

## Factura

SERIE:

FOLIO: 285

FECHA: 24/8/2016 12:20:11

Documento Válido

## Constructora Santa Rosalia SA de CV

CSR860912325 PERIFERICO VICENTE LOMBARDO  
TOLEDANO No. 1411 Int. No. D PLOMEROS,  
CHIHUAHUA 31370  
CHIHUAHUA CHIHUAHUA MEXICO

Cliente: MUNICIPIO DE CHIHUAHUA

R.F.C.: MCI651010V22

Domicilio: MINA No. 408

Teléfono:

Ciudad: CHIHUAHUA

Colonia:

Estado: CENTRO CHIHUAHUA

C.P.: 31000

País: MEXICO

Lugar de Expedición: PERIFERICO VICENTE LOMBARDO TOLEDANO 1411 D. PLOMEROS, 31370, CHIHUAHUA, CHIHUAHUA, MEXICO

| Cantidad | Unidad    | Concepto / Descripción                                                                                                                                                                                                                                                                                                                                 | Valor Unitario | Importe      |
|----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
| 1.00     | NO APLICA | ESTIMACION No. 6 (SEIS) CORRESPONDIENTE A LOS TRABAJOS EN LA CONSTRUCCION DEL EJE SESENTA (60) DEL DISTRIBUIDOR VIAL ZOOTECHIA, UBICADO EN ENTRONQUE DE PERIF. FRANCISCO R. ALMADA Y CARR. A CD. CUAUHTÉMOC, COLONIA ESPERANZA Y ZOOTECHIA, EN ESTA CIUDAD DE CHIHUAHUA, DE ACUERDO AL CONTRATO DE OBRA PUBLICA No. 049/2016 DEL 20 DE ABRIL DEL 2016. | 5,405,704.30   | 5,405,704.30 |
|          |           | RETENCIONES PACTADAS EN EL CONTRATO<br>0.2% I.O.U.C. \$ 10,811.41<br>0.2% C.M.I.C. \$ 10,811.41<br>0.2% D.I.F. \$ 10,811.41<br>SUMA DE DESCUENTOS \$ 32,434.23                                                                                                                                                                                         |                |              |
|          |           | SALDO NETO A RECIBIR \$ 5,238,182.76                                                                                                                                                                                                                                                                                                                   |                |              |

## Importe con letra

SEIS MILLONES DOSCIENTOS SETENTA MIL SEISCIENTOS DIECISEIS PESOS 99/100

## Método de Pago

Otros

|           |              |
|-----------|--------------|
| SUBTOTAL: | 5,405,704.30 |
| I.V.A.:   | 854,912.69   |
| TOTAL:    | 6,270,616.99 |



FIRMA DE CONFORMIDAD

Este documento es una representación impresa de un CFDI

\*Efectos fiscales al pago

PAGO EN UNA SOLA EXHIBICION

Emitido por:

CONTRAPAQ

Versión 1.0



|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Serie del Certificado del emisor:    | 00001000000202760873                 |
| Folio fiscal:                        | A1B848AE-E261-4E32-BC8A-7B76F3DD1BF1 |
| No de Serie del Certificado del SAT: | 00001000000202864883                 |
| Fecha y hora de certificación:       | Agosto 24 2016 - 13:20:16            |

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SHCP



gob.mx

## Verificación de Comprobantes Fiscales Digitales por Internet

A través de esta opción, Usted podrá verificar si el comprobante fue Certificado por el SAT

|              |                      |
|--------------|----------------------|
| Folio Fiscal | <input type="text"/> |
| RFC Emisor   | <input type="text"/> |
| RFC Receptor | <input type="text"/> |

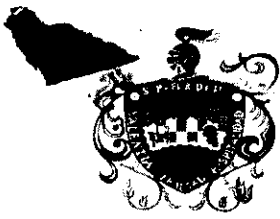
Proporcione los dígitos de la imagen

Verificar CFDI



| RFC del Emisor                       | Nombre o Razón Social del Emisor    | RFC del Receptor        | Nombre o Razón Social del Receptor |
|--------------------------------------|-------------------------------------|-------------------------|------------------------------------|
| CSR860912525                         | Constructora Santa Rosalia SA de CV | MCI651010V22            | MUNICIPIO DE CHIHUAHUA             |
| Folio Fiscal                         | Fecha de Expedición                 | Fecha Certificación SAT | PAC que Certificó                  |
| A1B848AE-E261-4E32-BC8A-7B76F3DD1BF1 | 2016-08-24T12:20:11                 | 2016-08-24T13:20:16     | MAS0810247C0                       |
| Total del CFDI                       | Efecto del Comprobante              | Estado CFDI             |                                    |
| \$6,270,616.99                       | ingreso                             | Vigente                 |                                    |

Imprimir



AYUNTAMIENTO  
**CHIHUAHUA**  
2013 2016

## DIRECCIÓN DE OBRAS PÚBLICAS

### RESUMEN DE ESTIMACION

|                                                                                                                                                                                                                            |                                      |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|
| PROGRAMA: ESTATAL-MUNICIPAL                                                                                                                                                                                                | CONTRATO No. 040/2016                | CONTRATADOS              |
| OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua | ESTIMACIÓN No. No. 6                 | \$ 62,635,080.96 CON IVA |
| UBICACIÓN: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc                                                                                                                                                                | PERÍODO EJEC. 01 AL 15 DE JULIO 2016 |                          |
| CONTRATISTA: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.                                                                                                                                                                       | IMPORTE ESTIMADO (CON IVA)           | \$ 6,270,616.99 CON IVA  |
| RFC CSR860912S25                                                                                                                                                                                                           | ACUMULADO ANTERIOR (CON IVA)         | \$ 34,947,032.73 CON IVA |
|                                                                                                                                                                                                                            | IMPORTE ACUMULADO (CON IVA)          | \$ 41,217,649.72 CON IVA |

| TIPO DE OBRA                        | IMPORTE         | OBSERVACIONES |
|-------------------------------------|-----------------|---------------|
| <u>NORMAL</u>                       | \$ 3,066,166.05 |               |
| <u>EXEDENTES</u>                    | \$ 1,227,144.71 |               |
| <u>EXTRAORDINARIOS</u>              | \$ 1,112,393.54 |               |
| IMPORTE TOTAL ESTIMACION ( SIN IVA) | \$ 5,405,704.30 |               |

|  |  |
|--|--|
|  |  |
|--|--|

|                                                                                |    |              |
|--------------------------------------------------------------------------------|----|--------------|
| DESCUENTOS                                                                     |    |              |
| 0.2% I.C.I.C.                                                                  | \$ | 10,811.41    |
| 0.2% C.M.I.C.                                                                  | \$ | 10,811.41    |
| 0.2% D.I.F.                                                                    | \$ | 10,811.41    |
| SUMA DESCUENTOS                                                                | \$ | 32,434.23    |
| RESUMEN                                                                        |    |              |
| SUMA ESTA ESTIMACION                                                           | \$ | 5,405,704.30 |
| AMORT ANTICIPO                                                                 | \$ | 0.00         |
| SUB-TOTAL                                                                      | \$ | 5,405,704.30 |
| I.V.A.                                                                         | \$ | 864,912.69   |
| TOTAL                                                                          | \$ | 6,270,616.99 |
| (CON LETRA)                                                                    |    |              |
| (SEIS MILLONES DOSCIENTOS SETENTA MIL SEISCIENTOS DIECISEIS PESOS 99/100 M.N.) |    |              |
| DESCUENTOS                                                                     | \$ | 32,434.23    |
| SALDO NETO A RECIBIR                                                           | \$ | 6,238,182.76 |

|                                               |                                         |
|-----------------------------------------------|-----------------------------------------|
| AUTORIZO                                      | ELABORO                                 |
|                                               |                                         |
| ING. RODOLFO BERMENDARIZ RONQUILLO            | CONSTRUCTORA SANTA ROSALIA S.A. DE C.V. |
| RESIDENTE D.O.P.M                             | CONTRATISTA                             |
| Vo. Bo.                                       | REVISO                                  |
|                                               |                                         |
| ING. XOCHITL PEREZ BLANCO                     | ING. ENRIQUE VILLARREAL ALEMÁN          |
| SUBDIRECTOR DE OBRA PUBLICA E INFRAESTRUCTURA | JEFE DEL DEPTO DE CONSTRUCCION.         |
| Vo. Bo.                                       |                                         |
|                                               |                                         |
| ING. RAMON DAVID RAMOS ARMENTA                |                                         |
| DIRECTOR DE OBRAS PUBLICAS Y MANTENIMIENTO    |                                         |

RECIBIMOS DE LA DIRECCIÓN DE OBRAS PÚBLICAS Y MANTENIMIENTO DEL MPIO., LA CANTIDAD DE: \$ **6,238,182.76**  
**(SEIS MILLONES DOSCIENTOS TREINTA Y OCHO MIL CIENTO OCHENTA Y DOS PESOS 76/100 M.N.)** COMO PAGO A LA  
 ESTIMACIÓN NUM. No. 6 CONTRATO No. 040/2016 POR LA CANTIDAD DE: \$ **62,635,080.96**  
 SESENTA Y DOS MILLONES SEISCIENTOS TREINTA Y CINCO MIL OCHENTA PESOS 96/100 M.N. POR TRABAJOS EN LA OBRA:  
 Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y  
 Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

ALCANCE DE LA ESTIMACION \$ **5,405,704.30**

AMORTIZACION DEL ANTICIPO \$ -

SUBTOTAL \$ **5,405,704.30**  
 IVA \$ **864,912.69**  
 TOTAL \$ **6,270,616.99**

RETENCIONES PACTADA EN CONTRATO

|                   |             |
|-------------------|-------------|
| I.C.I.C. DEL 0.2% | \$10,811.41 |
| C.M.I.C. DEL 0.2% | \$10,811.41 |
| D.I.F. DEL 0.2%   | \$10,811.41 |
| SUMA              | \$32,434.23 |

**RESUMEN FINANCIERO DE LA OBRA**

**1.- CONTRATO**

|                                | CONTRATO                |
|--------------------------------|-------------------------|
| IMPORTE CONTRATADO             | \$ <b>62,635,080.96</b> |
| CONVENIO MODIFICATORIO         | \$ -                    |
| ESTIMACION ACUMULADA ANTERIOR  | \$ 34,947,032.73        |
| ESTA ESTIMACION                | \$ 6,270,616.99         |
| ACUMULADO HASTA EST ESTIMACION | \$ 41,217,649.72        |
| POR EJERCER CONVENIO           | \$ -                    |
| POR EJERCER                    | \$ 21,417,431.24        |

**2.- AMORTIZACION DEL ANTICIPO**

|                     | CONTRATO |
|---------------------|----------|
| IMPORTE DE ANTICIPO | \$ -     |
| ACUMULADO ANTERIOR  | \$ -     |
| ESTA ESTIMACION     | \$ -     |
| ACUMULADO ACTUAL    | \$ -     |
| POR AMORTIZAR       | \$ -     |

**3.- RETENCIONES PACTADAS EN CONTRATO**

|                    | 0.2% I.C.I.C. | 0.2% C.M.I.C. | 0.2% D.I.F.  |
|--------------------|---------------|---------------|--------------|
| ACUMULADO ANTERIOR | \$60,253.50   | \$60,253.50   | \$ 60,253.50 |
| ESTA ESTIMACION    | \$10,811.41   | \$10,811.41   | \$ 10,811.41 |
| ACUMULADO ACTUAL   | \$71,064.91   | \$71,064.91   | \$ 71,064.91 |

R E C I B I M O S

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.  
 CSR860912S25

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootécnico  
Ubicado en Entronque del Periférico Francisco R. Almada y Carretera  
a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

UBICACIÓN Perif. Fco. R. Almada y Carretera Cd. Cuauhtémoc

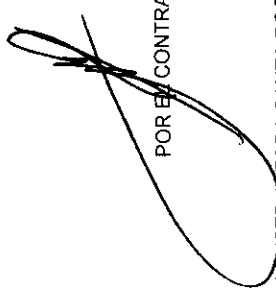
No. CONTRATO: 040/2016

No. 6

ESTIMACIÓN No.

PERÍODO: 01 AL 15 DE JULIO 2016

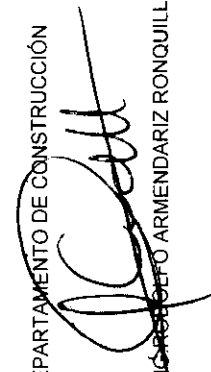
| RESUMEN DE LA ESTIMACIÓN POR PARTIDAS |                             |              |
|---------------------------------------|-----------------------------|--------------|
| No.                                   | DESCRIPCIÓN DE LAS PARTIDAS | IMPORTE      |
| <b>OBRA NORMAL</b>                    |                             |              |
|                                       | OBRAS PRELIMINARES          | 18,110.02    |
|                                       | TERRACERIAS                 | 122,760.00   |
|                                       | ESTRUCTURAS                 | 2,925,296.03 |
|                                       |                             | 3,066,166.05 |
| <b>OBRA EXEDENTE</b>                  |                             |              |
|                                       | OBRAS PRELIMINARES          | 20,932.48    |
|                                       | TERRACERIAS                 | 982,080.00   |
|                                       | ESTRUCTURAS                 | 224,132.23   |
|                                       |                             | 1,227,144.71 |
| <b>EXTRAORDINARIOS</b>                |                             |              |
|                                       |                             | 1,112,393.54 |
|                                       | SUBTOTAL                    | 5,405,704.30 |
|                                       | I.V.A.                      | 864,912.69   |
|                                       | TOTAL                       | 6,270,616.99 |



POR EL CONTRATISTA

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

POR EL DEPARTAMENTO DE CONSTRUCCIÓN



ING. ROBERTO ARMENDARIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO: 040/2016

ESTIMACIÓN No. 6

PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| No.                | CONCEPTOS                                                                                                                                                                                                                                                                           |        | PROYECTO |             | VOLUMENES     |               |            | PRECIO UNITARIO | IMPORTE    |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|-------------|---------------|---------------|------------|-----------------|------------|
|                    | DESCRIPCIÓN                                                                                                                                                                                                                                                                         | UNIDAD | VOLUMEN  | ACUM. TOTAL | CUM. ANTERIOR | VOL. ESTIMADO |            |                 |            |
| OBRA NORMAL        |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            |                 |            |
| OBRAS PRELIMINARES |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            |                 |            |
| 4                  | Retiro de árboles de cualquier altura con recuperación para su trasplante, arriates y accesorios, traslado adonde lo indique la Supervisión de la DOPM, incluye desentraice, protección de la raíz carga, acarreo, descarga y todo lo necesario para su correcta ejecución P.U.O.T. | pza    | 5.00     | 5.00        | 0.00          | 5.00          | \$1,921.24 | \$              | 9,606.20   |
| 11                 | Excavación manual para Sondeos de líneas de servicios existentes cualesquiera que sean clasificación y profundidad(incluye el relleno ompactado). por unidad de obra terminada                                                                                                      | m3     | 15.00    | 15.00       | 2.00          | 13.00         | \$654.14   | \$              | 8,503.82   |
|                    |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            | \$              | 18,110.02  |
| TERRACERIAS        |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            |                 |            |
| 15                 | Excavaciones, por unidad de obra terminada (inciso 3.01.01.003-H.04) en cortes y adicionales abajo de la subrasante: cuando el material se desperdicie, incluye retiro del material fuera de la obra.                                                                               | m3     | 240.00   | 240.00      | 0.00          | 240.00        | \$511.50   | \$              | 122,760.00 |
|                    |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            | \$              | 122,760.00 |
| ESTRUCTURAS        |                                                                                                                                                                                                                                                                                     |        |          |             |               |               |            |                 |            |
| 20                 | Excavaciones para estructuras, de acuerdo con su clasificación, a cualquier profundidad (Inciso: 3.01.02.022-H.01): Excavado, por unidad de obra terminada, cualesquiera que sean su clasificación y profundidad.                                                                   | m3     | 1,900.00 | 1,900.00    | 1,820.47      | 79.53         | \$241.58   | \$              | 19,212.86  |
| 22                 | Concreto hidráulico, por unidad de obra terminada (Inciso: 3.01.02.026-H.10): Simple, colado en seco en puentes y pasos a desnivel: De f'c = 250 Kg/cm2, utilizado en columnas de pilas.                                                                                            | m3     | 136.00   | 88.99       | 63.23         | 25.76         | \$3,642.76 | \$              | 93,837.50  |
| 27                 | Concreto hidráulico, por unidad de obra terminada (Inciso: 3.01.02.026-H.10): Simple, colado en seco en puentes y pasos a desnivel: De f'c= 250 Kg/cm2, utilizado en zapatas de pilas.                                                                                              | m3     | 344.00   | 262.50      | 201.25        | 61.25         | \$2,109.49 | \$              | 129,206.26 |
| 30                 | Concreto hidráulico, por unidad de obra terminada (Inciso: 3.01.02.026-H.10): Simple, colado en seco en puentes y pasos a desnivel: De f'c = 150 Kg/cm2, en plantilla de 5 cm de espesor.                                                                                           | m3     | 21.00    | 21.00       | 19.31         | 1.69          | \$2,256.23 | \$              | 3,813.03   |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. RODOLFO ARMENDARIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO: 040/2016  
Cd. Cuauhtémoc  
ESTIMACIÓN No. No. 6  
PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| CONCEPTOS          |                                                                                                                                                                                                                                                                                                | PROYECTO |            | VOLUMENES   |                            | PRECIO UNITARIO | IMPORTE      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------------|----------------------------|-----------------|--------------|
| No.                | DESCRIPCIÓN                                                                                                                                                                                                                                                                                    | UNIDAD   | VOLUMEN    | ACUM. TOTAL | CUM. ANTERIO/VOL. ESTIMADO |                 |              |
| 33                 | Acero de Refuerzo, por unidad de obra terminada (Inciso: 3.01.02.027-H.03): Varillas con límite elástico igual o mayor a 4,200 Kg/cm <sup>2</sup> . En puentes: Suministro, habilitación y colocación y de acero para todos los elementos de la estructura.                                    | Kg       | 64,967.00  | 50,237.00   | 43,015.00                  | \$22.34 \$      | 161,339.48   |
| 36                 | Fabricación de elementos estructurales de acero A709 grado 50, conforme a Proyecto y medido en planos y pesos teóricos.                                                                                                                                                                        | Kg       | 698,800.00 | 537,662.43  | 453,772.70                 | \$12.83 \$      | 1,076,305.24 |
| 38                 | Suministro, fabricación y Montaje de Elementos de cortante.                                                                                                                                                                                                                                    | Kg       | 6,800.00   | 6,188.86    | 5,353.04                   | \$80.05 \$      | 66,907.39    |
| 39                 | Cimbra muerta de lamina seccion 4 calibre 20.                                                                                                                                                                                                                                                  | m2       | 2,628.00   | 294.75      | 294.75                     | \$303.55 \$     | 89,471.36    |
| 43                 | Suministro y aplicación de Pintura para acabado final como recubrimiento en superficies, por unidad de obra terminada (inciso 3.01.02.042-H.02): en Vigas y cualquier elemento de Acero Estructural que requiera el acabado final a juicio de la Supervision de Obra, a cualquier altura.      | Kg       | 698,800.00 | 537,662.42  | 354,986.16                 | \$3.60 \$       | 657,634.54   |
| 44                 | SUBESTRUCTURA: Suministro y colocación de Muro de contención mecánicamente estabilizado, por unidad de obra terminada. Incluye materiales, herrajes, acarreo, patente, proyecto, mano de obra, equipo, herramienta y todo lo necesario para su correcta ejecución por unidad de obra terminada | m2       | 1,800.00   | 1,281.00    | 950.60                     | \$1,899.42 \$   | 627,568.37   |
|                    |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 | 2,925,296.03 |
| OBRA EXEDENTE      |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 |              |
| OBRAS PRELIMINARES |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 |              |
| 11                 | Excavación manual para Sondeos de líneas de servicios existentes cualesquiera que sean clasificación y profundidad(incluye el relleno ompactado). por unidad de obra terminada                                                                                                                 | m3       | 15.00      | 47.00       | 15.00                      | \$654.14 \$     | 20,932.48    |
|                    |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 | 20,932.48    |
| TERRACERIAS        |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 |              |
| 15                 | Excavaciones, por unidad de obra terminada (inciso 3.01.01.003-H.04) en cortes y adicionales debajo de la subrasante: cuando el material se desperdicia, incluye retiro del material fuera de la obra.                                                                                         | m3       | 240.00     | 2,160.00    | 240.00                     | \$511.50 \$     | 982,080.00   |
|                    |                                                                                                                                                                                                                                                                                                |          |            |             |                            |                 | 982,080.00   |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. RODOLFO ARMANDO RIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO:

040/2016

ESTIMACIÓN No. 6

PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| CONCEPTOS           |                                                                                                                                                                                                                                              | PROYECTO |          | VOLUMENES   |               |              | PRECIO UNITARIO | IMPORTE       |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------------|---------------|--------------|-----------------|---------------|
| No.                 | DESCRIPCION                                                                                                                                                                                                                                  | UNIDAD   | VOLUMEN  | ACUM. TOTAL | CUM. ANTERIOR | OL. ESTIMADO |                 |               |
| ESTRUCTURAS         |                                                                                                                                                                                                                                              |          |          |             |               |              |                 |               |
| 20                  | Excavaciones para estructuras, de acuerdo con su clasificación, a cualquier profundidad (Inciso: 3.01.02.022-H.01): Excavado, por unidad de obra terminada, cualesquiera que sean su clasificación y profundidad.                            | m3       | 1,900.00 | 2,817.97    | 1,900.00      | 917.97       | \$ 241.58       | \$ 221,763.19 |
| 30                  | Concreto hidráulico, por unidad de obra terminada (Inciso: 3.01.02.026-H.10): Simple, colado en seco en puentes y pasos a desnivel: De f'c = 150 Kg/cm2, en plantilla de 5 cm de espesor.                                                    | m3       | 21.00    | 22.05       | 21.00         | 1.05         | \$ 2,256.23     | \$ 2,369.04   |
|                     |                                                                                                                                                                                                                                              |          |          |             |               |              | \$              | 224,132.23    |
| OBRA EXTRAORDINARIA |                                                                                                                                                                                                                                              |          |          |             |               |              |                 |               |
| EXT-2               | Suministro y colocación de alcantarilla galvanizada de 90 cms de diámetro cal 14 de 54 kg/ml, incluye todo lo necesario para su correcta ejecución                                                                                           | m        | 0.00     | 12.00       | 0.00          | 12.00        | \$ 3,002.93     | \$ 36,035.16  |
| EXT-3               | Suministro y colocación de tubería de PVC serie 20 de 8" diámetro, incluye todo lo necesario para su correcta ejecución.                                                                                                                     | m        | 0.00     | 29.76       | 0.00          | 29.76        | \$ 267.75       | \$ 7,968.24   |
| EXT-4               | Retiro de señalamiento existente de 3.00 x 6.00 mts, incluye todo lo necesario para su correcta ejecución.                                                                                                                                   | pza      | 0.00     | 1.00        | 0.00          | 1.00         | \$ 4,130.29     | \$ 4,130.29   |
| EXT-5               | Reubicación de señal SID-14 existente (doble bandera) para desvío provisional, incluye: base de concreto nueva, demolición base anterior, prolongación de poliducto y cable para su conexión y todo lo necesario para su correcta ejecución. | pza      | 0.00     | 1.00        | 0.00          | 1.00         | \$ 19,369.33    | \$ 19,369.33  |
| EXT-6               | Excavación en zanja en material "C" por medios mecánicos, para líneas de agua potable, alcantarillado, etc. Incluye: retiro del material fuera de la obra, afine del fondo de la zanja y todo lo necesario para su correcta ejecución        | m3       | 0.00     | 123.04      | 0.00          | 123.04       | \$ 713.98       | \$ 87,848.10  |
| EXT-7               | Suministro y colocación de arena para plantilla y arropo de tubería hidráulica y/o sanitaria, incluye todo lo necesario para su correcta ejecución                                                                                           | m3       | 0.00     | 47.74       | 0.00          | 47.74        | \$ 250.41       | \$ 11,954.57  |
| EXT-8               | Suministro y colocación de relleno con material producto de banco cribado a 3" diámetro y compactado al 90%, incluye todo lo necesario para su correcta ejecución                                                                            | m3       | 0.00     | 73.28       | 0.00          | 73.28        | \$ 314.33       | \$ 23,034.10  |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. RODOLFO ARMENDARIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO:

040/2016

ESTIMACIÓN No. 6

PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| CONCEPTOS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | PROYECTO |             | VOLUMENES    |               |              | PRECIO UNITARIO | IMPORTE    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|-------------|--------------|---------------|--------------|-----------------|------------|
| No.       | DESCRIPCIÓN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | UNIDAD | VOLUMEN  | ACUM. TOTAL | CUM. ANTERIO | VOL. ESTIMADO |              |                 |            |
| EXT-9     | Acabado exterior en tubería de 18" diámetro de acuerdo a especificación de la JMAS, consistente en: SAND BLAST exterior en tubería a grado metal comercial y protección anticorrosiva a base de recubrimiento RP-5 alquitrán de hulla en un espesor promedio de 12 a 16 milésimas incluye todo lo necesario para su correcta ejecución                                                                                                                                                                                                                                        | m2     | 0.00     | 35.88       | 0.00         | 35.88         | \$ 739.17    | \$              | 26,521.42  |
| EXT-10    | Acabado interior en tubería de 18" diámetro de acuerdo a especificación de la JMAS, consistente en: SAND BLAST interior en tubería a grado metal blanco y protección anticorrosiva a base de aplicación de primario y acabado epóxido catalizado altos sólidos grado alimenticio con un espesor promedio de 12 milésimas incluye todo lo necesario para su correcta ejecución                                                                                                                                                                                                 | m2     | 0.00     | 34.46       | 0.00         | 34.46         | \$ 738.87    | \$              | 25,461.46  |
| EXT-12    | Caja de válvulas de 1.00 x 1.00 mts paños interiores y 1.40 mts de profundidad con muros de ladrillo de 14 cms ancho, asentado con mortero cemento:arena 1:3, incluye: excavación en material "C", retiro del material producto de excavación, losa de cimentación con concreto F'c= 200 kg/cm2, aplanado interior a base de mortero cemento arena 1:3, contramarco metálico de 4" x 1.30, cimbrado, armado, tapa de fo.fo de 130 kg, concreto F'c= 250 kg/cm2 en losa, relleno compactado con material de banco cribado de 3" y todo lo necesario para su correcta ejecución | pza    | 0.00     | 1.00        | 0.00         | 1.00          | \$ 17,391.86 | \$              | 17,391.86  |
| EXT-13    | Suministro y fabricación de contraventeos provisionales en vigas cajón a base de Angulo de acero de acuerdo a diseño proporcionado, incluye todo lo necesario para su correcta ejecución                                                                                                                                                                                                                                                                                                                                                                                      | pza    | 0.00     | 12.00       | 0.00         | 12.00         | \$ 12,155.19 | \$              | 145,862.28 |
| EXT-16    | Retiro de barandal existente del puente con medidas de 2.00 x 1.00 mt, incluye demolición de guarnición de concreto armada de 20 x 30 cms y todo lo necesario para su correcta ejecución                                                                                                                                                                                                                                                                                                                                                                                      | pza    | 0.00     | 1.00        | 0.00         | 1.00          | \$ 1,648.68  | \$              | 1,648.68   |
| EXT-17    | Retiro de anuncio existente de 1.00 x 2.00 mts, incluye: demolición de base en anclaje y todo lo necesario para su ejecución                                                                                                                                                                                                                                                                                                                                                                                                                                                  | pza    | 0.00     | 1.00        | 0.00         | 1.00          | \$ 1,107.56  | \$              | 1,107.56   |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. RODOLFO ARMENDARIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

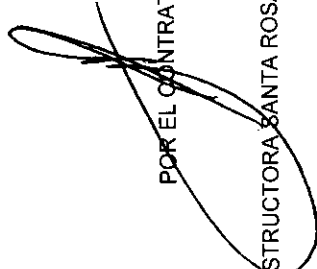
UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO: 040/2016

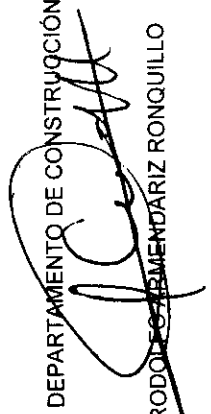
ESTIMACIÓN No. 6

PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| CONCEPTOS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PROYECTO |         | VOLUMENES   |               | PRECIO UNITARIO | IMPORTE      |               |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|-------------|---------------|-----------------|--------------|---------------|
| No.       | DESCRIPCIÓN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | UNIDAD   | VOLUMEN | ACUM. TOTAL | CUM. ANTERIOR |                 |              | VOL. ESTIMADO |
| EXT-20    | Ampliación de carriles existentes para desvío de tráfico en una área de 52 m2, incluye: demolición de guarnición, muro de mampostería y banquetta existente, excavación para abrir cajón , acarreo del material producto de demoliciones y excavaciones, compactación del terreno natural por medios manuales, colocación y compactación a mano de 30 cms de base triturada de 1 1/2" a finos, riego de impregnación, riego de liga, carpeta asfáltica de 10 cms de espesor y todo lo necesario para su correcta ejecución                                                                                                                                                             | pza      | 0.00    | 1.00        | 0.00          | 1.00            | \$ 51,153.96 | \$ 51,153.96  |
| EXT-21    | Suministro y fabricación de pozo de visita de 1.25 mts de profundidad a base de ladrillo rojo recocido en un espesor de 28 cms, asentado con mortero cemento arena 1:3, aplanado interior y exterior con mortero cemento arena 1:3 con impermeabilizante integral en el mortero, incluye: concreto fc=250 en cimentación y formación de media caña, escalones prefabricados de Fo.Fo., dala perimetral armada colada con concreto F'c= 250 kg/cm2 y brocal de Fo.Fo. Redondo de 130 kg, incluye: excavación en material "C" y retiro del material producto de excavación fuera de la obra, relleno con material de banco cribado de 3" y todo lo necesario para su correcta ejecución. | pza      | 0.00    | 1.00        | 0.00          | 1.00            | \$ 17,403.04 | \$ 17,403.04  |
| EXT-22    | Suministro y fabricación de pozo de visita de 1.60 mts de                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | pza      | 0.00    | 1.00        | 0.00          | 1.00            | \$ 21,499.53 | \$ 21,499.53  |

  
 POR EL CONTRATISTA  
 CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

  
 POR EL DEPARTAMENTO DE CONSTRUCCIÓN  
 ING. RODOLFO C. MENDEZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO:

