------------|---------|--------------|-------|-------------|
|         |        | IZQUIERDA        |       |              |         |               | DERECHA       |         |              |       |             |
|         |        | CARRIL BICI      | ACERA | APARCAMIENTO | CALZADA | ACERA CENTRAL | ACERA CENTRAL | CALZADA | APARCAMIENTO | ACERA | CARRIL BICI |
| RAMALES | GRN-R1 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R2 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R3 | 1,50             | 3,00  | -            | -       | -             | -             | -       | -            | -     | -           |
|         | GRN-R4 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R5 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R6 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R7 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |
|         | GRN-R8 | -                | -     | -            | -       | -             | -             | -       | -            | 3,00  | 1,50        |

Tabla 6. Sección Tipo utilizada en los distintos ramales.

**4- APÉNDICE 1: LISTADOS DE REPLANTEO.**



CONEXION 5-11

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 726.075,860<br>4.375.039,084 | 726.072,074<br>4.375.049,455 |
| 2          | Móvil       | -30,000      |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 726.050,052<br>4.375.069,565 | 726.045,325<br>4.375.070,102 |

GLORIETA RONDA NORTE

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>   | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|---------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo          | 38,500       |                 |              | 725.591,600<br>4.374.413,207 | 725.537,078<br>4.374.448,215 |
| 2          | Acoplado a P2 | Infinito     |                 |              | 77,000<br>0,000              |                              |
| 3          | Giratorio     | 38,500       |                 |              |                              | 725.591,600<br>4.374.413,207 |

GLORIETA VIAL 1-3

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>   | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|---------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo          | -24,501      |                 |              | 725.588,395<br>4.374.731,522 | 725.565,733<br>4.374.697,075 |
| 2          | Acoplado a P2 | Infinito     |                 |              | 49,002<br>0,000              |                              |
| 3          | Giratorio     | -24,501      |                 |              |                              | 725.588,395<br>4.374.731,522 |

GLORIETA VIAL 3-11

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>   | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|---------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo          | 10,000       |                 |              | 725.988,747<br>4.374.819,877 | 725.974,586<br>4.374.828,970 |
| 2          | Acoplado a P2 | Infinito     |                 |              | 20,000<br>0,000              |                              |
| 3          | Giratorio     | 10,000       |                 |              |                              | 725.988,747<br>4.374.819,877 |

GRN-R1

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>  | <u>X2/Y2</u>  |
|------------|------------------|--------------|-----------------|--------------|---------------|---------------|
| 1          | Retroacopl. a P2 | Infinito     |                 |              |               | 0,000         |
| 2          | Fijo             | -740,000     | 12,000          |              | 725.861,988   | 725.284,280   |
| 3          | Móvil            | 20,000       |                 |              | 4.374.483,329 | 4.374.269,516 |
| 4          | Fijo             | -38,500      |                 |              | 725.614,078   | 725.591,600   |
| 5          | Acoplado a P1    | Infinito     |                 |              | 4.374.448,215 | 4.374.483,223 |

GRN-R2

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>  | <u>X2/Y2</u>  |
|------------|------------------|--------------|-----------------|--------------|---------------|---------------|
| 1          | Retroacopl. a P2 | Infinito     |                 |              |               | 0,000         |
| 2          | Fijo             | -38,500      |                 |              | 725.591,600   | 725.591,600   |
| 3          | Móvil            | 20,000       |                 |              | 4.374.413,207 | 4.374.483,223 |
| 4          | Fijo             | Infinito     | 13,050          |              | 725.578,243   | 725.599,828   |
| 5          | Acoplado a P1    | 20,000       |                 |              | 4.374.486,594 | 4.375.007,658 |

GRN-R3

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>  | <u>X2/Y2</u>  |
|------------|------------------|--------------|-----------------|--------------|---------------|---------------|
| 1          | Retroacopl. a P2 | Infinito     |                 |              |               | 0,000         |
|            |                  |              |                 |              |               | 0,000         |
| 2          | Fijo             | 38,500       |                 |              | 725.537,078   | 725.591,600   |
|            |                  |              |                 |              | 4.374.448,215 | 4.374.483,223 |
| 3          | Móvil            | -20,000      |                 |              |               |               |
| 4          | Fijo             | Infinito     | -13,050         |              | 725.578,243   | 725.599,828   |
|            |                  |              |                 |              | 4.374.486,594 | 4.375.007,658 |
| 5          | Acoplado a P1    | -20,000      |                 |              | 0,000         | 0,000         |

GRN-R4

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>  | <u>X2/Y2</u>  |
|------------|------------------|--------------|-----------------|--------------|---------------|---------------|
| 1          | Retroacopl. a P2 | 20,000       |                 |              |               | 0,000         |
|            |                  |              |                 |              |               | 0,000         |
| 2          | Fijo             | -38,500      |                 |              | 725.591,600   | 725.537,078   |
|            |                  |              |                 |              | 4.374.483,223 | 4.374.448,215 |
| 3          | Móvil            | 20,000       |                 |              |               |               |
| 4          | Fijo             | -740,000     | 12,000          |              | 725.861,988   | 725.284,280   |
|            |                  |              |                 |              | 4.374.483,329 | 4.374.269,516 |
| 5          | Acoplado a P1    | Infinito     |                 |              | 0,000         | 0,000         |

GRN-R5

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retrang.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|------------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Retroacopl. a P2 | Infinito     |                 |              |                              | 0,000<br>0,000               |
| 2          | Fijo             | 740,000      | 12,000          |              | 725.284,280<br>4.374.269,516 | 725.861,988<br>4.374.483,329 |
| 3          | Móvil            | 20,000       |                 |              |                              |                              |
| 4          | Fijo             | -38,500      |                 |              | 725.537,078<br>4.374.448,215 | 725.591,600<br>4.374.413,207 |
| 5          | Acoplado a P1    | Infinito     |                 |              | 0,000<br>0,000               |                              |

GRN-R6

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retrang.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|------------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Retroacopl. a P2 | Infinito     |                 |              |                              | 0,000<br>0,000               |
| 2          | Fijo             | -38,500      |                 |              | 725.537,078<br>4.374.448,215 | 725.591,600<br>4.374.413,207 |
| 3          | Móvil            | 20,000       |                 |              |                              |                              |
| 4          | Fijo             | Infinito     | 8,500           |              | 725.581,523<br>4.374.407,333 | 725.579,636<br>4.374.360,535 |
| 5          | Acoplado a P1    | 20,000       |                 |              | 0,000<br>0,000               |                              |

GRN-R7

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|------------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Retroacopl. a P2 | 20,000       |                 |              |                              | 0,000<br>0,000               |
| 2          | Fijo             | Infinito     | 8,500           |              | 725.579,636<br>4.374.360,535 | 725.581,523<br>4.374.407,333 |
| 3          | Móvil            | 20,000       |                 |              |                              |                              |
| 4          | Fijo             | -38,500      |                 |              | 725.591,600<br>4.374.413,207 | 725.591,600<br>4.374.483,223 |
| 5          | Acoplado a P1    | Infinito     |                 |              | 0,000<br>0,000               |                              |

GRN-R8

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u>      | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|------------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Retroacopl. a P2 | 20,000       |                 |              |                              | 0,000<br>0,000               |
| 2          | Fijo             | -38,500      |                 |              | 725.591,600<br>4.374.413,207 | 725.591,600<br>4.374.483,223 |
| 3          | Móvil            | 20,000       |                 |              |                              |                              |
| 4          | Fijo             | 740,000      | 12,000          |              | 725.284,280<br>4.374.269,516 | 725.861,988<br>4.374.483,329 |
| 5          | Acoplado a P1    | Infinito     |                 |              | 0,000<br>0,000               |                              |

RONDA NORTE 1

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725.272,881<br>4.374.258,154 | 725.309,525<br>4.374.294,678 |
| 2          | Móvil       | 740,000      |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725.857,724<br>4.374.483,649 | 726.199,872<br>4.374.458,005 |

VIAL 1

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725.578,243<br>4.374.486,594 | 725.599,828<br>4.375.007,658 |

VIAL 10

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,980.441<br>4,374,668.456 | 725,980.041<br>4,374,668.460 |
| 2          | Móvil       | 15,000       |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725,966.123<br>4,374,677.475 | 725,815.405<br>4,375,067.709 |

VIAL 11

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     | -1.350          |              | 725,993.023<br>4,374,512.338 | 725,994.782<br>4,374,719.883 |
| 2          | Móvil       | -210.000     |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725,988.420<br>4,374,816.588 | 725,988.276<br>4,374,817.215 |
| 4          | Móvil       | 0.501        |                 |              |                              |                              |
| 5          | Fijo        | Infinito     |                 |              | 725,988.251<br>4,374,817.302 | 725,988.595<br>4,374,836.703 |
| 6          | Móvil       | 0.501        |                 |              |                              |                              |
| 7          | Fijo        | Infinito     |                 |              | 725,988.726<br>4,374,837.109 | 725,988.945<br>4,374,837.988 |
| 8          | Móvil       | -210.000     |                 |              |                              |                              |
| 9          | Fijo        | Infinito     | -1.400          |              | 725,996.426<br>4,374,897.780 | 725,996.500<br>4,374,913.041 |
| 10         | Giratorio   | 126.500      |                 |              |                              | 726,076.806<br>4,375,030.482 |



VIAL 12

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | -375,000     |                 |              | 725,981.185<br>4,374,891.373 | 725,885.480<br>4,374,883.502 |

VIAL 13

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | -498.120     |                 |              | 726,020.552<br>4,375,009.996 | 725,841.924<br>4,374,998.138 |

VIAL 2

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,978.986<br>4,374,628.892 | 725,827.729<br>4,374,628.887 |
| 2          | Móvil       | -850,000     |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725,469.435<br>4,374,560.473 | 725,457.623<br>4,374,555.738 |

VIAL 3

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,972.965<br>4,374,826.309 | 725,968.665<br>4,374,826.316 |
| 2          | Móvil       | -300,000     |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725,744.471<br>4,374,763.554 | 725,461.842<br>4,374,654.515 |

VIAL 4

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,987.379<br>4,374,952.943 | 725,968.495<br>4,374,953.466 |
| 2          | Móvil       | -425,000     |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725,741.828<br>4,374,898.843 | 725,467.702<br>4,374,792.970 |

VIAL 5

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 726.054,251<br>4.375.073,469 | 726.046,426<br>4.375.074,457 |
| 2          | Móvil       | -820,000     |                 |              |                              |                              |
| 3          | Fijo        | Infinito     |                 |              | 725.650,514<br>4.375.026,773 | 725.471,887<br>4.374.959,280 |

VIAL 6

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725.455,101<br>4.374.556,960 | 725.471,776<br>4.374.959,259 |

VIAL 7

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,779.192<br>4,374,639.386 | 725,633.501<br>4,375,016.608 |

VIAL 8

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,843.271<br>4,374,639.726 | 725,689.833<br>4,375,037.007 |

VIAL 9

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725,909.962<br>4,374,639.682 | 725,749.838<br>4,375,054.284 |

VIAL MONTESOL II

DATOS DE ENTRADA

| <u>Al.</u> | <u>Tipo</u> | <u>Radio</u> | <u>Retranq.</u> | <u>AE/AS</u> | <u>X1/Y1</u>                 | <u>X2/Y2</u>                 |
|------------|-------------|--------------|-----------------|--------------|------------------------------|------------------------------|
| 1          | Fijo        | Infinito     |                 |              | 725.579,636<br>4.374.360,535 | 725.581,523<br>4.374.407,333 |

**5.REPLANTEO GENERAL.**

**(DATOS DE ENTRADA, PUNTOS SINGULARES, VERTICES...)**

## CONEXION 5-11

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+046,894 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000,000       | 726.078,414    | 4.375.036,356  | 149,5015      | 0,000            | 0,000         | 0,000         |
| PS | 0+012,043       | 726.074,284    | 4.375.047,669  | 27,2182       | 12,044           | 10,960        | -4,994        |
|    | 0+020           | 726.070,602    | 4.375.054,696  | 23,8671       | 19,935           | 18,550        | -7,300        |
|    | 0+040           | 726.054,650    | 4.375.066,139  | 6,6269        | 38,102           | 37,895        | -3,959        |
| PS | 0+045,273       | 726.049,489    | 4.375.067,190  | 1,5349        | 42,277           | 42,265        | -1,019        |
|    | 0+046,894       | 726.047,879    | 4.375.067,373  | 0,0000        | 43,525           | 43,525        | 0,000         |

## GLORIETA RONDA NORTE

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+253,526 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000,000       | 725.596,156    | 4.374.412,739  | 227,3244      | 0,000            | 0,000         | 0,000         |
|    | 0+020           | 725.611,585    | 4.374.425,141  | 184,2222      | 19,796           | -19,191       | -4,856        |
|    | 0+040           | 725.619,259    | 4.374.443,389  | 168,4448      | 38,382           | -33,763       | -18,255       |
|    | 0+060           | 725.617,331    | 4.374.463,091  | 152,6673      | 54,623           | -40,208       | -36,973       |
|    | 0+080           | 725.606,264    | 4.374.479,504  | 136,8899      | 67,526           | -36,976       | -56,503       |
| PS | 0+092,125       | 725.596,156    | 4.374.486,119  | 127,3241      | 73,380           | -30,537       | -66,724       |
| PS | 0+092,125       | 725.596,156    | 4.374.486,119  | 127,3241      | 73,380           | -30,537       | -66,724       |
|    | 0+100           | 725.588,722    | 4.374.488,679  | 121,1124      | 76,303           | -24,843       | -72,145       |
|    | 0+120           | 725.568,928    | 4.374.488,406  | 105,3350      | 80,417           | -6,731        | -80,135       |
|    | 0+140           | 725.551,646    | 4.374.478,752  | 89,5576       | 79,617           | 13,001        | -78,548       |
|    | 0+160           | 725.541,035    | 4.374.462,040  | 73,7801       | 73,952           | 29,604        | -67,768       |
|    | 0+180           | 725.539,650    | 4.374.442,293  | 58,0027       | 63,768           | 39,082        | -50,388       |
|    | 0+200           | 725.547,824    | 4.374.424,263  | 42,2252       | 49,687           | 39,153        | -30,592       |
|    | 0+220           | 725.563,589    | 4.374.412,291  | 26,4478       | 32,570           | 29,800        | -13,145       |
|    | 0+240           | 725.583,151    | 4.374.409,257  | 10,6704       | 13,463           | 13,275        | -2,246        |
|    | 0+253,526       | 725.596,156    | 4.374.412,739  | 0,0000        | 0,001            | 0,001         | 0,000         |



GLORIETA VIAL 1-3

REPLANTEO POR POLARES (CUERDA Y FLECHA)

|                    |                 |                 |                 |               |                  |               |               |
|--------------------|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| Estación en P.K.   | 0+000,000       | Despla.         | 0,000           |               |                  |               |               |
| Orientación a P.K. | 0+153,944       | Despla.         | 0,000           |               |                  |               |               |
|                    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
| PS                 | 0+000,000       | 725.614,413     | 4.374.703,925   | 299,9988      | 0,000            | 0,000         | 0,000         |
|                    | 0+020           | 725.606,694     | 4.374.721,777   | 174,0162      | 19,449           | -17,852       | -7,720        |
|                    | 0+040           | 725.588,399     | 4.374.728,380   | 148,0327      | 35,703           | -24,454       | -26,014       |
|                    | 0+060           | 725.571,058     | 4.374.719,573   | 122,0493      | 46,092           | -15,647       | -43,355       |
|                    | 0+080           | 725.565,598     | 4.374.700,905   | 96,0659       | 48,908           | 3,020         | -48,815       |
| PS                 | 0+098,004       | 725.573,897     | 4.374.685,383   | 72,6753       | 44,557           | 18,543        | -40,516       |
| PS                 | 0+098,004       | 725.573,897     | 4.374.685,383   | 72,6753       | 44,557           | 18,543        | -40,516       |
|                    | 0+100           | 725.575,459     | 4.374.684,141   | 70,0825       | 43,690           | 19,784        | -38,954       |
|                    | 0+120           | 725.594,427     | 4.374.679,844   | 44,0991       | 31,294           | 24,081        | -19,985       |
|                    | 0+140           | 725.610,551     | 4.374.690,721   | 18,1156       | 13,757           | 13,204        | -3,862        |
|                    | 0+153,944       | 725.614,413     | 4.374.703,925   | 0,0000        | 0,000            | 0,000         | 0,000         |

GLORIETA VIAL 3-11

REPLANTEO POR POLARES (CUERDA Y FLECHA)

|                    |                 |                 |                 |               |                  |               |               |
|--------------------|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| Estación en P.K.   | 0+000,000       | Despla.         | 0,000           |               |                  |               |               |
| Orientación a P.K. | 0+062,831       | Despla.         | 0,000           |               |                  |               |               |
|                    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
| PS                 | 0+000,000       | 726.005,631     | 4.374.825,331   | 296,8298      | 0,000            | 0,000         | 0,000         |
|                    | 0+020           | 725.996,652     | 4.374.842,120   | 165,5662      | 19,039           | -16,321       | -9,803        |
| PS                 | 0+040           | 725.977,613     | 4.374.842,082   | 131,1339      | 32,643           | -15,335       | -28,817       |
| PS                 | 0+060           | 725.968,703     | 4.374.825,257   | 96,7015       | 36,928           | 1,912         | -36,879       |
|                    | 0+073,955       | 725.974,398     | 4.374.812,877   | 72,6751       | 33,624           | 13,993        | -30,574       |
|                    | 0+073,955       | 725.974,398     | 4.374.812,877   | 72,6751       | 33,624           | 13,993        | -30,574       |
|                    | 0+080           | 725.979,369     | 4.374.809,486   | 62,2692       | 30,672           | 17,133        | -25,441       |

## RONDA NORTE

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+990,266 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000,000       | 725.272,881    | 4.374.258,154  | 13,5181       | 0,000            | 0,000         | 0,000         |
| PS | 0+016,094       | 725.284,280    | 4.374.269,516  | 363,6225      | 16,094           | 13,537        | 8,704         |
|    | 0+020           | 725.287,054    | 4.374.272,266  | 363,6553      | 20,000           | 16,828        | 10,808        |
|    | 0+040           | 725.301,481    | 4.374.286,115  | 364,2370      | 39,998           | 33,851        | 21,306        |
|    | 0+060           | 725.316,278    | 4.374.299,570  | 365,0044      | 59,988           | 51,151        | 31,340        |
|    | 0+080           | 725.331,433    | 4.374.312,620  | 365,8183      | 79,968           | 68,715        | 40,903        |
|    | 0+100           | 725.346,935    | 4.374.325,256  | 366,6507      | 99,933           | 86,532        | 49,988        |
|    | 0+120           | 725.362,773    | 4.374.337,469  | 367,4924      | 119,880          | 104,588       | 58,589        |
|    | 0+140           | 725.378,935    | 4.374.349,248  | 368,3394      | 139,805          | 122,870       | 66,698        |
|    | 0+160           | 725.395,409    | 4.374.360,587  | 369,1897      | 159,705          | 141,364       | 74,310        |
|    | 0+180           | 725.412,184    | 4.374.371,476  | 370,0422      | 179,575          | 160,057       | 81,419        |
|    | 0+200           | 725.429,247    | 4.374.381,909  | 370,8963      | 199,413          | 178,935       | 88,021        |
|    | 0+220           | 725.446,586    | 4.374.391,876  | 371,7515      | 219,214          | 197,985       | 94,110        |
|    | 0+240           | 725.464,187    | 4.374.401,371  | 372,6076      | 238,975          | 217,193       | 99,683        |
|    | 0+260           | 725.482,039    | 4.374.410,387  | 373,4643      | 258,693          | 236,544       | 104,734       |
|    | 0+280           | 725.500,128    | 4.374.418,917  | 374,3215      | 278,363          | 256,024       | 109,260       |
|    | 0+300           | 725.518,441    | 4.374.426,955  | 375,1791      | 297,983          | 275,620       | 113,258       |
|    | 0+320           | 725.536,965    | 4.374.434,495  | 376,0370      | 317,548          | 295,316       | 116,725       |
|    | 0+340           | 725.555,685    | 4.374.441,532  | 376,8952      | 337,055          | 315,099       | 119,659       |
|    | 0+360           | 725.574,589    | 4.374.448,061  | 377,7537      | 356,500          | 334,954       | 122,057       |
|    | 0+380           | 725.593,662    | 4.374.454,076  | 378,6123      | 375,881          | 354,867       | 123,918       |
|    | 0+400           | 725.612,891    | 4.374.459,574  | 379,4711      | 395,192          | 374,823       | 125,239       |
|    | 0+420           | 725.632,262    | 4.374.464,550  | 380,3300      | 414,432          | 394,807       | 126,021       |
|    | 0+440           | 725.651,759    | 4.374.469,001  | 381,1891      | 433,596          | 414,805       | 126,263       |
|    | 0+460           | 725.671,370    | 4.374.472,923  | 382,0483      | 452,681          | 434,802       | 125,964       |
|    | 0+480           | 725.691,080    | 4.374.476,314  | 382,9075      | 471,683          | 454,784       | 125,125       |
|    | 0+500           | 725.710,875    | 4.374.479,171  | 383,7668      | 490,599          | 474,735       | 123,746       |
|    | 0+520           | 725.730,739    | 4.374.481,492  | 384,6263      | 509,425          | 494,643       | 121,829       |
|    | 0+540           | 725.750,659    | 4.374.483,276  | 385,4857      | 528,158          | 514,491       | 119,374       |
|    | 0+560           | 725.770,619    | 4.374.484,520  | 386,3452      | 546,795          | 534,266       | 116,384       |
|    | 0+580           | 725.790,606    | 4.374.485,225  | 387,2048      | 565,332          | 553,952       | 112,861       |
|    | 0+600           | 725.810,605    | 4.374.485,389  | 388,0644      | 583,766          | 573,536       | 108,806       |
|    | 0+620           | 725.830,601    | 4.374.485,012  | 388,9241      | 602,093          | 593,004       | 104,224       |
|    | 0+640           | 725.850,579    | 4.374.484,096  | 389,7838      | 620,310          | 612,340       | 99,118        |
| PS | 0+651,434       | 725.861,988    | 4.374.483,329  | 390,2753      | 630,675          | 623,331       | 95,964        |
|    | 0+660           | 725.870,529    | 4.374.482,689  | 390,6391      | 638,435          | 631,546       | 93,538        |
|    | 0+680           | 725.890,473    | 4.374.481,194  | 391,4548      | 656,633          | 650,727       | 87,874        |
|    | 0+700           | 725.910,417    | 4.374.479,700  | 392,2264      | 674,933          | 669,908       | 82,210        |
|    | 0+720           | 725.930,362    | 4.374.478,205  | 392,9572      | 693,327          | 689,089       | 76,545        |
|    | 0+740           | 725.950,306    | 4.374.476,710  | 393,6501      | 711,808          | 708,270       | 70,881        |
|    | 0+760           | 725.970,250    | 4.374.475,215  | 394,3079      | 730,369          | 727,451       | 65,216        |
|    | 0+780           | 725.990,194    | 4.374.473,720  | 394,9330      | 749,004          | 746,632       | 59,552        |
|    | 0+800           | 726.010,138    | 4.374.472,226  | 395,5277      | 767,707          | 765,813       | 53,887        |
|    | 0+820           | 726.030,082    | 4.374.470,731  | 396,0941      | 786,474          | 784,995       | 48,223        |
|    | 0+840           | 726.050,026    | 4.374.469,236  | 396,6340      | 805,301          | 804,176       | 42,559        |
|    | 0+860           | 726.069,970    | 4.374.467,741  | 397,1493      | 824,183          | 823,357       | 36,894        |

| <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| 0+880           | 726.089,914    | 4.374.466,246  | 397,6414      | 843,116          | 842,538       | 31,230        |
| 0+900           | 726.109,858    | 4.374.464,752  | 398,1118      | 862,098          | 861,719       | 25,565        |
| 0+920           | 726.129,802    | 4.374.463,257  | 398,5620      | 881,125          | 880,900       | 19,901        |
| 0+940           | 726.149,746    | 4.374.461,762  | 398,9932      | 900,194          | 900,081       | 14,236        |
| 0+960           | 726.169,690    | 4.374.460,267  | 399,4064      | 919,302          | 919,262       | 8,572         |
| 0+980           | 726.189,634    | 4.374.458,772  | 399,8028      | 938,448          | 938,443       | 2,908         |
| 0+990,266       | 726.199,872    | 4.374.458,005  | 0,0000        | 948,289          | 948,289       | 0,000         |

## VIAL 1

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+521,509 Despla. 0,000

|       | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|-------|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS    | 0+000,000       | 725.580,797    | 4.374.483,867  | 97,3644       | 0,000            | 0,000         | 0,000         |
|       | 0+020           | 725.581,625    | 4.374.503,850  | 400,0000      | 20,000           | 20,000        | 0,000         |
|       | 0+040           | 725.582,453    | 4.374.523,833  | 400,0000      | 40,000           | 40,000        | 0,000         |
|       | 0+060           | 725.583,280    | 4.374.543,816  | 400,0000      | 60,000           | 60,000        | 0,000         |
|       | 0+080           | 725.584,108    | 4.374.563,798  | 400,0000      | 80,000           | 80,000        | 0,000         |
|       | 0+100           | 725.584,936    | 4.374.583,781  | 400,0000      | 100,000          | 100,000       | 0,000         |
|       | 0+120           | 725.585,764    | 4.374.603,764  | 400,0000      | 120,000          | 120,000       | 0,000         |
|       | 0+140           | 725.586,591    | 4.374.623,747  | 400,0000      | 140,000          | 140,000       | 0,000         |
|       | 0+160           | 725.587,419    | 4.374.643,730  | 400,0000      | 160,000          | 160,000       | 0,000         |
|       | 0+180           | 725.588,247    | 4.374.663,713  | 400,0000      | 180,000          | 180,000       | 0,000         |
|       | 0+200           | 725.589,075    | 4.374.683,696  | 400,0000      | 200,000          | 200,000       | 0,000         |
|       | 0+220           | 725.589,902    | 4.374.703,678  | 400,0000      | 220,000          | 220,000       | 0,000         |
|       | 0+240           | 725.590,730    | 4.374.723,661  | 400,0000      | 240,000          | 240,000       | 0,000         |
|       | 0+260           | 725.591,558    | 4.374.743,644  | 400,0000      | 260,000          | 260,000       | 0,000         |
|       | 0+280           | 725.592,386    | 4.374.763,627  | 400,0000      | 280,000          | 280,000       | 0,000         |
|       | 0+300           | 725.593,213    | 4.374.783,610  | 400,0000      | 300,000          | 300,000       | 0,000         |
|       | 0+320           | 725.594,041    | 4.374.803,593  | 0,0000        | 320,000          | 320,000       | 0,000         |
|       | 0+340           | 725.594,869    | 4.374.823,576  | 0,0000        | 340,000          | 340,000       | 0,000         |
|       | 0+360           | 725.595,697    | 4.374.843,559  | 0,0000        | 360,000          | 360,000       | 0,000         |
|       | 0+380           | 725.596,524    | 4.374.863,541  | 0,0000        | 380,000          | 380,000       | 0,000         |
|       | 0+400           | 725.597,352    | 4.374.883,524  | 0,0000        | 400,000          | 400,000       | 0,000         |
|       | 0+420           | 725.598,180    | 4.374.903,507  | 0,0000        | 420,000          | 420,000       | 0,000         |
|       | 0+440           | 725.599,008    | 4.374.923,490  | 0,0000        | 440,000          | 440,000       | 0,000         |
|       | 0+460           | 725.599,835    | 4.374.943,473  | 0,0000        | 460,000          | 460,000       | 0,000         |
|       | 0+480           | 725.600,663    | 4.374.963,456  | 0,0000        | 480,000          | 480,000       | 0,000         |
| 0+500 | 725.601,491     | 4.374.983,439  | 0,0000         | 500,000       | 500,000          | 0,000         |               |
| 0+520 | 725.602,319     | 4.375.003,421  | 0,0000         | 520,000       | 520,000          | 0,000         |               |
|       | 0+521,509       | 725.602,381    | 4.375.004,929  | 0,0000        | 521,509          | 521,509       | 0,000         |