040/2016

ESTIMACIÓN No. 6

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

PERIODO: 01 AL 15 DE JULIO 2016

| No.    | CONCEPTOS<br>DESCRIPCIÓN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PROYECTO |         | VOLUMENES   |                |               | PRECIO<br>UNITARIO | IMPORTE       |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|-------------|----------------|---------------|--------------------|---------------|
|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UNIDAD   | VOLUMEN | ACUM. TOTAL | ACUM. ANTERIOR | VOL. ESTIMADO |                    |               |
| EXT-23 | Suministro y fabricación de garza de agua potable para desvió de línea de agua potable que se encontraba dentro del desplante de la pila # 2 de acuerdo al proyecto de la JMAS, incluye: 30 mts de tubería de PVC RD-26 de 8" diámetro, 12.40 mt de tubería de acero A-53 con 0.322" espesor de pared, 6 pza brida soldable de 8" diámetro, 4 pza junta universal Fo.Fo. De 8" diam para tubo PVC métrico, 2 pza junta universal 8" para tubería Asbesto-Cemento, 1 pza válvula mariposa con operador de engrane de 8" diámetro, mano de obra y todo lo necesario para su correcta ejecución                                                                    | pza      | 0.00    | 1.00        | 0.00           | 1.00          | \$ 79,711.88       | \$ 79,711.88  |
| EXT-24 | Trabajos de conexión de garza de 18" de diámetro y 24 m de longitud a línea existente (se conecta en las 2 puntas), incluye: corte de la tubería existente en las 2 puntas, retiro de la misma, excavaciones necesarias para su colocación, equipo necesario solicitado por la J.M.A.S. para la realización de los trabajos, desagüe del agua de la línea cargada y todo lo necesario para su correcta ejecución.                                                                                                                                                                                                                                               | pza      | 0.00    | 1.00        | 0.00           | 1.00          | \$ 57,102.62       | \$ 57,102.62  |
| EXT-25 | Suministro y fabricación de garza metálica para desvió de línea de agua potable existente debido a que se encontraba dentro del desplante de la zapata de la pila 4, con una longitud de 24 ml de tubería de acero negro de 18" de diámetro y 3/8" de espesor de pared, de acuerdo a proyecto de la J.M.A.S., incluye: 2 juntas universales Fo.Fo. especiales (1 pza de 20" de diámetro que de 22 3/4" de diámetro en brida y barril y 1 pza de 18" de diámetro que de 20 1/4" de diámetro en brida y barril) y fabricación de 2 bridas soldables de 20" de diámetro a base de placa de acero de 3/4" de espesor y todo lo necesario para su correcta ejecución | m        | 0.00    | 6.27        | 0.00           | 6.27          | \$ 2,958.74        | \$ 18,551.30  |
| EXT-27 | Suministro de tubería de 18" de diámetro y 3/8" de espesor, incluye: acarreo al lugar destinado por supervisión y todo lo necesario para su correcta ejecución.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | m3       | 0.00    | 810.00      | 0.00           | 810.00        | \$ 359.57          | \$ 291,251.70 |
| EXT-28 | Suministro y colocación de pedraplen para estabilizar desplante de tierra armada por inestabilidad del terreno y presencia de agua, incluye acomodo nivelado y bandeado del material con excavadora de oruga y todo lo necesario para su correcta ejecución                                                                                                                                                                                                                                                                                                                                                                                                     |          |         |             |                |               |                    |               |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. RONCIBERTO ARMENDARIZ RONQUILLO

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

UBICACIÓN: Perif. Fco. R. Almada y Carretera No. CONTRATO: 040/2016  
Cd. Cuauhtemoc ESTIMACIÓN No. No. 6  
PERIODO: 01 AL 15 DE JULIO 2016

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA, S.A. DE C.V.

| CONCEPTOS |                                                                                                                                                                                                                                                   | PROYECTO |         | VOLUMENES   |               | PRECIO UNITARIO | IMPORTE      |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|-------------|---------------|-----------------|--------------|
| No.       | DESCRIPCIÓN                                                                                                                                                                                                                                       | UNIDAD   | VOLUMEN | ACUM. TOTAL | CUM. ANTERIOR |                 |              |
| EXT-29    | Retiro de líneas existentes de telégrafos por estorbar en el trazo del puente, incluye todo lo necesario para su correcta ejecución                                                                                                               | m        | 0.00    | 302.00      | 0.00          | \$ 28.20        | 8,516.40     |
| EXT-30    | Suministro y fabricación de atraques de concreto en línea de agua potable de 18" de diámetro de 1.80 x 1.0 x 1.0 mts, a base de concreto de F'c=200 kg/cm2, incluye: cimbrado, colado, descimbrado y todo lo necesario para su correcta ejecución | pza      | 0.00    | 4.00        | 0.00          | \$ 4,213.31     | 16,853.24    |
|           |                                                                                                                                                                                                                                                   |          |         |             |               | \$              | 1,112,393.54 |

POR EL CONTRATISTA

POR EL DEPARTAMENTO DE CONSTRUCCIÓN

CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

ING. ROBERTO ARMENDARIZ RONQUILLO

|              |                                                                                                                                                                                                                       |        |                                                  |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO:    | 040/2016                                                                                                                                                                                                              | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA:        | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua. |        |                                                  |
| CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV                                                                                                                                                                                   |        |                                                  |

[illegible]

|                         |                            |
|-------------------------|----------------------------|
| <p>CROQUIS</p>          | <p>VOLUMEN<br/>A PAGAR</p> |
| <p>SE ANEXA CROQUIS</p> | <p>5 PZA</p>               |

CONTRATISTA  
CONSTRUCTORA SANTA ROSA

ING. RODOLFO ARMENDARIZ RONQUILLO

**DERIE R. ALMADA**



OXXO  
GASOLINERA

$$V_{OL} = 5 \text{ pZA}$$


|            |                                                                                                                                                                                                                                                                                      |        |                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                                                                                             | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.</p> <p>CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV</p> |        |                                                  |

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ING. RODOLFO ARMENDARIZ RONQUILLO

CONSTRUCTORA SANTA ROSALIA SA DE CV

# 11- EXCAVACION MANCHA / SONDEOS

PERIF. R. AL

SALIDA CUAUHTEMOC

F.F.C.C.

TRANSPORTE  
CHIHUAHUENSES

VIALIDAD CH-P

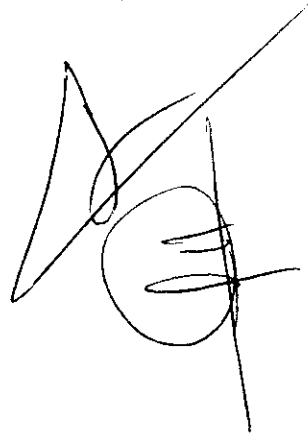
OXO

GASOLINERA

ENTRADA CHIHUAHUA

LARGO ANCHO ALTO  
 $10\text{ m} \times 3\text{ m} \times 1.5\text{ m} = 45\text{ m}^3$

$\text{VOL.} = 45\text{ m}^3$



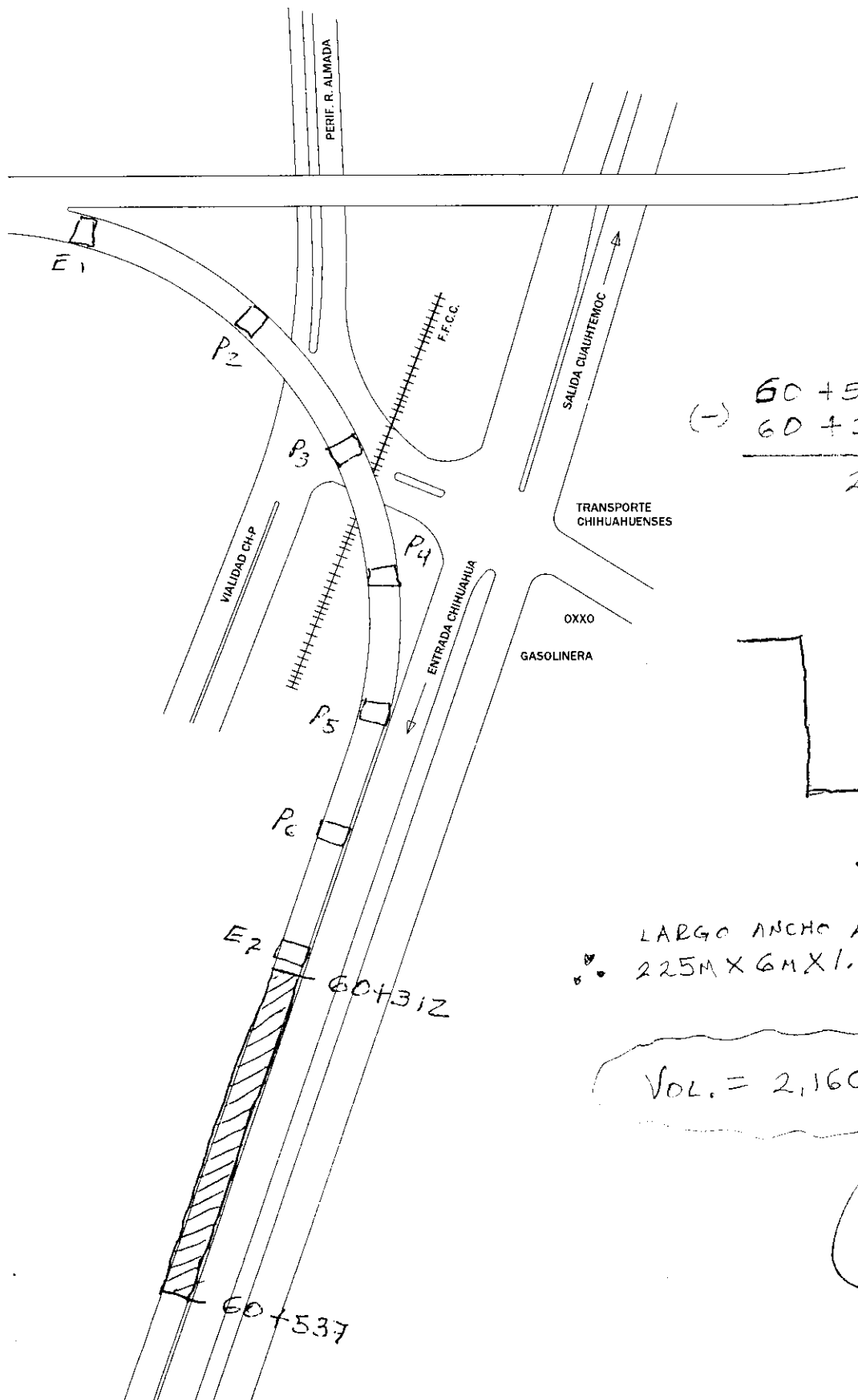
|            |                                                                                                                                                                                                                       |              |                                                  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                              | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua. |              |                                                  |
|            |                                                                                                                                                                                                                       | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

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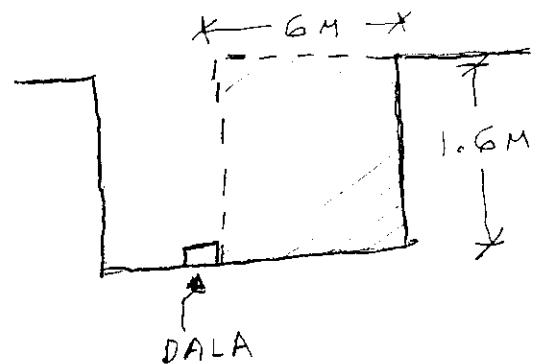
CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

~~RESIDENTE~~  
ING. RODOLFO ARMENDARIZ RONQUILLO

# 15 - EXCAVACION EN CORTE. ABAJO DE SUBRASANTE.



$$\begin{array}{r} (-) \quad 60+537 \\ \quad 60+312 \\ \hline 225\text{M} \end{array}$$



LARGO ANCHO ALTO  
 $\therefore 225\text{M} \times 6\text{M} \times 1.6\text{M} = 2,160 \text{ m}^3$

$\text{VOL.} = 2,160 \text{ m}^3 \text{ (VOL. PARCIAL)}$

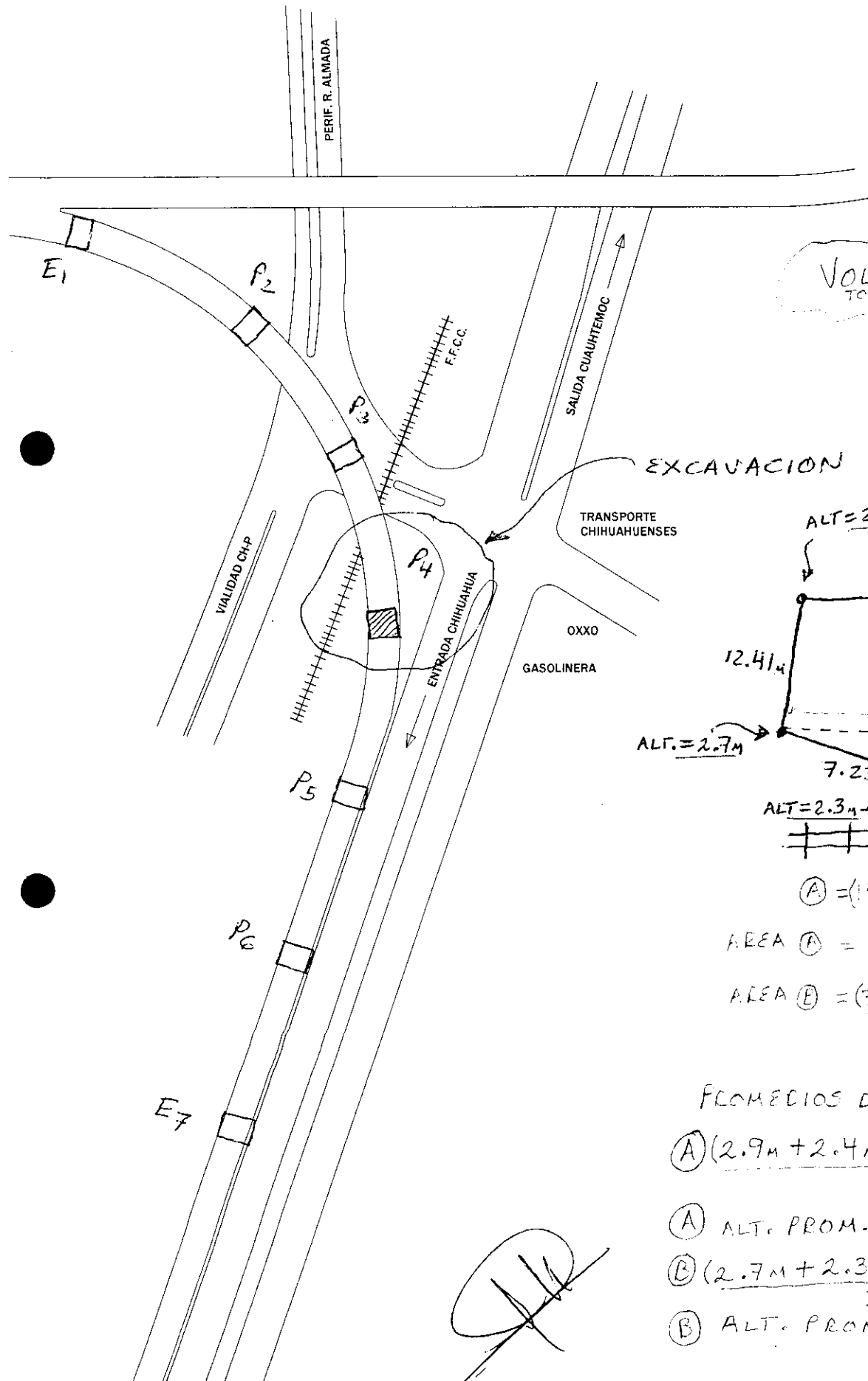
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|                                                                                                                                                                                                                              |                                     |        |                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------|--------------------------------------------------|
| CONTRATO :                                                                                                                                                                                                                   | 040/2016                            | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc. Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.</p> |                                     |        |                                                  |
| OBRA :                                                                                                                                                                                                                       | CONSTRUCTORA SANTA ROSALIA SA DE CV |        |                                                  |

|                |                         |
|----------------|-------------------------|
| <p>CROQUIS</p> | <p>SE ANEXA CROQUIS</p> |
|----------------|-------------------------|

~~RESIDENTE~~  
ING. RODOLFO ARMENDARIZ RONQUILLO

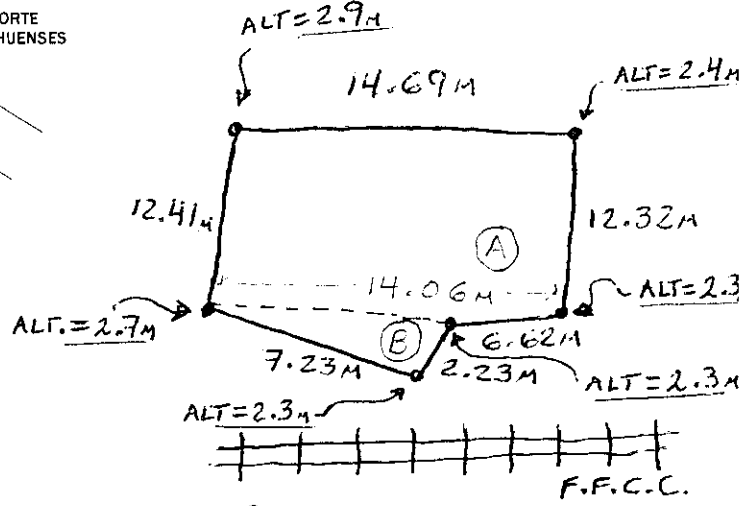
# 20 - EXCAVACION P/ESTRUCTURAS



$$VOL. = 997.5 m^3$$

TOTAL

EXCAVACION



$$A = \frac{(14.69m + 14.06m) \times (12.32m + 12.41m)}{2} = 14.37m \times 12.36m = 177.61m^2$$

$$B = \frac{(7.23m \times 2.23m)}{2} = 8.06m^2$$

$$E = 185.67 m^3$$

PROMEDIOS DE ALTO

$$A) \frac{(2.9m + 2.4m + 2.3m + 2.3m + 2.3m + 2.7m)}{6} = 2.48m$$

$$B) \frac{(2.7m + 2.3m + 2.3m)}{3} = 2.43m$$

# EXCAVACION P/ESTRUCTURA

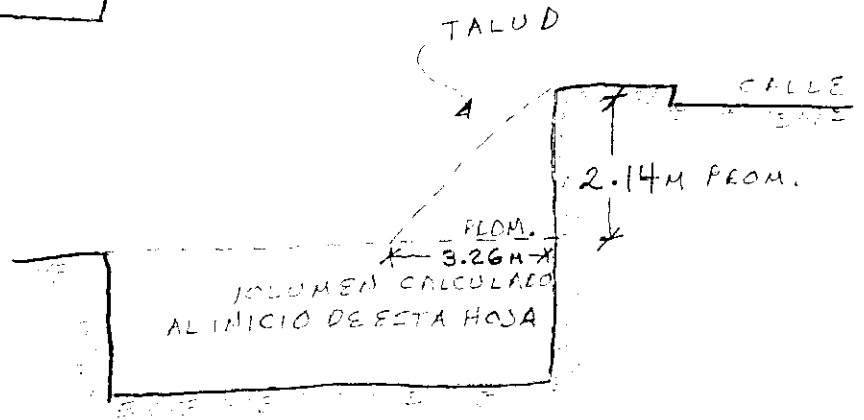
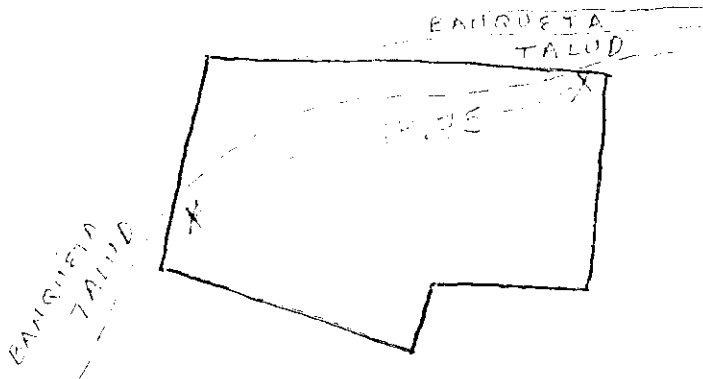
FOR LO TANTO

AREA (A)  $177.61 \text{ m}^2 \times 2.48 \text{ m} = 440.47 \text{ m}^3$

AREA (B)  $2.06 \text{ m}^2 \times 2.43 \text{ m} = 19.58 \text{ m}^3$

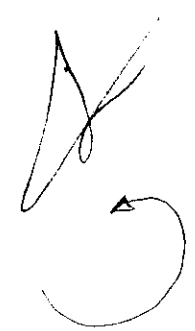
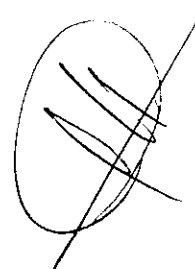
$\Sigma @ (A+B) = 460.05 \text{ m}^3 \leftarrow \text{VOL.}$

-1.00 P. ALIADA

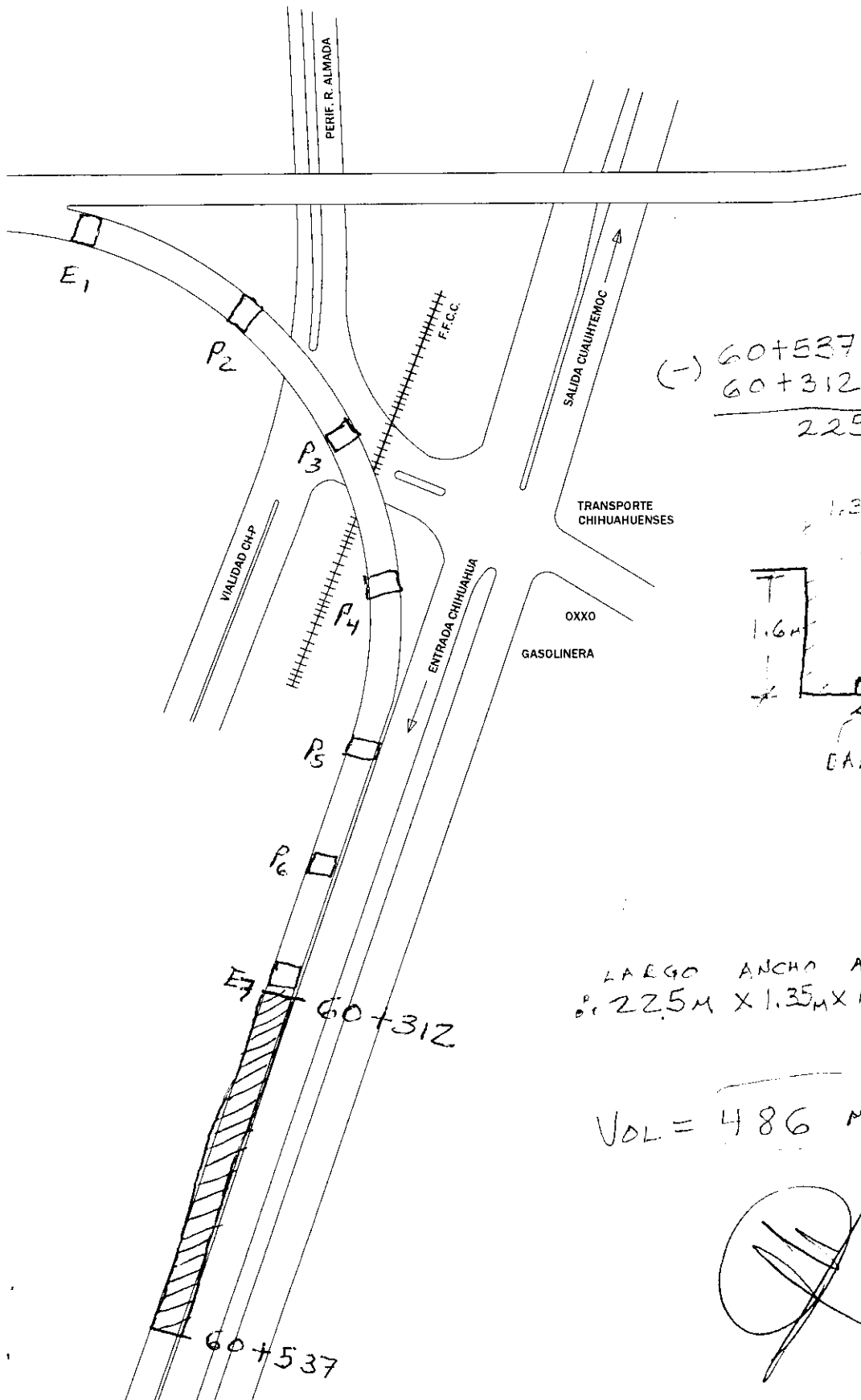


$\therefore \frac{(3.26 \text{ m} \times 2.14 \text{ m})}{2} \times 14.75 \text{ m} = 51.45 \text{ m}^3$   
VOL. 3

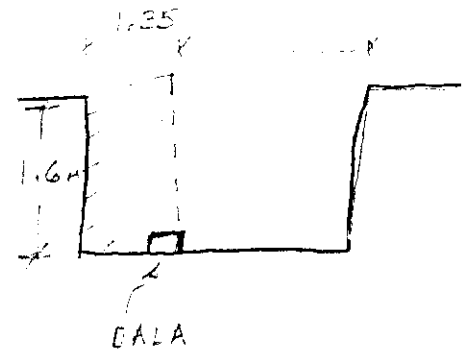
$\therefore \text{CASO TALUD} = 460.05 \text{ m}^3 + 51.45 \text{ m}^3 = 511.50 \text{ m}^3$



## EXCAVACION PARA ESTRUCTURAS

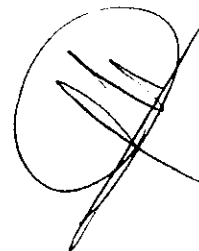


$$\begin{array}{r} (-) 60+537 \\ 60+312 \\ \hline 225m \end{array}$$



LARGO ANCHO ALTO  
p.  $2.25\text{M} \times 1.35\text{M} \times 1.6\text{M} = 486\text{M}^3$

$$V_{OL} = 486 \text{ m}^3 (\text{VOL. FARCIAL})$$



|                                                                                                                                                                                                                              |                                                  |        |                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO :                                                                                                                                                                                                                   | 040/2016                                         | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.</p> |                                                  |        |                                                  |
| OBRA :                                                                                                                                                                                                                       | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV |        |                                                  |

|                                                                                                                                                                                                                              |                                                  |        |                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO :                                                                                                                                                                                                                   | 040/2016                                         | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.</p> |                                                  |        |                                                  |
| OBRA :                                                                                                                                                                                                                       | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV |        |                                                  |

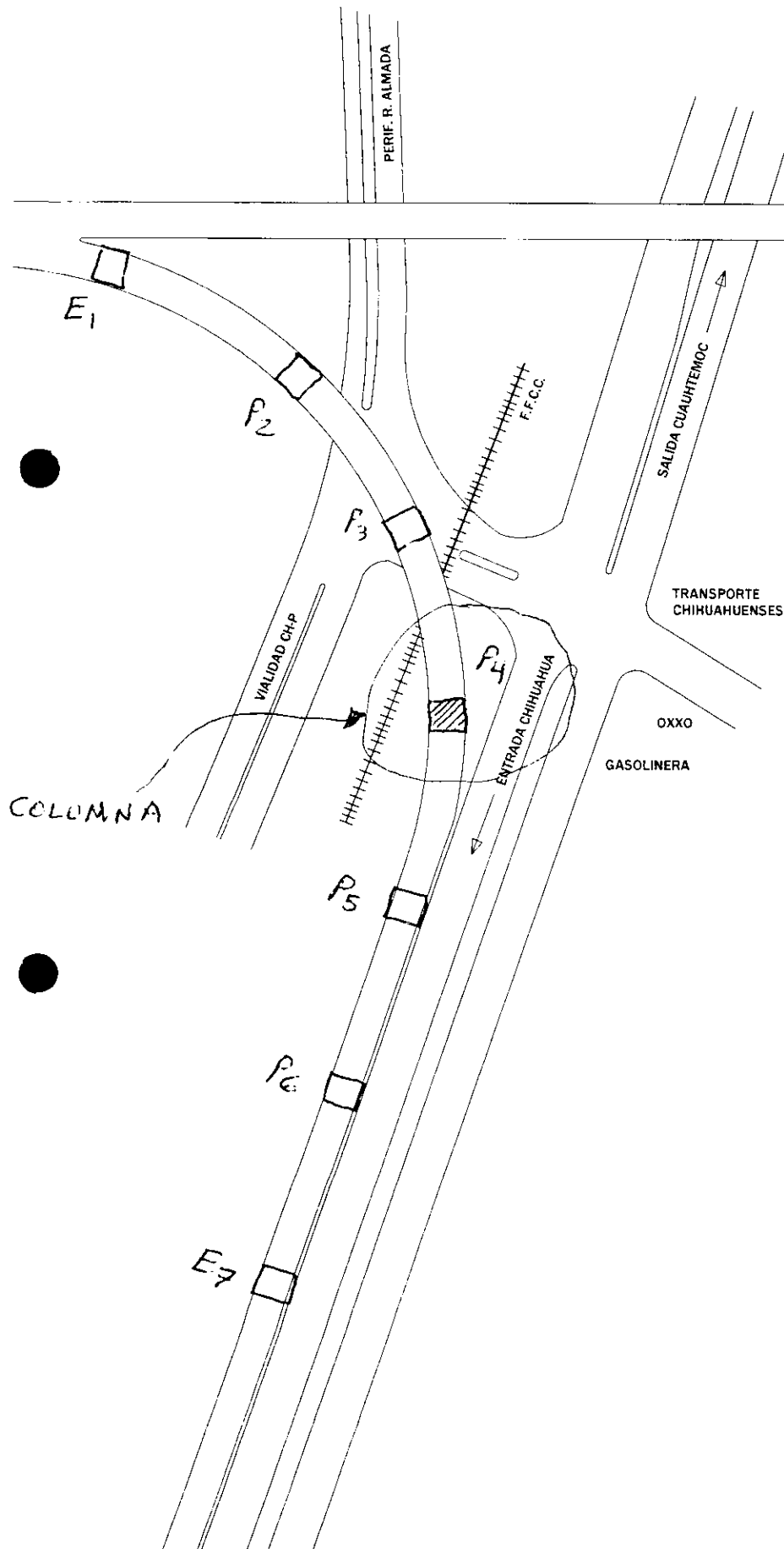
[illegible]

RESIDENTE

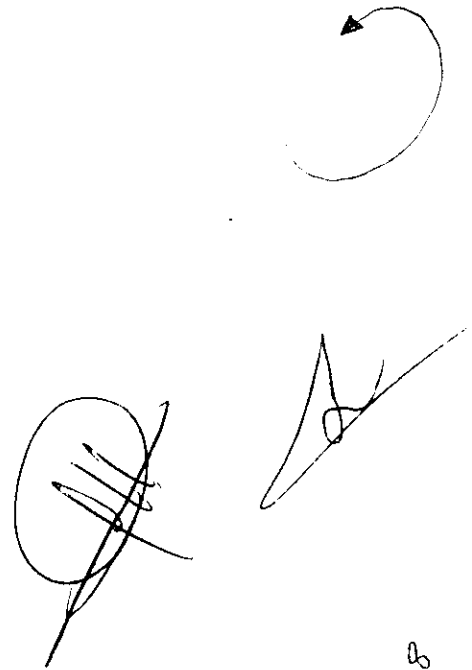
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