## VIAL 2

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+531,495 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,978.986     | 4,374,628.892   | 208.8747      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 725,958.986     | 4,374,628.891   | 8.8726        | 20.000           | 19.806        | -2.778        |
|    | 0+040           | 725,938.986     | 4,374,628.891   | 8.8726        | 40.000           | 39.612        | -5.557        |
|    | 0+060           | 725,918.986     | 4,374,628.890   | 8.8726        | 60.000           | 59.418        | -8.335        |
|    | 0+080           | 725,898.986     | 4,374,628.889   | 8.8726        | 80.000           | 79.224        | -11.114       |
|    | 0+100           | 725,878.986     | 4,374,628.889   | 8.8726        | 100.000          | 99.030        | -13.892       |
|    | 0+120           | 725,858.986     | 4,374,628.888   | 8.8726        | 120.000          | 118.836       | -16.670       |
|    | 0+140           | 725,838.986     | 4,374,628.887   | 8.8726        | 140.000          | 138.643       | -19.449       |
|    | 0+160           | 725,818.986     | 4,374,628.887   | 8.8726        | 160.000          | 158.449       | -22.227       |
| PS | 0+174.891       | 725,804.094     | 4,374,628.886   | 8.8726        | 174.892          | 173.196       | -24.296       |
|    | 0+180           | 725,798.986     | 4,374,628.871   | 8.8671        | 180.000          | 178.257       | -24.990       |
|    | 0+200           | 725,778.990     | 4,374,628.515   | 8.7545        | 199.997          | 198.109       | -27.416       |
|    | 0+220           | 725,759.007     | 4,374,627.688   | 8.5263        | 219.982          | 218.012       | -29.374       |
|    | 0+240           | 725,739.050     | 4,374,626.392   | 8.2113        | 239.949          | 237.956       | -30.864       |
|    | 0+260           | 725,719.128     | 4,374,624.626   | 7.8297        | 259.893          | 257.930       | -31.883       |
|    | 0+280           | 725,699.254     | 4,374,622.392   | 7.3957        | 279.808          | 277.922       | -32.433       |
|    | 0+300           | 725,679.438     | 4,374,619.692   | 6.9199        | 299.690          | 297.921       | -32.512       |
|    | 0+320           | 725,659.690     | 4,374,616.525   | 6.4102        | 319.535          | 317.917       | -32.120       |
|    | 0+340           | 725,640.023     | 4,374,612.895   | 5.8725        | 339.340          | 337.898       | -31.258       |
|    | 0+360           | 725,620.446     | 4,374,608.804   | 5.3115        | 359.102          | 357.853       | -29.926       |
|    | 0+380           | 725,600.972     | 4,374,604.253   | 4.7310        | 378.817          | 377.771       | -28.125       |
|    | 0+400           | 725,581.609     | 4,374,599.245   | 4.1338        | 398.481          | 397.642       | -25.856       |
|    | 0+420           | 725,562.370     | 4,374,593.782   | 3.5223        | 418.093          | 417.453       | -23.120       |
|    | 0+440           | 725,543.265     | 4,374,587.869   | 2.8985        | 437.648          | 437.195       | -19.919       |
|    | 0+460           | 725,524.304     | 4,374,581.508   | 2.2641        | 457.145          | 456.856       | -16.254       |
|    | 0+480           | 725,505.498     | 4,374,574.702   | 1.6202        | 476.579          | 476.425       | -12.128       |
| PS | 0+498.925       | 725,487.854     | 4,374,567.856   | 1.0034        | 494.910          | 494.849       | -7.800        |
|    | 0+500           | 725,486.857     | 4,374,567.457   | 0.9683        | 495.949          | 495.892       | -7.543        |
|    | 0+520           | 725,468.293     | 4,374,560.015   | 0.3401        | 515.317          | 515.310       | -2.753        |
|    | 0+531.495       | 725,457.623     | 4,374,555.738   | 0.0000        | 526.470          | 526.470       | 0.000         |

## VIAL 3

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+541,850 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,972.965     | 4,374,826.309   | 220.6423      | 0.000            | 0.000         | 0.000         |
| PS | 0+009.440       | 725,963.525     | 4,374,826.324   | 20.7459       | 9.440            | 8.943         | -3.022        |
|    | 0+020           | 725,952.967     | 4,374,826.156   | 20.1544       | 19.999           | 19.005        | -6.226        |
|    | 0+040           | 725,933.015     | 4,374,824.819   | 18.2688       | 39.977           | 38.343        | -11.315       |
|    | 0+060           | 725,913.197     | 4,374,822.156   | 16.2257       | 59.912           | 57.977        | -15.105       |
|    | 0+080           | 725,893.600     | 4,374,818.179   | 14.1432       | 79.780           | 77.819        | -17.578       |
|    | 0+100           | 725,874.312     | 4,374,812.905   | 12.0449       | 99.559           | 97.783        | -18.725       |
|    | 0+120           | 725,855.418     | 4,374,806.357   | 9.9387        | 119.228          | 117.778       | -18.538       |
| PS | 0+120.390       | 725,855.054     | 4,374,806.217   | 9.8976        | 119.611          | 118.168       | -18.521       |
|    | 0+140           | 725,836.758     | 4,374,799.159   | 8.1166        | 138.886          | 137.759       | -17.659       |
|    | 0+160           | 725,818.099     | 4,374,791.960   | 6.7471        | 158.630          | 157.739       | -16.781       |
|    | 0+180           | 725,799.440     | 4,374,784.761   | 5.6811        | 178.430          | 177.720       | -15.902       |
|    | 0+200           | 725,780.780     | 4,374,777.562   | 4.8282        | 198.271          | 197.701       | -15.023       |
|    | 0+220           | 725,762.121     | 4,374,770.363   | 4.1306        | 218.141          | 217.682       | -14.144       |
|    | 0+240           | 725,743.461     | 4,374,763.164   | 3.5495        | 238.032          | 237.662       | -13.265       |
|    | 0+260           | 725,724.802     | 4,374,755.966   | 3.0581        | 257.940          | 257.643       | -12.386       |
|    | 0+280           | 725,706.142     | 4,374,748.767   | 2.6372        | 277.862          | 277.624       | -11.507       |
|    | 0+300           | 725,687.483     | 4,374,741.568   | 2.2726        | 297.794          | 297.604       | -10.628       |
|    | 0+320           | 725,668.823     | 4,374,734.369   | 1.9537        | 317.735          | 317.585       | -9.749        |
|    | 0+340           | 725,650.164     | 4,374,727.170   | 1.6725        | 337.682          | 337.566       | -8.870        |
|    | 0+360           | 725,631.504     | 4,374,719.971   | 1.4227        | 357.636          | 357.546       | -7.991        |
|    | 0+380           | 725,612.845     | 4,374,712.772   | 1.1992        | 377.594          | 377.527       | -7.113        |
|    | 0+400           | 725,594.185     | 4,374,705.573   | 0.9983        | 397.557          | 397.508       | -6.234        |
|    | 0+420           | 725,575.526     | 4,374,698.374   | 0.8165        | 417.523          | 417.488       | -5.355        |
|    | 0+440           | 725,556.866     | 4,374,691.176   | 0.6513        | 437.492          | 437.469       | -4.476        |
|    | 0+460           | 725,538.207     | 4,374,683.977   | 0.5006        | 457.464          | 457.450       | -3.597        |
|    | 0+480           | 725,519.547     | 4,374,676.778   | 0.3624        | 477.438          | 477.430       | -2.718        |
|    | 0+500           | 725,500.888     | 4,374,669.579   | 0.2354        | 497.414          | 497.411       | -1.839        |
|    | 0+520           | 725,482.228     | 4,374,662.380   | 0.1181        | 517.393          | 517.392       | -0.960        |
|    | 0+540           | 725,463.569     | 4,374,655.181   | 0.0096        | 537.372          | 537.372       | -0.081        |
|    | 0+541.850       | 725,461.843     | 4,374,654.515   | 0.0000        | 539.221          | 539.221       | 0.000         |

## VIAL 4

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+547,803 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,987.379     | 4,374,952.943   | 219.0111      | 0.000            | 0.000         | 0.000         |
|    | 0+013.131       | 725,974.252     | 4,374,953.307   | 20.7738       | 13.132           | 12.439        | -4.209        |
|    | 0+020           | 725,967.385     | 4,374,953.441   | 20.5972       | 20.000           | 18.962        | -6.358        |
|    | 0+040           | 725,947.389     | 4,374,953.201   | 19.4222       | 39.991           | 38.144        | -12.012       |
|    | 0+060           | 725,927.425     | 4,374,952.021   | 18.0319       | 59.961           | 57.571        | -16.757       |
|    | 0+080           | 725,907.540     | 4,374,949.903   | 16.5879       | 79.897           | 77.200        | -20.583       |
|    | 0+100           | 725,887.776     | 4,374,946.851   | 15.1224       | 99.789           | 96.987        | -23.482       |
|    | 0+120           | 725,868.177     | 4,374,942.874   | 13.6461       | 119.626          | 116.889       | -25.446       |
|    | 0+140           | 725,848.787     | 4,374,937.978   | 12.1636       | 139.397          | 136.860       | -26.472       |
|    | 0+160           | 725,829.649     | 4,374,932.176   | 10.6773       | 159.091          | 156.858       | -26.558       |
|    | 0+180           | 725,810.806     | 4,374,925.481   | 9.1885        | 178.696          | 176.838       | -25.702       |
| PS | 0+181.541       | 725,809.367     | 4,374,924.928   | 9.0737        | 180.203          | 178.376       | -25.597       |
|    | 0+200           | 725,792.148     | 4,374,918.277   | 7.8238        | 198.285          | 196.790       | -24.307       |
|    | 0+220           | 725,773.491     | 4,374,911.072   | 6.7042        | 217.948          | 216.741       | -22.909       |
|    | 0+240           | 725,754.834     | 4,374,903.866   | 5.7701        | 237.667          | 236.692       | -21.512       |
|    | 0+260           | 725,736.177     | 4,374,896.661   | 4.9792        | 257.430          | 256.643       | -20.114       |
|    | 0+280           | 725,717.520     | 4,374,889.455   | 4.3012        | 277.226          | 276.594       | -18.716       |
|    | 0+300           | 725,698.863     | 4,374,882.249   | 3.7137        | 297.050          | 296.545       | -17.318       |
|    | 0+320           | 725,680.206     | 4,374,875.044   | 3.1997        | 316.896          | 316.496       | -15.921       |
|    | 0+340           | 725,661.550     | 4,374,867.838   | 2.7463        | 336.761          | 336.447       | -14.523       |
|    | 0+360           | 725,642.893     | 4,374,860.632   | 2.3434        | 356.640          | 356.398       | -13.125       |
|    | 0+380           | 725,624.236     | 4,374,853.427   | 1.9831        | 376.532          | 376.349       | -11.727       |
|    | 0+400           | 725,605.579     | 4,374,846.221   | 1.6590        | 396.435          | 396.301       | -10.330       |
|    | 0+420           | 725,586.922     | 4,374,839.015   | 1.3658        | 416.347          | 416.252       | -8.932        |
|    | 0+440           | 725,568.265     | 4,374,831.810   | 1.0995        | 436.268          | 436.203       | -7.534        |
|    | 0+460           | 725,549.608     | 4,374,824.604   | 0.8564        | 456.195          | 456.154       | -6.136        |
|    | 0+480           | 725,530.952     | 4,374,817.398   | 0.6336        | 476.129          | 476.105       | -4.739        |
|    | 0+500           | 725,512.295     | 4,374,810.193   | 0.4287        | 496.067          | 496.056       | -3.341        |
|    | 0+520           | 725,493.638     | 4,374,802.987   | 0.2397        | 516.011          | 516.007       | -1.943        |
|    | 0+540           | 725,474.981     | 4,374,795.781   | 0.0648        | 535.958          | 535.958       | -0.545        |
|    | 0+547.803       | 725,467.702     | 4,374,792.970   | 0.0000        | 543.742          | 543.742       | 0.000         |

## VIAL 5

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+599,974 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 726.056,798     | 4.375.070,690   | 212,2968      | 0,000            | 0,000         | 0,000         |
| PS | 0+007.966       | 726.048,894     | 4.375.071,692   | 20,3229       | 7,967            | 7,564         | -2,500        |
|    | 0+020           | 726.036,946     | 4.375.073,117   | 20,0411       | 20,000           | 19,017        | -6,193        |
|    | 0+040           | 726.017,045     | 4.375.075,096   | 19,3244       | 39,997           | 38,168        | -11,955       |
|    | 0+060           | 725.997,101     | 4.375.076,588   | 18,5664       | 59,988           | 57,455        | -17,248       |
|    | 0+080           | 725.977,127     | 4.375.077,592   | 17,7982       | 79,970           | 76,865        | -22,067       |
|    | 0+100           | 725.957,134     | 4.375.078,107   | 17,0259       | 99,940           | 96,387        | -26,411       |
|    | 0+120           | 725.937,134     | 4.375.078,133   | 16,2514       | 119,895          | 116,010       | -30,275       |
|    | 0+140           | 725.917,140     | 4.375.077,670   | 15,4759       | 139,832          | 135,721       | -33,659       |
|    | 0+160           | 725.897,163     | 4.375.076,718   | 14,6995       | 159,748          | 155,509       | -36,559       |
|    | 0+180           | 725.877,216     | 4.375.075,277   | 13,9227       | 179,641          | 175,362       | -38,975       |
|    | 0+200           | 725.857,309     | 4.375.073,350   | 13,1456       | 199,506          | 195,268       | -40,904       |
|    | 0+220           | 725.837,456     | 4.375.070,936   | 12,3682       | 219,342          | 215,216       | -42,346       |
|    | 0+240           | 725.817,668     | 4.375.068,037   | 11,5906       | 239,145          | 235,192       | -43,300       |
|    | 0+260           | 725.797,956     | 4.375.064,655   | 10,8128       | 258,912          | 255,186       | -43,765       |
|    | 0+280           | 725.778,333     | 4.375.060,792   | 10,0350       | 278,640          | 275,186       | -43,740       |
|    | 0+300           | 725.758,811     | 4.375.056,451   | 9,2571        | 298,327          | 295,179       | -43,227       |
|    | 0+320           | 725.739,400     | 4.375.051,633   | 8,4791        | 317,969          | 315,153       | -42,225       |
|    | 0+340           | 725.720,113     | 4.375.046,342   | 7,7010        | 337,564          | 335,097       | -40,734       |
|    | 0+360           | 725.700,962     | 4.375.040,581   | 6,9229        | 357,108          | 354,999       | -38,757       |
|    | 0+380           | 725.681,956     | 4.375.034,353   | 6,1447        | 376,599          | 374,846       | -36,293       |
|    | 0+400           | 725.663,109     | 4.375.027,662   | 5,3665        | 396,033          | 394,627       | -33,345       |
| PS | 0+406.092       | 725.657,401     | 4.375.025,533   | 5,1294        | 401,941          | 400,637       | -32,351       |
|    | 0+420           | 725.644,389     | 4.375.020,623   | 4,6058        | 415,437          | 414,350       | -30,030       |
|    | 0+440           | 725.625,677     | 4.375.013,563   | 3,9099        | 434,890          | 434,070       | -26,693       |
|    | 0+460           | 725.606,964     | 4.375.006,502   | 3,2737        | 454,390          | 453,789       | -23,356       |
|    | 0+480           | 725.588,252     | 4.374.999,442   | 2,6898        | 473,932          | 473,509       | -20,019       |
|    | 0+500           | 725.569,540     | 4.374.992,381   | 2,1523        | 493,511          | 493,229       | -16,681       |
|    | 0+520           | 725.550,828     | 4.374.985,321   | 1,6558        | 513,122          | 512,948       | -13,344       |
|    | 0+540           | 725.532,115     | 4.374.978,260   | 1,1959        | 532,762          | 532,668       | -10,007       |
|    | 0+560           | 725.513,403     | 4.374.971,200   | 0,7687        | 552,428          | 552,387       | -6,670        |
|    | 0+580           | 725.494,691     | 4.374.964,140   | 0,3709        | 572,117          | 572,107       | -3,333        |
|    | 0+599.974       | 725.476,003     | 4.374.957,088   | 0,0000        | 591,801          | 591,801       | 0,000         |

## VIAL 6

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+400,000 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000,000       | 725.457,605    | 4.374.554,234  | 97,3628       | 0,000            | 0,000         | 0,000         |
|    | 0+020           | 725.458,433    | 4.374.574,217  | 400,0000      | 20,000           | 20,000        | 0,000         |
|    | 0+040           | 725.459,261    | 4.374.594,200  | 0,0000        | 40,000           | 40,000        | 0,000         |
|    | 0+060           | 725.460,090    | 4.374.614,183  | 400,0000      | 60,000           | 60,000        | 0,000         |
|    | 0+080           | 725.460,918    | 4.374.634,165  | 0,0000        | 80,000           | 80,000        | 0,000         |
|    | 0+100           | 725.461,746    | 4.374.654,148  | 400,0000      | 100,000          | 100,000       | 0,000         |
|    | 0+120           | 725.462,574    | 4.374.674,131  | 400,0000      | 120,000          | 120,000       | 0,000         |
|    | 0+140           | 725.463,403    | 4.374.694,114  | 0,0000        | 140,000          | 140,000       | 0,000         |
|    | 0+160           | 725.464,231    | 4.374.714,097  | 400,0000      | 160,000          | 160,000       | 0,000         |
|    | 0+180           | 725.465,059    | 4.374.734,080  | 400,0000      | 180,000          | 180,000       | 0,000         |
|    | 0+200           | 725.465,887    | 4.374.754,062  | 400,0000      | 200,000          | 200,000       | 0,000         |
|    | 0+220           | 725.466,716    | 4.374.774,045  | 400,0000      | 220,000          | 220,000       | 0,000         |
|    | 0+240           | 725.467,544    | 4.374.794,028  | 0,0000        | 240,000          | 240,000       | 0,000         |
|    | 0+260           | 725.468,372    | 4.374.814,011  | 400,0000      | 260,000          | 260,000       | 0,000         |
|    | 0+280           | 725.469,200    | 4.374.833,994  | 400,0000      | 280,000          | 280,000       | 0,000         |
|    | 0+300           | 725.470,029    | 4.374.853,977  | 400,0000      | 300,000          | 300,000       | 0,000         |
|    | 0+320           | 725.470,857    | 4.374.873,959  | 400,0000      | 320,000          | 320,000       | 0,000         |
|    | 0+340           | 725.471,685    | 4.374.893,942  | 400,0000      | 340,000          | 340,000       | 0,000         |
|    | 0+360           | 725.472,513    | 4.374.913,925  | 400,0000      | 360,000          | 360,000       | 0,000         |
|    | 0+380           | 725.473,342    | 4.374.933,908  | 400,0000      | 380,000          | 380,000       | 0,000         |
|    | 0+400           | 725.474,170    | 4.374.953,891  | 0,0000        | 400,000          | 400,000       | 0,000         |
|    | 0+000,000       | 725.457,605    | 4.374.554,234  | 97,3628       | 0,000            | 0,000         | 0,000         |

## VIAL 7

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+404,378 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,779.192    | 4,374,639.386  | 123.4640      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 725,771.986    | 4,374,658.043  | 0.0000        | 20.000           | 20.000        | 0.000         |
|    | 0+040           | 725,764.781    | 4,374,676.700  | 400.0000      | 40.000           | 40.000        | 0.000         |
|    | 0+060           | 725,757.575    | 4,374,695.357  | 0.0000        | 60.000           | 60.000        | 0.000         |
|    | 0+080           | 725,750.369    | 4,374,714.013  | 0.0000        | 80.000           | 80.000        | 0.000         |
|    | 0+100           | 725,743.164    | 4,374,732.670  | 0.0000        | 100.000          | 100.000       | 0.000         |
|    | 0+120           | 725,735.958    | 4,374,751.327  | 0.0000        | 120.000          | 120.000       | 0.000         |
|    | 0+140           | 725,728.752    | 4,374,769.984  | 0.0000        | 140.000          | 140.000       | 0.000         |
|    | 0+160           | 725,721.547    | 4,374,788.641  | 0.0000        | 160.000          | 160.000       | 0.000         |
|    | 0+180           | 725,714.341    | 4,374,807.298  | 0.0000        | 180.000          | 180.000       | 0.000         |
|    | 0+200           | 725,707.135    | 4,374,825.955  | 400.0000      | 200.000          | 200.000       | 0.000         |
|    | 0+220           | 725,699.930    | 4,374,844.611  | 400.0000      | 220.000          | 220.000       | 0.000         |
|    | 0+240           | 725,692.724    | 4,374,863.268  | 400.0000      | 240.000          | 240.000       | 0.000         |
|    | 0+260           | 725,685.518    | 4,374,881.925  | 400.0000      | 260.000          | 260.000       | 0.000         |
|    | 0+280           | 725,678.313    | 4,374,900.582  | 400.0000      | 280.000          | 280.000       | 0.000         |
|    | 0+300           | 725,671.107    | 4,374,919.239  | 400.0000      | 300.000          | 300.000       | 0.000         |
|    | 0+320           | 725,663.901    | 4,374,937.896  | 0.0000        | 320.000          | 320.000       | 0.000         |
|    | 0+340           | 725,656.696    | 4,374,956.553  | 0.0000        | 340.000          | 340.000       | 0.000         |
|    | 0+360           | 725,649.490    | 4,374,975.209  | 0.0000        | 360.000          | 360.000       | 0.000         |
|    | 0+380           | 725,642.284    | 4,374,993.866  | 0.0000        | 380.000          | 380.000       | 0.000         |
|    | 0+400           | 725,635.079    | 4,375,012.523  | 0.0000        | 400.000          | 400.000       | 0.000         |
|    | 0+404.378       | 725,633.501    | 4,375,016.607  | 0.0000        | 404.378          | 404.378       | 0.000         |

## VIAL 8

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+425,881 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,843.271    | 4,374,639.726  | 123.4640      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 725,836.065    | 4,374,658.383  | 400.0000      | 20.000           | 20.000        | 0.000         |
|    | 0+040           | 725,828.860    | 4,374,677.040  | 0.0000        | 40.000           | 40.000        | 0.000         |
|    | 0+060           | 725,821.654    | 4,374,695.697  | 400.0000      | 60.000           | 60.000        | 0.000         |
|    | 0+080           | 725,814.448    | 4,374,714.353  | 400.0000      | 80.000           | 80.000        | 0.000         |
|    | 0+100           | 725,807.243    | 4,374,733.010  | 0.0000        | 100.000          | 100.000       | 0.000         |
|    | 0+120           | 725,800.037    | 4,374,751.667  | 0.0000        | 120.000          | 120.000       | 0.000         |
|    | 0+140           | 725,792.831    | 4,374,770.324  | 400.0000      | 140.000          | 140.000       | 0.000         |
|    | 0+160           | 725,785.626    | 4,374,788.981  | 0.0000        | 160.000          | 160.000       | 0.000         |
|    | 0+180           | 725,778.420    | 4,374,807.638  | 0.0000        | 180.000          | 180.000       | 0.000         |
|    | 0+200           | 725,771.214    | 4,374,826.295  | 400.0000      | 200.000          | 200.000       | 0.000         |
|    | 0+220           | 725,764.009    | 4,374,844.951  | 400.0000      | 220.000          | 220.000       | 0.000         |
|    | 0+240           | 725,756.803    | 4,374,863.608  | 0.0000        | 240.000          | 240.000       | 0.000         |
|    | 0+260           | 725,749.597    | 4,374,882.265  | 400.0000      | 260.000          | 260.000       | 0.000         |
|    | 0+280           | 725,742.392    | 4,374,900.922  | 400.0000      | 280.000          | 280.000       | 0.000         |
|    | 0+300           | 725,735.186    | 4,374,919.579  | 400.0000      | 300.000          | 300.000       | 0.000         |
|    | 0+320           | 725,727.980    | 4,374,938.236  | 400.0000      | 320.000          | 320.000       | 0.000         |
|    | 0+340           | 725,720.775    | 4,374,956.893  | 400.0000      | 340.000          | 340.000       | 0.000         |
|    | 0+360           | 725,713.569    | 4,374,975.550  | 0.0000        | 360.000          | 360.000       | 0.000         |
|    | 0+380           | 725,706.363    | 4,374,994.206  | 400.0000      | 380.000          | 380.000       | 0.000         |
|    | 0+400           | 725,699.158    | 4,375,012.863  | 400.0000      | 400.000          | 400.000       | 0.000         |
|    | 0+420           | 725,691.952    | 4,375,031.520  | 0.0000        | 420.000          | 420.000       | 0.000         |
|    | 0+425.881       | 725,689.833    | 4,375,037.006  | 0.0000        | 425.881          | 425.881       | 0.000         |

## VIAL 9

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+444,448 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,909.962    | 4,374,639.682  | 123.4635      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 725,902.756    | 4,374,658.339  | 0.0000        | 20.000           | 20.000        | 0.000         |
|    | 0+040           | 725,895.551    | 4,374,676.996  | 400.0000      | 40.000           | 40.000        | 0.000         |
|    | 0+060           | 725,888.345    | 4,374,695.653  | 0.0000        | 60.000           | 60.000        | 0.000         |
|    | 0+080           | 725,881.140    | 4,374,714.310  | 0.0000        | 80.000           | 80.000        | 0.000         |
|    | 0+100           | 725,873.934    | 4,374,732.967  | 400.0000      | 100.000          | 100.000       | 0.000         |
|    | 0+120           | 725,866.729    | 4,374,751.624  | 400.0000      | 120.000          | 120.000       | 0.000         |
|    | 0+140           | 725,859.523    | 4,374,770.280  | 0.0000        | 140.000          | 140.000       | 0.000         |
|    | 0+160           | 725,852.318    | 4,374,788.937  | 400.0000      | 160.000          | 160.000       | 0.000         |
|    | 0+180           | 725,845.112    | 4,374,807.594  | 0.0000        | 180.000          | 180.000       | 0.000         |
|    | 0+200           | 725,837.907    | 4,374,826.251  | 0.0000        | 200.000          | 200.000       | 0.000         |
|    | 0+220           | 725,830.701    | 4,374,844.908  | 400.0000      | 220.000          | 220.000       | 0.000         |
|    | 0+240           | 725,823.496    | 4,374,863.565  | 0.0000        | 240.000          | 240.000       | 0.000         |
|    | 0+260           | 725,816.290    | 4,374,882.222  | 0.0000        | 260.000          | 260.000       | 0.000         |
|    | 0+280           | 725,809.085    | 4,374,900.879  | 400.0000      | 280.000          | 280.000       | 0.000         |
|    | 0+300           | 725,801.879    | 4,374,919.536  | 0.0000        | 300.000          | 300.000       | 0.000         |
|    | 0+320           | 725,794.674    | 4,374,938.193  | 0.0000        | 320.000          | 320.000       | 0.000         |
|    | 0+340           | 725,787.468    | 4,374,956.850  | 400.0000      | 340.000          | 340.000       | 0.000         |
|    | 0+360           | 725,780.263    | 4,374,975.507  | 0.0000        | 360.000          | 360.000       | 0.000         |
|    | 0+380           | 725,773.057    | 4,374,994.163  | 0.0000        | 380.000          | 380.000       | 0.000         |
|    | 0+400           | 725,765.852    | 4,375,012.820  | 400.0000      | 400.000          | 400.000       | 0.000         |
|    | 0+420           | 725,758.646    | 4,375,031.477  | 0.0000        | 420.000          | 420.000       | 0.000         |
|    | 0+440           | 725,751.441    | 4,375,050.134  | 0.0000        | 440.000          | 440.000       | 0.000         |
|    | 0+444.448       | 725,749.838    | 4,375,054.283  | 0.0000        | 444.448          | 444.448       | 0.000         |