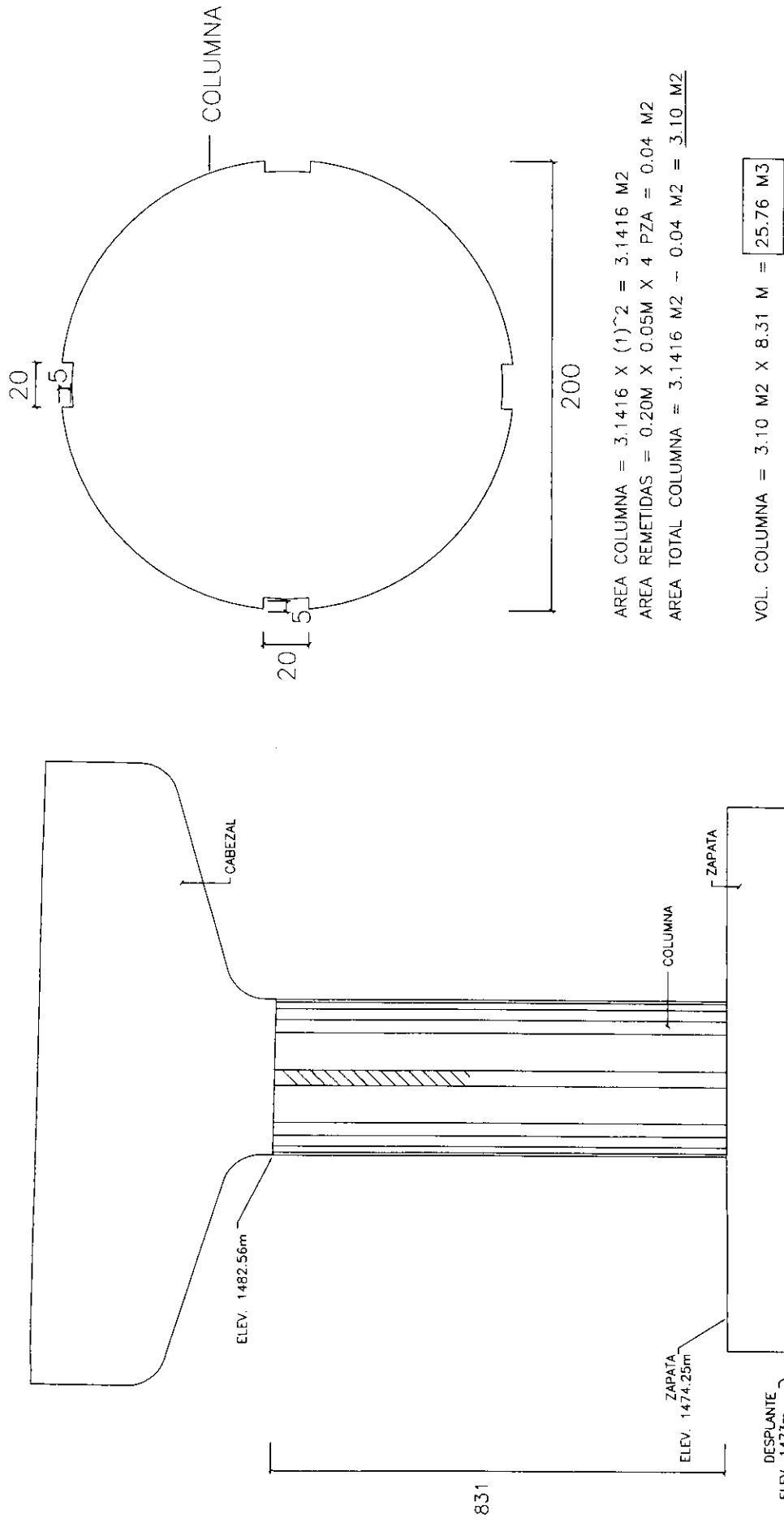
# 22-CONCRETO $F'_c = 250 \text{ kg/cm}^2$ UTILIZADO EN COLUMNAS



VOL. = 25.76 M<sup>3</sup>



# CONCRETO COLUMNA PILA 4



*[Handwritten signature]*

*[Handwritten signature]*

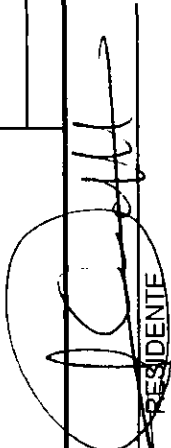
# GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                                |                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| CONTRATO : 040/2016                                                                                                                                                                                                            | TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vial Zoolectria, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zoolectria, en esta Ciudad de Chihuahua. | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV        |

|                         |                                 |
|-------------------------|---------------------------------|
| No DE ESTIMACION: No. 6 | PERIODO: 01 AL 15 DE JULIO 2016 |
|-------------------------|---------------------------------|

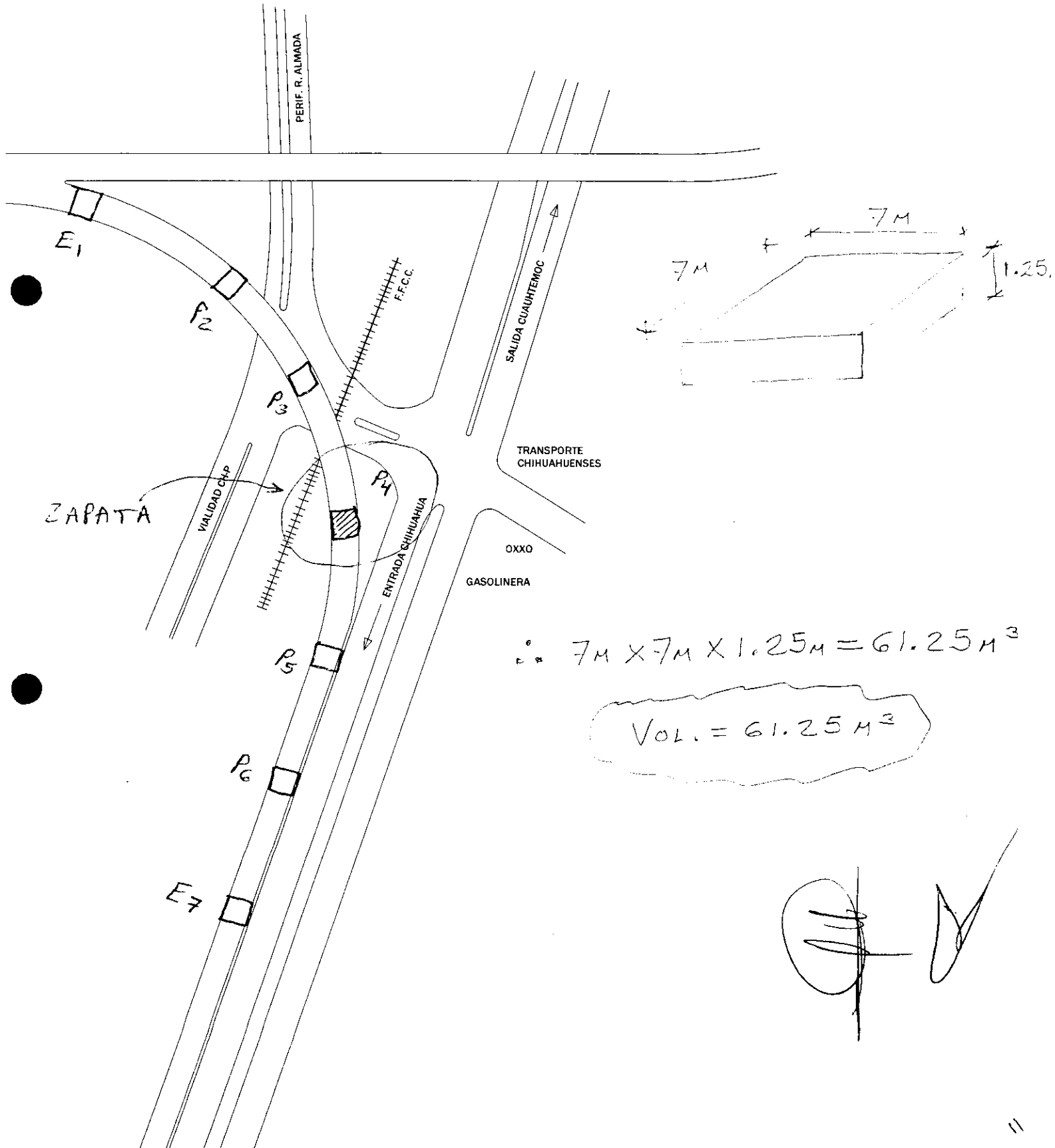
| CONCEPTO                                                                                                                                                                                                             | 27 | OPERACIONES ARITMETICAS |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------------------|
| <p>Concreto hidráulico, por unidad de obra terminada (Inciso: 3.01.02.026-H.10): Simple, colado en seco en puentes y pasos a desnivel: De <math>f_c = 250 \text{ Kg/cm}^2</math>, utilizado en zapatas de pilas.</p> |    |                         |
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| VOL. = 61.25 M3                                                                                                                                                                                                      |    |                         |
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|                                                                                                                                                                                                                      |    |                         |

|                  |                 |
|------------------|-----------------|
| CROQUIS          | VOLUMEN A PAGAR |
| SE ANEXA CROQUIS | 61.25 M3        |

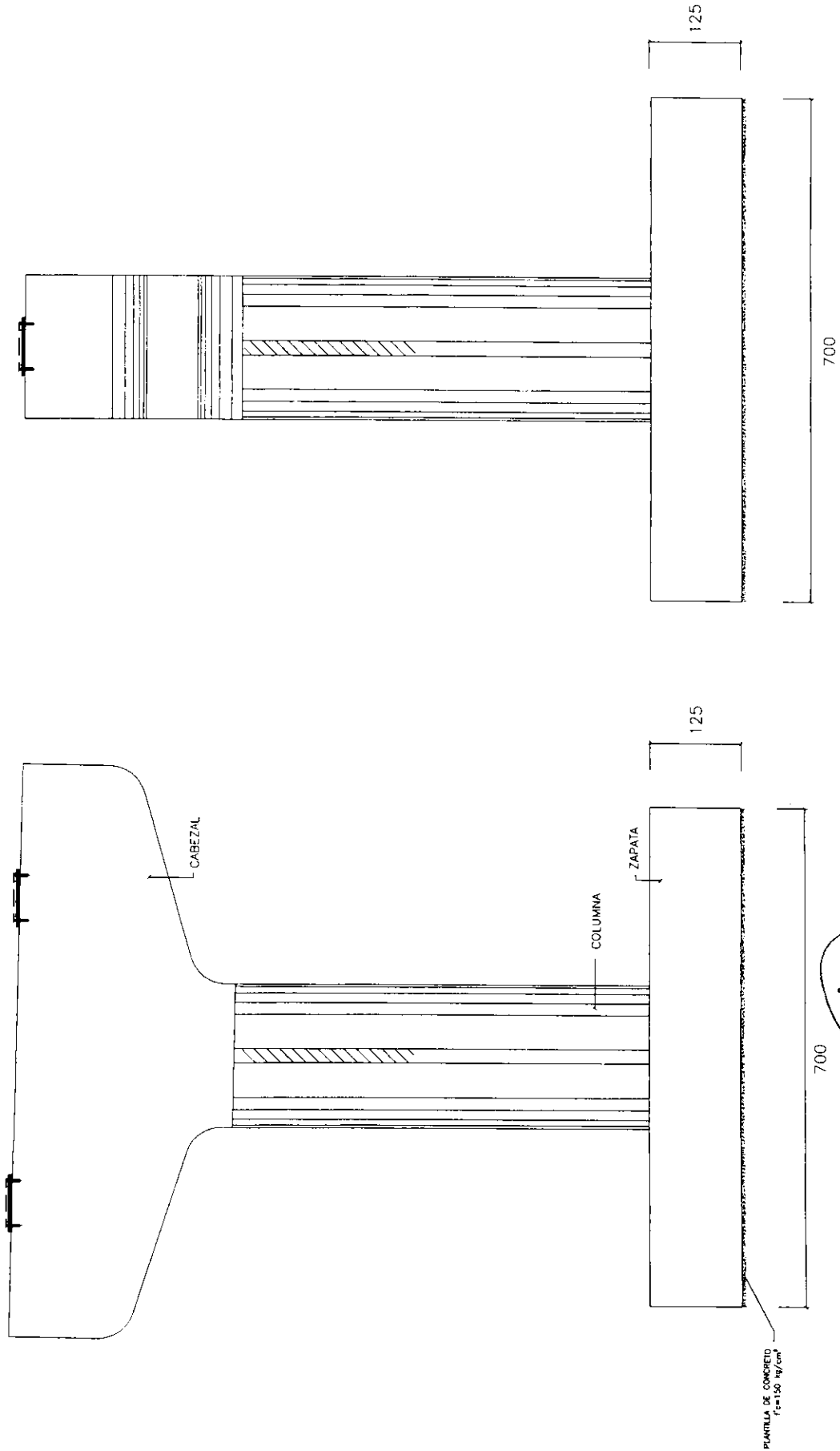
  
 RESIDENTE  
 ING. RODOLFO ARMENDARIZ RONQUILLO

  
 CONTRATISTA  
 CONSTRUCTORA SANTA ROSALIA SA DE CV

# 27- CONCRETO $f'_c = 250 \text{ KG/cm}^2$ UTILIZADO EN ZAPATAS



# CONCRETO EN ZAPATA DE PILA 4



*[Handwritten signature]*

|              |                                                                                                                                                                                                                       |        |                                                  |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO :   | 040/2016                                                                                                                                                                                                              | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :       | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtemoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua. |        |                                                  |
| CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV                                                                                                                                                                                   |        |                                                  |

|                   |       |                                 |
|-------------------|-------|---------------------------------|
| Nº DE ESTIMACION: | No. 6 | PERIODO: 01 AL 15 DE JULIO 2016 |
|-------------------|-------|---------------------------------|

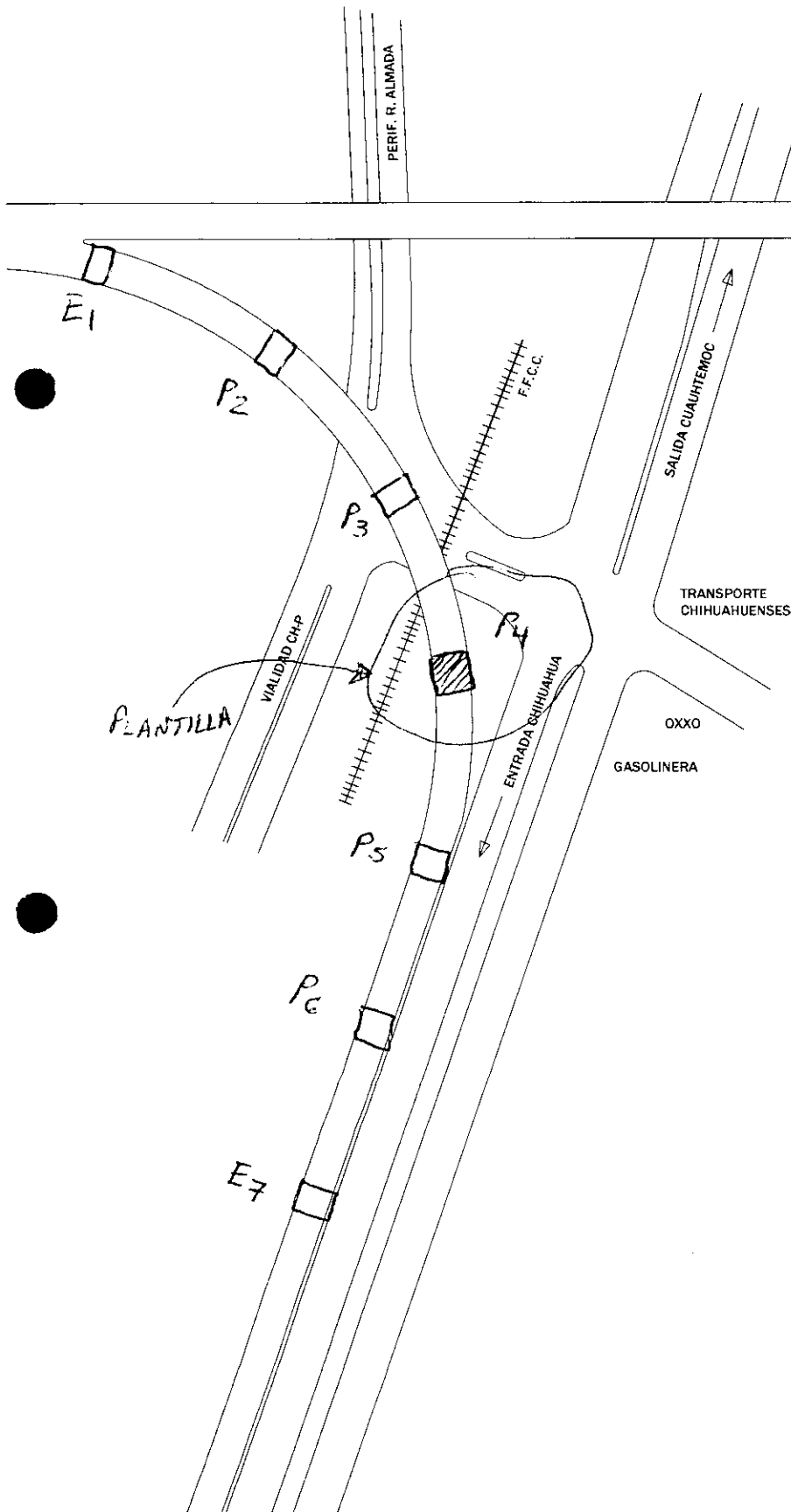
[illegible]

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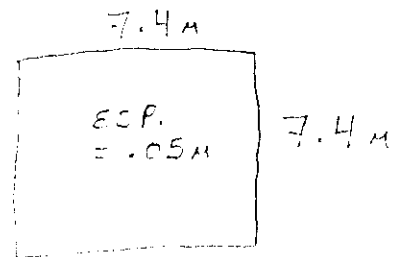
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSA

30-CONCRETO  $F'_c = 150 \text{ KG/CM}^2$  UTILIZADO EN PLANTILLA

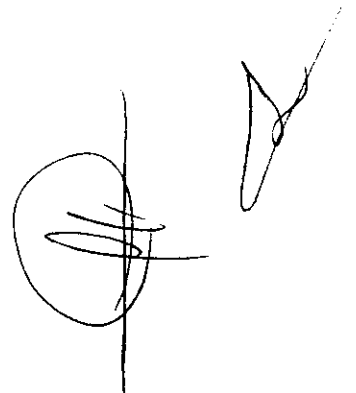


PILA 4



$$\therefore 7.4 \text{ m} \times 7.4 \text{ m} \times 0.05 \text{ m} = 2.74 \text{ m}^3$$

$$\text{VOL.} = 2.74 \text{ m}^3$$



# GENERADOR DE ESTIMACION

|            |                                                                                                                                                                                                                       |              |                                                  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                              | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua. |              |                                                  |
|            |                                                                                                                                                                                                                       | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

No DE ESTIMACION: No. 6 PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

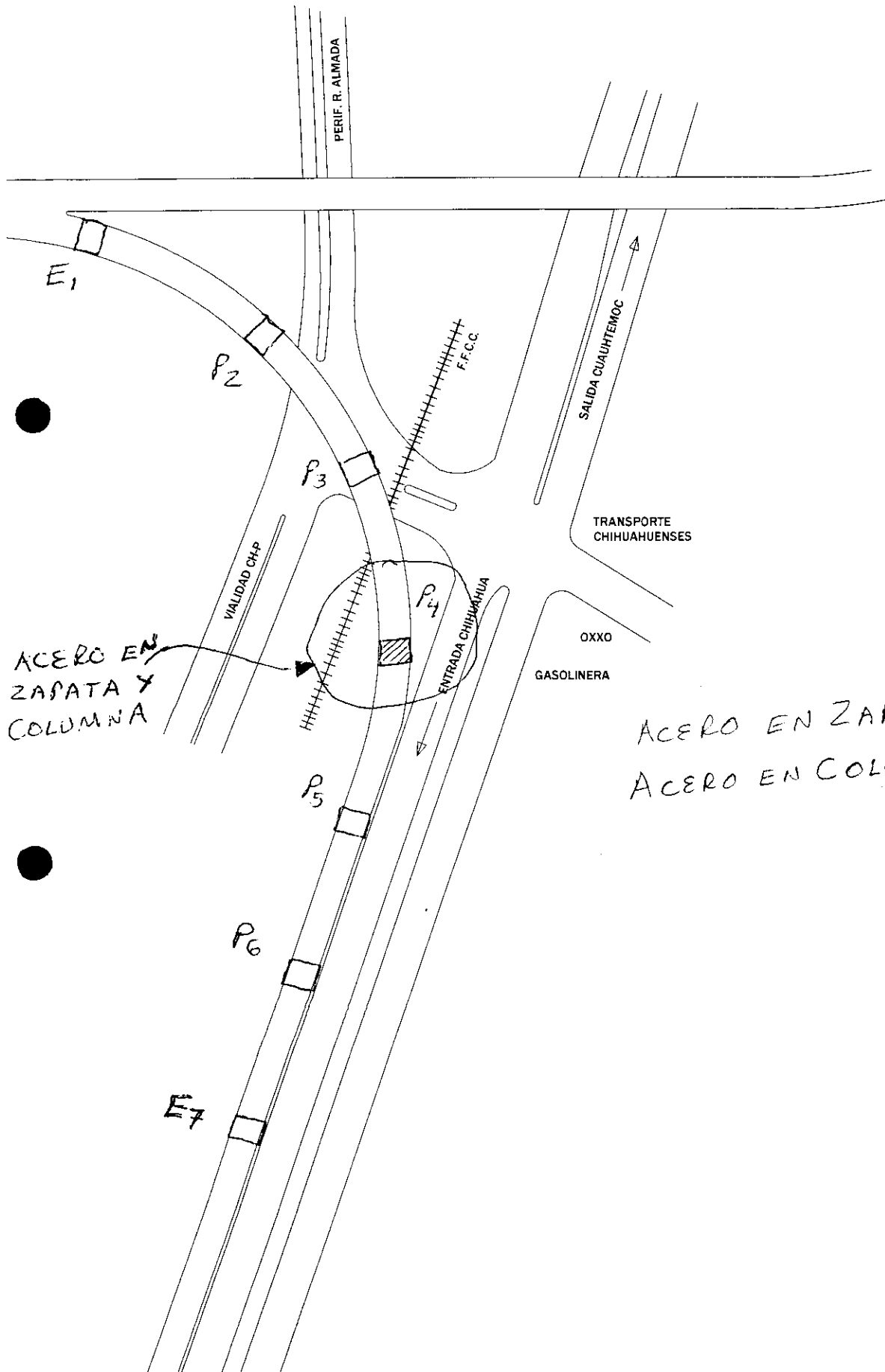
  
RESIDENTE

ING. RODOLFO ARMENDARIZ RONQUILLO

|                                        |                                            |
|----------------------------------------|--------------------------------------------|
| <p>CROQUIS</p> <p>SE ANEXA CROQUIS</p> | <p>VOLUMEN<br/>A PAGAR</p> <p>7,222 KG</p> |
|----------------------------------------|--------------------------------------------|

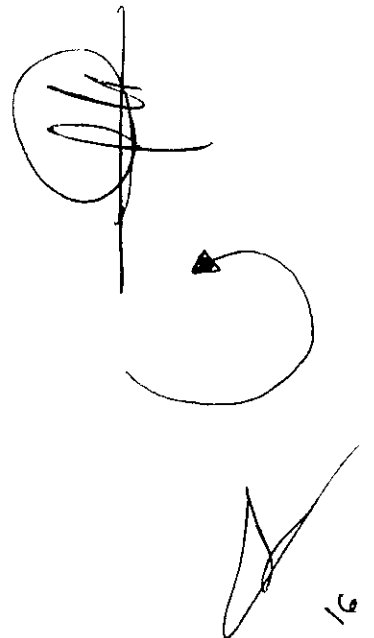
CONTRATISTA  
CONSTRUCTORA SANTA ROS

# 33 - ACERO DE REFUERZO PARA LA ESTRUCTURA



ACERO EN ZAPATA = 3,278 KG  
ACERO EN COLUMNA = 3,944 KG

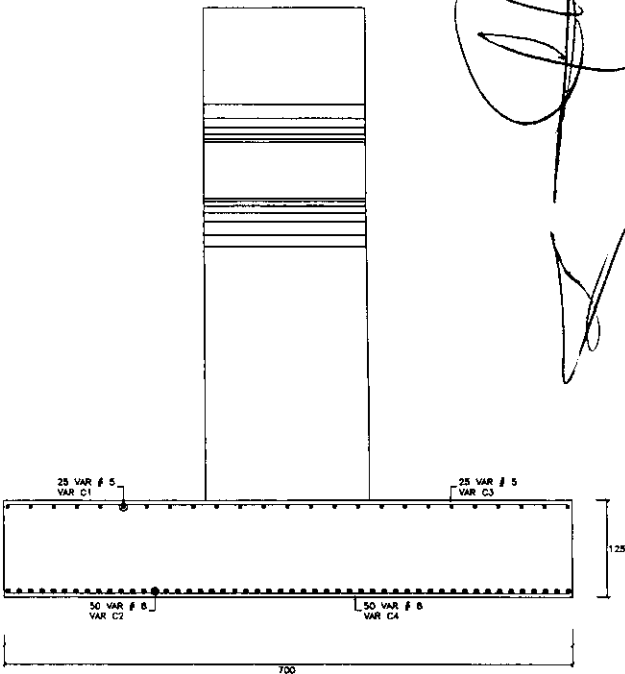
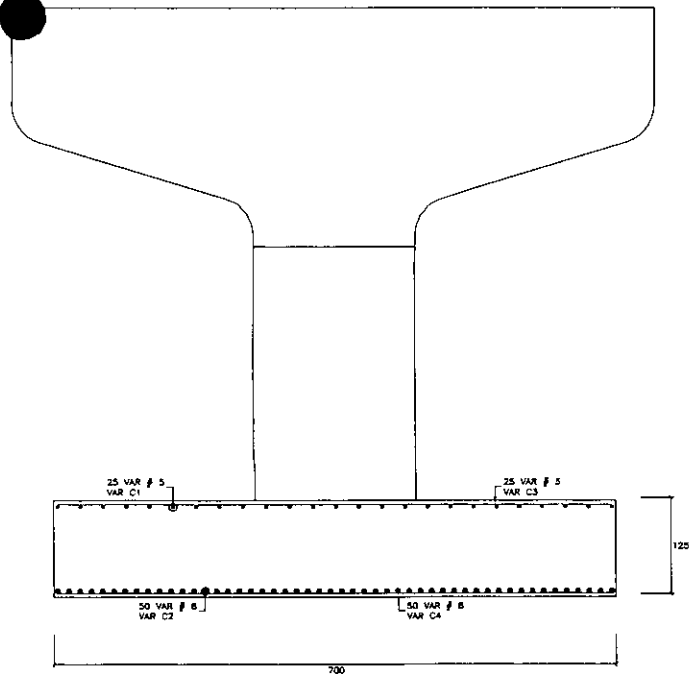
$\Sigma = 7,222 \text{ KG}$



# ACERO EN ZAPATA PILA 4

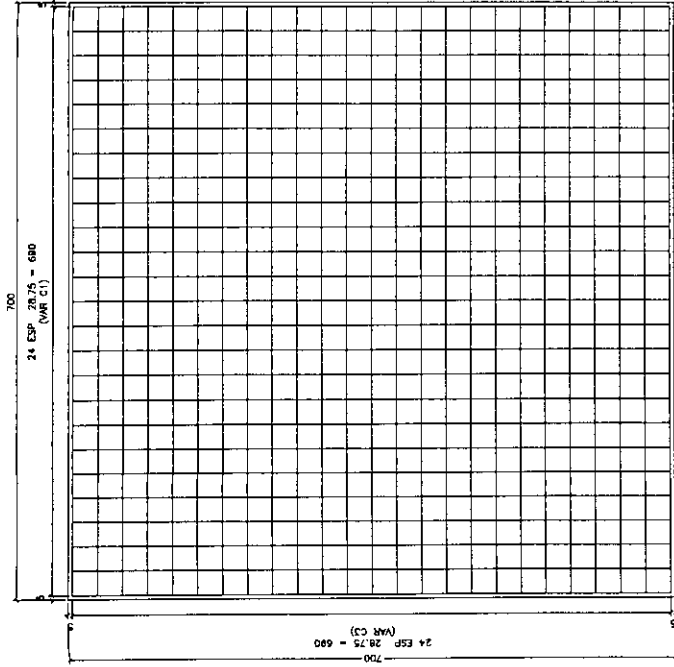
| MATERIALES DE UNA PILA                         |      |       |             |           |             |         |         |        |         |
|------------------------------------------------|------|-------|-------------|-----------|-------------|---------|---------|--------|---------|
| LISTA DE VARILLAS                              |      |       |             |           |             |         |         |        |         |
| LOC.                                           | VAR. | DIAM. | PESO (kg/m) | NUM. PZA. | LONG. TOTAL | CROQUIS | a (cm)  | b (cm) | PESO KG |
| COLUMNAS                                       | A1   | 10C   | 6.208       | 40        | 1215        |         | 975     | 120    |         |
|                                                | B1   | 4C    | 0.893       | 33        | 595         |         | 190     | -      |         |
| CABEZAL                                        | A2   | 10C   | 6.208       | 20        | 790         |         | 790     | -      |         |
|                                                | A3   | 8C    | 3.973       | 7         | 1218        |         | 190     | 150    |         |
|                                                | A4   | 5C    | 1.552       | 8         | 790         |         | 790     | -      |         |
|                                                | B2   | 5C    | 1.552       | 50        | 750         |         | 290     | 70     |         |
|                                                | B3   | 5C    | 1.552       | 50        | 690         |         | 290     | 190    |         |
| CIMENTACIÓN                                    | C1   | 5C    | 1.552       | 25        | 690         |         | 690     | -      | 268     |
|                                                | C2   | 8C    | 3.973       | 50        | 690         |         | 690     | -      | 1371    |
|                                                | C3   | 5C    | 1.552       | 25        | 690         |         | 690     | -      | 268     |
|                                                | C4   | 8C    | 3.973       | 50        | 690         |         | 690     | -      | 1371    |
| BANCOS                                         | H    | 4C    | 0.893       | 26        | 152         |         | 72      | 40     |         |
|                                                | I    | 4C    | 0.893       | 26        | 152         |         | 72      | 40     |         |
| SUBSTRUCTURA:                                  |      |       |             |           |             |         |         |        |         |
| ACERO DE REFUERZO $f_y = 4200 \text{ kg/cm}^2$ |      |       |             |           |             |         | 3278 kg |        |         |
| CONCRETO $f'_c = 250 \text{ kg/cm}^2$ :        |      |       |             |           |             |         |         |        |         |
| CABEZAL                                        |      |       |             |           |             |         |         |        |         |
| COLUMNA                                        |      |       |             |           |             |         |         |        |         |
| ZAPATAS                                        |      |       |             |           |             |         |         |        |         |
| PLANTILLA $f'_c = 150 \text{ kg/cm}^2$         |      |       |             |           |             |         |         |        |         |
| EXCAVACION APROX.                              |      |       |             |           |             |         |         |        |         |
| RELLENO APROX.                                 |      |       |             |           |             |         |         |        |         |
| BANCOS:                                        |      |       |             |           |             |         |         |        |         |
| ACERO DE REFUERZO $f_y = 4200 \text{ kg/cm}^2$ |      |       |             |           |             |         |         |        |         |
| CONCRETO $f'_c = 250 \text{ kg/cm}^2$          |      |       |             |           |             |         |         |        |         |

$Vol. = 3,278 \text{ kg}$

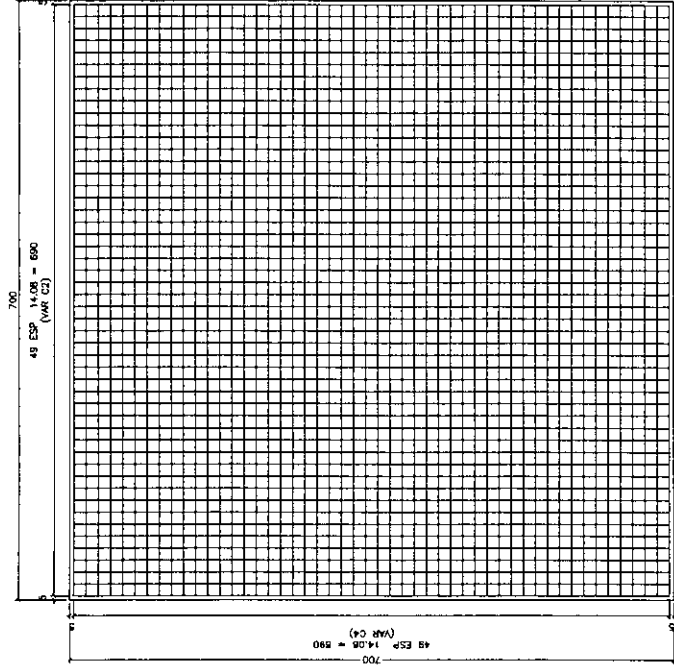


Handwritten signature and initials.