## VIAL 10

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+436,287 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,980.441    | 4,374,668.456  | 124.9537      | 0.000            | 0.000         | 0.000         |
| PS | 0+000.700       | 725,979.740    | 4,374,668.463  | 325.5903      | 0.701            | 0.274         | 0.645         |
| PS | 0+018.583       | 725,965.898    | 4,374,678.058  | 362.1030      | 17.427           | 14.429        | 9.772         |
|    | 0+020           | 725,965.388    | 4,374,679.379  | 364.9151      | 18.599           | 15.845        | 9.739         |
|    | 0+040           | 725,958.182    | 4,374,698.036  | 383.8850      | 37.019           | 35.840        | 9.271         |
|    | 0+060           | 725,950.976    | 4,374,716.693  | 390.0446      | 56.524           | 55.834        | 8.803         |
|    | 0+080           | 725,943.770    | 4,374,735.349  | 393.0301      | 76.285           | 75.829        | 8.335         |
|    | 0+100           | 725,936.565    | 4,374,754.006  | 394.7848      | 96.146           | 95.823        | 7.867         |
|    | 0+120           | 725,929.359    | 4,374,772.663  | 395.9382      | 116.054          | 115.818       | 7.399         |
|    | 0+140           | 725,922.153    | 4,374,791.320  | 396.7536      | 135.989          | 135.812       | 6.932         |
|    | 0+160           | 725,914.948    | 4,374,809.977  | 397.3605      | 155.941          | 155.807       | 6.464         |
|    | 0+180           | 725,907.742    | 4,374,828.634  | 397.8296      | 175.904          | 175.801       | 5.996         |
|    | 0+200           | 725,900.536    | 4,374,847.290  | 398.2031      | 195.874          | 195.796       | 5.528         |
|    | 0+220           | 725,893.330    | 4,374,865.947  | 398.5075      | 215.850          | 215.790       | 5.060         |
|    | 0+240           | 725,886.125    | 4,374,884.604  | 398.7603      | 235.830          | 235.785       | 4.592         |
|    | 0+260           | 725,878.919    | 4,374,903.261  | 398.9736      | 255.813          | 255.779       | 4.124         |
|    | 0+280           | 725,871.713    | 4,374,921.918  | 399.1560      | 275.798          | 275.774       | 3.656         |
|    | 0+300           | 725,864.507    | 4,374,940.575  | 399.3137      | 295.786          | 295.768       | 3.188         |
|    | 0+320           | 725,857.302    | 4,374,959.231  | 399.4515      | 315.775          | 315.763       | 2.721         |
|    | 0+340           | 725,850.096    | 4,374,977.888  | 399.5729      | 335.765          | 335.758       | 2.253         |
|    | 0+360           | 725,842.890    | 4,374,996.545  | 399.6806      | 355.757          | 355.752       | 1.785         |
|    | 0+380           | 725,835.685    | 4,375,015.202  | 399.7769      | 375.749          | 375.747       | 1.317         |
|    | 0+400           | 725,828.479    | 4,375,033.859  | 399.8634      | 395.742          | 395.741       | 0.849         |
|    | 0+420           | 725,821.273    | 4,375,052.516  | 399.9417      | 415.736          | 415.736       | 0.381         |
|    | 0+436.287       | 725,815.405    | 4,375,067.709  | 0.0000        | 432.018          | 432.018       | 0.000         |

## VIAL 11

## REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+547,805 Despla. 0,000

|    | <u>Estación</u> | <u>Coor. X</u> | <u>Coor. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|----------------|----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,991.673    | 4,374,512.349  | 89.6325       | 0.000            | 0.000         | 0.000         |
| PS | 0+020           | 725,991.843    | 4,374,532.349  | 390.1720      | 20.000           | 19.762        | 3.075         |
|    | 0+040           | 725,992.012    | 4,374,552.348  | 390.1720      | 40.000           | 39.524        | 6.151         |
|    | 0+060           | 725,992.182    | 4,374,572.347  | 390.1720      | 60.000           | 59.286        | 9.226         |
|    | 0+080           | 725,992.351    | 4,374,592.347  | 390.1720      | 80.000           | 79.049        | 12.301        |
|    | 0+100           | 725,992.521    | 4,374,612.346  | 390.1720      | 100.000          | 98.811        | 15.376        |
|    | 0+120           | 725,992.690    | 4,374,632.345  | 390.1720      | 120.000          | 118.573       | 18.452        |
|    | 0+140           | 725,992.860    | 4,374,652.344  | 390.1720      | 140.000          | 138.335       | 21.527        |
|    | 0+160           | 725,993.029    | 4,374,672.344  | 390.1720      | 160.000          | 158.097       | 24.602        |
|    | 0+180           | 725,993.199    | 4,374,692.343  | 390.1720      | 180.000          | 177.859       | 27.678        |
|    | 0+200           | 725,993.368    | 4,374,712.342  | 390.1720      | 200.000          | 197.622       | 30.753        |
|    | 0+220           | 725,993.538    | 4,374,732.342  | 390.1720      | 220.000          | 217.384       | 33.828        |
|    | 0+240           | 725,993.707    | 4,374,752.341  | 390.1720      | 240.000          | 237.146       | 36.904        |
| PS | 0+255.054       | 725,993.835    | 4,374,767.394  | 390.1720      | 255.054          | 252.021       | 39.218        |
|    | 0+260           | 725,993.818    | 4,374,772.340  | 390.1578      | 260.000          | 256.899       | 40.036        |
|    | 0+280           | 725,992.566    | 4,374,792.293  | 389.8355      | 279.945          | 276.385       | 44.507        |
|    | 0+300           | 725,989.421    | 4,374,812.037  | 389.1542      | 299.696          | 295.357       | 50.811        |
| PS | 0+304.241       | 725,988.514    | 4,374,816.180  | 388.9706      | 303.847          | 299.298       | 52.379        |
| PS | 0+305.352       | 725,988.265    | 4,374,817.263  | 388.9210      | 304.932          | 300.326       | 52.799        |
| PS | 0+305.474       | 725,988.252    | 4,374,817.384  | 388.9186      | 305.053          | 300.444       | 52.832        |
|    | 0+320           | 725,988.510    | 4,374,831.907  | 389.0024      | 319.573          | 314.817       | 54.932        |
| PS | 0+324.610       | 725,988.592    | 4,374,836.517  | 389.0274      | 324.182          | 319.379       | 55.599        |
| PS | 0+324.724       | 725,988.606    | 4,374,836.629  | 389.0305      | 324.294          | 319.492       | 55.603        |
| PS | 0+325.303       | 725,988.747    | 4,374,837.192  | 389.0590      | 324.856          | 320.070       | 55.555        |
|    | 0+340           | 725,991.798    | 4,374,851.565  | 389.6559      | 339.215          | 334.747       | 54.875        |
|    | 0+360           | 725,994.322    | 4,374,871.397  | 390.1021      | 359.058          | 354.727       | 55.600        |
|    | 0+375.562       | 725,994.973    | 4,374,886.943  | 390.1934      | 374.608          | 370.172       | 57.477        |
| PS | 0+380           | 725,994.995    | 4,374,891.380  | 390.1904      | 379.045          | 374.554       | 58.176        |
|    | 0+400           | 725,995.092    | 4,374,911.380  | 390.1779      | 399.045          | 394.305       | 61.322        |
| PS | 0+401.411       | 725,995.099    | 4,374,912.791  | 390.1771      | 400.456          | 395.698       | 61.544        |
|    | 0+420           | 725,996.552    | 4,374,931.306  | 390.3738      | 418.985          | 414.204       | 63.112        |
|    | 0+440           | 726,001.123    | 4,374,950.755  | 391.0046      | 438.508          | 434.137       | 61.755        |
|    | 0+460           | 726,008.700    | 4,374,969.242  | 392.0039      | 457.210          | 453.608       | 57.276        |
|    | 0+480           | 726,019.092    | 4,374,986.306  | 393.3114      | 474.749          | 472.131       | 49.788        |
|    | 0+500           | 726,032.042    | 4,375,001.520  | 394.8743      | 490.833          | 489.243       | 39.476        |
|    | 0+520           | 726,047.225    | 4,375,014.506  | 396.6468      | 505.220          | 504.519       | 26.599        |
|    | 0+540           | 726,064.264    | 4,375,024.939  | 398.5885      | 517.704          | 517.577       | 11.477        |
|    | 0+553.719       | 726,076.806    | 4,375,030.482  | 0.0000        | 525.080          | 525.080       | 0.000         |

VIAL 12

REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+096,292 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 725,981.185     | 4,374,891.373   | 205.2239      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 725,961.191     | 4,374,891.766   | 6.4759        | 19.998           | 19.894        | -2.031        |
|    | 0+040           | 725,941.205     | 4,374,891.093   | 4.7782        | 39.981           | 39.868        | -2.998        |
|    | 0+060           | 725,921.283     | 4,374,889.355   | 3.0806        | 59.936           | 59.866        | -2.899        |
|    | 0+080           | 725,901.482     | 4,374,886.558   | 1.3829        | 79.848           | 79.830        | -1.734        |
|    | 0+096.292       | 725,885.480     | 4,374,883.502   | 0.0000        | 96.028           | 96.028        | 0.000         |
|    |                 |                 |                 |               |                  |               |               |

VIAL 13

REPLANTEO POR POLARES (CUERDA Y FLECHA)

Estación en P.K. 0+000,000 Despla. 0,000  
Orientación a P.K. 0+179,988 Despla. 0,000

|    | <u>Estación</u> | <u>Coord. X</u> | <u>Coord. Y</u> | <u>Ángulo</u> | <u>Distancia</u> | <u>Cuerda</u> | <u>Flecha</u> |
|----|-----------------|-----------------|-----------------|---------------|------------------|---------------|---------------|
| PS | 0+000.000       | 726,020.552     | 4,375,009.996   | 204.2199      | 0.000            | 0.000         | 0.000         |
|    | 0+020           | 726,000.642     | 4,375,011.879   | 10.2242       | 19.999           | 19.741        | -3.198        |
|    | 0+040           | 725,980.673     | 4,375,012.962   | 8.9462        | 39.989           | 39.595        | -5.601        |
|    | 0+060           | 725,960.676     | 4,375,013.242   | 7.6681        | 59.964           | 59.529        | -7.205        |
|    | 0+080           | 725,940.684     | 4,375,012.720   | 6.3901        | 79.914           | 79.512        | -8.008        |
|    | 0+100           | 725,920.730     | 4,375,011.395   | 5.1121        | 99.832           | 99.510        | -8.008        |
|    | 0+120           | 725,900.844     | 4,375,009.270   | 3.8340        | 119.710          | 119.493       | -7.205        |
|    | 0+140           | 725,881.060     | 4,375,006.349   | 2.5560        | 139.540          | 139.427       | -5.601        |
|    | 0+160           | 725,861.409     | 4,375,002.636   | 1.2779        | 159.313          | 159.281       | -3.198        |
|    | 0+179.988       | 725,841.925     | 4,374,998.138   | 0.0000        | 179.020          | 179.020       | 0.000         |
|    |                 |                 |                 |               |                  |               |               |
|    |                 |                 |                 |               |                  |               |               |



6.LISTADO DE VÉRTICES

## CONEXION 5-11

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000,000<br>370,422 | 0+000,000              | 370,422            | 1,9999              |                  |                     |
| 2           | 0+015,000<br>370,722 | 0+001,800<br>0+028,199 | 370,458<br>370,252 | 1,9999<br>-3,5576   | 26,398<br>-0,183 | -475,000<br>-5,5576 |
| 3           | 0+046,894<br>369,587 | 0+046,894              | 369,587            | -3,5576             |                  |                     |

## GLORIETA RONDA NORTE

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000,000<br>371,800 | 0+000,000              | 371,800            | 1,4288              |                  |                     |
| 2           | 0+057,741<br>372,625 | 0+037,043<br>0+078,438 | 372,329<br>371,850 | 1,4288<br>-3,7457   | 41,396<br>-0,268 | -800,000<br>-5,1745 |
| 3           | 0+094,450<br>371,250 | 0+084,182<br>0+104,717 | 371,635<br>371,314 | -3,7457<br>0,6233   | 20,534<br>0,112  | 470,000<br>4,3690   |
| 4           | 0+107,767<br>371,333 | 0+104,836<br>0+110,697 | 371,315<br>371,315 | 0,6233<br>-0,6235   | 5,860<br>-0,009  | -470,000<br>-1,2468 |
| 5           | 0+121,080<br>371,250 | 0+116,323<br>0+125,836 | 371,280<br>371,277 | -0,6235<br>0,5655   | 9,512<br>0,014   | 800,000<br>1,1890   |
| 6           | 0+147,603<br>371,400 | 0+139,505<br>0+155,700 | 371,354<br>371,282 | 0,5655<br>-1,4588   | 16,195<br>-0,041 | -800,000<br>-2,0244 |
| 7           | 0+174,097<br>371,013 | 0+166,804<br>0+181,389 | 371,120<br>371,059 | -1,4588<br>0,6246   | 14,584<br>0,038  | 700,000<br>2,0834   |
| 8           | 0+186,346<br>371,090 | 0+181,952<br>0+190,739 | 371,063<br>371,062 | 0,6246<br>-0,6307   | 8,787<br>-0,014  | -700,000<br>-1,2553 |
| 9           | 0+198,477<br>371,013 | 0+191,269<br>0+205,684 | 371,059<br>371,116 | -0,6307<br>1,4287   | 14,416<br>0,037  | 700,000<br>2,0594   |
| 10          | 0+253,526<br>371,800 | 0+253,526              | 371,800            | 1,4287              |                  |                     |

## GLORIETA VIAL 1-3

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000,000<br>367,671 | 0+000,000              | 367,671            | -1,1211             |                  |                     |
| 2           | 0+023,709<br>367,405 | 0+016,527<br>0+030,890 | 367,486<br>367,454 | -1,1211<br>0,6742   | 14,363<br>0,032  | 800,000<br>1,7953   |
| 3           | 0+037,741<br>367,500 | 0+032,227<br>0+043,254 | 367,463<br>367,461 | 0,6742<br>-0,7041   | 11,027<br>-0,019 | -800,000<br>-1,3783 |
| 4           | 0+051,233<br>367,405 | 0+043,866<br>0+058,599 | 367,457<br>367,489 | -0,7041<br>1,1375   | 14,733<br>0,034  | 800,000<br>1,8417   |
| 5           | 0+114,000<br>368,119 | 0+103,836<br>0+124,163 | 368,003<br>368,005 | 1,1375<br>-1,1211   | 20,327<br>-0,057 | -900,000<br>-2,2586 |
| 6           | 0+153,943<br>367,671 | 0+153,943              | 367,671            | -1,1211             |                  |                     |