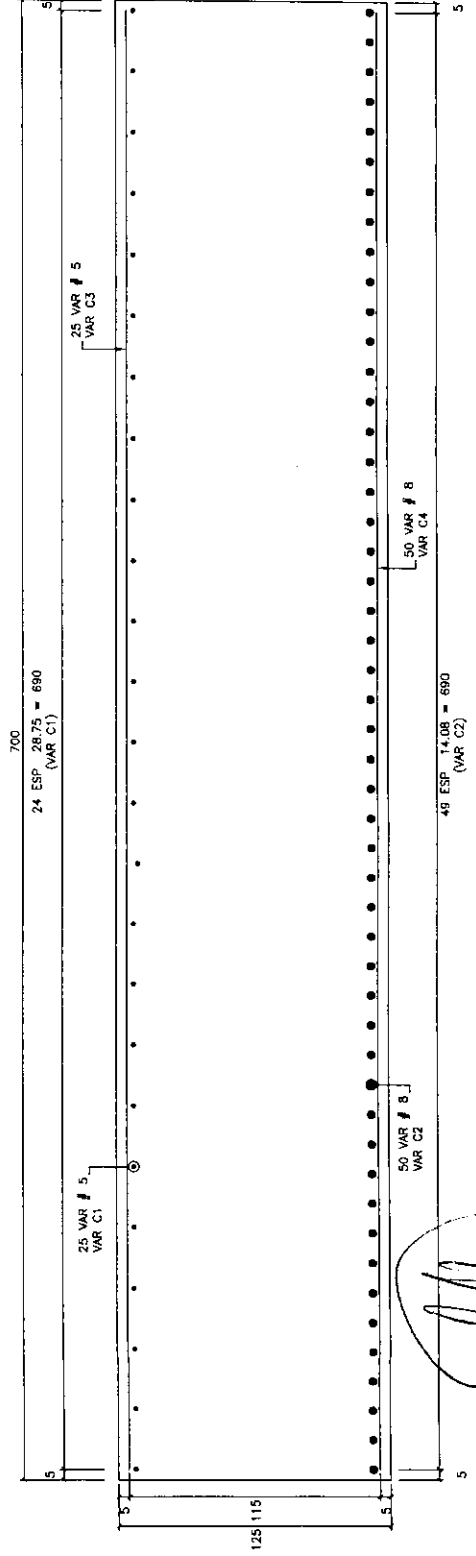
# ACERO EN ZAPATA PILA 4



ARMADO DE ZAPATA  
LECHO SUPERIOR  
12 ESCALA/SCALE: 1:50



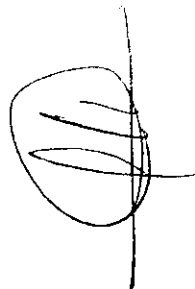
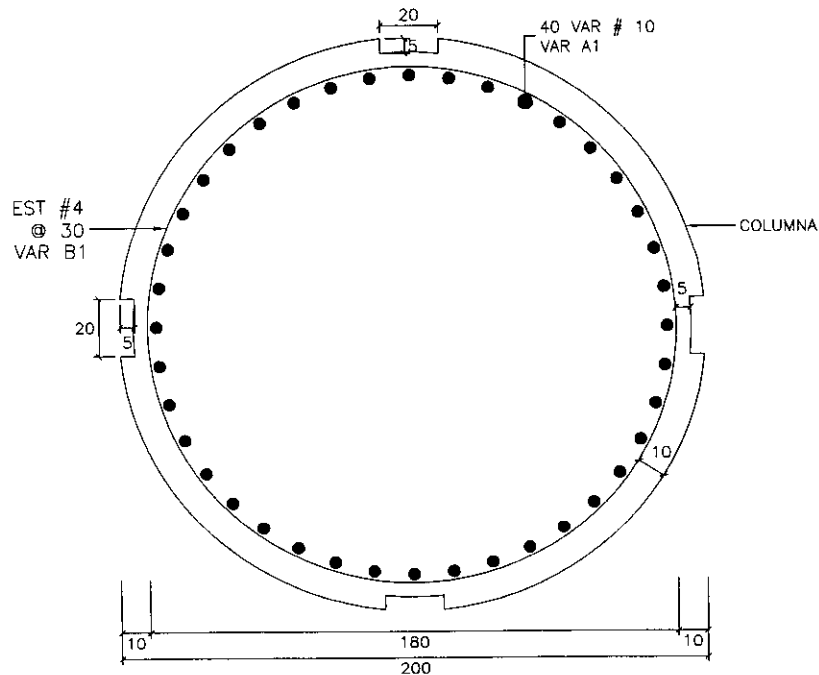
ARMADO DE ZAPATA  
LECHO INFERIOR  
13 ESCALA/SCALE: 1:50



# ACERO EN COLUMNA PILA 4

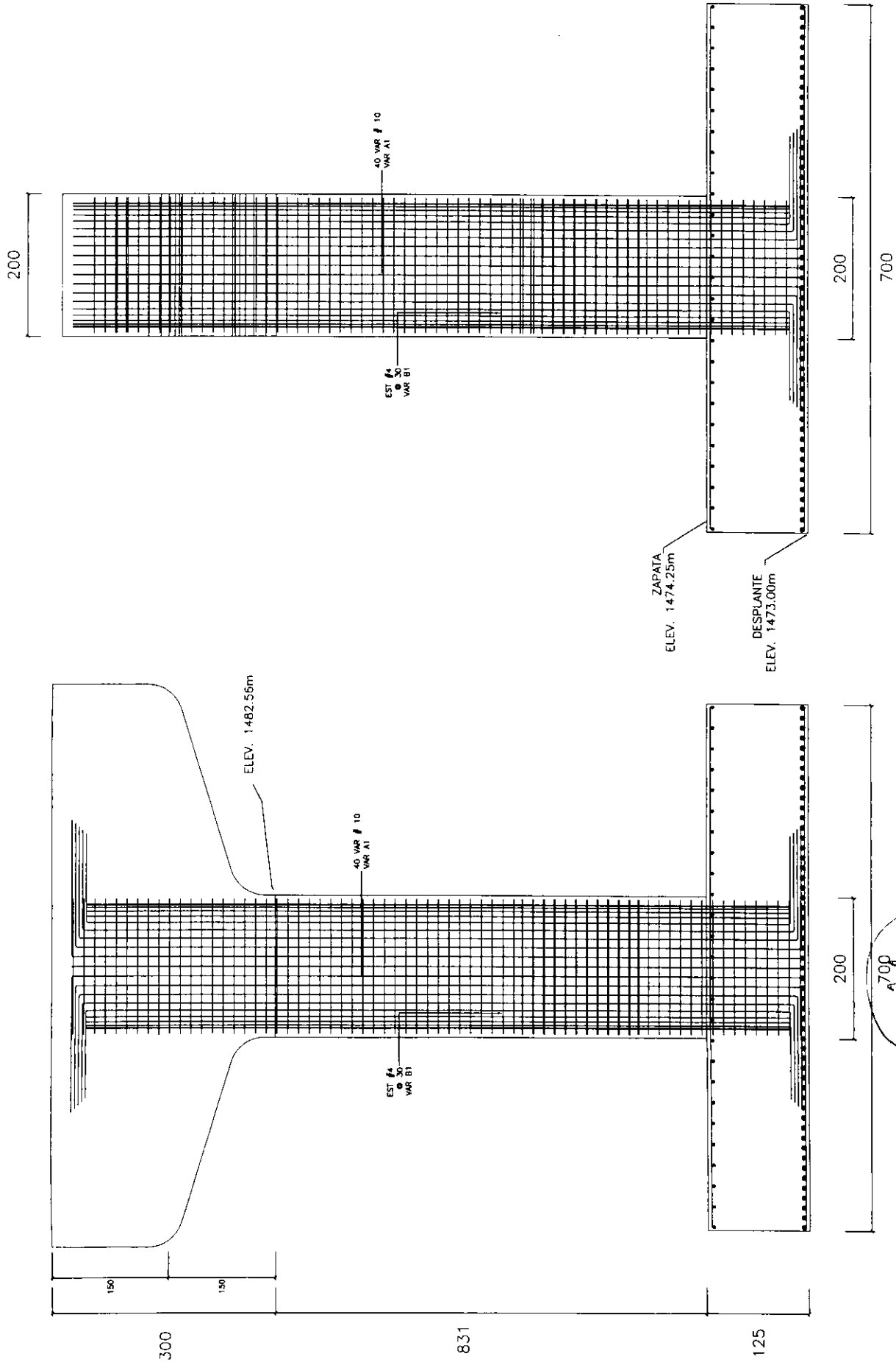
| MATERIALES DE UNA PILA                         |      |       |             |           |             |         |         |        |         |  |  |  |
|------------------------------------------------|------|-------|-------------|-----------|-------------|---------|---------|--------|---------|--|--|--|
| LISTA DE VARILLAS                              |      |       |             |           |             |         |         |        |         |  |  |  |
| LOC.                                           | VAR. | DIAM. | PESO (kg/m) | NUM. PZA. | LONG. TOTAL | CROQUIS | a (cm)  | b (cm) | PESO KG |  |  |  |
| COLUMNAS                                       | A1   | 10C   | 6.208       | 40        | 1486        |         | 1246    | 120    | 3690    |  |  |  |
|                                                | B1   | 4C    | 0.993       | 43        | 596         |         | 180     | -      | 254     |  |  |  |
| CABEZAL                                        | A2   | 10C   | 6.208       | 20        | 790         |         | 790     | -      |         |  |  |  |
|                                                | A3   | 8C    | 3.973       | 7         | 1218        |         | 190     | 150    |         |  |  |  |
|                                                | A4   | 5C    | 1.552       | 8         | 790         |         | 790     | -      |         |  |  |  |
|                                                | B2   | 5C    | 1.552       | 50        | 750         |         | 290     | 70     |         |  |  |  |
|                                                | B3   | 5C    | 1.552       | 50        | 990         |         | 290     | 190    |         |  |  |  |
| CIMENTACIÓN                                    | C1   | 5C    | 1.552       | 25        | 690         |         | 690     | -      |         |  |  |  |
|                                                | C2   | 8C    | 3.973       | 50        | 690         |         | 690     | -      |         |  |  |  |
|                                                | C3   | 5C    | 1.552       | 25        | 690         |         | 690     | -      |         |  |  |  |
|                                                | C4   | 8C    | 3.973       | 50        | 690         |         | 690     | -      |         |  |  |  |
| BANCOS                                         | H    | 4C    | 0.993       | 26        | 152         |         | 72      | 40     |         |  |  |  |
|                                                | I    | 4C    | 0.993       | 26        | 152         |         | 72      | 40     |         |  |  |  |
| SUBESTRUCTURA:                                 |      |       |             |           |             |         |         |        |         |  |  |  |
| ACERO DE REFUERZO $f_y = 4200 \text{ kg/cm}^2$ |      |       |             |           |             |         | 3944 kg |        |         |  |  |  |
| CONCRETO $f'_c = 250 \text{ kg/cm}^2$ :        |      |       |             |           |             |         |         |        |         |  |  |  |
| CABEZAL:                                       |      |       |             |           |             |         |         |        |         |  |  |  |
| COLUMNA:                                       |      |       |             |           |             |         |         |        |         |  |  |  |
| ZAPATAS:                                       |      |       |             |           |             |         |         |        |         |  |  |  |
| PLANTILLA $f'_c = 150 \text{ kg/cm}^2$         |      |       |             |           |             |         |         |        |         |  |  |  |
| EXCAVACION APROX.:                             |      |       |             |           |             |         |         |        |         |  |  |  |
| RELLENO APROX.:                                |      |       |             |           |             |         |         |        |         |  |  |  |
| BANCOS:                                        |      |       |             |           |             |         |         |        |         |  |  |  |
| ACERO DE REFUERZO $f_y = 4200 \text{ kg/cm}^2$ |      |       |             |           |             |         |         |        |         |  |  |  |
| CONCRETO $f'_c = 250 \text{ kg/cm}^2$          |      |       |             |           |             |         |         |        |         |  |  |  |

VOL. = 3,944 m<sup>3</sup>



19

# ACERO EN COLUMNA PILA 4



700

20

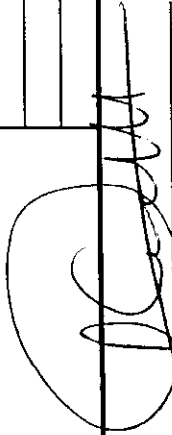
# GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                       |                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| CONTRATO : 040/2016                                                                                                                                                                                                   | TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua. |                                                         |
| OBRA :                                                                                                                                                                                                                | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV        |

|                         |                                 |
|-------------------------|---------------------------------|
| No DE ESTIMACION: No. 6 | PERIODO: 01 AL 15 DE JULIO 2016 |
|-------------------------|---------------------------------|

| CONCEPTO                                                                                                                | 36 | OPERACIONES ARITMETICAS |
|-------------------------------------------------------------------------------------------------------------------------|----|-------------------------|
| Fabricación de elementos estructurales de acero A709 grado 50, conforme a Proyecto y medido en planos y pesos teóricos. |    |                         |
|                                                                                                                         |    |                         |
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|                                                                                                                         |    |                         |
| VOL. = 83,889.73 KG                                                                                                     |    |                         |

|                  |                 |
|------------------|-----------------|
| CROQUIS          | VOLUMEN A PAGAR |
| SE ANEXA CROQUIS | 83,889.73 KG    |

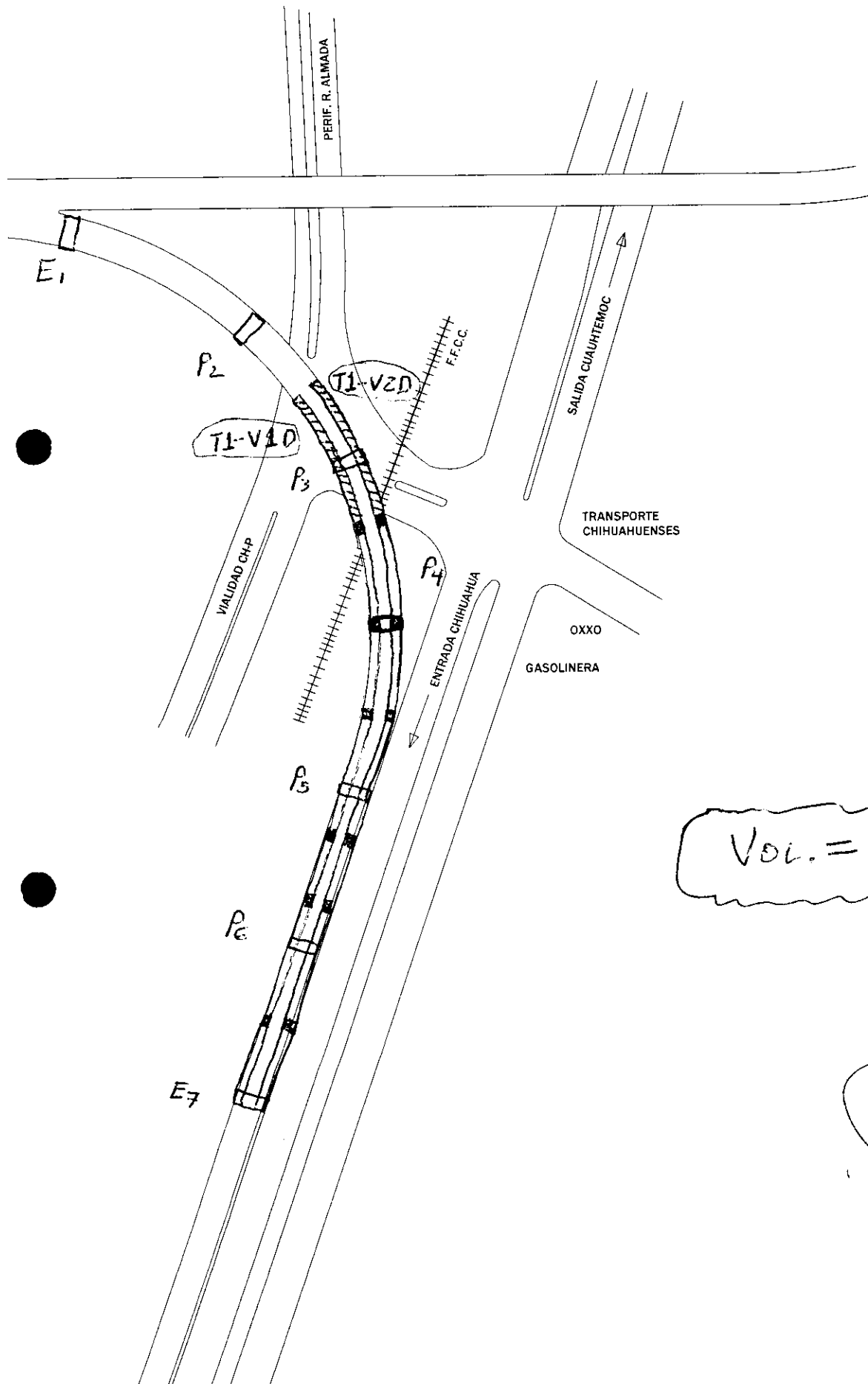
  
 RESIDENTE

ING. RODOLFO ARMENDARIZ RONQUILLO

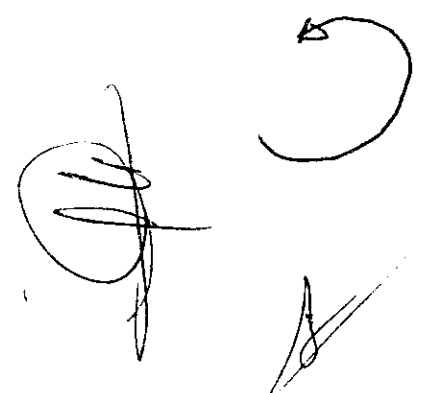
CONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

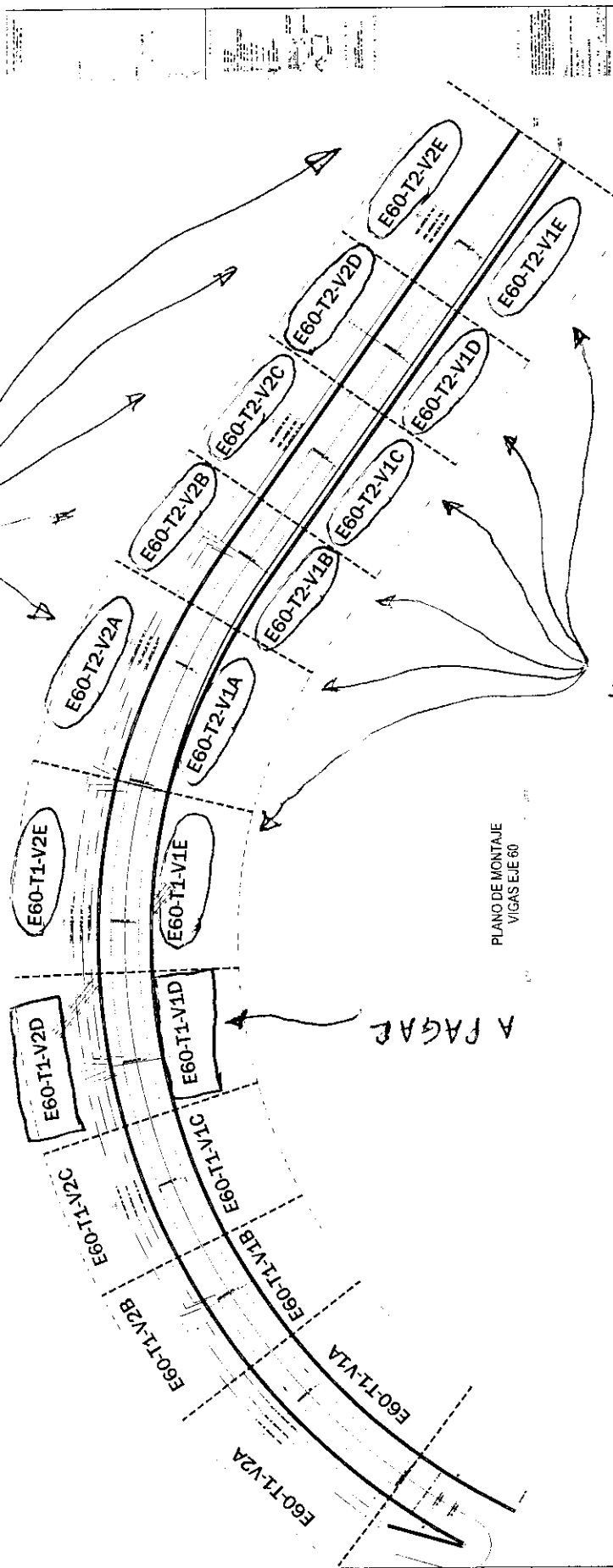
# 36 - FABRICACION DE ELEMENTOS ESTRUCTURALES DE ACERO A709



VOL. = 83,889.73 KG



# 36 - FABRICACION DE ELEMENTOS ESTRUCTURALES CON ACERO A-709



A PAGAR

A PAGAR

PAGADAS

PAGADAS

# RESUMEN DE GENERADORES

Construcción de Distribuidor Vial Zooloconia Chihuahua, Chih. Eje 60

TRAMO 1

Contratista:

Fecha:

Tramo:

Obra:

| DESCRIPCIÓN                  | PESO         |
|------------------------------|--------------|
| E60-T1-V1A                   | 38126.075    |
| CH-01                        | 1688.352     |
| TORNILLERIA CONEX. CAMPO 1-2 | 750.809      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 78.380       |
| VIGA E60-T1-V2A              | 42750.184    |
| CH-01                        | 1688.352     |
| TORNILLERIA CONEX. CAMPO 1-2 | 750.809      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 80.280       |
| VIGA E60-T1-V1B              | 28296.922    |
| CH-01                        | 964.773      |
| TORNILLERIA CONEX. CAMPO 2-3 | 536.292      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 79.180       |
| VIGA E60-T1-V28              | 31358.295    |
| CH-01                        | 964.773      |
| TORNILLERIA CONEX. CAMPO 2-3 | 495.793      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 81.080       |
| VIGA E60-T1-V1C              | 28930.740    |
| CH-01                        | 1205.966     |
| TORNILLERIA CONEX. CAMPO 3-4 | 643.551      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 31082.10 Kg  |
| VIGA E60-T1-V2C              | 29760.842    |
| CH-01                        | 1205.984     |
| TORNILLERIA CONEX. CAMPO 3-4 | 643.551      |
| TORNILLERIA DIAFRAGMA        | 316.400      |
| PERNOS NELSON                | 41944.585    |
| CH-01                        | 1205.984     |
| TORNILLERIA CONEX. CAMPO 4-5 | 536.292      |
| TORNILLERIA DIAFRAGMA        | 311.600      |
| PERNOS NELSON                | 80.780       |
| VIGA E60-T1-V1D              | 35867.271    |
| CH-01                        | 1205.984     |
| TORNILLERIA CONEX. CAMPO 4-5 | 536.292      |
| TORNILLERIA DIAFRAGMA        | 301.840      |
| PERNOS NELSON                | 81.080       |
| VIGA E60-T1-V1E              | 45372.949    |
| CH-01                        | 1447.159     |
| TORNILLERIA DIAFRAGMA        | 750.809      |
| PERNOS NELSON                | 79.180       |
| VIGA E60-T1-V2E              | 47029.579    |
| CH-01                        | 1447.159     |
| TORNILLERIA DIAFRAGMA        | 750.809      |
| PERNOS NELSON                | 79.180       |
| DIAFRAGMA 1                  | 1420.163     |
| DIAFRAGMA 2                  | 1432.430     |
| DIAFRAGMA 3                  | 1438.207     |
| DIAFRAGMA 4B                 | 1432.583     |
| CUNA 1                       | 373.935      |
| CUNA 2                       | 374.355      |
| CUNA 3                       | 379.808      |
| CUNA PILA 4B                 | 397.126      |
| Peso Total =                 | 399183.72 Kg |

379.808 Kg

1,438.207

82,077

= 83,889.73

Contratista: CONSTRUCTORA SANTA ROSALIA SA DE CV  
Fecha:

**Fechta:**

**Tiamo:**

Construcción de Distribuidor Vial Zootechnia Chihuahua, Chih. Eje 60

| Cantidad | Descripción     | Mca.   | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m <sup>2</sup> ) | Calculo (unif) (Kg) | Calculo (unif) (Kg) | Calculo (unif) (Kg) |
|----------|-----------------|--------|-----------|-----------|-------------|---------------------------|---------------------|---------------------|---------------------|
| 1        | VIGA E60-11-V1D | 1 Pzas |           |           |             |                           |                     |                     |                     |
| 1        | PL 32x1520      | 83     | 25.922    | 1.520     | 249.60      |                           | 9.834.599           |                     |                     |
| 1        | PL 22x1819      | 53     | 25.628    | 1.819     | 174.40      |                           | 8.130.063           |                     |                     |
| 1        | PL 22x1819      | 50     | 25.994    | 1.819     | 174.30      |                           | 8.241.442           |                     |                     |
| 1        | PL 25.4x500     | 66     | 25.537    | 0.500     | 199.40      |                           | 2.546.039           |                     |                     |
| 1        | PL 25.4x500     | 47     | 26.037    | 0.500     | 199.40      |                           | 2.595.889           |                     |                     |
| 10       | PL 16x350       | 13     | 1.700     | 0.350     | 124.80      |                           | 742.560             |                     |                     |
| 4        | PL 16x175       | 14     | 0.800     | 0.175     | 124.80      |                           | 17.472              |                     |                     |
| 4        | PL 16x650       | 15     | 1.525     | 0.650     | 124.80      |                           | 123.708             |                     |                     |
| 2        | PL 16x400       | 17     | 0.800     | 0.400     | 124.80      |                           | 39.936              |                     |                     |
| 2        | PL 16x175       | 18     | 0.800     | 0.175     | 124.80      |                           | 17.472              |                     |                     |
| 2        | PL 16x650       | 20     | 1.300     | 0.650     | 124.80      |                           | 105.456             |                     |                     |
| 4        | PL 25.4x160     | 21     | 1.792     | 0.160     | 199.40      |                           | 57.172              |                     |                     |
| 1        | PL 6x312.5      | 25     | 1.300     | 0.313     | 50.24       |                           | 20.410              |                     |                     |
| 1        | PL 12.7x340     | 26     | 0.460     | 0.340     | 99.70       |                           | 15.593              |                     |                     |
| 1        | PL 19.1x340     | 27     | 1.730     | 0.340     | 149.90      |                           | 88.171              |                     |                     |
| 2        | PL 16x350       | 29     | 0.850     | 0.350     | 124.80      |                           | 37.128              |                     |                     |
| 1        | PL 16x400       | 30     | 0.800     | 0.400     | 124.80      |                           | 39.936              |                     |                     |
| 1        | PL 19.1x1793    | 37     | 2.222     | 1.793     | 149.90      |                           | 597.208             |                     |                     |
| 1        | WT8x38.5        | B44    | 3.001     | 57.300    | 171.957     |                           | 171.957             |                     |                     |
| 1        | WT8x38.5        | B50    | 2.975     | 57.300    | 170.468     |                           | 170.468             |                     |                     |
| 1        | WT8x38.5        | B51    | 2.972     | 57.300    | 170.296     |                           | 170.296             |                     |                     |
| 1        | WT8x38.5        | B58    | 2.952     | 57.300    | 169.150     |                           | 169.150             |                     |                     |
| 1        | WT8x38.5        | B60    | 2.938     | 57.300    | 168.347     |                           | 168.347             |                     |                     |
| 1        | WT8x38.5        | B61    | 2.936     | 57.300    | 168.233     |                           | 168.233             |                     |                     |
| 1        | WT8x38.5        | B66    | 2.821     | 57.300    | 161.643     |                           | 161.643             |                     |                     |
| 1        | WT8x38.5        | B87    | 2.811     | 57.300    | 161.070     |                           | 161.070             |                     |                     |
| 1        | WT8x38.5        | B29    | 2.806     | 57.300    | 160.784     |                           | 160.784             |                     |                     |
| 1        | WT8x38.5        | B93    | 2.800     | 57.300    | 160.440     |                           | 160.440             |                     |                     |
| 1        | WT8x38.5        | B33    | 2.785     | 57.300    | 159.581     |                           | 159.581             |                     |                     |

|        |              |     |       |       |       |       |  |  |  |
|--------|--------------|-----|-------|-------|-------|-------|--|--|--|
| CH-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 5      | L5X5X3/8     | b11 | 2.026 |       | 18.30 |       |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CH-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       | 35.12 |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.180 |       | 99.70 |  |  |  |
| 10     | L5X5X5/8     | b18 | 1.386 |       | 29.76 |       |  |  |  |
| 5      | L5X5X3/4     | b12 | 2.026 |       |       |       |  |  |  |
| 5      | PL 12.7x387  | 12  | 0.450 | 0.387 |       | 99.70 |  |  |  |
| 10     | PL 12.7x97.1 | 10  | 0.177 | 0.097 |       | 99.70 |  |  |  |
| 5 Pzds |              |     |       |       |       |       |  |  |  |
| CT-01  |              |     |       |       |       |       |  |  |  |
| 10     | PL 12.7x180  | 11  | 1.860 | 0.18  |       |       |  |  |  |

[illegible]

| TORNILLERIA DIAFRAGMA |                      |                |  |  |  |             | Peso TORN = | 81.080 |
|-----------------------|----------------------|----------------|--|--|--|-------------|-------------|--------|
| 40                    | TORNILLO 1" x 2-3/4" | PATIN SUPERIOR |  |  |  | 0.57 Kg/pzo |             | 22.800 |
| 24                    | TORNILLO 1" x 3"     | PATIN SUPERIOR |  |  |  | 0.62 Kg/pzo |             | 14.880 |
| 16                    | TORNILLO 1" x 3 1/2" | PATIN INFERIOR |  |  |  | 0.67 Kg/pzo |             | 10.720 |
| 16                    | TORNILLO 1" x 2 3/4" | PATIN INFERIOR |  |  |  | 0.57 Kg/pzo |             | 9.120  |
| 38                    | TORNILLO 1" x 3"     | PATIN INFERIOR |  |  |  | 0.62 Kg/pzo |             | 23.560 |

[illegible]

|             |        |                                  |
|-------------|--------|----------------------------------|
| 37992.47 kg | 1 Pzas | Cantidad de Vigas y Peso Total = |
|-------------|--------|----------------------------------|