## GLORIETA VIAL 3-11

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000,000<br>374,266 | 0+000,000              | 374,266            | -0,5040             |                  |                     |
| 2           | 0+033,726<br>374,096 | 0+032,151<br>0+035,301 | 374,104<br>374,104 | -0,5040<br>0,5124   | 3,151<br>0,004   | 310,000<br>1,0164   |
| 3           | 0+040,945<br>374,133 | 0+035,942<br>0+045,948 | 374,107<br>373,997 | 0,5124<br>-2,7153   | 10,006<br>-0,040 | -310,000<br>-3,2277 |
| 4           | 0+050,631<br>373,870 | 0+045,994<br>0+055,267 | 373,996<br>373,871 | -2,7153<br>0,0121   | 9,273<br>0,032   | 340,000<br>2,7275   |
| 5           | 0+067,238<br>373,872 | 0+066,262<br>0+068,213 | 373,872<br>373,878 | 0,0121<br>0,6412    | 1,950<br>0,002   | 310,000<br>0,6291   |
| 6           | 0+075,500<br>373,925 | 0+074,626<br>0+076,373 | 373,919<br>373,936 | 0,6412<br>1,2049    | 1,747<br>0,001   | 310,000<br>0,5636   |
| 7           | 0+084,132<br>374,029 | 0+083,854<br>0+084,409 | 374,026<br>374,032 | 1,2049<br>1,0460    | 0,556<br>0,000   | -350,000<br>-0,1589 |
| 8           | 0+109,850<br>374,298 | 0+107,132<br>0+112,567 | 374,270<br>374,284 | 1,0460<br>-0,5066   | 5,434<br>-0,011  | -350,000<br>-1,5526 |
| 9           | 0+116,169<br>374,266 | 0+116,169              | 374,266            | -0,5066             |                  |                     |

GRN-R1

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>372,121 | 0+000,000    | 372,121           | -1,6926             |                 |                    |
| 2           | 0+019,498<br>371,791 | 0+019,498    | 371,791           | -1,6926             |                 |                    |

GRN-R2

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>371,694 | 0+000,000    | 371,694           | -3,6119             |                 |                    |
| 2           | 0+018,937<br>371,010 | 0+018,937    | 371,010           | -3,6119             |                 |                    |

GRN-R3

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>371,316 | 0+000,000    | 371,316           | -1,9533             |                 |                    |
| 2           | 0+018,942<br>370,946 | 0+018,942    | 370,946           | -1,9533             |                 |                    |

GRN-R4

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>371,159 | 0+000,000    | 371,159           | -2,6464             |                 |                    |
| 2           | 0+019,498<br>370,643 | 0+019,498    | 370,643           | -2,6464             |                 |                    |

GRN-R5

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>370,594 | 0+000,000    | 370,594           | 2,7253              |                 |                    |
| 2           | 0+021,025<br>371,167 | 0+021,025    | 371,167           | 2,7253              |                 |                    |

GRN-R6

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>371,286 | 0+000,000    | 371,286           | 1,0169              |                 |                    |
| 2           | 0+023,009<br>371,520 | 0+023,009    | 371,520           | 1,0169              |                 |                    |

GRN-R7

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>371,449 | 0+000,000    | 371,449           | 2,0209              |                 |                    |
| 2           | 0+020,090<br>371,855 | 0+020,090    | 371,855           | 2,0209              |                 |                    |

GRN-R8

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u> | <u>Cota TE/TS</u> | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|--------------|-------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>372,297 | 0+000,000    | 372,297           | -0,7324             |                 |                    |
| 2           | 0+021,025<br>372,143 | 0+021,025    | 372,143           | -0,7324             |                 |                    |

RONDA NORTE

## LISTADO DE VÉRTICES

| Ver. | Esta./Cota           | TE/TS                  | Cota TE/TS         | Pente.(%)E/S       | L/Flecha        | Kv/Theta(%)         |
|------|----------------------|------------------------|--------------------|--------------------|-----------------|---------------------|
| 1    | 0+185,000<br>372,300 | 0+185,000              | 372,300            | -5,9733            |                 |                     |
| 2    | 0+189,929<br>372,006 | 0+189,929<br>0+189,929 | 372,006<br>372,006 | -5,9733<br>-2,1643 | 0,000<br>0,000  | 0,000<br>3,8090     |
| 3    | 0+204,818<br>371,683 | 0+204,818<br>0+204,818 | 371,683<br>371,683 | -2,1643<br>-3,2045 | 0,000<br>0,000  | 0,000<br>-1,0403    |
| 4    | 0+214,873<br>371,361 | 0+214,873<br>0+214,873 | 371,361<br>371,361 | -3,2045<br>-2,3102 | 0,000<br>0,000  | 0,000<br>0,8943     |
| 5    | 0+217,277<br>371,306 | 0+217,277<br>0+217,277 | 371,306<br>371,306 | -2,3102<br>-1,5278 | 0,000<br>0,000  | 0,000<br>0,7824     |
| 6    | 0+225,095<br>371,186 | 0+225,095<br>0+225,095 | 371,186<br>371,186 | -1,5278<br>-3,8283 | 0,000<br>0,000  | 0,000<br>-2,3004    |
| 7    | 0+229,956<br>371,000 | 0+229,956<br>0+229,956 | 371,000<br>371,000 | -3,8283<br>0,0000  | 0,000<br>0,000  | 0,000<br>3,8283     |
| 8    | 0+235,012<br>371,000 | 0+235,012<br>0+235,012 | 371,000<br>371,000 | 0,0000<br>-3,3029  | 0,000<br>0,000  | 0,000<br>-3,3029    |
| 9    | 0+240,068<br>370,833 | 0+240,068<br>0+240,068 | 370,833<br>370,833 | -3,3029<br>-1,3374 | 0,000<br>0,000  | 0,000<br>1,9654     |
| 10   | 0+250,012<br>370,700 | 0+250,012<br>0+250,012 | 370,700<br>370,700 | -1,3374<br>-3,9768 | 0,000<br>0,000  | 0,000<br>-2,6393    |
| 11   | 0+254,997<br>370,502 | 0+254,997<br>0+254,997 | 370,502<br>370,502 | -3,9768<br>-0,0392 | 0,000<br>0,000  | 0,000<br>3,9376     |
| 12   | 0+264,963<br>370,498 | 0+264,963<br>0+264,963 | 370,498<br>370,498 | -0,0392<br>-0,7832 | 0,000<br>0,000  | 0,000<br>-0,7440    |
| 13   | 0+287,030<br>370,325 | 0+270,339<br>0+303,720 | 370,456<br>370,659 | -0,7832<br>1,9987  | 33,382<br>0,116 | 1.200,000<br>2,7818 |
| 14   | 0+324,604<br>371,076 | 0+324,604<br>0+324,604 | 371,076<br>371,076 | 1,9987<br>1,9993   | 0,000<br>0,000  | 0,000<br>0,0006     |
| 15   | 0+338,110<br>371,346 | 0+338,110<br>0+338,110 | 371,346<br>371,346 | 1,9993<br>2,1226   | 0,000<br>0,000  | 0,000<br>0,1233     |
| 16   | 0+391,818<br>372,486 | 0+391,818<br>0+391,818 | 372,486<br>372,486 | 2,1226<br>-0,9733  | 0,000<br>0,000  | 0,000<br>-3,0959    |

|    |                      |                        |                    |                   |                 |                   |
|----|----------------------|------------------------|--------------------|-------------------|-----------------|-------------------|
| 17 | 0+422,000<br>372,192 | 0+403,091<br>0+440,908 | 372,376<br>373,030 | -0,9733<br>4,4292 | 37,817<br>0,255 | 700,000<br>5,4025 |
| 18 | 0+469,901<br>374,314 | 0+469,901<br>0+469,901 | 374,314<br>374,314 | 4,4292<br>3,6845  | 0,000<br>0,000  | 0,000<br>-0,7447  |
| 19 | 0+475,179<br>374,508 | 0+475,179<br>0+475,179 | 374,508<br>374,508 | 3,6845<br>4,9864  | 0,000<br>0,000  | 0,000<br>1,3019   |
| 20 | 0+485,373<br>375,017 | 0+485,373<br>0+485,373 | 375,017<br>375,017 | 4,9864<br>4,2349  | 0,000<br>0,000  | 0,000<br>-0,7514  |
| 21 | 0+490,095<br>375,217 | 0+490,095<br>0+490,095 | 375,217<br>375,217 | 4,2349<br>2,8980  | 0,000<br>0,000  | 0,000<br>-1,3370  |
| 22 | 0+499,873<br>375,500 | 0+499,873<br>0+499,873 | 375,500<br>375,500 | 2,8980<br>4,8913  | 0,000<br>0,000  | 0,000<br>1,9933   |
| 23 | 0+504,984<br>375,750 | 0+504,984<br>0+504,984 | 375,750<br>375,750 | 4,8913<br>2,4240  | 0,000<br>0,000  | 0,000<br>-2,4673  |
| 24 | 0+514,151<br>375,972 | 0+514,151<br>0+514,151 | 375,972<br>375,972 | 2,4240<br>4,0309  | 0,000<br>0,000  | 0,000<br>1,6070   |
| 25 | 0+519,388<br>376,183 | 0+519,388<br>0+519,388 | 376,183<br>376,183 | 4,0309<br>2,0199  | 0,000<br>0,000  | 0,000<br>-2,0110  |
| 26 | 0+534,929<br>376,497 | 0+534,929<br>0+534,929 | 376,497<br>376,497 | 2,0199<br>2,0089  | 0,000<br>0,000  | 0,000<br>-0,0110  |
| 27 | 0+550,000<br>376,800 | 0+550,000              | 376,800            | 2,0089            |                 |                   |



## VIAL 1

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|-----------------|---------------------|
| 1           | 0+000,000<br>371,441 | 0+000,000              | 371,441            | -1,9997             |                 |                     |
| 2           | 0+020,053<br>371,040 | 0+018,640<br>0+021,465 | 371,068<br>371,015 | -1,9997<br>-1,7978  | 2,826<br>0,001  | 1.400,000<br>0,2019 |
| 3           | 0+190,011<br>367,984 | 0+177,656<br>0+202,366 | 368,207<br>368,101 | -1,7978<br>0,9477   | 24,710<br>0,085 | 900,000<br>2,7456   |
| 4           | 0+204,425<br>368,121 | 0+204,425<br>0+204,425 | 368,121<br>368,121 | 0,9477<br>-1,4801   | 0,000<br>0,000  | 0,000<br>-2,4279    |
| 5           | 0+236,247<br>367,650 | 0+236,247<br>0+236,247 | 367,650<br>367,650 | -1,4801<br>-1,9998  | 0,000<br>0,000  | 0,000<br>-0,5197    |
| 6           | 0+244,747<br>367,480 | 0+244,747<br>0+244,747 | 367,480<br>367,480 | -1,9998<br>-1,9999  | 0,000<br>0,000  | 0,000<br>-0,0001    |
| 7           | 0+521,510<br>361,945 | 0+521,510              | 361,945            | -1,9999             |                 |                     |

## VIAL 2

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>    |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|-----------------------|
| 1           | 0+000.000<br>372.245 | 0+000.000              | 372.245            | 2.0002              |                  |                       |
| 2           | 0+164.381<br>375.533 | 0+139.621<br>0+189.142 | 375.038<br>374.802 | 2.0002<br>-2.9518   | 49.520<br>-0.307 | -1,000.000<br>-4.9520 |
| 3           | 0+382.213<br>369.103 | 0+373.498<br>0+390.927 | 369.360<br>369.150 | -2.9518<br>0.5341   | 17.430<br>0.076  | 500.000<br>3.4860     |
| 4           | 0+409.546<br>369.249 | 0+403.326<br>0+415.765 | 369.216<br>369.437 | 0.5341<br>3.0221    | 12.440<br>0.039  | 500.000<br>2.4880     |
| 5           | 0+499.900<br>371.980 | 0+490.807<br>0+508.992 | 371.705<br>372.117 | 3.0221<br>1.5067    | 18.185<br>-0.034 | -1,200.000<br>-1.5154 |
| 6           | 0+516.918<br>372.236 | 0+516.918<br>0+516.918 | 372.236<br>372.236 | 1.5067<br>1.5064    | 0.000<br>0.000   | 0.000<br>-0.0003      |
| 7           | 0+531.391<br>372.454 | 0+531.391<br>0+531.391 | 372.454<br>372.454 | 1.5064<br>1.4823    | 0.000<br>0.000   | 0.000<br>-0.0241      |
| 8           | 0+531.496<br>372.456 | 0+531.496              | 372.456            | 1.4823              |                  |                       |

## VIAL 3

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000.000<br>373.978 | 0+000.000              | 373.978            | -2.5002             |                  |                     |
| 2           | 0+004.288<br>373.871 | 0+004.288<br>0+004.288 | 373.871<br>373.871 | -2.5002<br>-2.5001  | 0.000<br>0.000   | 0.000<br>0.0000     |
| 3           | 0+013.328<br>373.645 | 0+004.755<br>0+021.900 | 373.859<br>373.134 | -2.5001<br>-5.9638  | 17.145<br>-0.074 | -495.000<br>-3.4637 |
| 4           | 0+113.179<br>367.690 | 0+092.605<br>0+133.753 | 368.917<br>367.874 | -5.9638<br>0.8942   | 41.148<br>0.353  | 600.000<br>6.8580   |
| 5           | 0+275.144<br>369.138 | 0+263.614<br>0+286.674 | 369.035<br>368.946 | 0.8942<br>-1.6680   | 23.060<br>-0.074 | -900.000<br>-2.5622 |
| 6           | 0+374.243<br>367.485 | 0+366.017<br>0+382.468 | 367.622<br>367.594 | -1.6680<br>1.3230   | 16.451<br>0.062  | 550.000<br>2.9911   |
| 7           | 0+388.581<br>367.675 | 0+388.581<br>0+388.581 | 367.675<br>367.675 | 1.3230<br>0.6566    | 0.000<br>0.000   | 0.000<br>-0.6664    |
| 8           | 0+420.567<br>367.885 | 0+420.567<br>0+420.567 | 367.885<br>367.885 | 0.6566<br>-1.0588   | 0.000<br>0.000   | 0.000<br>-1.7154    |
| 9           | 0+445.000<br>367.626 | 0+425.580<br>0+464.419 | 367.832<br>368.678 | -1.0588<br>5.4142   | 38.838<br>0.314  | 600.000<br>6.4730   |
| 10          | 0+505.000<br>370.875 | 0+495.083<br>0+514.916 | 370.338<br>371.193 | 5.4142<br>3.2105    | 19.834<br>-0.055 | -900.000<br>-2.2037 |
| 11          | 0+527.493<br>371.597 | 0+527.493<br>0+527.493 | 371.597<br>371.597 | 3.2105<br>3.2107    | 0.000<br>0.000   | 0.000<br>0.0002     |
| 12          | 0+541.852<br>372.058 | 0+541.852              | 372.058            | 3.2107              |                  |                     |

## VIAL 4

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000.000<br>372.611 | 0+000.000              | 372.611            | -2.3273             |                  |                     |
| 2           | 0+033.000<br>371.843 | 0+016.578<br>0+049.421 | 372.225<br>370.862 | -2.3273<br>-5.9765  | 32.843<br>-0.150 | -900.000<br>-3.6492 |
| 3           | 0+169.000<br>363.715 | 0+136.617<br>0+201.382 | 365.650<br>363.877 | -5.9765<br>0.5000   | 64.764<br>0.524  | 1,000.000<br>6.4764 |
| 4           | 0+388.014<br>364.810 | 0+384.397<br>0+391.630 | 364.792<br>364.872 | 0.5000<br>1.7056    | 7.234<br>0.011   | 600.000<br>1.2057   |
| 5           | 0+410.646<br>365.196 | 0+406.119<br>0+415.172 | 365.119<br>365.191 | 1.7056<br>-0.1048   | 9.052<br>-0.020  | -500.000<br>-1.8104 |
| 6           | 0+431.640<br>365.174 | 0+423.993<br>0+439.286 | 365.182<br>365.361 | -0.1048<br>2.4441   | 15.294<br>0.049  | 600.000<br>2.5489   |
| 7           | 0+516.030<br>367.237 | 0+513.787<br>0+518.272 | 367.182<br>367.300 | 2.4441<br>2.8178    | 4.484<br>0.002   | 1,200.000<br>0.3737 |
| 8           | 0+533.575<br>367.731 | 0+533.575<br>0+533.575 | 367.731<br>367.731 | 2.8178<br>2.8182    | 0.000<br>0.000   | 0.000<br>0.0004     |
| 9           | 0+547.804<br>368.132 | 0+547.804              | 368.132            | 2.8182              |                  |                     |

## VIAL 5

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u>    |
|-------------|----------------------|------------------------|--------------------|---------------------|-----------------|-----------------------|
| 1           | 0+000,000<br>370,000 | 0+000,000              | 370,000            | -3,5579             |                 |                       |
| 2           | 0+030,800<br>368,904 | 0+022,717<br>0+038,882 | 369,192<br>368,725 | -3,5579<br>-2,2108  | 16,165<br>0,027 | 1.200,000<br>1,3471   |
| 3           | 0+326,000<br>362,378 | 0+316,906<br>0+335,093 | 362,579<br>362,315 | -2,2108<br>-0,6951  | 18,188<br>0,034 | 1.200,000<br>1,5157   |
| 4           | 0+442,674<br>361,567 | 0+436,662<br>0+448,685 | 361,609<br>361,670 | -0,6951<br>1,7093   | 12,022<br>0,036 | 500,000<br>2,4044     |
| 5           | 0+464,905<br>361,947 | 0+460,297<br>0+469,512 | 361,868<br>361,941 | 1,7093<br>-0,1338   | 9,216<br>-0,021 | -500,000<br>-1,8431   |
| 6           | 0+485,825<br>361,919 | 0+478,517<br>0+493,132 | 361,929<br>362,123 | -0,1338<br>2,7893   | 14,615<br>0,053 | 500,000<br>2,9231     |
| 7           | 0+561,220<br>364,022 | 0+558,997<br>0+563,442 | 363,960<br>364,076 | 2,7893<br>2,4189    | 4,445<br>-0,002 | -1.200,000<br>-0,3704 |
| 8           | 0+587,472<br>364,657 | 0+587,472<br>0+587,472 | 364,657<br>364,657 | 2,4189<br>2,4193    | 0,000<br>0,000  | 0,000<br>0,0004       |
| 9           | 0+601,649<br>365,000 | 0+601,649              | 365,000            | 2,4193              |                 |                       |

## VIAL 6

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000,000<br>372,442 | 0+000,000              | 372,442            | 0,7842              |                  |                     |
| 2           | 0+001,545<br>372,454 | 0+001,545<br>0+001,545 | 372,454<br>372,454 | 0,7842<br>0,7844    | 0,000<br>0,000   | 0,000<br>0,0003     |
| 3           | 0+014,928<br>372,559 | 0+010,875<br>0+018,980 | 372,527<br>372,618 | 0,7844<br>1,4598    | 8,104<br>0,007   | 1.200,000<br>0,6754 |
| 4           | 0+065,004<br>373,290 | 0+046,490<br>0+083,519 | 373,020<br>372,646 | 1,4598<br>-3,4773   | 37,028<br>-0,229 | -750,000<br>-4,9371 |
| 5           | 0+154,000<br>370,195 | 0+147,700<br>0+160,299 | 370,414<br>370,042 | -3,4773<br>-2,4274  | 12,599<br>0,017  | 1.200,000<br>1,0499 |
| 6           | 0+303,000<br>366,579 | 0+300,346<br>0+305,653 | 366,643<br>366,536 | -2,4274<br>-1,6110  | 5,307<br>0,005   | 650,000<br>0,8164   |
| 7           | 0+391,119<br>365,159 | 0+391,119<br>0+391,119 | 365,159<br>365,159 | -1,6110<br>-1,3622  | 0,000<br>0,000   | 0,000<br>0,2488     |
| 8           | 0+402,643<br>365,002 | 0+402,643              | 365,002            | -1,3622             |                  |                     |

## VIAL 7

## LISTADO DE VÉRTICES

| Ver. | Esta./Cota           | TE/TS                  | Cota TE/TS         | Pente.(%)E/S       | L/Flecha         | Kv/Theta(%)           |
|------|----------------------|------------------------|--------------------|--------------------|------------------|-----------------------|
| 1    | 0+000.000<br>374.258 | 0+000.000              | 374.258            | -1.4098            |                  |                       |
| 2    | 0+001.420<br>374.238 | 0+001.420<br>0+001.420 | 374.238<br>374.238 | -1.4098<br>-1.4098 | 0.000<br>0.000   | 0.000<br>0.0001       |
| 3    | 0+019.225<br>373.987 | 0+002.569<br>0+035.880 | 374.222<br>373.012 | -1.4098<br>-5.8512 | 33.311<br>-0.185 | -750.000<br>-4.4415   |
| 4    | 0+094.030<br>369.610 | 0+076.695<br>0+111.364 | 370.624<br>369.263 | -5.8512<br>-1.9991 | 34.669<br>0.167  | 900.000<br>3.8521     |
| 5    | 0+114.138<br>369.208 | 0+114.138<br>0+114.138 | 369.208<br>369.208 | -1.9991<br>-1.9993 | 0.000<br>0.000   | 0.000<br>-0.0002      |
| 6    | 0+128.342<br>368.924 | 0+128.342<br>0+128.342 | 368.924<br>368.924 | -1.9993<br>-2.0107 | 0.000<br>0.000   | 0.000<br>-0.0115      |
| 7    | 0+142.517<br>368.639 | 0+142.517<br>0+142.517 | 368.639<br>368.639 | -2.0107<br>-2.0115 | 0.000<br>0.000   | 0.000<br>-0.0008      |
| 8    | 0+163.000<br>368.227 | 0+150.700<br>0+175.299 | 368.474<br>367.601 | -2.0115<br>-5.0864 | 24.599<br>-0.095 | -800.000<br>-3.0749   |
| 9    | 0+226.050<br>365.020 | 0+214.619<br>0+237.480 | 365.601<br>364.792 | -5.0864<br>-1.9970 | 22.862<br>0.088  | 740.000<br>3.0894     |
| 10   | 0+246.781<br>364.606 | 0+246.781<br>0+246.781 | 364.606<br>364.606 | -1.9970<br>-1.9968 | 0.000<br>0.000   | 0.000<br>0.0002       |
| 11   | 0+255.494<br>364.432 | 0+255.494<br>0+255.494 | 364.432<br>364.432 | -1.9968<br>-1.9976 | 0.000<br>0.000   | 0.000<br>-0.0008      |
| 12   | 0+264.205<br>364.258 | 0+264.205<br>0+264.205 | 364.258<br>364.258 | -1.9976<br>-1.6544 | 0.000<br>0.000   | 0.000<br>0.3432       |
| 13   | 0+282.950<br>363.948 | 0+270.184<br>0+295.715 | 364.159<br>363.465 | -1.6544<br>-3.7820 | 25.531<br>-0.068 | -1,200.000<br>-2.1276 |
| 14   | 0+322.000<br>362.471 | 0+310.203<br>0+333.796 | 362.917<br>362.352 | -3.7820<br>-1.0063 | 23.593<br>0.082  | 850.000<br>2.7756     |
| 15   | 0+388.579<br>361.801 | 0+388.579<br>0+388.579 | 361.801<br>361.801 | -1.0063<br>-1.0055 | 0.000<br>0.000   | 0.000<br>0.0008       |
| 16   | 0+404.291<br>361.643 | 0+404.291<br>0+404.291 | 361.643<br>361.643 | -1.0055<br>-1.0173 | 0.000<br>0.000   | 0.000<br>-0.0117      |
| 17   | 0+404.378<br>361.642 | 0+404.378              | 361.642            | -1.0173            |                  |                       |

## VIAL 8

## LISTADO DE VÉRTICES

| Ver. | Esta./Cota           | TE/TS                  | Cota TE/TS         | Pente.(%)E/S       | L/Flecha         | Kv/Theta(%)         |
|------|----------------------|------------------------|--------------------|--------------------|------------------|---------------------|
| 1    | 0+000.000<br>374.745 | 0+000.000              | 374.745            | -1.3638            |                  |                     |
| 2    | 0+001.459<br>374.725 | 0+001.459<br>0+001.459 | 374.725<br>374.725 | -1.3638<br>-1.3641 | 0.000<br>0.000   | 0.000<br>-0.0003    |
| 3    | 0+019.860<br>374.474 | 0+002.441<br>0+037.278 | 374.712<br>373.478 | -1.3641<br>-5.7187 | 34.837<br>-0.190 | -800.000<br>-4.3546 |
| 4    | 0+112.950<br>369.150 | 0+094.350<br>0+131.549 | 370.214<br>368.779 | -5.7187<br>-1.9989 | 37.198<br>0.173  | 1,000.000<br>3.7198 |
| 5    | 0+136.884<br>368.672 | 0+136.884<br>0+136.884 | 368.672<br>368.672 | -1.9989<br>-1.9991 | 0.000<br>0.000   | 0.000<br>-0.0002    |
| 6    | 0+151.090<br>368.388 | 0+151.090<br>0+151.090 | 368.388<br>368.388 | -1.9991<br>-2.0007 | 0.000<br>0.000   | 0.000<br>-0.0015    |
| 7    | 0+165.285<br>368.104 | 0+165.285<br>0+165.285 | 368.104<br>368.104 | -2.0007<br>-2.0008 | 0.000<br>0.000   | 0.000<br>-0.0001    |
| 8    | 0+178.030<br>367.849 | 0+169.594<br>0+186.465 | 368.018<br>367.477 | -2.0008<br>-4.4109 | 16.870<br>-0.051 | -700.000<br>-2.4100 |
| 9    | 0+249.015<br>364.718 | 0+239.371<br>0+258.658 | 365.143<br>364.525 | -4.4109<br>-1.9999 | 19.287<br>0.058  | 800.000<br>2.4109   |
| 10   | 0+269.563<br>364.307 | 0+269.563<br>0+269.563 | 364.307<br>364.307 | -1.9999<br>-2.0001 | 0.000<br>0.000   | 0.000<br>-0.0002    |
| 11   | 0+278.263<br>364.133 | 0+278.263<br>0+278.263 | 364.133<br>364.133 | -2.0001<br>-2.0114 | 0.000<br>0.000   | 0.000<br>-0.0112    |
| 12   | 0+286.963<br>363.958 | 0+286.963<br>0+286.963 | 363.958<br>363.958 | -2.0114<br>-2.0110 | 0.000<br>0.000   | 0.000<br>0.0004     |
| 13   | 0+314.440<br>363.405 | 0+312.536<br>0+316.343 | 363.444<br>363.374 | -2.0110<br>-1.6302 | 3.808<br>0.002   | 1,000.000<br>0.3808 |
| 14   | 0+347.470<br>362.867 | 0+344.766<br>0+350.173 | 362.911<br>362.839 | -1.6302<br>-1.0295 | 5.406<br>0.004   | 900.000<br>0.6007   |
| 15   | 0+410.123<br>362.222 | 0+410.123<br>0+410.123 | 362.222<br>362.222 | -1.0295<br>-1.0286 | 0.000<br>0.000   | 0.000<br>0.0010     |
| 16   | 0+425.872<br>362.060 | 0+425.872<br>0+425.872 | 362.060<br>362.060 | -1.0286<br>-1.0173 | 0.000<br>0.000   | 0.000<br>0.0113     |
| 17   | 0+425.881<br>362.060 | 0+425.881              | 362.060            | -1.0173            |                  |                     |