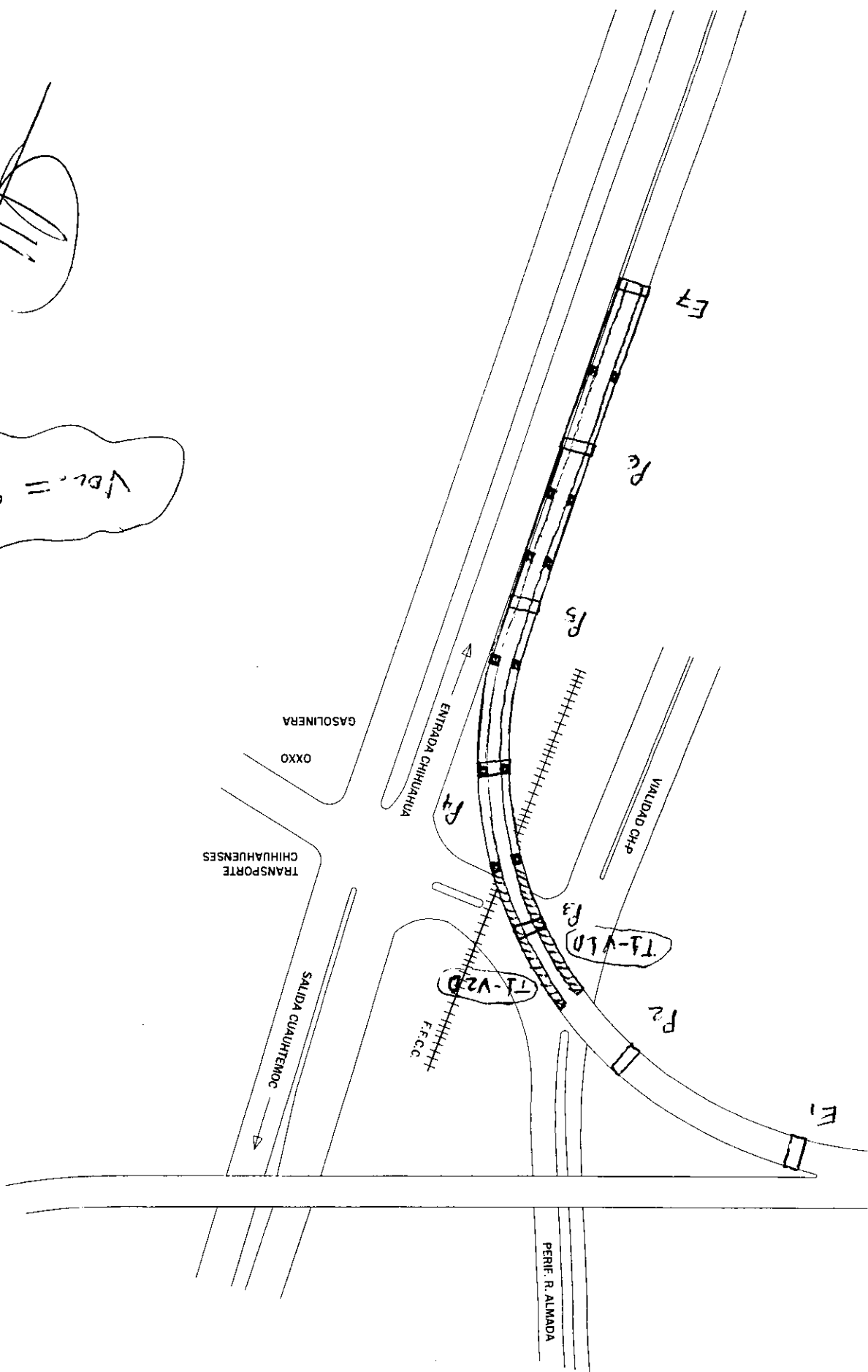
1 PZas

37992.47 kg

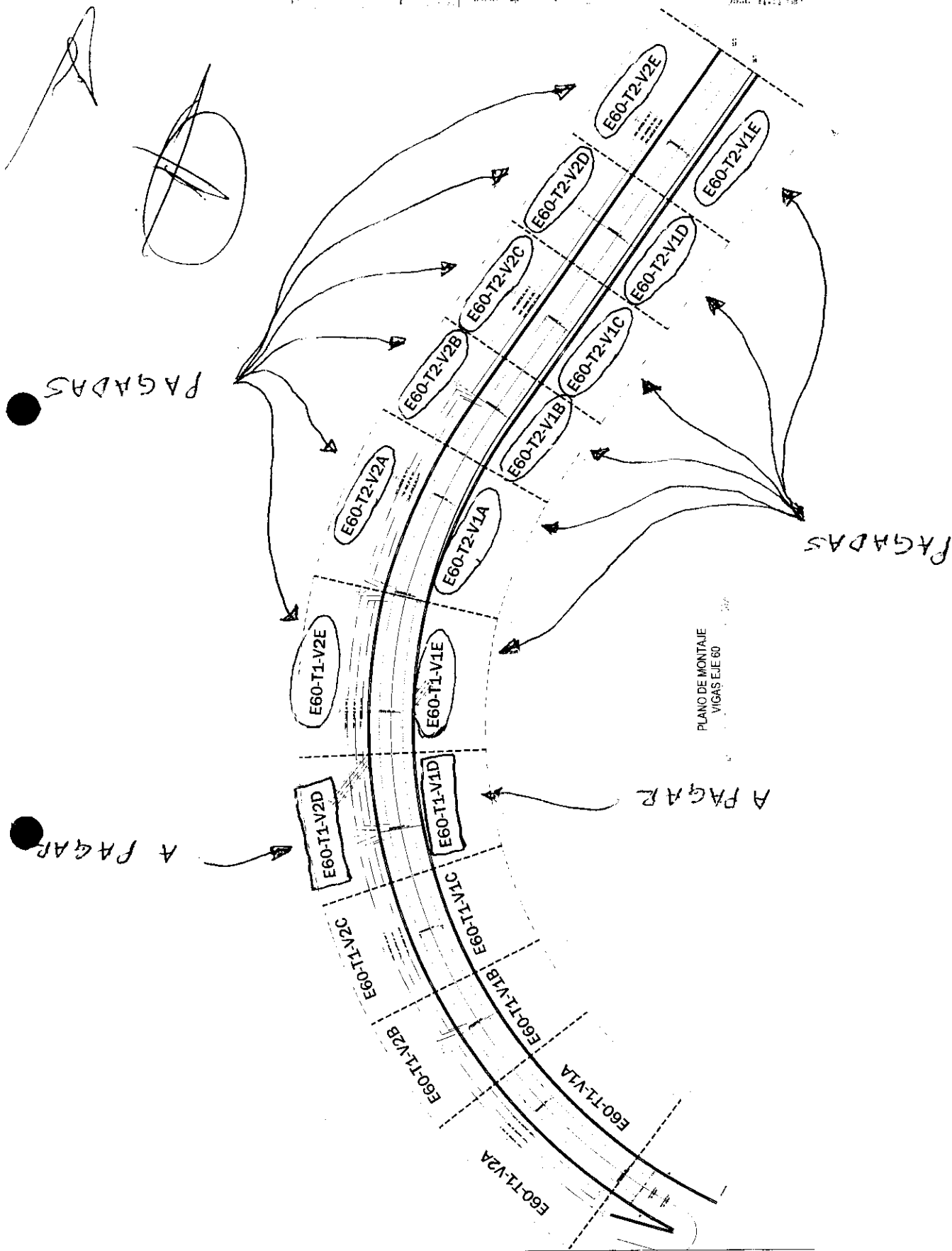
44079.24 kg



# 38 - FABRICACION DE ELEMENTOS A COBERTANTE



$V_{OL} = 835.82 \text{ Kg}$



GENERADOR DE ESTIMACION

Obra: Construcción de Distribuidor Vial Zootecnia Chihuahua, Chih. Eje 60

Tramo:

Contratista: CONSTRUCTORA SANTA ROSALIA SA DE CV

TRAMO 1

Fecha:

| Cantidad    | Descripción             | Marca | Superior | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m2) | Calculo (unif) | Calculo (kg) |
|-------------|-------------------------|-------|----------|-----------|-----------|-------------|--------------|----------------|--------------|
| E60-T1-V1A  |                         |       |          |           |           |             |              |                |              |
| 328         | PERNO NELSON 7/8" x 10" | 57    | 32.703   |           |           |             | 0.79 kg/pzo  |                | 259.120      |
| 322         | PERNO NELSON 7/8" x 10" | 56    | 32.092   |           |           |             | 0.79 kg/pzo  |                | 254.380      |
| E60-T1-V2A  |                         |       |          |           |           |             |              |                |              |
| 342         | PERNO NELSON 7/8" x 10" | 63    | 34.049   |           |           |             | 0.79 kg/pzo  |                | 270.180      |
| 336         | PERNO NELSON 7/8" x 10" | 58    | 33.438   |           |           |             | 0.79 kg/pzo  |                | 265.440      |
| E60-T1-V1B  |                         |       |          |           |           |             |              |                |              |
| 222         | PERNO NELSON 7/8" x 10" | 102   | 22.183   |           |           |             | 0.79 kg/pzo  |                | 175.380      |
| 218         | PERNO NELSON 7/8" x 10" | 101   | 21.738   |           |           |             | 0.79 kg/pzo  |                | 172.220      |
| E60-T1-V2B  |                         |       |          |           |           |             |              |                |              |
| 232         | PERNO NELSON 7/8" x 10" | 112   | 23.152   |           |           |             | 0.79 kg/pzo  |                | 183.280      |
| 228         | PERNO NELSON 7/8" x 10" | 111   | 22.656   |           |           |             | 0.79 kg/pzo  |                | 180.120      |
| E60-T1-V1C  |                         |       |          |           |           |             |              |                |              |
| 246         | PERNO NELSON 7/8" x 10" | 76    | 24.447   |           |           |             | 0.79 kg/pzo  |                | 194.340      |
| 240         | PERNO NELSON 7/8" x 10" | 75    | 23.976   |           |           |             | 0.79 kg/pzo  |                | 189.600      |
| E60-T1-V2C  |                         |       |          |           |           |             |              |                |              |
| 256         | PERNO NELSON 7/8" x 10" | 74    | 25.498   |           |           |             | 0.79 kg/pzo  |                | 202.240      |
| 252         | PERNO NELSON 7/8" x 10" | 73    | 25.027   |           |           |             | 0.79 kg/pzo  |                | 199.080      |
| E60-T1-V1D  |                         |       |          |           |           |             |              |                |              |
| 256         | PERNO NELSON 7/8" x 10" | 72    | 25.537   |           |           |             | 0.79 kg/pzo  |                | 202.240      |
| 262         | PERNO NELSON 7/8" x 10" | 71    | 26.037   |           |           |             | 0.79 kg/pzo  |                | 206.980      |
| E60-T1-V2D  |                         |       |          |           |           |             |              |                |              |
| 272         | PERNO NELSON 7/8" x 10" | 70    | 27.138   |           |           |             | 0.79 kg/pzo  |                | 214.880      |
| 268         | PERNO NELSON 7/8" x 10" | 69    | 26.638   |           |           |             | 0.79 kg/pzo  |                | 211.720      |
| E60-T1-V1E  |                         |       |          |           |           |             |              |                |              |
| 334         | PERNO NELSON 7/8" x 10" | 68    | 33.253   |           |           |             | 0.79 kg/pzo  |                | 263.860      |
| 328         | PERNO NELSON 7/8" x 10" | 65    | 32.648   |           |           |             | 0.79 kg/pzo  |                | 259.120      |
| E60-T1-V2E  |                         |       |          |           |           |             |              |                |              |
| 346         | PERNO NELSON 7/8" x 10" | 67    | 34.592   |           |           |             | 0.79 kg/pzo  |                | 273.340      |
| 340         | PERNO NELSON 7/8" x 10" | 66    | 33.987   |           |           |             | 0.79 kg/pzo  |                | 268.600      |
| E60-T1-V1F  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2F  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1G  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2G  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1H  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2H  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1I  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2I  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1J  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2J  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1K  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2K  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1L  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2L  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1M  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2M  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1N  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2N  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1O  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2O  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1P  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2P  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1Q  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2Q  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1R  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2R  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1S  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2S  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1T  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2T  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1U  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2U  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1V  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2V  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1W  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2W  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1X  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2X  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1Y  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2Y  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1Z  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2Z  |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1AZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2AZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1BZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2BZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1CZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2CZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1DZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2DZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1ED |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2ED |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1ER |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2ER |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1ES |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2ES |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1ET |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2ET |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1EZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2EZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1FZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2FZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1GZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2GZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HD |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HI |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HQ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HR |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HS |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HT |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HU |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HV |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HW |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HX |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HY |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1HZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2HZ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IA |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IB |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IC |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1ID |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2ID |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IE |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IF |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IG |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IH |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1II |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2II |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IJ |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IK |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IL |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IM |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IN |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IO |                         |       |          |           |           |             |              |                |              |
| E60-T1-V1IP |                         |       |          |           |           |             |              |                |              |
| E60-T1-V2IP |                         |       |          |           |           |             |              |                |              |

# GENERADOR DE ESTIMACION

[illegible]

**RESIDENTE**

ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

CONTRATO : 040/2016

**TRAMO:** Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Amador y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| No DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

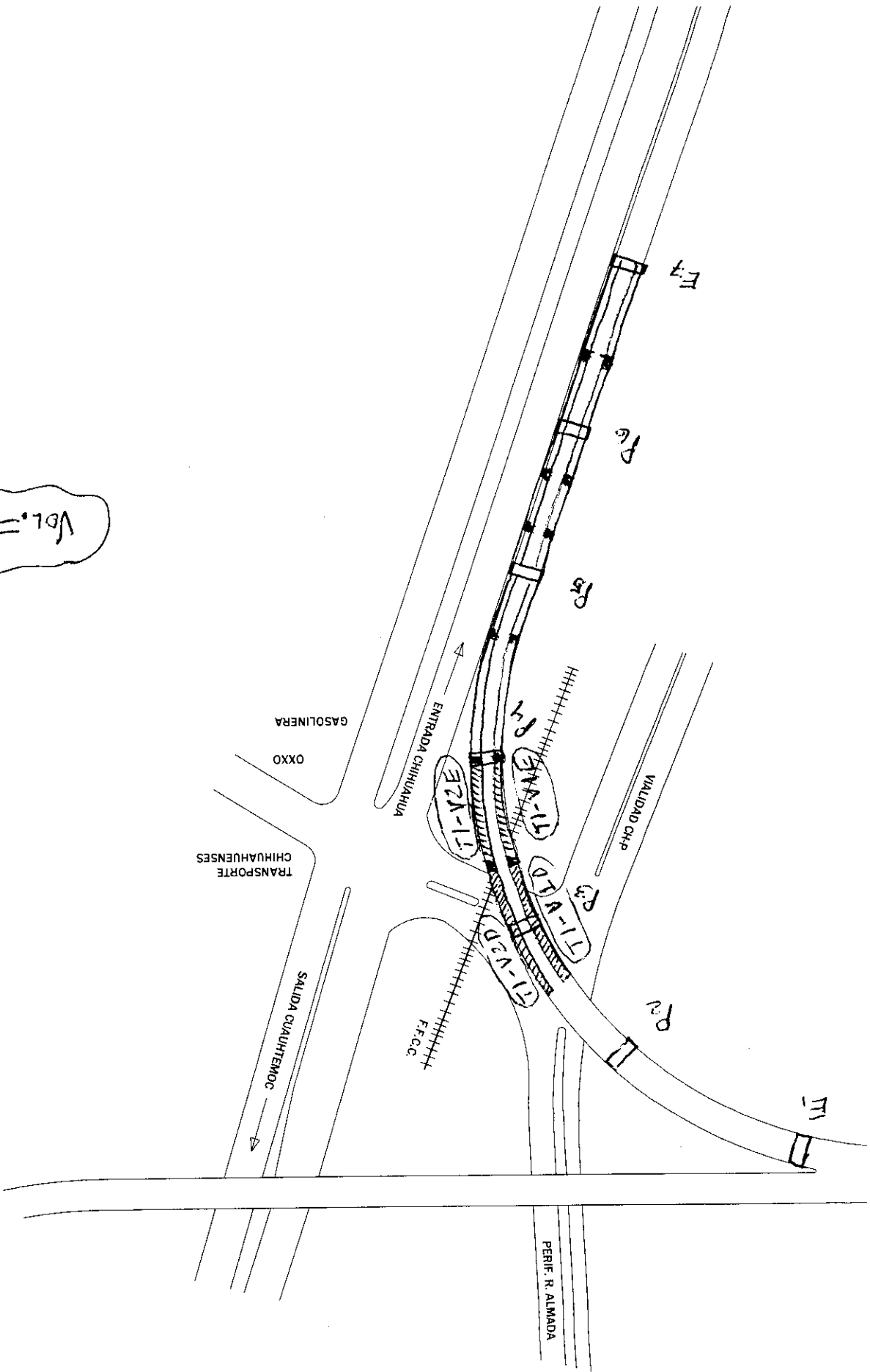
~~RESIDENTE~~

ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA

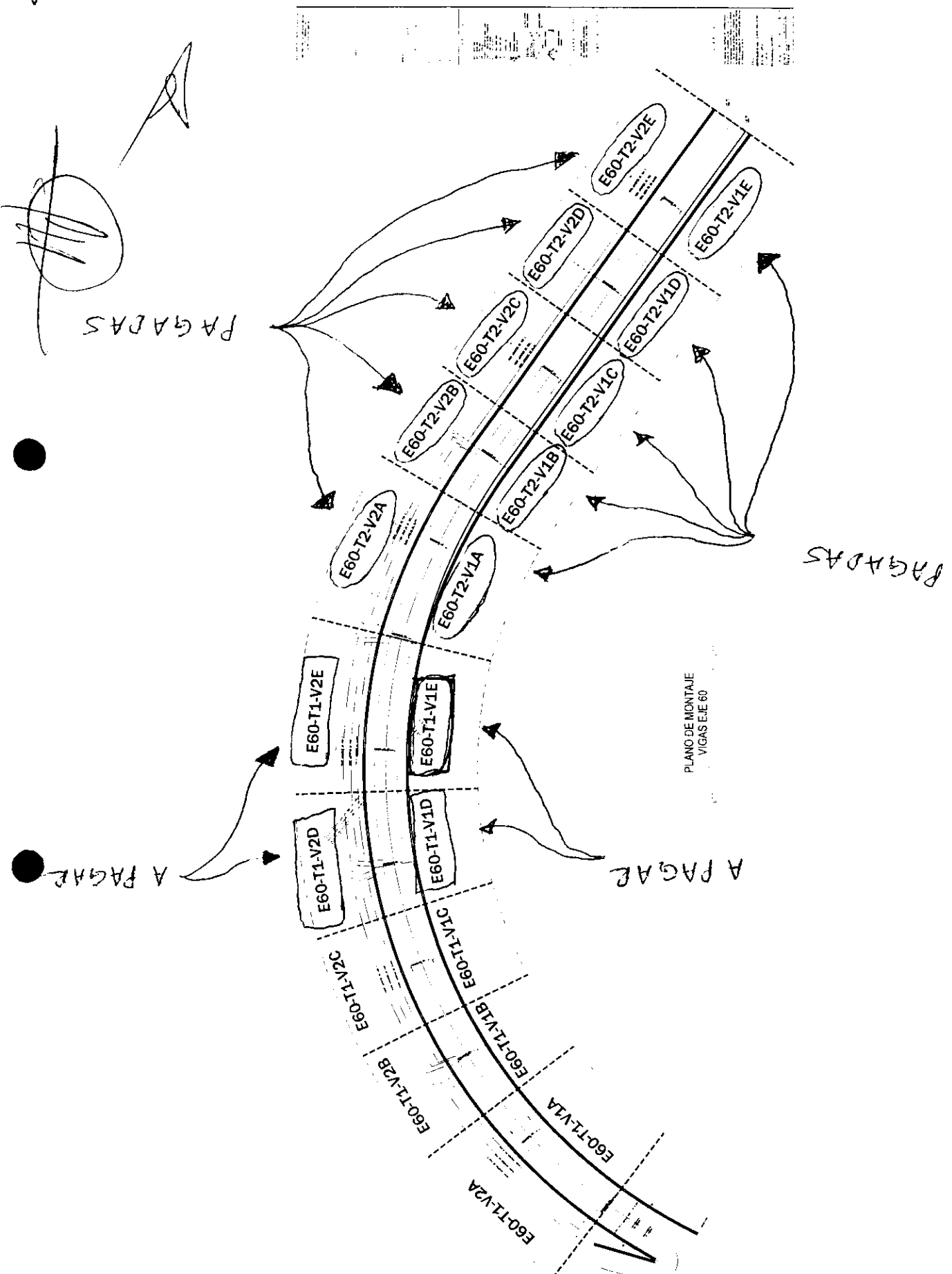
CONSTRUCTORA SANTA ROSALIA SA DE CV

# 43 - APLICACION DE PINTURA PARA ACABADO FINAL VIGAS



$V_{01} = 182,676.26 \text{ kg}$

# 43 - APLICACION DE PINTURA PARA ACABADO FINAL EN VIGAS



Fecha:

Contratista:

Tramo:

Obra:

RESUMEN DE GENERADORES

| DESCRIPCIÓN                                                                                                 | PESO                                                                                     |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| E60-T1-V1A<br>CH-01<br>CT-01<br>TORNILLERIA CONEX. CAMPO 1-2<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON      | 38126.075<br>1688.352<br>750.809<br>301.840<br>78.380                                    |
| VIGA E60-T1-V2A<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 1-2<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 42750.184<br>1688.352<br>750.809<br>301.840<br>80.280                                    |
| VIGA E60-T1-V1B<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 2-3<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 28296.922<br>964.773<br>536.292<br>301.840<br>79.180                                     |
| VIGA E60-T1-V2B<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 2-3<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 31358.295<br>964.773<br>495.793<br>301.840<br>81.080                                     |
| VIGA E60-T1-V1C<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 3-4<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 28930.740<br>1205.966<br>643.551<br>301.840                                              |
| VIGA E60-T1-V2C<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 3-4<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 29760.842<br>1205.984<br>643.551<br>316.400                                              |
| VIGA E60-T1-V2D<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 4-5<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 41944.585<br>1205.984<br>536.292<br>311.600<br>80.780                                    |
| VIGA E60-T1-V1D<br>CT-01<br>CH-01<br>TORNILLERIA CONEX. CAMPO 4-5<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON | 35867.271<br>1205.984<br>536.292<br>301.840<br>81.080                                    |
| VIGA E60-T1-V1E<br>CT-01<br>CH-01<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON                                 | 45372.949<br>1447.159<br>750.809<br>47650.10 Kg                                          |
| VIGA E60-T1-V2E<br>CT-01<br>CH-01<br>TORNILLERIA DIAFRAGMA<br>PERNOS NELSON                                 | 47029.579<br>1447.159<br>750.809<br>49306.73 Kg                                          |
| DIAFRAGMA 1<br>DIAFRAGMA 2<br>DIAFRAGMA 3<br>DIAFRAGMA 4B<br>CUÑA 1<br>CUÑA 2<br>CUÑA 3<br>CUÑA PILA 4B     | 1420.163<br>1432.430<br>1438.207<br>1432.583<br>373.935<br>374.355<br>379.808<br>397.126 |
|                                                                                                             | 1525.22 Kg                                                                               |

Peso Total = 399183.72 Kg

$\Sigma = 182,676.26 \text{ Kg}$

776.93 Kg

2,870.79 Kg

49,306.73 Kg

47,650.10 Kg

37,992.47 Kg

44,079.24 Kg

|     |                         |    |        |  |             |               |
|-----|-------------------------|----|--------|--|-------------|---------------|
| 268 | PERNO NELSON 7/8" x 10" | 69 | 26.638 |  | 0.79 kg/pza | Peso PERNOS = |
| 272 | PERNO NELSON 7/8" x 10" | 70 | 27.138 |  | 0.79 kg/pza |               |

Cantidad de Vigas y Peso Total = 1 Pzas 44079.24 Kg

# GENERADOR DE ESTIMACION

Obra: Construcción de Distribuidor Vial Zooloceria Chihuahua, Chih. Eje 60

Tramo:

Contratista: CONSTRUCTORA SANTA ROSALIA SA DE CV

Fecha:

| Cantidad | Descripción | Mca. | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m2) | Calculo (unit) (kg) | Calculo (kgum) (kg) |
|----------|-------------|------|-----------|-----------|-------------|--------------|---------------------|---------------------|
|----------|-------------|------|-----------|-----------|-------------|--------------|---------------------|---------------------|

|    |              |     |        |       |  |        |           |           |
|----|--------------|-----|--------|-------|--|--------|-----------|-----------|
| 1  | PL 32x1520   | 83  | 25.922 | 1.520 |  | 249.60 | 9.834.599 | 9.834.599 |
| 1  | PL 22x1819   | 53  | 25.628 | 1.819 |  | 174.40 | 8.130.063 | 8.130.063 |
| 1  | PL 22x1819   | 50  | 25.994 | 1.819 |  | 174.30 | 8.241.442 | 8.241.442 |
| 1  | PL 25.4x500  | 66  | 25.537 | 0.500 |  | 199.40 | 2.546.039 | 2.546.039 |
| 1  | PL 25.4x500  | 47  | 26.037 | 0.500 |  | 199.40 | 2.595.889 | 2.595.889 |
| 10 | PL 16x350    | 13  | 1.700  | 0.350 |  | 124.80 | 742.560   | 742.560   |
| 4  | PL 16x175    | 14  | 0.800  | 0.175 |  | 124.80 | 69.888    | 69.888    |
| 4  | PL 16x650    | 15  | 1.525  | 0.650 |  | 124.80 | 494.832   | 494.832   |
| 2  | PL 16x400    | 17  | 0.800  | 0.400 |  | 124.80 | 79.872    | 79.872    |
| 2  | PL 16x175    | 18  | 0.800  | 0.175 |  | 124.80 | 34.944    | 34.944    |
| 2  | PL 16x650    | 20  | 1.300  | 0.650 |  | 124.80 | 105.456   | 105.456   |
| 4  | PL 25.4x160  | 21  | 1.792  | 0.160 |  | 199.40 | 228.688   | 228.688   |
| 1  | PL 6x312.5   | 25  | 1.300  | 0.313 |  | 50.24  | 20.410    | 20.410    |
| 1  | PL 12.7x340  | 26  | 0.460  | 0.340 |  | 99.70  | 15.593    | 15.593    |
| 1  | PL 19.1x340  | 27  | 1.730  | 0.340 |  | 149.90 | 88.171    | 88.171    |
| 2  | PL 16x350    | 29  | 0.850  | 0.350 |  | 124.80 | 74.256    | 74.256    |
| 1  | PL 16x400    | 30  | 0.800  | 0.400 |  | 124.80 | 39.936    | 39.936    |
| 1  | PL 19.1x1793 | 37  | 2.222  | 1.793 |  | 149.90 | 597.208   | 597.208   |
| 1  | WTBx38.5     | b44 | 3.001  |       |  | 57.300 | 171.957   | 171.957   |
| 1  | WTBx38.5     | b50 | 2.975  |       |  | 57.300 | 170.468   | 170.468   |
| 1  | WTBx38.5     | b51 | 2.972  |       |  | 57.300 | 170.296   | 170.296   |
| 1  | WTBx38.5     | b58 | 2.952  |       |  | 57.300 | 169.150   | 169.150   |
| 1  | WTBx38.5     | b60 | 2.938  |       |  | 57.300 | 168.347   | 168.347   |
| 1  | WTBx38.5     | b61 | 2.936  |       |  | 57.300 | 168.233   | 168.233   |
| 1  | WTBx38.5     | b96 | 2.821  |       |  | 57.300 | 161.643   | 161.643   |
| 1  | WTBx38.5     | b87 | 2.811  |       |  | 57.300 | 161.070   | 161.070   |
| 1  | WTBx38.5     | b29 | 2.806  |       |  | 57.300 | 160.784   | 160.784   |
| 1  | WTBx38.5     | b93 | 2.800  |       |  | 57.300 | 160.440   | 160.440   |
| 1  | WTBx38.5     | b33 | 2.785  |       |  | 57.300 | 159.581   | 159.581   |

|              |              |     |       |       |  |       |         |         |
|--------------|--------------|-----|-------|-------|--|-------|---------|---------|
| CT-01        |              |     |       |       |  |       |         |         |
| 5 Pzas       |              |     |       |       |  |       |         |         |
| 10           | PL 12.7x180  | 11  | 1.860 | 0.180 |  | 99.70 | 33.380  | 333.796 |
| 5            | L5X5X3/8     | b18 | 1.386 |       |  |       | 412.474 | 355.766 |
| 5            | L5X5X3/4     | b12 | 2.026 |       |  |       | 71.153  | 86.814  |
| 5            | PL 12.7x387  | 12  | 0.450 | 0.387 |  | 99.70 | 17.363  | 17.135  |
| 10           | PL 12.7x97.1 | 10  | 0.177 | 0.097 |  | 99.70 | 1.214   | 1.214   |
| Peso CT-01 = |              |     |       |       |  |       |         |         |
| 1.205.984    |              |     |       |       |  |       |         |         |

|              |              |     |       |       |  |       |        |         |
|--------------|--------------|-----|-------|-------|--|-------|--------|---------|
| CH-01        |              |     |       |       |  |       |        |         |
| 5 Pzas       |              |     |       |       |  |       |        |         |
| 10           | PL 12.7x180  | 11  | 1.860 | 0.180 |  | 99.70 | 33.380 | 333.796 |
| 5            | L5X5X3/8     | b11 | 2.026 |       |  |       | 37.076 | 185.379 |
| 10           | PL 12.7x97.1 | 10  | 0.177 | 0.097 |  | 99.70 | 1.212  | 1.212   |
| Peso CH-01 = |              |     |       |       |  |       |        |         |
| 536.292      |              |     |       |       |  |       |        |         |

|                              |                        |            |  |  |             |  |         |  |
|------------------------------|------------------------|------------|--|--|-------------|--|---------|--|
| TORNILLERIA CONEX. CAMPO 4-5 |                        |            |  |  |             |  |         |  |
| 80                           | TORNILLO 7/8" x 3-3/4" | PATIN SUP. |  |  | 0.57 Kg/pzo |  | 45.600  |  |
| 320                          | TORNILLO 7/8" x 3-1/2" | ALMA       |  |  | 0.55 Kg/pzo |  | 176.000 |  |
| 136                          | TORNILLO 7/8" x 4"     | PATIN INF. |  |  | 0.59 Kg/pzo |  | 80.240  |  |
| Peso TORN =                  |                        |            |  |  |             |  |         |  |
| 301.840                      |                        |            |  |  |             |  |         |  |

|                        |                      |                |  |  |             |  |        |  |
|------------------------|----------------------|----------------|--|--|-------------|--|--------|--|
| TORNILLERIA DIAPHRAGMA |                      |                |  |  |             |  |        |  |
| 40                     | TORNILLO 1" x 2-3/4" | PATIN SUPERIOR |  |  | 0.57 Kg/pzo |  | 22.800 |  |
| 24                     | TORNILLO 1" x 3"     | PATIN SUPERIOR |  |  | 0.62 Kg/pzo |  | 14.880 |  |
| 16                     | TORNILLO 1" x 3 1/2" | PATIN INFERIOR |  |  | 0.67 Kg/pzo |  | 10.720 |  |
| 16                     | TORNILLO 1" x 2 1/2" | PATIN INFERIOR |  |  | 0.57 Kg/pzo |  | 9.120  |  |
| 38                     | TORNILLO 1" x 3"     | PATIN INFERIOR |  |  | 0.62 Kg/pzo |  | 23.560 |  |
| Peso TORN =            |                      |                |  |  |             |  |        |  |
| 81.080                 |                      |                |  |  |             |  |        |  |

|               |                         |    |        |  |             |  |  |  |
|---------------|-------------------------|----|--------|--|-------------|--|--|--|
| 256           | PERNO NELSON 7/8" x 10" | 72 | 25.537 |  | 0.79 Kg/pzo |  |  |  |
| 262           | PERNO NELSON 7/8" x 10" | 71 | 26.037 |  | 0.79 Kg/pzo |  |  |  |
| Peso PERNOS = |                         |    |        |  |             |  |  |  |
|               |                         |    |        |  |             |  |  |  |

Cantidad de Vigas y Peso Total = 1 Pzas 37992.47 kg

# GENERADOR DE ESTIMACION

Obra: Construcción de Distribuidor Vial Zootecnia Chihuahua, Chih. Eje 60

Tramo:

Contratista: CONSTRUCTORA SANTA ROSALIA SA DE CV

Fecha:

| Cantidad | Descripción | Mca. | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m2) | Calculo (unif) (kg) | Calculo (accum.) (kg) |
|----------|-------------|------|-----------|-----------|-------------|--------------|---------------------|-----------------------|
|----------|-------------|------|-----------|-----------|-------------|--------------|---------------------|-----------------------|

**VIGA E60-11-V1E** 1 Pzas

|    |              |     |        |        |         |            |            |            |
|----|--------------|-----|--------|--------|---------|------------|------------|------------|
| 1  | PL 32x1520   | 85  | 33.144 | 1.520  | 249.60  | 12.574.568 | 12.574.568 | 12.574.568 |
| 1  | PL 22x1819   | 58  | 33.302 | 1.819  | 174.30  | 10.558.456 | 10.558.456 | 10.558.456 |
| 1  | PL 22x1819   | 56  | 32.854 | 1.819  | 174.30  | 10.416.417 | 10.416.417 | 10.416.417 |
| 1  | PL 25.4x500  | 71  | 33.253 | 0.500  | 199.40  | 3.315.324  | 3.315.324  | 3.315.324  |
| 1  | PL 25.4x500  | 69  | 32.648 | 0.500  | 199.40  | 3.255.006  | 3.255.006  | 3.255.006  |
| 13 | PL 16x350    | 13  | 1.700  | 0.350  | 124.80  | 74.256     | 74.256     | 965.328    |
| 4  | PL 16x175    | 14  | 0.800  | 0.175  | 124.80  | 17.472     | 17.472     | 69.888     |
| 4  | PL 16x500    | 15  | 1.525  | 0.650  | 124.80  | 123.708    | 123.708    | 494.832    |
| 2  | PL 16x400    | 17  | 0.800  | 0.400  | 124.80  | 39.936     | 39.936     | 79.872     |
| 2  | PL 16x175    | 18  | 0.800  | 0.175  | 124.80  | 17.472     | 17.472     | 34.944     |
| 2  | PL 16x500    | 20  | 1.300  | 0.650  | 124.80  | 105.456    | 105.456    | 210.912    |
| 4  | PL 25.4x160  | 21  | 1.792  | 0.160  | 199.40  | 57.172     | 57.172     | 228.688    |
| 1  | PL 19.1x1788 | 24  | 2.222  | 1.788  | 149.90  | 595.543    | 595.543    | 595.543    |
| 1  | PL 6x312.5   | 25  | 1.300  | 0.313  | 50.24   | 20.410     | 20.410     | 20.410     |
| 1  | PL 12.7x340  | 26  | 0.460  | 0.340  | 99.70   | 15.593     | 15.593     | 15.593     |
| 1  | PL 19.1x340  | 27  | 1.730  | 0.340  | 149.90  | 88.171     | 88.171     | 88.171     |
| 1  | PL 16x350    | 29  | 0.550  | 0.350  | 124.80  | 37.128     | 37.128     | 37.128     |
| 1  | PL 16x400    | 30  | 0.800  | 0.400  | 124.80  | 39.936     | 39.936     | 39.936     |
| 2  | WT8X38.5     | b20 | 2.980  | 57.300 | 170.754 | 341.508    | 341.508    | 341.508    |
| 1  | WT8X38.5     | b52 | 2.968  | 57.300 | 170.066 | 170.066    | 170.066    | 170.066    |
| 1  | WT8X38.5     | b21 | 2.967  | 57.300 | 170.009 | 170.009    | 170.009    | 170.009    |
| 1  | WT8X38.5     | b53 | 2.962  | 57.300 | 169.723 | 169.723    | 169.723    | 169.723    |
| 1  | WT8X38.5     | b54 | 2.960  | 57.300 | 169.608 | 169.608    | 169.608    | 169.608    |
| 1  | WT8X38.5     | b55 | 2.956  | 57.300 | 169.379 | 169.379    | 169.379    | 169.379    |
| 1  | WT8X38.5     | b56 | 2.955  | 57.300 | 169.322 | 169.322    | 169.322    | 169.322    |
| 1  | WT8X38.5     | b57 | 2.954  | 57.300 | 169.264 | 169.264    | 169.264    | 169.264    |
| 1  | WT8X38.5     | b59 | 2.940  | 57.300 | 168.462 | 168.462    | 168.462    | 168.462    |
| 1  | WT8X38.5     | b24 | 2.836  | 57.300 | 162.503 | 162.503    | 162.503    | 162.503    |
| 2  | WT8X38.5     | b18 | 2.985  | 57.300 | 171.041 | 342.081    | 342.081    | 342.081    |

Peso E60-11-V1E = 45,372.949

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| 12    | PL 12.7x180  | 11     | 1.860 | 0.180 | 99.70 | 33.380 | 400.555 |
| 12    | LSX5X5/8     | b18    | 1.386 | 29.76 |       | 41.247 | 494.968 |
| 6     | LSX5X3/4     | b12    | 2.026 | 35.12 |       | 71.153 | 426.919 |
| 6     | PL 12.7x387  | 12     | 0.450 | 0.387 | 99.70 | 17.363 | 104.177 |
| 12    | PL 12.7x97.1 | 10     | 0.177 | 0.097 | 99.70 | 1.712  | 20.541  |
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Peso CT-01 = 1,447.159

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| CH-01 |  |  |  |  |  |  | 7 Pzas |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Peso CH-01 = 750.809

|    |                      |                |             |        |
|----|----------------------|----------------|-------------|--------|
| 40 | TORNILLO 1" x 2-3/4" | PATIN SUPERIOR | 0.57 kg/pzo | 22.800 |
| 24 | TORNILLO 1" x 3"     | PATIN SUPERIOR | 0.62 kg/pzo | 14.880 |
| 16 | TORNILLO 1" x 3 1/4" | PATIN INFERIOR | 0.67 kg/pzo | 10.720 |
| 16 | TORNILLO 1" x 2 1/2" | PATIN INFERIOR | 0.57 kg/pzo | 9.120  |
| 38 | TORNILLO 1" x 2 1/2" | PATIN INFERIOR | 0.57 kg/pzo | 21.660 |

Peso TORN = 79.180

Cantidad de Vigas y Peso Total = 1 Pzas 47650.10 kg

|     |                         |             |        |
|-----|-------------------------|-------------|--------|
| 334 | PERNO NELSON 7/8" x 10" | 0.79 kg/pzo | 33.253 |
| 328 | PERNO NELSON 7/8" x 10" | 0.79 kg/pzo | 32.648 |

Peso PERNOS =

# GENERADOR DE ESTIMACION

Obra: Construcción de Distribuidor Vial Zooloecnia Chihuahua, Chih. Eje 60  
 Tramo: Contralista: CONSTRUCTORA SANTA ROSALIA SA DE CV  
 Fecha:

| Cantidad | Descripción       | Mco.   | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m2) | Calculo (unif) (Kg) | Calculo (ocum.) (Kq) |
|----------|-------------------|--------|-----------|-----------|-------------|--------------|---------------------|----------------------|
| 1        | VIGA E60-T1-V2E 1 | 1 Pzas | 34.481    | 1.520     | 249.60      | 13.081.816   | 13.081.816          | 13.081.816           |
| 1        | PL 32x1520        | 84     | 34.643    | 1.819     | 174.30      | 10.983.622   | 10.983.622          | 10.983.622           |
| 1        | PL 22x1819        | 59     | 34.177    | 1.819     | 174.30      | 10.835.876   | 10.835.876          | 10.835.876           |
| 1        | PL 25.4x500       | 74     | 34.592    | 0.500     | 199.40      | 3.448.822    | 3.448.822           | 3.448.822            |
| 1        | PL 25.4x500       | 73     | 33.987    | 0.500     | 199.40      | 3.388.504    | 3.388.504           | 3.388.504            |
| 13       | PL 16x350         | 13     | 1.700     | 0.350     | 124.80      | 74.256       | 965.328             | 965.328              |
| 4        | PL 16x175         | 14     | 0.800     | 0.175     | 124.80      | 17.472       | 69.888              | 69.888               |
| 4        | PL 16x650         | 15     | 1.525     | 0.650     | 124.80      | 123.708      | 494.832             | 494.832              |
| 2        | PL 16x175         | 17     | 0.800     | 0.175     | 124.80      | 39.936       | 79.872              | 79.872               |
| 2        | PL 16x400         | 17     | 0.800     | 0.400     | 124.80      | 39.936       | 79.872              | 79.872               |
| 2        | PL 16x175         | 18     | 0.800     | 0.175     | 124.80      | 17.472       | 34.944              | 34.944               |
| 2        | PL 16x650         | 20     | 1.300     | 0.650     | 124.80      | 105.456      | 210.912             | 210.912              |
| 4        | PL 25.4x160       | 21     | 1.792     | 0.160     | 199.40      | 57.172       | 228.688             | 228.688              |
| 1        | PL 19.1x1788      | 24     | 2.222     | 1.788     | 149.90      | 595.543      | 595.543             | 595.543              |
| 1        | PL 6x312.5        | 25     | 1.300     | 0.313     | 50.24       | 20.410       | 20.410              | 20.410               |
| 1        | PL 12.7x340       | 26     | 0.460     | 0.340     | 99.70       | 15.593       | 15.593              | 15.593               |
| 1        | PL 19.1x340       | 27     | 1.730     | 0.340     | 149.90      | 88.171       | 88.171              | 88.171               |
| 1        | PL 16x350         | 29     | 0.850     | 0.350     | 124.80      | 37.128       | 37.128              | 37.128               |
| 1        | PL 16x400         | 30     | 0.800     | 0.400     | 124.80      | 39.936       | 39.936              | 39.936               |
| 3        | WT8x38.5          | b16    | 3.019     |           | 57.300      | 172.989      | 518.966             | 518.966              |
| 1        | WT8x38.5          | b34    | 3.052     |           | 57.300      | 174.880      | 174.880             | 174.880              |
| 1        | WT8x38.5          | b38    | 3.029     |           | 57.300      | 173.562      | 173.562             | 173.562              |
| 1        | WT8x38.5          | b39    | 3.026     |           | 57.300      | 173.390      | 173.390             | 173.390              |
| 1        | WT8x38.5          | b40    | 3.021     |           | 57.300      | 173.103      | 173.103             | 173.103              |
| 1        | WT8x38.5          | b41    | 3.014     |           | 57.300      | 172.702      | 172.702             | 172.702              |
| 1        | WT8x38.5          | b42    | 3.013     |           | 57.300      | 172.645      | 172.645             | 172.645              |
| 1        | WT8x38.5          | b43    | 3.009     |           | 57.300      | 172.416      | 172.416             | 172.416              |
| 1        | WT8x38.5          | b45    | 2.995     |           | 57.300      | 171.614      | 171.614             | 171.614              |
| 1        | WT8x38.5          | b47    | 2.991     |           | 57.300      | 171.384      | 171.384             | 171.384              |
| 1        | WT8x38.5          | b19    | 2.982     |           | 57.300      | 170.869      | 170.869             | 170.869              |
| 1        | WT8x38.5          | b65    | 2.865     |           | 57.300      | 164.165      | 164.165             | 164.165              |

|       |              |        |       |       |       |        |              |           |
|-------|--------------|--------|-------|-------|-------|--------|--------------|-----------|
| CT-01 |              | 7 Pzas |       |       |       |        |              |           |
| 12    | PL 12.7x180  | 11     | 1.860 | 0.180 | 99.70 | 33.380 | 400.555      | 400.555   |
| 12    | LS5x5/8      | b18    | 1.386 |       | 29.76 | 41.247 | 494.968      | 494.968   |
| 6     | LS5x3/4      | b12    | 2.026 |       | 35.12 | 71.153 | 426.919      | 426.919   |
| 6     | PL 12.7x387  | 12     | 0.450 | 0.387 | 99.70 | 17.363 | 104.177      | 104.177   |
| 12    | PL 12.7x97.1 | 10     | 0.177 | 0.097 | 99.70 | 1.712  | 20.541       | 20.541    |
|       |              |        |       |       |       |        | Peso CT-01 = | 1,447,159 |

|       |              |        |       |       |       |        |              |         |
|-------|--------------|--------|-------|-------|-------|--------|--------------|---------|
| CH-01 |              | 7 Pzas |       |       |       |        |              |         |
| 14    | PL 12.7x180  | 11     | 1.860 | 0.180 | 99.70 | 33.380 | 467.314      | 467.314 |
| 7     | LS5x3/8      | b11    | 2.026 |       | 18.30 | 37.076 | 259.531      | 259.531 |
| 14    | PL 12.7x97.1 | 10     | 0.177 | 0.097 | 99.70 | 1.712  | 23.964       | 23.964  |
|       |              |        |       |       |       |        | Peso CH-01 = | 750.809 |

|                       |                      |                |             |  |  |        |             |        |
|-----------------------|----------------------|----------------|-------------|--|--|--------|-------------|--------|
| TORNILLERIA DIAFRAGMA |                      |                |             |  |  |        |             |        |
| 40                    | TORNILLO 1" x 2-3/4" | PATIN SUPERIOR | 0.57 kg/pzo |  |  | 22.800 |             |        |
| 24                    | TORNILLO 1" x 3"     | PATIN SUPERIOR | 0.62 kg/pzo |  |  | 14.880 |             |        |
| 16                    | TORNILLO 1" x 3 1/4" | PATIN INFERIOR | 0.67 kg/pzo |  |  | 10.720 |             |        |
| 16                    | TORNILLO 1" x 2 3/4" | PATIN INFERIOR | 0.57 kg/pzo |  |  | 9.120  |             |        |
| 38                    | TORNILLO 1" x 2 3/4" | PATIN INFERIOR | 0.57 kg/pzo |  |  | 21.660 |             |        |
|                       |                      |                |             |  |  |        | Peso TORN = | 79.180 |

|     |                         |  |        |  |             |  |               |  |
|-----|-------------------------|--|--------|--|-------------|--|---------------|--|
| 346 | PERNO NELSON 7/8" x 10" |  | 34.592 |  | 0.79 kg/pzo |  |               |  |
| 340 | PERNO NELSON 7/8" x 10" |  | 33.987 |  | 0.79 kg/pzo |  |               |  |
|     |                         |  |        |  |             |  | Peso PERNOS = |  |

1 Pzas = 49306.73 kg  
 Cantidad de Vigas y Peso Total =

43

# GENERADOR DE ESTIMACION

Obra: Construcción de Distribuidor Vial Zootecnia Chihuahua, Chih. Eje 60

Tramo:

Contratista: CONSTRUCTORA SANTA ROSALIA SA DE CV

Fecha:

| Cantidad               | Descripción    | Mca. | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m2) | Calculo (unff) (Kq) | Calculo (kgum) (Kq) |
|------------------------|----------------|------|-----------|-----------|-------------|--------------|---------------------|---------------------|
| 1                      | PL 19.1X1793.4 | 99   | 3.411     | 1.793     | 149.90      |              | 916.981             | 916.981             |
| 1                      | PL 19.1X340    | 35   | 3.411     | 0.340     | 149.90      |              | 173.845             | 173.845             |
| 4                      | L4X4X1/2       | b74  | 1.710     |           |             | 19.050       | 32.576              | 130.302             |
| 1                      | PL 19.1X340    | 34   | 2.181     | 0.340     | 149.90      |              | 111.157             | 111.157             |
| 2                      | PL 12.7X340    | 22   | 1.060     | 0.340     | 124.80      |              | 44.978              | 89.956              |
| 2                      | PL 12.7X340    | 28   | 0.500     | 0.340     | 99.70       |              | 16.949              | 33.898              |
| -1                     | HUECO          |      | 0.600     | 0.400     | 149.90      |              | 35.976              | 35.976              |
| DIAFRAGMA 1            |                |      |           |           |             |              |                     |                     |
| 1 Pzas                 |                |      |           |           |             |              |                     |                     |
| Peso DIAFI = 1,420.163 |                |      |           |           |             |              |                     |                     |

|                        |                |     |       |       |        |       |         |         |
|------------------------|----------------|-----|-------|-------|--------|-------|---------|---------|
| 1                      | PL 19.1X1800.7 | 172 | 3.411 | 1.801 | 149.90 |       | 920.714 | 920.714 |
| 1                      | PL 19.1X340    | 35  | 3.411 | 0.340 | 149.90 |       | 173.845 | 173.845 |
| 4                      | L4X4X1/2       | b74 | 1.710 |       |        | 19.05 | 32.576  | 130.302 |
| 1                      | PL 19.1X340    | 34  | 2.181 | 0.340 | 149.90 |       | 111.157 | 111.157 |
| 2                      | PL 12.7X340    | 22  | 1.060 | 0.340 | 124.80 |       | 44.978  | 89.956  |
| 2                      | PL 12.7X340    | 28  | 0.500 | 0.340 | 124.80 |       | 21.216  | 42.432  |
| -1                     | HUECO          |     | 0.600 | 0.400 | 149.90 |       | 35.976  | 35.976  |
| DIAFRAGMA 2            |                |     |       |       |        |       |         |         |
| 1 Pzas                 |                |     |       |       |        |       |         |         |
| Peso DIAF2 = 1,432.430 |                |     |       |       |        |       |         |         |

|                       |              |     |       |       |        |       |         |         |
|-----------------------|--------------|-----|-------|-------|--------|-------|---------|---------|
| 1                     | PL 19.1X1812 | 100 | 3.411 | 1.812 | 149.90 |       | 926.492 | 926.492 |
| 1                     | PL 19.1X340  | 35  | 3.411 | 0.340 | 149.90 |       | 173.845 | 173.845 |
| 4                     | L4X4X1/2     | b74 | 1.710 |       |        | 19.05 | 32.576  | 130.302 |
| 1                     | PL 19.1X340  | 34  | 2.181 | 0.340 | 149.90 |       | 111.157 | 111.157 |
| 2                     | PL 12.7X340  | 22  | 1.060 | 0.340 | 124.80 |       | 44.978  | 89.956  |
| 2                     | PL 12.7X340  | 28  | 0.500 | 0.340 | 124.80 |       | 21.216  | 42.432  |
| -1                    | HUECO        |     | 0.600 | 0.400 | 149.90 |       | 35.976  | 35.976  |
| DIAFRAGMA 3           |              |     |       |       |        |       |         |         |
| 1 Pzas                |              |     |       |       |        |       |         |         |
| Peso DIAF3= 1,438.203 |              |     |       |       |        |       |         |         |

|                         |              |     |       |       |        |       |         |         |
|-------------------------|--------------|-----|-------|-------|--------|-------|---------|---------|
| 1                       | PL 19.1X1801 | 172 | 3.411 | 1.801 | 149.90 |       | 920.867 | 920.867 |
| 1                       | PL 19.1X340  | 102 | 3.411 | 0.340 | 149.90 |       | 173.845 | 173.845 |
| 4                       | L4X4X1/2     | b74 | 1.710 |       |        | 19.05 | 32.576  | 130.302 |
| 1                       | PL 19.1X340  | 101 | 2.181 | 0.340 | 149.90 |       | 111.157 | 111.157 |
| 2                       | PL 12.7X340  | 22  | 1.060 | 0.340 | 124.80 |       | 44.978  | 89.956  |
| 2                       | PL 12.7X340  | 98  | 0.500 | 0.340 | 124.80 |       | 21.216  | 42.432  |
| -1                      | HUECO        |     | 0.600 | 0.400 | 149.90 |       | 35.976  | 35.976  |
| DIAFRAGMA 4B            |              |     |       |       |        |       |         |         |
| 1 Pzas                  |              |     |       |       |        |       |         |         |
| Peso DIAF4B = 1,432.583 |              |     |       |       |        |       |         |         |

Cantidad de Diafragmas y Peso Total = 4 Pzas 5723.38 kg

Σ = 2,870.79 kg



1525.22 Kg

Peso Total Cuñas =

397.126

PESO CUÑA 4B

| Cantidad | Descripción  | Mca. | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m <sup>2</sup> ) | Calculo (unif) (Kg) | Calculo (tácum) (Kca) |
|----------|--------------|------|-----------|-----------|-------------|---------------------------|---------------------|-----------------------|
| 2        | PL 19x700    | 103  | 0.700     | 0.700     |             |                           | 73.471              | 146.941               |
| 2        | PL 19x700    | 146  | 0.700     | 0.700     |             |                           | 73.471              | 146.941               |
| 2        | PL 19.1x73   | 143  | 0.642     | 0.073     |             |                           | 7.027               | 14.054                |
| 2        | PL 19.1x73.7 | 144  | 0.680     | 0.074     |             |                           | 7.514               | 15.029                |
| 2        | PL 19.1x64   | 141  | 0.642     | 0.064     |             |                           | 6.161               | 12.321                |
| 2        | PL 19.1x55.1 | 132  | 0.642     | 0.055     |             |                           | 5.304               | 10.608                |
| 2        | PL 19.1x46.1 | 122  | 0.642     | 0.046     |             |                           | 4.438               | 8.875                 |
| 2        | PL 19.1x50.3 | 124  | 0.680     | 0.050     |             |                           | 5.129               | 10.257                |
| 2        | PL 19.1x37.1 | 117  | 0.642     | 0.037     |             |                           | 3.571               | 7.143                 |
| 2        | PL 19.1x66.8 | 142  | 0.146     | 0.067     |             |                           | 1.462               | 2.925                 |
| 2        | PL 19.1x61   | 145  | 0.146     | 0.061     |             |                           | 1.335               | 2.671                 |
| 2        | PL 19.1x57.8 | 133  | 0.146     | 0.058     |             |                           | 1.265               | 2.531                 |
| 2        | PL 19.1x55.2 | 151  | 0.146     | 0.055     |             |                           | 1.208               | 2.417                 |
| 2        | PL 19.1x52   | 127  | 0.146     | 0.052     |             |                           | 1.138               | 2.277                 |
| 2        | PL 19.1x48.8 | 123  | 0.146     | 0.049     |             |                           | 1.068               | 2.137                 |
| 2        | PL 19.1x46.2 | 131  | 0.146     | 0.046     |             |                           | 1.011               | 2.023                 |
| 2        | PL 19.1x43   | 106  | 0.146     | 0.043     |             |                           | 0.941               | 1.883                 |
| 2        | PL 19.1x39.8 | 120  | 0.146     | 0.040     |             |                           | 0.871               | 1.743                 |
| 2        | PL 19.1x37.2 | 118  | 0.146     | 0.037     |             |                           | 0.814               | 1.629                 |
| 2        | PL 19.1x34   | 116  | 0.146     | 0.034     |             |                           | 0.744               | 1.489                 |
| 2        | PL 19.1x28.2 | 111  | 0.146     | 0.028     |             |                           | 0.617               | 1.235                 |

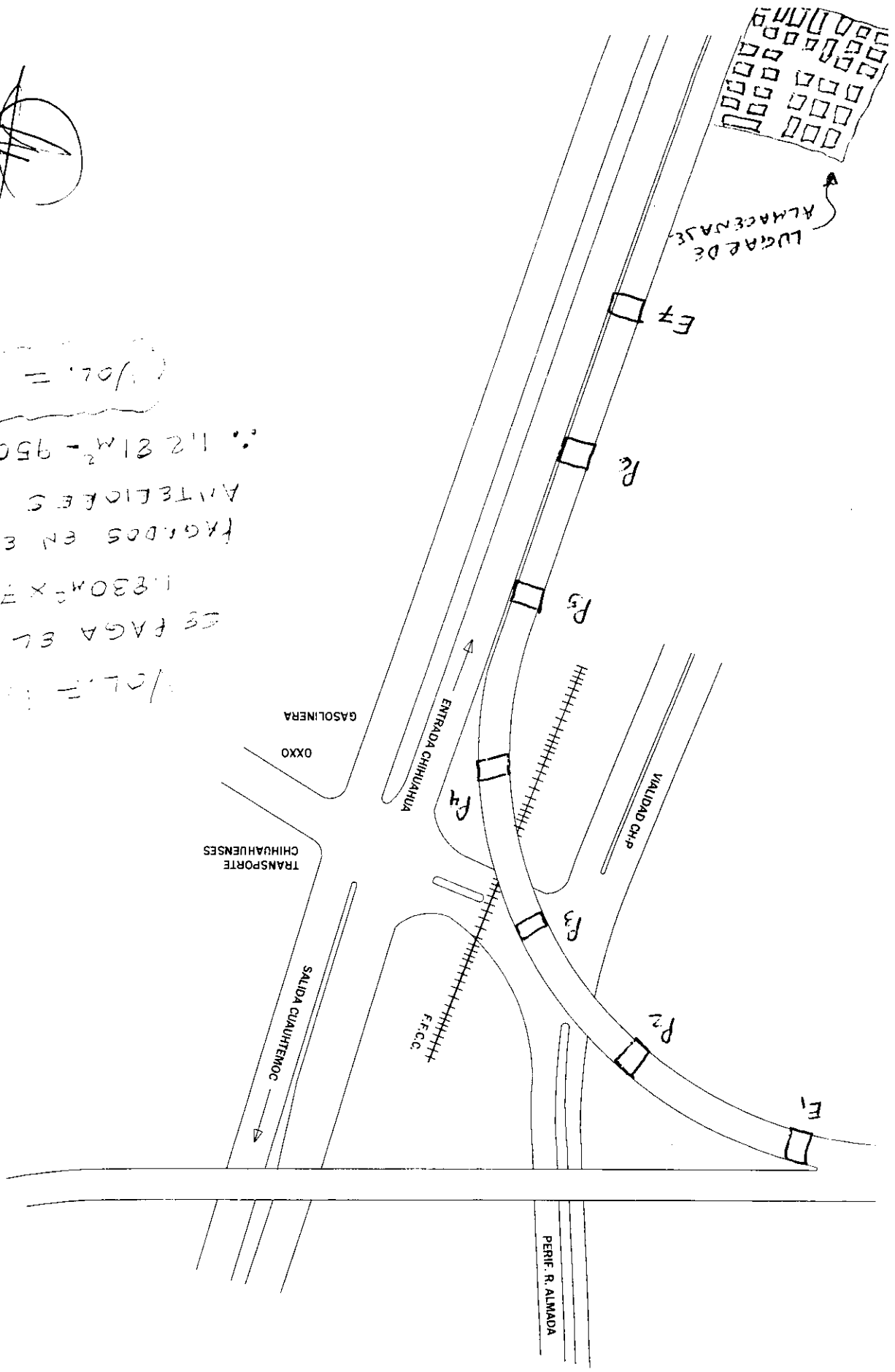
379.808

PESO CUÑA 3

| Cantidad | Descripción  | Mca. | Largo (m) | Ancho (m) | Peso (kg/m) | Peso (kg/m <sup>2</sup> ) | Calculo (unif) (Kg) | Calculo (tácum) (Kca) |
|----------|--------------|------|-----------|-----------|-------------|---------------------------|---------------------|-----------------------|
| 2        | PL 19x700    | 103  | 0.700     | 0.700     |             |                           | 73.451              | 146.902               |
| 2        | PL 19x700    | 147  | 0.700     | 0.700     |             |                           | 73.451              | 146.902               |
| 2        | PL 19.1x61.6 | 138  | 0.642     | 0.062     |             |                           | 5.928               | 11.856                |
| 2        | PL 19.1x52   | 129  | 0.642     | 0.052     |             |                           | 5.004               | 10.009                |
| 2        | PL 19.1x61.9 | 140  | 0.680     | 0.062     |             |                           | 6.310               | 12.619                |
| 2        | PL 19.1x42.4 | 121  | 0.642     | 0.042     |             |                           | 4.080               | 8.161                 |
| 2        | PL 19.1x52.6 | 125  | 0.680     | 0.053     |             |                           | 5.362               | 10.723                |
| 2        | PL 19.1x32.8 | 114  | 0.642     | 0.033     |             |                           | 3.157               | 6.313                 |
| 2        | PL 19.1x23.1 | 109  | 0.642     | 0.023     |             |                           | 2.223               | 4.446                 |
| 2        | PL 19.1x58.5 | 136  | 0.146     | 0.059     |             |                           | 1.280               | 2.561                 |
| 2        | PL 19.1x56.1 | 166  | 0.146     | 0.056     |             |                           | 1.228               | 2.456                 |
| 2        | PL 19.1x53.8 | 107  | 0.146     | 0.054     |             |                           | 1.177               | 2.355                 |
| 2        | PL 19.1x48.8 | 152  | 0.146     | 0.049     |             |                           | 1.068               | 2.136                 |
| 2        | PL 19.1x46.5 | 131  | 0.146     | 0.047     |             |                           | 1.018               | 2.035                 |
| 2        | PL 19.1x44.1 | 139  | 0.146     | 0.044     |             |                           | 0.965               | 1.930                 |
| 2        | PL 19.1x39.2 | 119  | 0.146     | 0.039     |             |                           | 0.858               | 1.716                 |
| 2        | PL 19.1x36.8 | 105  | 0.146     | 0.037     |             |                           | 0.805               | 1.611                 |
| 2        | PL 19.1x34.5 | 104  | 0.146     | 0.035     |             |                           | 0.755               | 1.510                 |
| 2        | PL 19.1x29.5 | 113  | 0.146     | 0.030     |             |                           | 0.646               | 1.291                 |
| 2        | PL 19.1x27.2 | 148  | 0.146     | 0.027     |             |                           | 0.595               | 1.191                 |
| 2        | PL 19.1x24.8 | 110  | 0.146     | 0.025     |             |                           | 0.543               | 1.086                 |

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# 44 - SUMINISTRO Y COLOCACION DE MURO DE CONTENSION MECANICAMENTE ESTABILIZADO



$$VOL. = 1.830 M^3$$

SE FAGA EL 70%

$$1.830 M^3 \times 70\% = 1.281 M^3$$

FRAGDOS EN ESTIMACIONES

ANTELOS 950.60 M<sup>2</sup>

$$\therefore 1.281 M^3 - 950.60 M^2 = 330.40 M^2$$

$$VOL. = 330.40 M^3$$

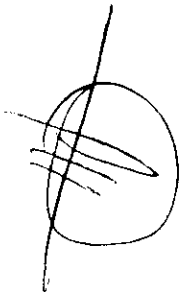
ANEXA  
HOJA DE VOL.

# CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

Fabricación de escamas  
Piezas fabricadas al 15 de julio de 2016

| Tipo           | Medida (m) | # De Piezas | Area (m²) |
|----------------|------------|-------------|-----------|
| Mitades        | 0.8        | 2           | 232       |
| Lisas          | 1.6        | 2           | 598.4     |
| Relieve        | 1.6        | 2           | 496       |
| Grande Lisa    | 2.41       | 2           | 28.92     |
| Grande Relieve | 2.41       | 2           | 38.56     |
| Esp. Lisa      | 2.31       | 2           | 18.48     |
| Esp. Relieve   | 2.31       | 2           | 50.82     |
| Esp. 2 Lisa    | 2.21       | 2           | 13.26     |
| Esp. 2 Relieve | 2.21       | 2           | 35.36     |
| Esp. 3 Lisa    | 2.11       | 2           | 8.44      |
| Esp. 3 Relieve | 2.11       | 2           | 8.44      |
| Esp. 4 Lisa    | 2.01       | 2           | 4.02      |
| Esp. 4 Relieve | 2.01       | 2           | 12.06     |
| Esp. 5 Lisa    | 1.81       | 2           | 3.62      |
| Esp. 5 Relieve | 1.81       | 2           | 3.62      |
| Esp. 1         | 1.01       | 2           | 28.28     |
| Esp. 2         | 0.91       | 2           | 27.3      |
| Esp. 3         | 1.6        | 7           | 16.24     |
| Esp. 4         | 1.6        | 7           | 15.12     |
| Esp. 5         | 1.6        | 7           | 11.76     |
| Esp. 6         | 0.8        | 3           | 2.52      |
| Esp. 7         | 1.11       | 2           | 42.18     |
| Esp. 8         | 1.21       | 2           | 41.14     |
| Esp. 9         | 1.31       | 2           | 52.4      |
| Esp. 10        | 1.51       | 1           | 1.5855    |
| Esp. 11        | 1.31       | 1           | 1.8995    |
| Esp. 12        | 0.8        | 1           | 1.16      |
| Esp. 13        | 0.8        | 1           | 0.92      |
| Esp. 14        | 1.41       | 2           | 19.74     |
| Esp. 15        | 1.71       | 2           | 3.42      |
| Tipo "L"       | 0.36       | 11          | 6.2568    |
| Tipo "T"       | 0.51       | 8           | 6.4464    |
| TOTAL          |            |             | 1830.3682 |
| 677            |            |             |           |

44



# PRESIDENCIA MUNICIPAL DE CHIHUAHUA DIRECCION DE OBRAS PUBLICAS Y MANTENIMIENTO

CHIHUAHUA, CHIH. 11 ABRIL 2016

OBRA: CONSTRUCCION DE EJE SESENTA (60) DEL DISTRIBUIDOR VIAL ZOOTECNIA, UBICADO EN EL ENTORNO DEL PERIFERICO FRANCISCO R. ALMADA Y CARRETERA A CD. CUAUHTEMOC, COL ESPERANZA Y ZOOTECNIA, EN ESTA CIUDAD DE CHIHUAHUA

## ANALISIS DE PRECIOS UNITARIOS (FORMA E-5)

NOMBRE DE LA PARTIDA

ESPECIFICACION: 047-Y-25

SUBESTRUCTURA: Suministro y colocación de Muro de contención mecánicamente estabilizado, por unidad de obra terminada. Incluye materiales, herrajes, acarreos, patente, proyecto, mano de obra, equipo, herramienta y todo lo necesario para su correcta ejecución por unidad de obra terminada

IMPORTANTE DE LA PARTIDA: \$ 3'418,956.00

PRECIO UNITARIO: \$ 1,899.42

UNIDAD: m2

VOLUMEN: 1,800.00

Costo unitario: \$ 1,899.42

Total: \$ 3,418,956.00

Descripción

Unidad

Cantidad

Costo

Total

Herramienta

HERR

HERRAMIENTA MENOR

Total de Herramienta

Auxiliares

+ TIARM1

DALA DESPLANTE CONCRETO Fc= 200 KG/CM2 P/MURO

ML

0.30000

\$ 168.42

\$ 50.53

TIPO TIERRA ARMADA

ARMADA

FABRICACION DE ESCAMAS P/MURO TIPO TIERRA

M2

1.00000

\$ 1,132.73

\$ 1,132.73

MONTAJE DE ESCAMAS P/MURO TIPO TIERRA ARMADA

M2

1.00000

\$ 129.33

\$ 129.33

COLOCACION SOLERAS GALVANIZADAS P/MURO TIPO

ARMADA

TIERRA ARMADA

CORONAMIENTO

FREYSSOL

RESANE FINAL EN MURO TIPO TIERRA ARMADA

ML

0.30000

\$ 540.09

\$ 162.03

TIARRM6

+ TIARRM6

RESANE FINAL EN MURO TIPO TIERRA ARMADA

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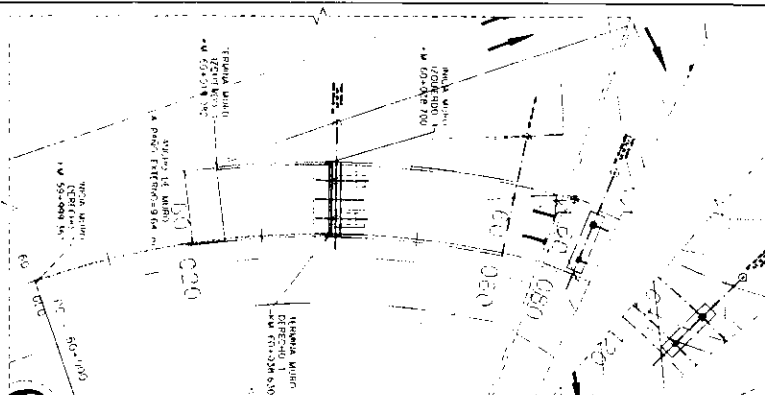
\$ 162.03

TIARRM6

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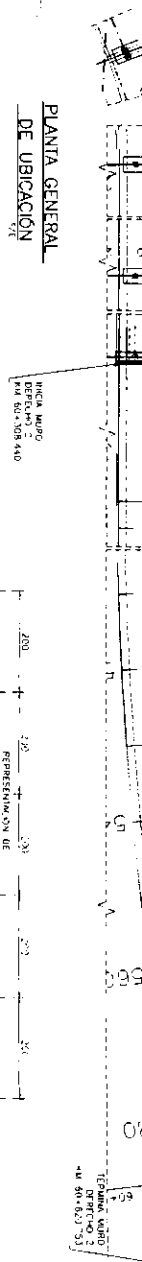
RESANE FINAL EN MURO TIPO TIERRA ARMADA

ML

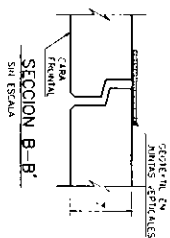


## PLANTA GENERAL

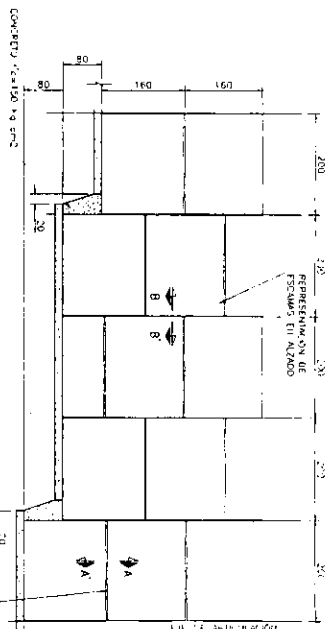
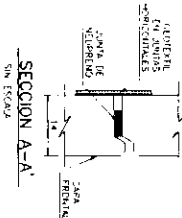
### DE UBICACIÓN<sup>4/1</sup>



**SECCION B-B'**  
SIN ESCALA



**SECCION A-A'**  
SIN ESCALA



## ESQUEMA DE MONTAJE DE ESCAMAS RECTANGULARES

[illegible]

| PANEL TIPO     |  | GEOSTRAP GRADO |          |
|----------------|--|----------------|----------|
| PAZES          |  | UNIDADES       | UNIDADES |
| 400 0 3 1150 0 |  | 35 5           | ---      |
| 5 500 1        |  | 3 5            | ---      |
| 8 51 2 70 5    |  | 50             | ---      |
| 14 150 4       |  | 50             | ---      |
| 16 160 4 10 0  |  | 65             | ---      |

## TABLA DE GEOSTRAP

DIRECCIÓN DE OBRAS  
PUBLICAS MUNICIPALES  
SUBDIRECCIÓN DE INFRAESTRUCTURA

---

DEPARTAMENTO DE CONSTRUCCION  
OFICINA DE TOPOGRAFIA

NOTAS

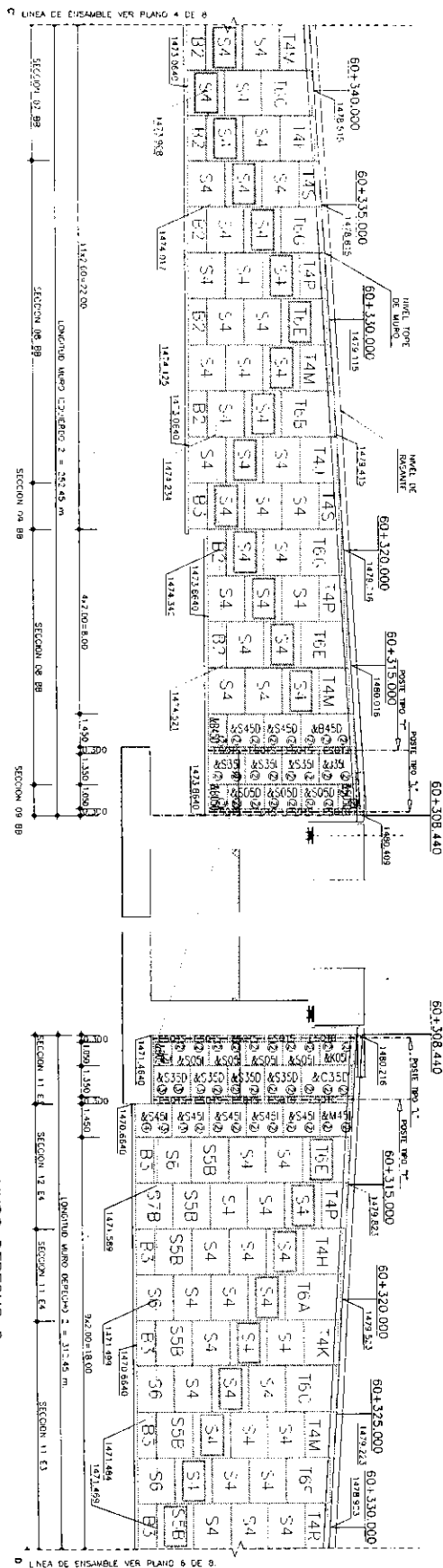
[illegible]

AREA ( TOTAL ) = 2.614.0

## BASES DE DISEÑO

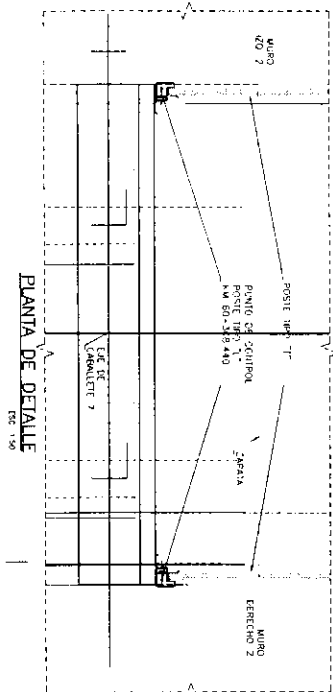
SECURITY ASSISTANCE (CONSTRUCTION) -  
PAGE: 10/11

energía, geología, etc.) para formar los sólidos, líquidos, gases y las subestructuras químicas. El constructor deberá verificar si el material vertido para crear el proyecto de Muros de Llanura cubren o difieren con el proyecto de defecto null, y el desarrollo de la imagen.



MURO IZQUIERDO 2 (CONTINUACIÓN)

MURO DERECHO 2

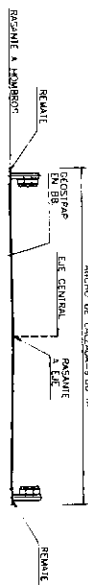


**PLANTA DE DETALLE**

NOTA 2: LAS SECCIONES T-<sub>1</sub> CORRESPONDEN A LAS ZONAS DONDE LOS RECIPIENTES SON DESVALIÉS Y ALGUNAS CAPAS NO PUEDE CALCULARSE EN EL PROGRAMA. SECCION TIPO. DESVALIÉS RESIDUALES)

[illegible]

## SECCIONES DE CALCULO

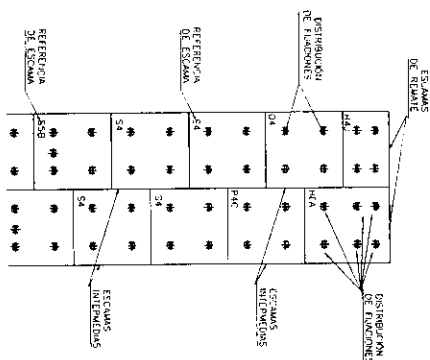
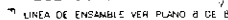


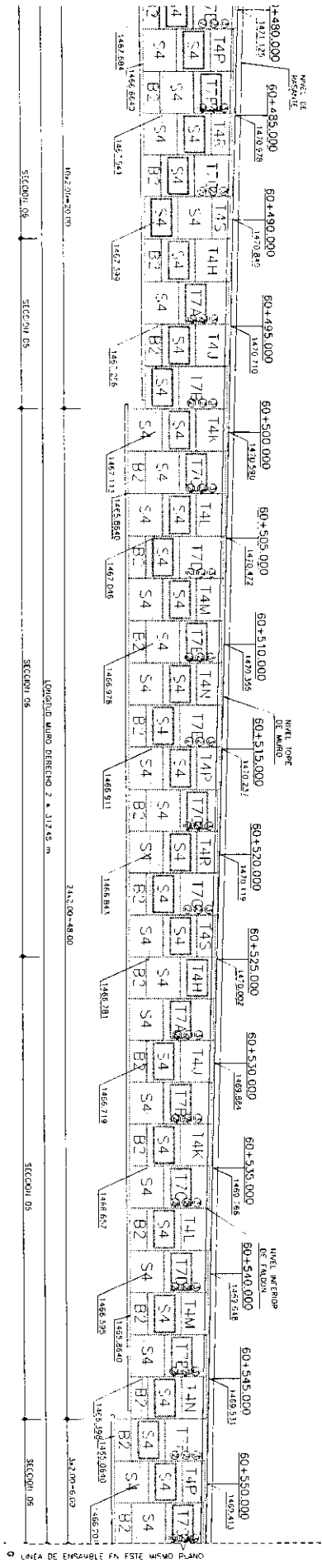




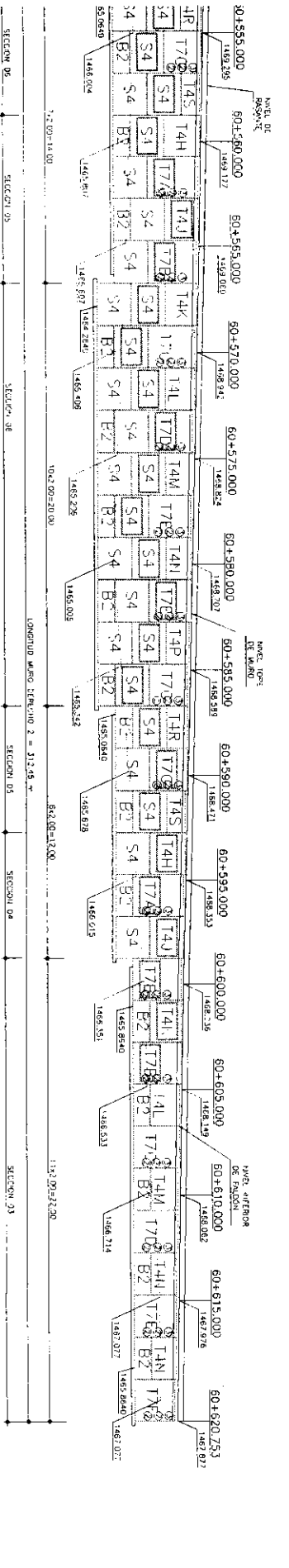
## SECCIONES DE CÁLCULO

## ESC 1.160





MURO DERECHO 2 (CONTINUACIÓN)



MURO DERECHO 2 (CONTINUACIÓN)

54

# GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                              |                                 |                                                         |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------|--|
| CONTRATO : 040/2016                                                                                                                                                                                                          |                                 | TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |  |
| OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vial Zooteccia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zooteccia, en esta Ciudad de Chihuahua. |                                 | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV        |  |
| No DE ESTIMACION: No. 6                                                                                                                                                                                                      | PERIODO: 01 AL 15 DE JULIO 2016 |                                                         |  |

| CONCEPTO                                                                                                                                           | EXT-2 | OPERACIONES ARITMETICAS | CROQUIS          | VOLUMEN<br>A PAGAR |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------|------------------|--------------------|
| Suministro y colocación de alcantarilla galvanizada de 90 cms de diámetro cal 14 de 54 kg/ml, incluye todo lo necesario para su correcta ejecución |       |                         | SE ANEXA CROQUIS | 12 M               |
|                                                                                                                                                    |       |                         |                  |                    |
|                                                                                                                                                    |       |                         |                  |                    |
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|                                                                                                                                                    |       |                         |                  |                    |
|                                                                                                                                                    |       |                         |                  |                    |

RESIDENTE  
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

## GENERADOR DE ESTIMACION

|            |                                                                                                                                                                                                                      |              |                                                  |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                             | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtemoc, Colonia Esperanza y Zootecnia, en esta Ciudad de Chihuahua. | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

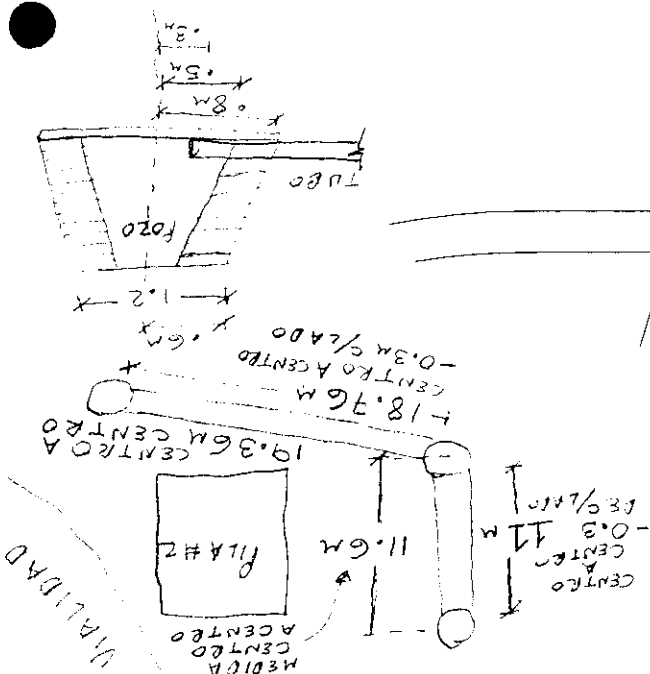
|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| No DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

[illegible]

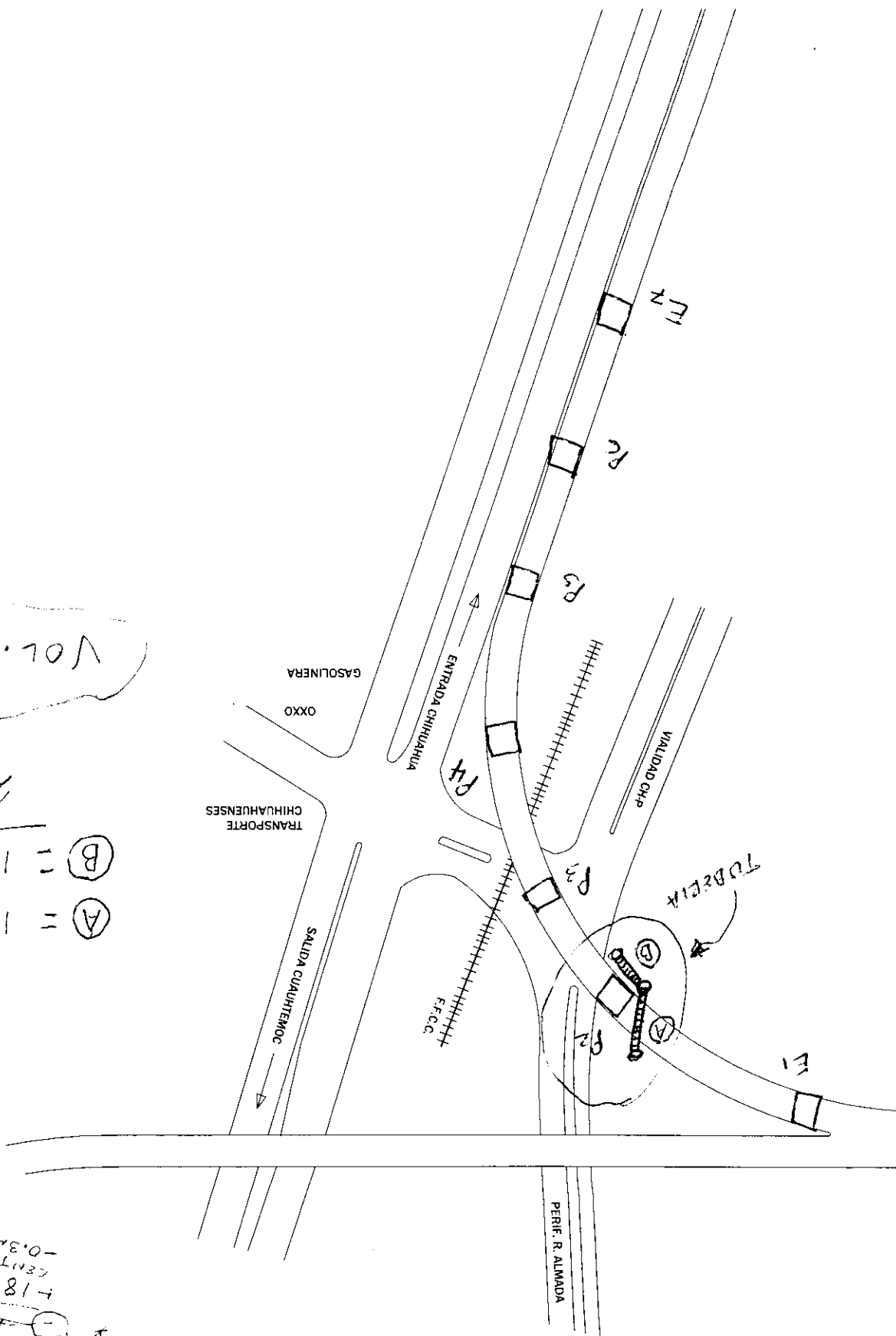
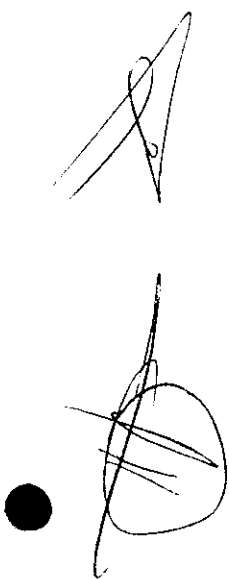
~~PRESIDENTE~~  
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

EXT-3 SUM. Y COLOCACION DE TUBERIA PVC 8" SERIE 20


$$\textcircled{A} = 11 \text{ M}$$

29.76M

$$Vol. = 29.76 \mu$$


# GENERADOR DE ESTIMACION

CONTRATO : 040/2016

**TRAMO:**

Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

**OBRA:** Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

No. 6

PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

RESIDENTE

ING. RODOLFO ARMENDARIZ RONQUILLO

**CONTRATISTA**

CONSTRUCTORA SANTA ROSALIA SA DE CV

# GENERADOR DE ESTIMACION

[illegible]

~~RESIDENTE~~  
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

# GENERADOR DE ESTIMACION

|            |                                                                                                                                                                                                                        |              |                                                  |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                               | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | Construcción del Eje Sesenta (60) del Distribuidor Vial Zootechnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza y Zootechnia, en esta Ciudad de Chihuahua. | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| Nº DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

[illegible]

  
RESIDENTE  
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

## GENERADOR DE ESTIMACION

[illegible]

RESIDENTE

ING. RODOLFO ARMENDARIZ RONQUILLO

~~CONTRATISTA~~

CONSTRUCTORA SANTA ROSALIA SA DE CV

2

# GENERADOR DE ESTIMACION

|              |                                                                                                                                                                                                                              |        |                                                  |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------|
| CONTRATO :   | 040/2016                                                                                                                                                                                                                     | TRAMO: | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBJETO :     | <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zooteclia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zooteclia, en esta Ciudad de Chihuahua.</p> |        |                                                  |
| CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV                                                                                                                                                                                          |        |                                                  |

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| NO DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

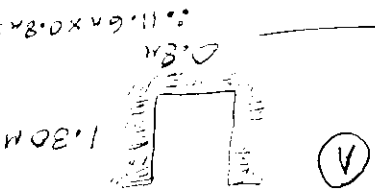
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~~RESIDENTE~~  
ING. RODOLFO ARMENDARIZ RONQUILLO

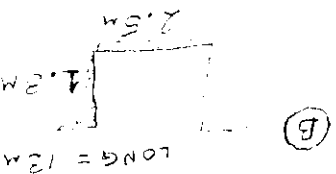
~~CONTRATISTA~~  
CONSTRUCTORA SANTA ROSALIA SA DE CV

# EXT-8 COLOCACION DE RELLENO CON MATERIAL PRODUCTO DE BANCO

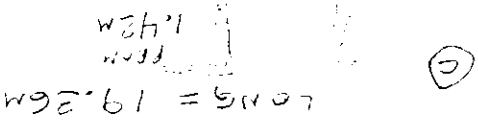
EXCAVACION TOTAL



$$\therefore 11.64 \times 0.8 \times 1.5M = 12.061$$



$$\therefore 1.3M \times 2.5M \times 1.5M = 42.25$$



$$\therefore 1.9.36M \times 2.5M \times 1.42M = 68.33M$$

$$\text{Vol. EXCAVACION} = 123.04M^3$$

RELLENO DE ARENA

$$= 47.74M^3 \text{ (SEGUN EXT-7)}$$

$$\therefore 123.04M^3 - 47.74M^3 = 75.30M^3$$

FALTARIA DESCONTAR LA PARTE DE LOS

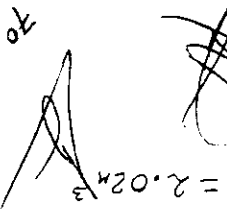
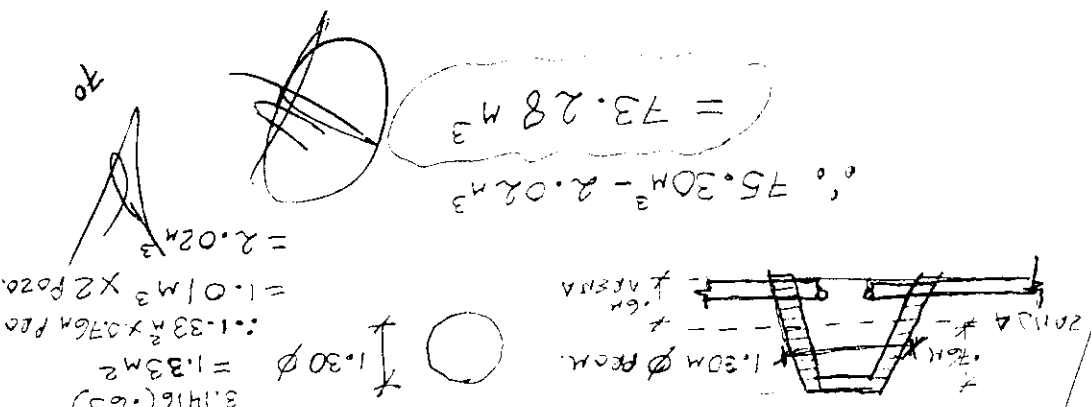
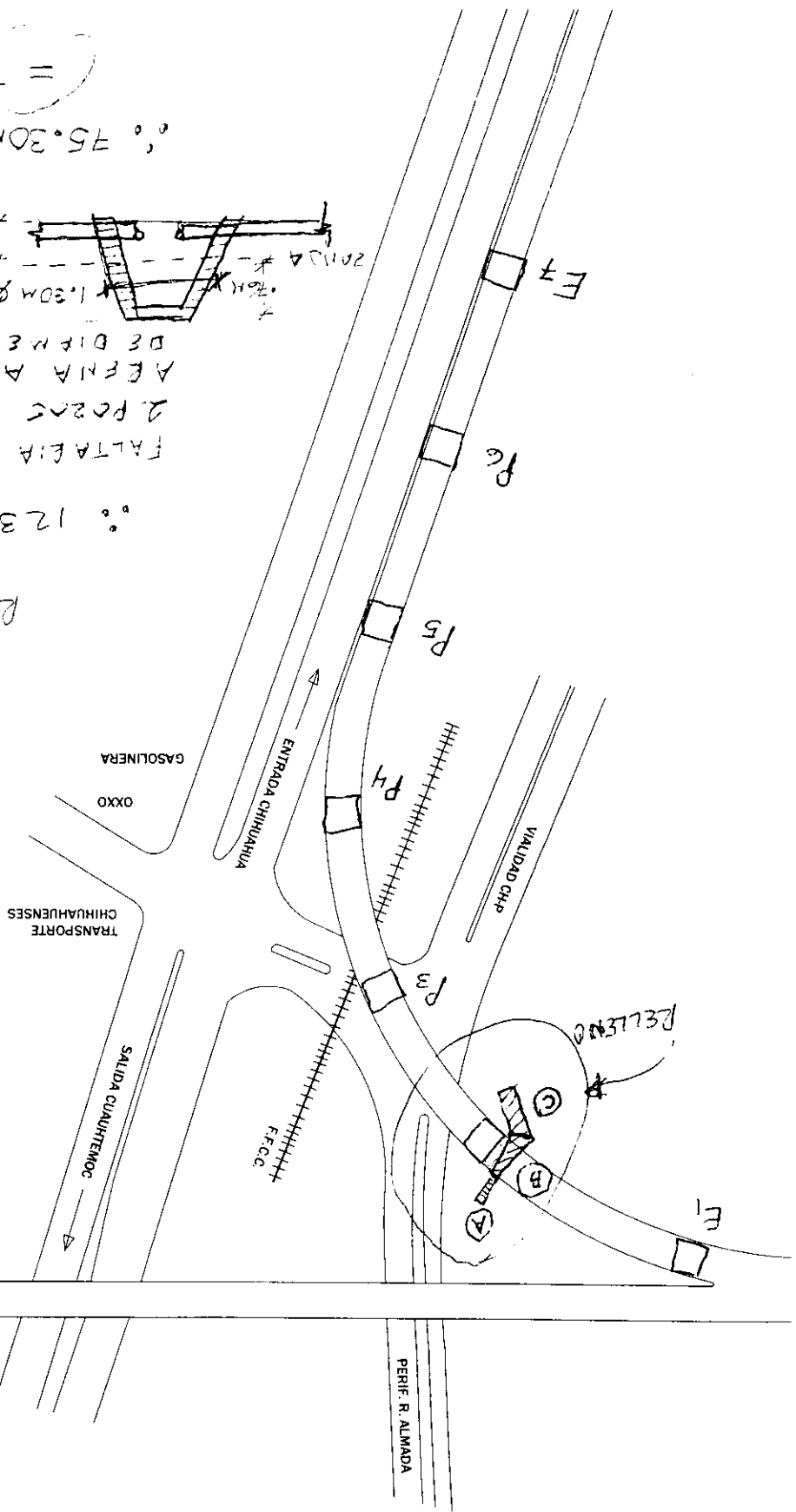
2 PUNTOS QUE QUEDA EL NIVEL SUPERIOR DE ARENA A TERCERA NATURAL CON UN PROF. DE 0.36M

$$3.1416 \times (.65)^2 \times 1.30 \div 2 = 1.33M^2$$

$$\therefore 1.33M^2 \times 0.36M \text{ PROF.} = 1.01M^3 \times 2 \text{ PUNTOS}$$

$$= 2.02M^3$$

$$\therefore 75.30M^3 - 2.02M^3 = 73.28M^3$$



## GENERADOR DE ESTIMACION

[illegible]