## VIAL 9

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>    |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|-----------------------|
| 1           | 0+000.000<br>373.413 | 0+000.000              | 373.413            | -1.3590             |                  |                       |
| 2           | 0+001.509<br>373.392 | 0+001.509<br>0+001.509 | 373.392<br>373.392 | -1.3590<br>-1.3590  | 0.000<br>0.000   | 0.000<br>0.0000       |
| 3           | 0+028.440<br>373.026 | 0+009.205<br>0+047.674 | 373.287<br>372.148 | -1.3590<br>-4.5647  | 38.468<br>-0.154 | -1,200.000<br>-3.2057 |
| 4           | 0+116.000<br>369.029 | 0+100.565<br>0+131.434 | 369.734<br>368.722 | -4.5647<br>-1.9923  | 30.869<br>0.099  | 1,200.000<br>2.5724   |
| 5           | 0+160.880<br>368.135 | 0+160.880<br>0+160.880 | 368.135<br>368.135 | -1.9923<br>-1.9921  | 0.000<br>0.000   | 0.000<br>0.0002       |
| 6           | 0+175.136<br>367.851 | 0+175.136<br>0+175.136 | 367.851<br>367.851 | -1.9921<br>-1.9992  | 0.000<br>0.000   | 0.000<br>-0.0071      |
| 7           | 0+189.343<br>367.567 | 0+189.343<br>0+189.343 | 367.567<br>367.567 | -1.9992<br>-1.9992  | 0.000<br>0.000   | 0.000<br>0.0000       |
| 8           | 0+207.000<br>367.214 | 0+196.523<br>0+217.476 | 367.423<br>366.785 | -1.9992<br>-4.0945  | 20.953<br>-0.055 | -1,000.000<br>-2.0953 |
| 9           | 0+275.050<br>364.428 | 0+264.579<br>0+285.520 | 364.856<br>364.218 | -4.0945<br>-2.0003  | 20.941<br>0.055  | 1,000.000<br>2.0941   |
| 10          | 0+293.632<br>364.056 | 0+293.632<br>0+293.632 | 364.056<br>364.056 | -2.0003<br>-2.0001  | 0.000<br>0.000   | 0.000<br>0.0002       |
| 11          | 0+302.332<br>363.882 | 0+302.332<br>0+302.332 | 363.882<br>363.882 | -2.0001<br>-1.9998  | 0.000<br>0.000   | 0.000<br>0.0004       |
| 12          | 0+311.032<br>363.708 | 0+311.032<br>0+311.032 | 363.708<br>363.708 | -1.9998<br>-2.0003  | 0.000<br>0.000   | 0.000<br>-0.0005      |
| 13          | 0+321.025<br>363.508 | 0+314.524<br>0+327.525 | 363.638<br>363.472 | -2.0003<br>-0.5558  | 13.001<br>0.023  | 900.000<br>1.4445     |
| 14          | 0+419.000<br>362.964 | 0+417.871<br>0+420.128 | 362.970<br>362.954 | -0.5558<br>-0.8065  | 2.257<br>-0.001  | -900.000<br>-0.2508   |
| 15          | 0+428.622<br>362.886 | 0+428.622<br>0+428.622 | 362.886<br>362.886 | -0.8065<br>-0.8719  | 0.000<br>0.000   | 0.000<br>-0.0654      |
| 16          | 0+444.449<br>362.748 | 0+444.449              | 362.748            | -0.8719             |                  |                       |

## VIAL 10

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>    |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|-----------------------|
| 1           | 0+000.000<br>372.871 | 0+000.000              | 372.871            | 2.0009              |                  |                       |
| 2           | 0+001.121<br>372.893 | 0+001.121<br>0+001.121 | 372.893<br>372.893 | 2.0009<br>2.0015    | 0.000<br>0.000   | 0.000<br>0.0005       |
| 3           | 0+030.000<br>373.471 | 0+014.036<br>0+045.963 | 373.151<br>373.224 | 2.0015<br>-1.5460   | 31.928<br>-0.142 | -900.000<br>-3.5475   |
| 4           | 0+136.870<br>371.819 | 0+128.859<br>0+144.880 | 371.943<br>371.567 | -1.5460<br>-3.1482  | 16.021<br>-0.032 | -1,000.000<br>-1.6021 |
| 5           | 0+158.049<br>371.152 | 0+158.049<br>0+158.049 | 371.152<br>371.152 | -3.1482<br>-3.1476  | 0.000<br>0.000   | 0.000<br>0.0006       |
| 6           | 0+172.536<br>370.696 | 0+172.536<br>0+172.536 | 370.696<br>370.696 | -3.1476<br>-3.0515  | 0.000<br>0.000   | 0.000<br>0.0961       |
| 7           | 0+186.988<br>370.255 | 0+186.988<br>0+186.988 | 370.255<br>370.255 | -3.0515<br>-3.0509  | 0.000<br>0.000   | 0.000<br>0.0007       |
| 8           | 0+215.472<br>369.386 | 0+210.366<br>0+220.578 | 369.542<br>369.187 | -3.0509<br>-3.9019  | 10.212<br>-0.011 | -1,200.000<br>-0.8510 |
| 9           | 0+269.699<br>367.270 | 0+263.011<br>0+276.386 | 367.531<br>367.084 | -3.9019<br>-2.7873  | 13.374<br>0.019  | 1,200.000<br>1.1145   |
| 10          | 0+292.593<br>366.632 | 0+292.593<br>0+292.593 | 366.632<br>366.632 | -2.7873<br>-2.7872  | 0.000<br>0.000   | 0.000<br>0.0001       |
| 11          | 0+301.420<br>366.386 | 0+301.420<br>0+301.420 | 366.386<br>366.386 | -2.7872<br>-2.7340  | 0.000<br>0.000   | 0.000<br>0.0532       |
| 12          | 0+310.198<br>366.146 | 0+310.198<br>0+310.198 | 366.146<br>366.146 | -2.7340<br>-2.7337  | 0.000<br>0.000   | 0.000<br>0.0003       |
| 13          | 0+338.880<br>365.362 | 0+328.594<br>0+349.165 | 365.643<br>365.257 | -2.7337<br>-1.0194  | 20.571<br>0.044  | 1,200.000<br>1.7143   |
| 14          | 0+401.005<br>364.729 | 0+398.600<br>0+403.410 | 364.753<br>364.694 | -1.0194<br>-1.4202  | 4.810<br>-0.002  | -1,200.000<br>-0.4008 |
| 15          | 0+420.198<br>364.456 | 0+420.198<br>0+420.198 | 364.456<br>364.456 | -1.4202<br>-1.4203  | 0.000<br>0.000   | 0.000<br>0.0000       |
| 16          | 0+436.251<br>364.228 | 0+436.251<br>0+436.251 | 364.228<br>364.228 | -1.4203<br>-1.4411  | 0.000<br>0.000   | 0.000<br>-0.0208      |
| 17          | 0+436.287<br>364.227 | 0+436.287              | 364.227            | -1.4411             |                  |                       |

VIAL 11

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> | <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>    |
|-------------|----------------------|------------------------|--------------------|---------------------|-----------------|--------------------|-------------|----------------------|------------------------|--------------------|---------------------|------------------|-----------------------|
| 1           | 0+020.005<br>371.510 | 0+020.005              | 371.510            | -0.2300             |                 |                    | 17          | 0+380.000<br>373.879 | 0+374.803<br>0+385.196 | 373.911<br>373.803 | -0.6049<br>-1.4709  | 10.392<br>-0.011 | -1,200.000<br>-0.8660 |
| 2           | 0+053.000<br>371.435 | 0+053.000<br>0+053.000 | 371.435<br>371.435 | -0.2300<br>0.2071   | 0.000<br>0.000  | 0.000<br>0.4371    | 18          | 0+438.000<br>373.026 | 0+438.000<br>0+438.000 | 373.026<br>373.026 | -1.4709<br>-2.0549  | 0.000<br>0.000   | 0.000<br>-0.5840      |
| 3           | 0+080.000<br>371.490 | 0+080.000<br>0+080.000 | 371.490<br>371.490 | 0.2071<br>1.8959    | 0.000<br>0.000  | 0.000<br>1.6888    | 19          | 0+460.000<br>372.574 | 0+460.000<br>0+460.000 | 372.574<br>372.574 | -2.0549<br>-0.5034  | 0.000<br>0.000   | 0.000<br>1.5516       |
| 4           | 0+100.000<br>371.870 | 0+100.000<br>0+100.000 | 371.870<br>371.870 | 1.8959<br>0.6247    | 0.000<br>0.000  | 0.000<br>-1.2712   | 20          | 0+480.000<br>372.474 | 0+480.000<br>0+480.000 | 372.474<br>372.474 | -0.5034<br>-2.3612  | 0.000<br>0.000   | 0.000<br>-1.8578      |
| 5           | 0+120.000<br>371.995 | 0+120.000<br>0+120.000 | 371.995<br>371.995 | 0.6247<br>2.0174    | 0.000<br>0.000  | 0.000<br>1.3927    | 21          | 0+501.000<br>371.978 | 0+501.000<br>0+501.000 | 371.978<br>371.978 | -2.3612<br>-2.5302  | 0.000<br>0.000   | 0.000<br>-0.1690      |
| 6           | 0+140.000<br>372.398 | 0+140.000<br>0+140.000 | 372.398<br>372.398 | 2.0174<br>1.3863    | 0.000<br>0.000  | 0.000<br>-0.6311   | 22          | 0+540.000<br>370.991 | 0+540.000<br>0+540.000 | 370.991<br>370.991 | -2.5302<br>-4.0424  | 0.000<br>0.000   | 0.000<br>-1.5122      |
| 7           | 0+220.000<br>373.507 | 0+220.000<br>0+220.000 | 373.507<br>373.507 | 1.3863<br>0.2431    | 0.000<br>0.000  | 0.000<br>-1.1432   | 23          | 0+551.700<br>370.518 | 0+551.700              | 370.518            | -4.0424             |                  |                       |
| 8           | 0+240.000<br>373.556 | 0+240.000<br>0+240.000 | 373.556<br>373.556 | 0.2431<br>1.3933    | 0.000<br>0.000  | 0.000<br>1.1502    |             |                      |                        |                    |                     |                  |                       |
| 9           | 0+260.000<br>373.834 | 0+260.000<br>0+260.000 | 373.834<br>373.834 | 1.3933<br>0.8372    | 0.000<br>0.000  | 0.000<br>-0.5561   |             |                      |                        |                    |                     |                  |                       |
| 10          | 0+278.000<br>373.985 | 0+278.000<br>0+278.000 | 373.985<br>373.985 | 0.8372<br>0.6500    | 0.000<br>0.000  | 0.000<br>-0.1872   |             |                      |                        |                    |                     |                  |                       |
| 11          | 0+295.990<br>374.102 | 0+295.990<br>0+295.990 | 374.102<br>374.102 | 0.6500<br>0.9046    | 0.000<br>0.000  | 0.000<br>0.2545    |             |                      |                        |                    |                     |                  |                       |
| 12          | 0+304.502<br>374.179 | 0+304.502<br>0+304.502 | 374.179<br>374.179 | 0.9046<br>0.1666    | 0.000<br>0.000  | 0.000<br>-0.7379   |             |                      |                        |                    |                     |                  |                       |
| 13          | 0+324.320<br>374.212 | 0+324.320<br>0+324.320 | 374.212<br>374.212 | 0.1666<br>-0.9502   | 0.000<br>0.000  | 0.000<br>-1.1168   |             |                      |                        |                    |                     |                  |                       |
| 14          | 0+332.844<br>374.131 | 0+332.844<br>0+332.844 | 374.131<br>374.131 | -0.9502<br>-0.4614  | 0.000<br>0.000  | 0.000<br>0.4888    |             |                      |                        |                    |                     |                  |                       |
| 15          | 0+340.000<br>374.098 | 0+340.000<br>0+340.000 | 374.098<br>374.098 | -0.4614<br>-0.4877  | 0.000<br>0.000  | 0.000<br>-0.0262   |             |                      |                        |                    |                     |                  |                       |
| 16          | 0+360.000<br>374.000 | 0+360.000<br>0+360.000 | 374.000<br>374.000 | -0.4877<br>-0.6049  | 0.000<br>0.000  | 0.000<br>-0.1172   |             |                      |                        |                    |                     |                  |                       |

## VIAL 12

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000.000<br>373.454 | 0+000.000              | 373.454            | -3.0001             |                  |                     |
| 2           | 0+017.000<br>372.944 | 0+006.330<br>0+027.669 | 373.264<br>372.244 | -3.0001<br>-6.5566  | 21.339<br>-0.095 | -600.000<br>-3.5565 |
| 3           | 0+073.005<br>369.272 | 0+064.190<br>0+081.819 | 369.850<br>368.953 | -6.5566<br>-3.6183  | 17.629<br>0.065  | 600.000<br>2.9382   |
| 4           | 0+088.178<br>368.723 | 0+088.178<br>0+088.178 | 368.723<br>368.723 | -3.6183<br>-3.6180  | 0.000<br>0.000   | 0.000<br>0.0003     |
| 5           | 0+095.281<br>368.466 | 0+095.281<br>0+095.281 | 368.466<br>368.466 | -3.6180<br>-3.6192  | 0.000<br>0.000   | 0.000<br>-0.0012    |
| 6           | 0+096.292<br>368.429 | 0+096.292              | 368.429            | -3.6192             |                  |                     |

## VIAL 13

## LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u>  | <u>Kv/Theta(%)</u>  |
|-------------|----------------------|------------------------|--------------------|---------------------|------------------|---------------------|
| 1           | 0+000.000<br>372.128 | 0+000.000              | 372.128            | 2.0001              |                  |                     |
| 2           | 0+020.000<br>372.528 | 0+001.684<br>0+038.315 | 372.162<br>371.552 | 2.0001<br>-5.3262   | 36.632<br>-0.335 | -500.000<br>-7.3264 |
| 3           | 0+139.020<br>366.189 | 0+122.705<br>0+155.334 | 367.058<br>365.763 | -5.3262<br>-2.6072  | 32.629<br>0.111  | 1,200.000<br>2.7190 |
| 4           | 0+172.609<br>365.313 | 0+172.609<br>0+172.609 | 365.313<br>365.313 | -2.6072<br>-2.6065  | 0.000<br>0.000   | 0.000<br>0.0007     |
| 5           | 0+179.668<br>365.129 | 0+179.668<br>0+179.668 | 365.129<br>365.129 | -2.6065<br>-2.6072  | 0.000<br>0.000   | 0.000<br>-0.0007    |
| 6           | 0+180.677<br>365.103 | 0+180.677              | 365.103            | -2.6072             |                  |                     |

VIAL MONTESOL II

LISTADO DE VÉRTICES

| <u>Ver.</u> | <u>Esta./Cota</u>    | <u>TE/TS</u>           | <u>Cota TE/TS</u>  | <u>Pente.(%)E/S</u> | <u>L/Flecha</u> | <u>Kv/Theta(%)</u> |
|-------------|----------------------|------------------------|--------------------|---------------------|-----------------|--------------------|
| 1           | 0+000,000<br>373,298 | 0+000,000              | 373,298            | -6,0830             |                 |                    |
| 2           | 0+029,000<br>371,534 | 0+011,640<br>0+046,359 | 372,590<br>371,574 | -6,0830<br>0,2294   | 34,718<br>0,274 | 550,000<br>6,3124  |
| 3           | 0+048,646<br>371,579 | 0+046,627<br>0+050,664 | 371,574<br>371,604 | 0,2294<br>1,2388    | 4,038<br>0,005  | 400,000<br>1,0094  |
| 4           | 0+050,735<br>371,605 | 0+050,735              | 371,605            | 1,2388              |                 |                    |