~~RESIDENTE~~

ING. RODOLFO ARMENDARIZ RONQUILLO

# KONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

CROQUIS

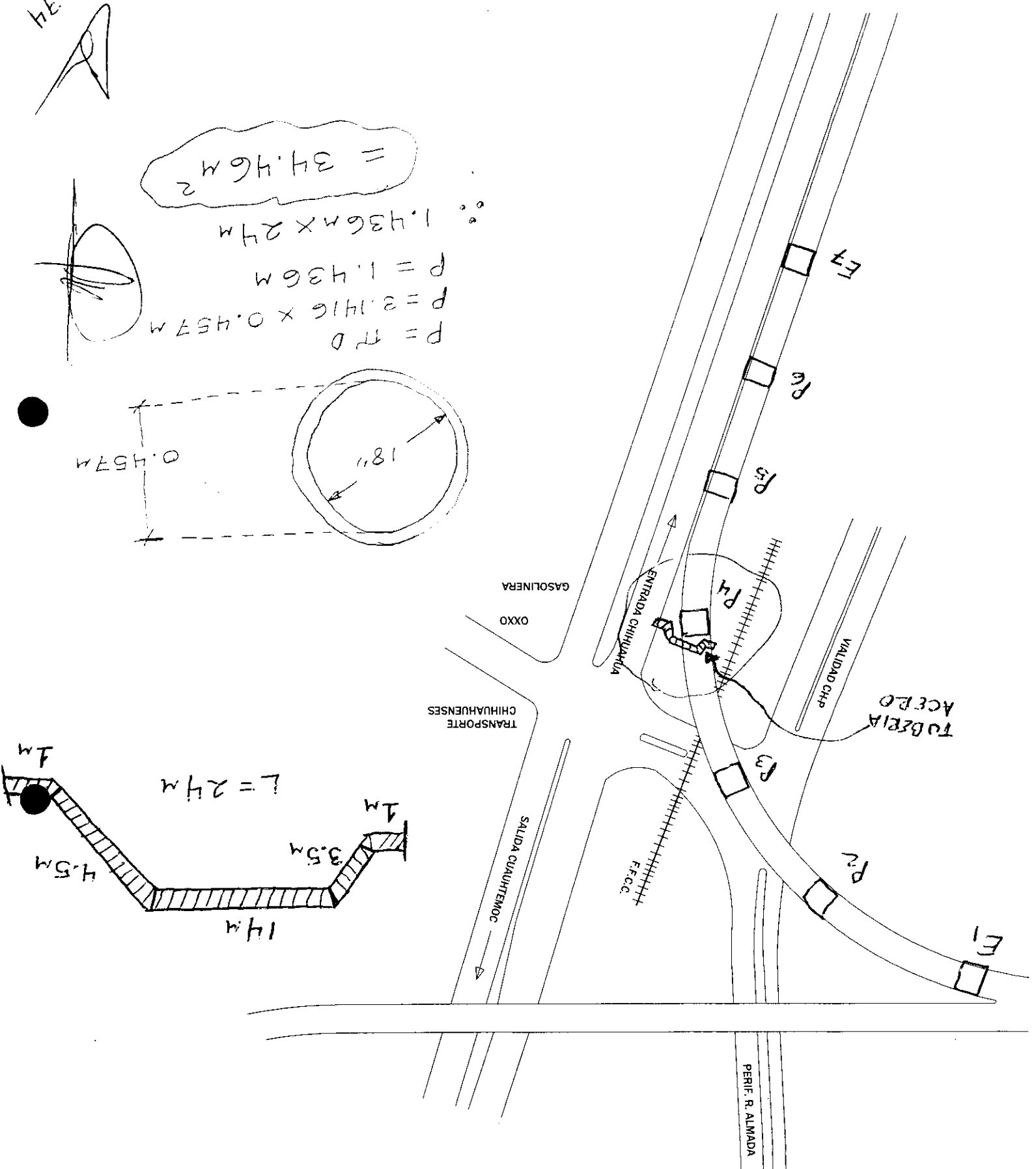
VOLUMEN

Acabado interior en tubería de 18" diámetro de acuerdo a especificación de la JMAS, consistente en: SAND BLAST interior en tubería a grado metal blanco y protección anticorrosiva a base de aplicación de primario y acabado epóxido catalizado altos sólidos grado alimenticio con un espesor promedio de 12 milésimas incluye todo lo necesario para su correcta ejecución

ING. RODOLFO ARMENDARIZ RONQUILLO

CONSTRUCTORA SANTA ROSALIA SA DE CV

# EXT-10 ACABADO INTERIOR EN TUBERIA DE 18" DE ACERO CONSISTENTE EN SAND BLAST



## GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                                  |                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| CONTRATO : 040/2016                                                                                                                                                                                                              | TRAMO: Perif. Fco. R. Almaday Carretera Cd. Cuauhtemoc |
| <p>Obra : Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almaday Carretera a Cd. Cuauhtémoc, Colonia Esperanza y Zootecnia, en esta Ciudad de Chihuahua</p> |                                                        |
| CONTRATISTA:                                                                                                                                                                                                                     | CONSTRUCTORA SANTA ROSALIA SA DE CV                    |

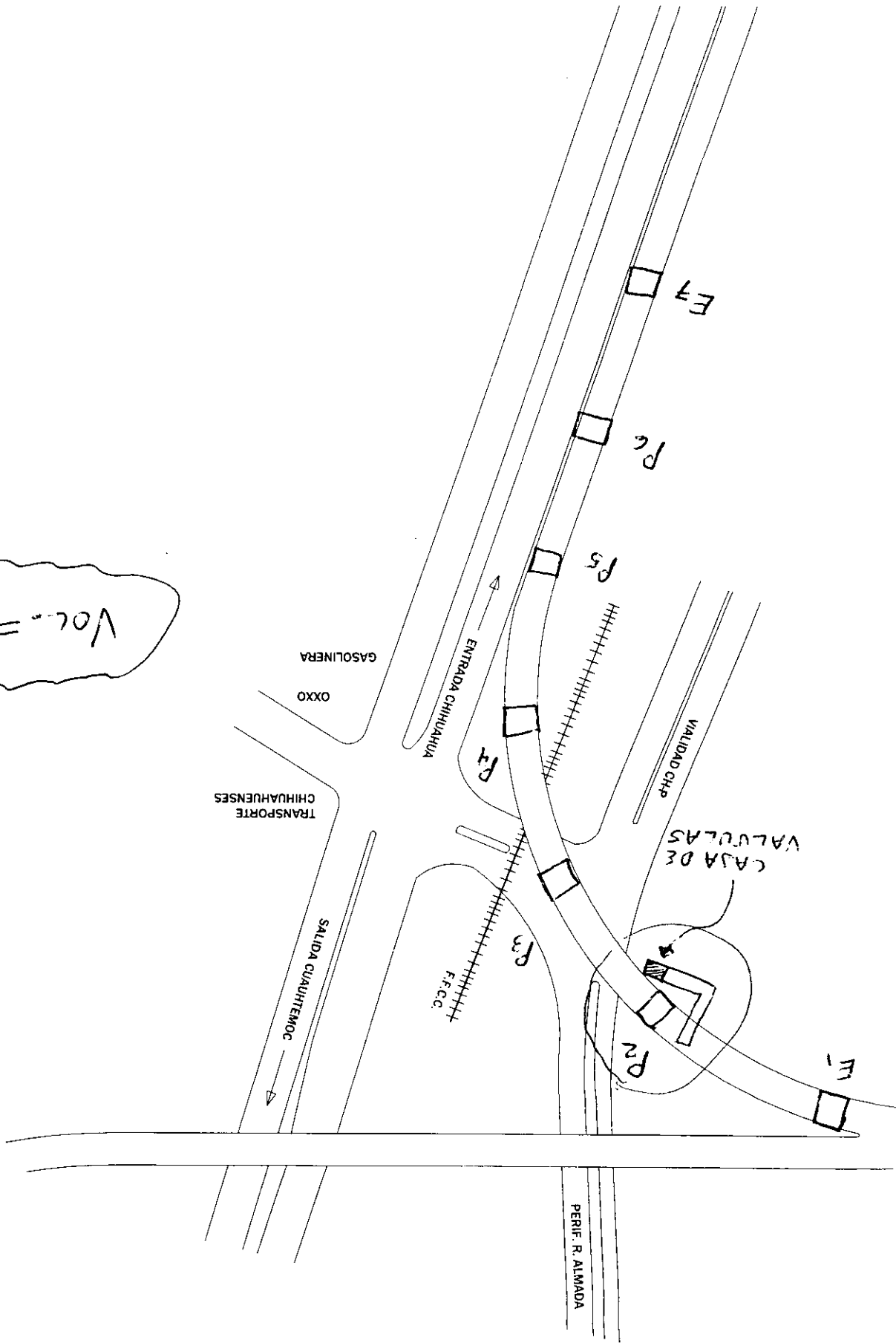
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|-------------------|-------|----------|------------------------|
| NO DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

[illegible]

ING. RODOLFO ARMENDARIZ RONQUILLO

CONSTRUCTORA SANTA ROSALIA SA DE CV

EXT-12  
CONSTRUCCION DE CASA DE VALUAS  
DE INXIMXIHU DE LADILLO



# GENERADOR DE ESTIMACION

|            |                                                                                                                                                                                                                       |              |                                                  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                              | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | Construcción del Eje Sesenta (60) del Distribuidor Vial Zoolécnia, Ubicado en Entlónque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zoolécnia, en esta Ciudad de Chihuahua. | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| NO DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

| CONCEPTO                                                                                                                                                                                 | EXT-13 | OPERACIONES ARITMETICAS |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------|--|
| Suministro y fabricación de contraventeos provisionales en vigas cajón a base de Angulo de acero de acuerdo a diseño proporcionado, incluye todo lo necesario para su correcta ejecución |        |                         |  |
|                                                                                                                                                                                          |        |                         |  |
|                                                                                                                                                                                          |        |                         |  |
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|                                                                                                                                                                                          |        |                         |  |

12 PZA

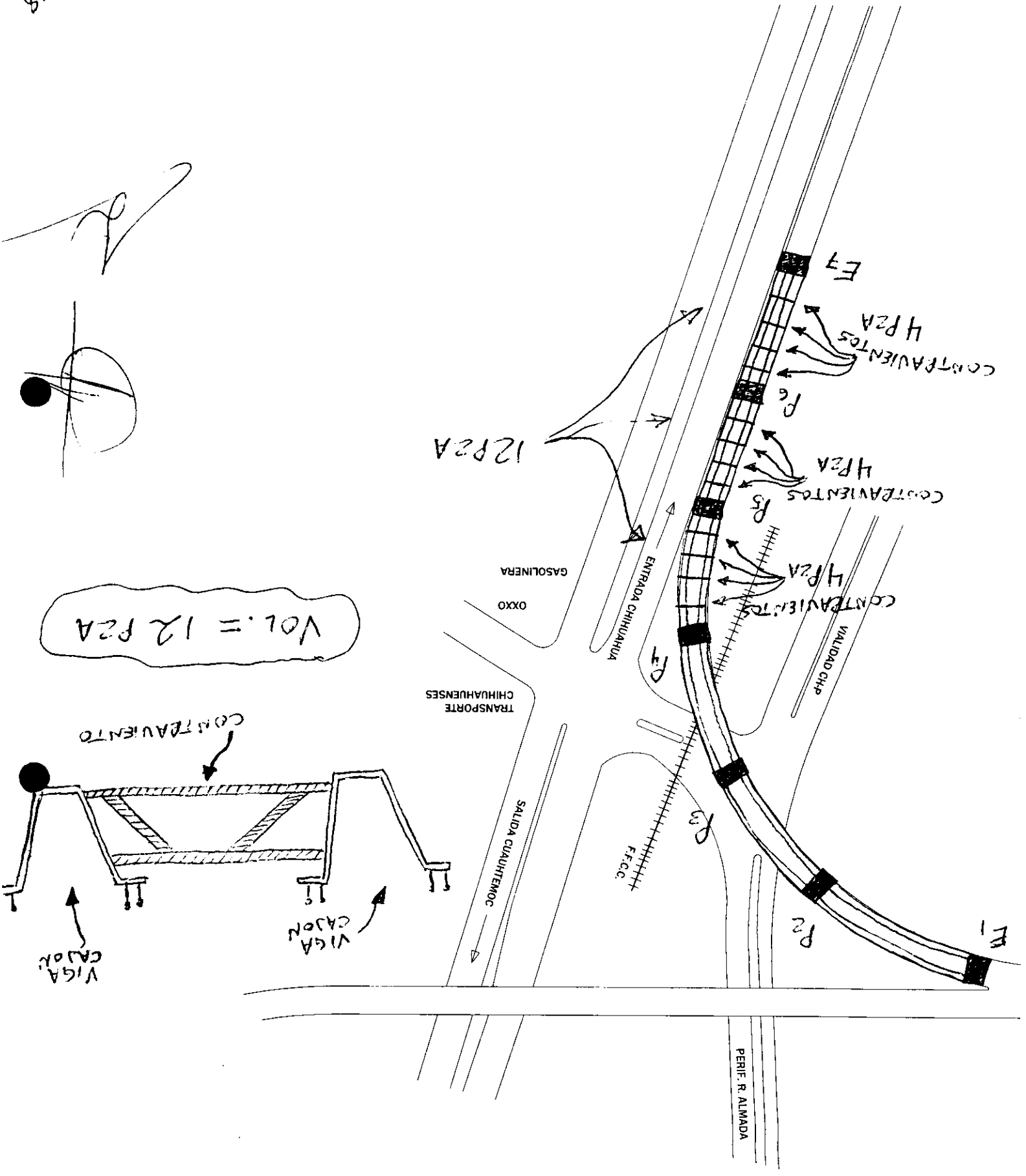
SE ANEXA CROQUIS

~~RESIDENT~~

ING. RODOLFO ARMENDARIZ RONQUILLO

~~CONTRATISTA~~

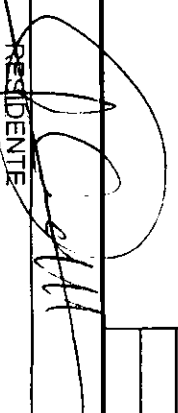
CONSTRUCTORA SANTA ROSALIA SA DE CV



# GENERADOR DE ESTIMACION

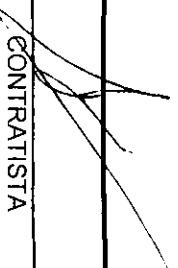
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| CONTRATO : 040/2016                                                                                                                                                                                                            |  | TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |  |
| OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vial Zooteccnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zooteccnia, en esta Ciudad de Chihuahua. |  | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV        |  |
| No DE ESTIMACION: No. 6                                                                                                                                                                                                        |  | PERIODO: 01 AL 15 DE JULIO 2016                         |  |

| CONCEPTO                                                                                                                                                                                 | EXT.-16 | OPERACIONES ARITMETICAS | CROQUIS          | VOLUMEN<br>A PAGAR |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|------------------|--------------------|
| Retiro de barandal existente del puente con medidas de 2.00 x 1.00 mt, incluye demolición de guarnición de concreto armada de 20 x 30 cms y todo lo necesario para su correcta ejecución |         |                         | SE ANEXA CROQUIS | 1 PZA              |
|                                                                                                                                                                                          |         |                         |                  |                    |
|                                                                                                                                                                                          |         |                         |                  |                    |
|                                                                                                                                                                                          |         |                         |                  |                    |
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|                                                                                                                                                                                          |         |                         |                  |                    |
| VOL. = 1 PZA                                                                                                                                                                             |         |                         |                  |                    |



RESIDENTE

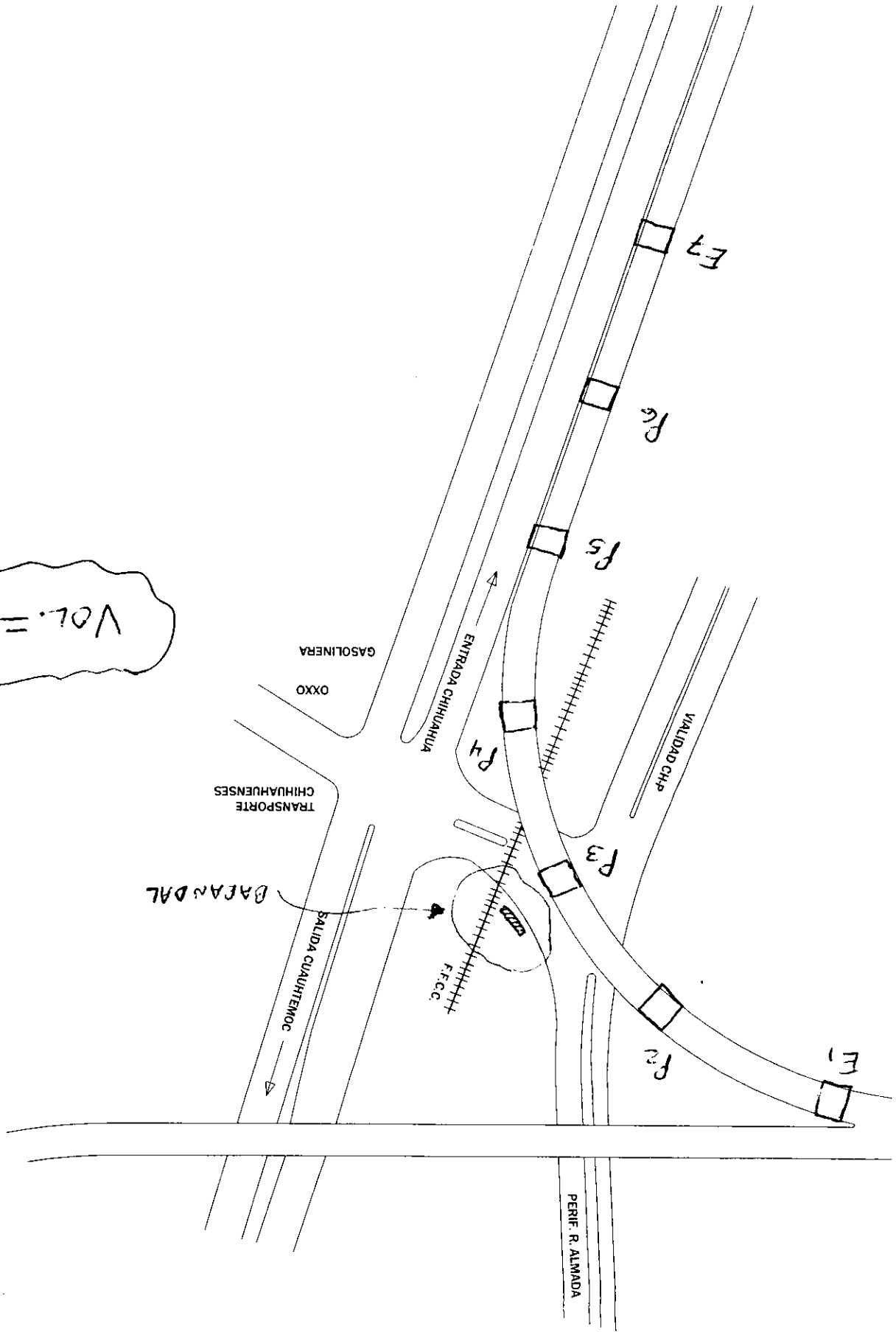
ING. RODOLFO ARMENDARIZ RONQUILLO



CONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

# EXT-16 PETIPO DE BAFANDAL EXISTENTE DE 24X14 INCLUYE DEMOLICION DE GUARNICION



VOL. = 1 PZA

# GENERADOR DE ESTIMACION

CONTRATO: 040/2016

**TRAMO:**

Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vía Zootecnia, Ubicado en Eltronque del Peñolítico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| No DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

~~RESIDENTE~~

ING. RODOLFO ARMENDARIZ RONQUILLO

**CONTRATISTA**

CONSTRUCTORA SANTA ROSALIA SA DE CV

## GENERADOR DE ESTIMACION

CONTRATO: 040/2016

TRAMO: Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

OBRA: Construcción del Eje Sesenta (60) del Distribuidor Vial Zootecna, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootecna, en esta Ciudad de Chihuahua.

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

No DE ESTIMACION: No. 6

PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

~~PRESIDENTE~~

ING. RODOLFO ARMENDARIZ RONQUILLO

**CONTRATISTA**

CONSTRUCTORA SANTA ROSALIA SA DE CV

# GENERADOR DE ESTIMACION

CONTRATO: 040/2016

**TRAMO:**

Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc

OBRA : Almada y Carretera a Cd. Cuauhlémoc, Colonia Esperanza, y Zootecnia, en esta Ciudad de Chihuahua.

CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV

No DE ESTIMACION: No. 6

PERIODO: 01 AL 15 DE JULIO 2016

[illegible]

RESIDENTE

ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

# GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------|---------------------------------|
| CONTRATO : 040/2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        | TRAMO: Perif. Fco. R Almada y Carretera Cd. Cuauhtemoc |                                 |
| OBRA : Construcción del Eje Sesenta (60) del Distribuidor Vial Zoolécnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zoolécnia, en esta Ciudad de Chihuahua.                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV       |                                 |
| No DE ESTIMACION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | No. 6  | PERIODO:                                               | 01 AL 15 DE JULIO 2016          |
| CONCEPTO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EXT-25 | OPERACIONES ARITMETICAS                                |                                 |
| Suministro y fabricación de garza metálica para desvío de línea de agua potable existente debido a que se encontraba dentro del desplante de la zapata de la pila 4, con una longitud de 24 ml de tubería de acero negro de 18" de diámetro y 3/8" de espesor de pared, de acuerdo a proyecto de la J.M.A.S., incluye: 2 juntas universales Fo.Fo. especiales (1 pza de 20" de diámetro que de 22 3/4" de diámetro en brida y barril y 1 pza de 18" de diámetro que de 20 1/4" de diámetro en brida y barril) y fabricación de 2 bridas soldables de 20" de diámetro a base de placa de acero de 3/4" de espesor y todo lo necesario para su correcta ejecución |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        | VOL. = 1 PZA                                           |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                                                        |                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        | CROQUIS                                                | VOLUMEN<br>A PAGAR<br><br>1 PZA |
| SE ANEXA CROQUIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |                                                        |                                 |

RESIDENTE

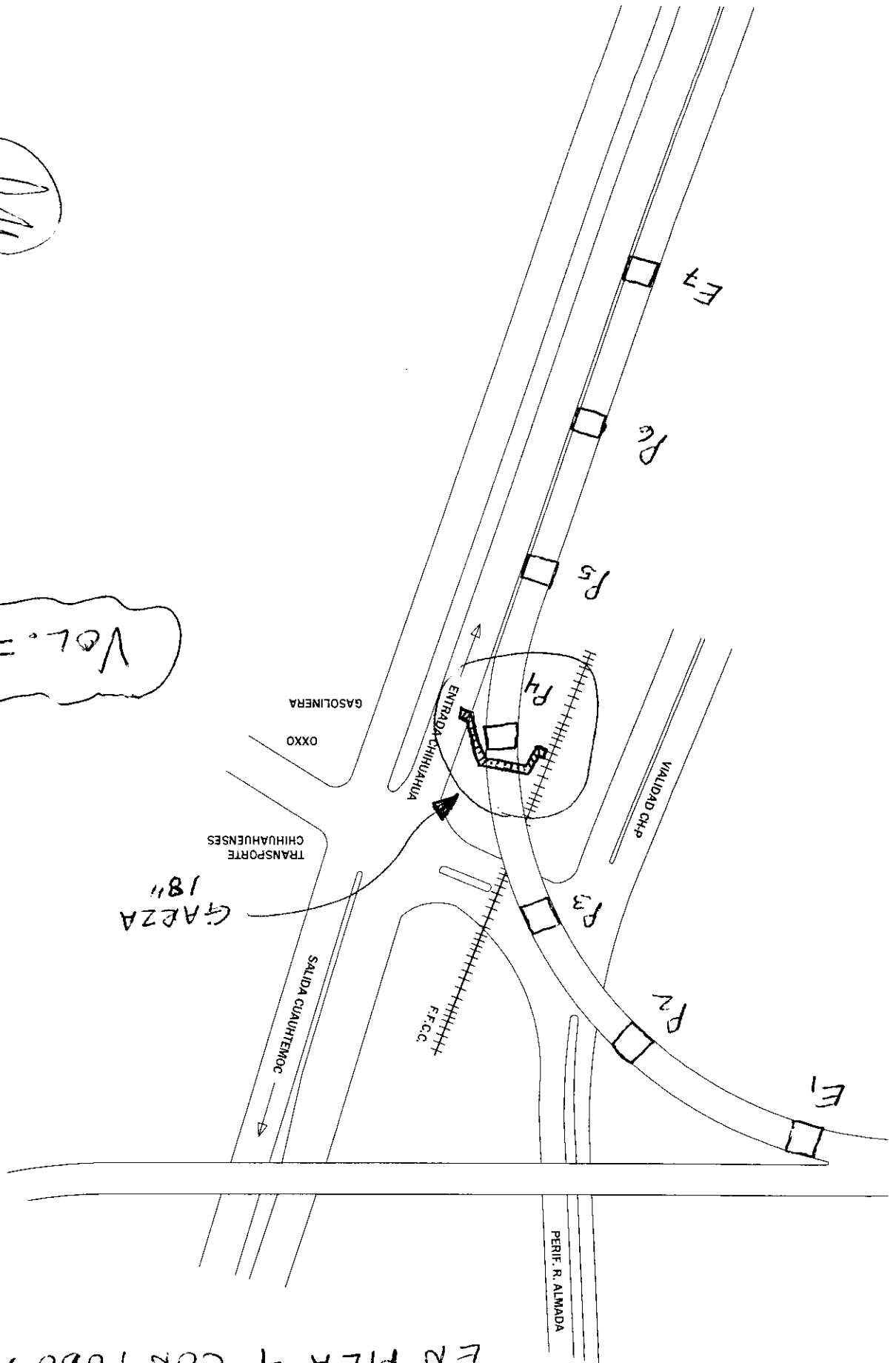
ING. RODOLFO ARMENDARIZ RONQUILLO

# CONTRATISTA

CONSTRUCTORA SANTA ROSALIA SA DE CV

EXT-25

FABRICACION DE GAZA METALICA  
P/DESUDIO DE LINEA DE AGUA POTABLE  
EN PILA 4 CON TUBO ACERO 18" DIAMET



VOL. = 1 PZA

# GENERADOR DE ESTIMACION

|                                                                                                                                                                                                                               |                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| CONTRATO : 040/2016                                                                                                                                                                                                           | RAMO: Perif. Fco. R. Almaday Carretera Cd. Cuauhtemoc |
| <p>Construcción del Eje Sesenta (60) del Distribuidor Vial Zootección. Ubicado en Entorno del Periférico Francisco R. Almaday y Carretera a Cd. Cuauhtémoc, Colonia Esperanza, y Zootección, en esta Ciudad de Chihuahua.</p> |                                                       |
| OBRA :                                                                                                                                                                                                                        | CONTRATISTA: CONSTRUCTORA SANTA ROSALIA SA DE CV      |

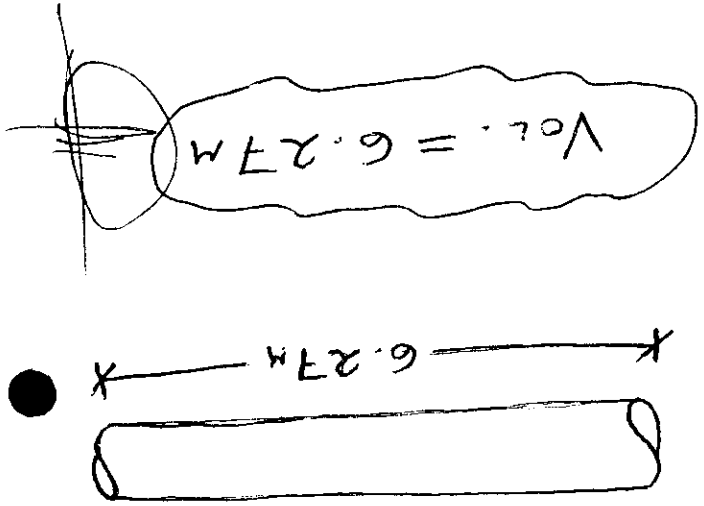
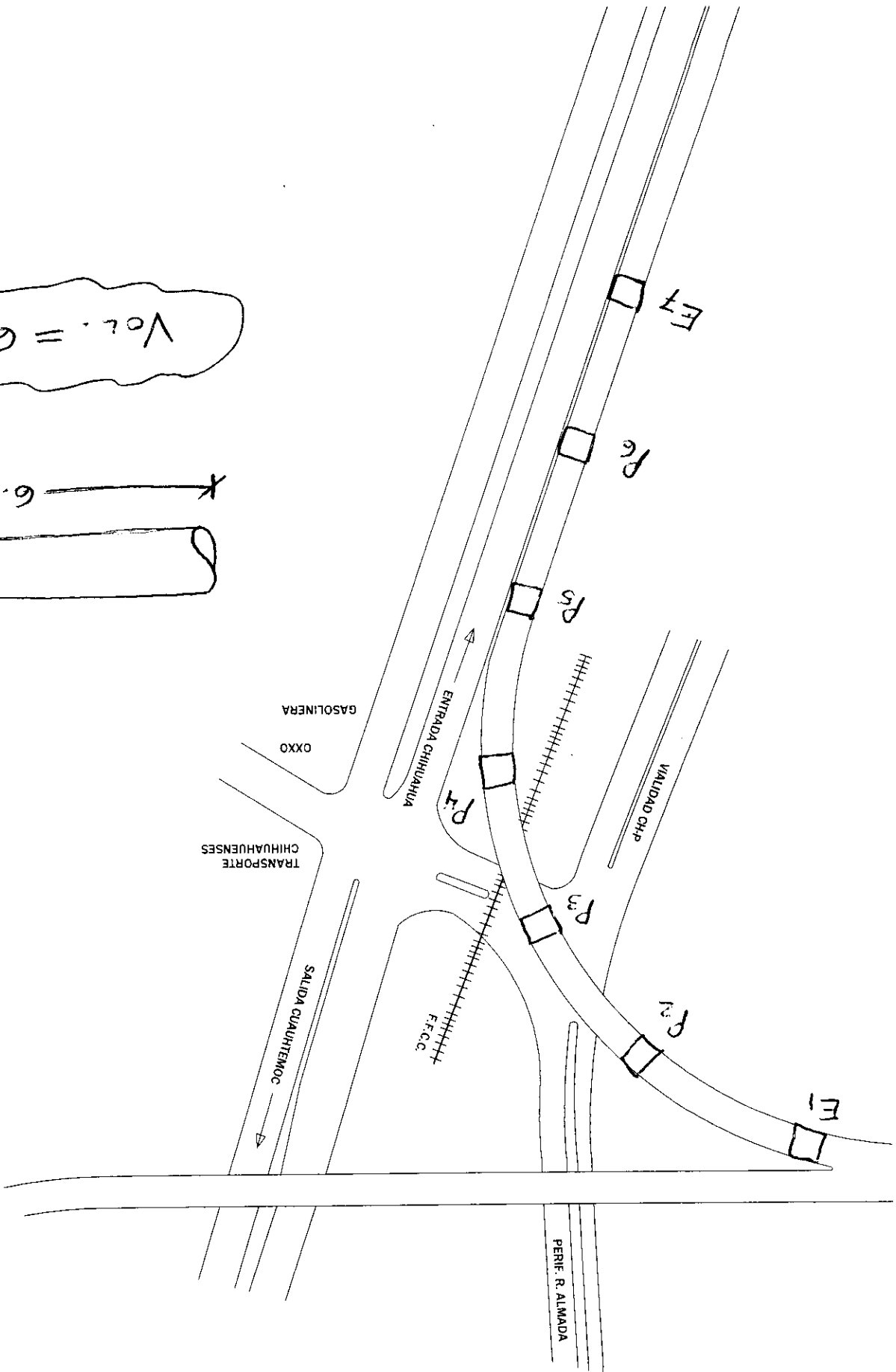
|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| Nº DE ESTIMACION: | Nº. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

[illegible]

RESIDENTE  
ING. RODOLFO ARMENDARIZ RONQUILLO

CONTRATISTA  
CONSTRUCTORA SANTA ROSALIA SA DE CV

EXI-27 SUMINISTRO DE TUBERIA 18" DIAMETRO



98

99

ING. RODOLFO ARMENDARIZ RONQUILLO

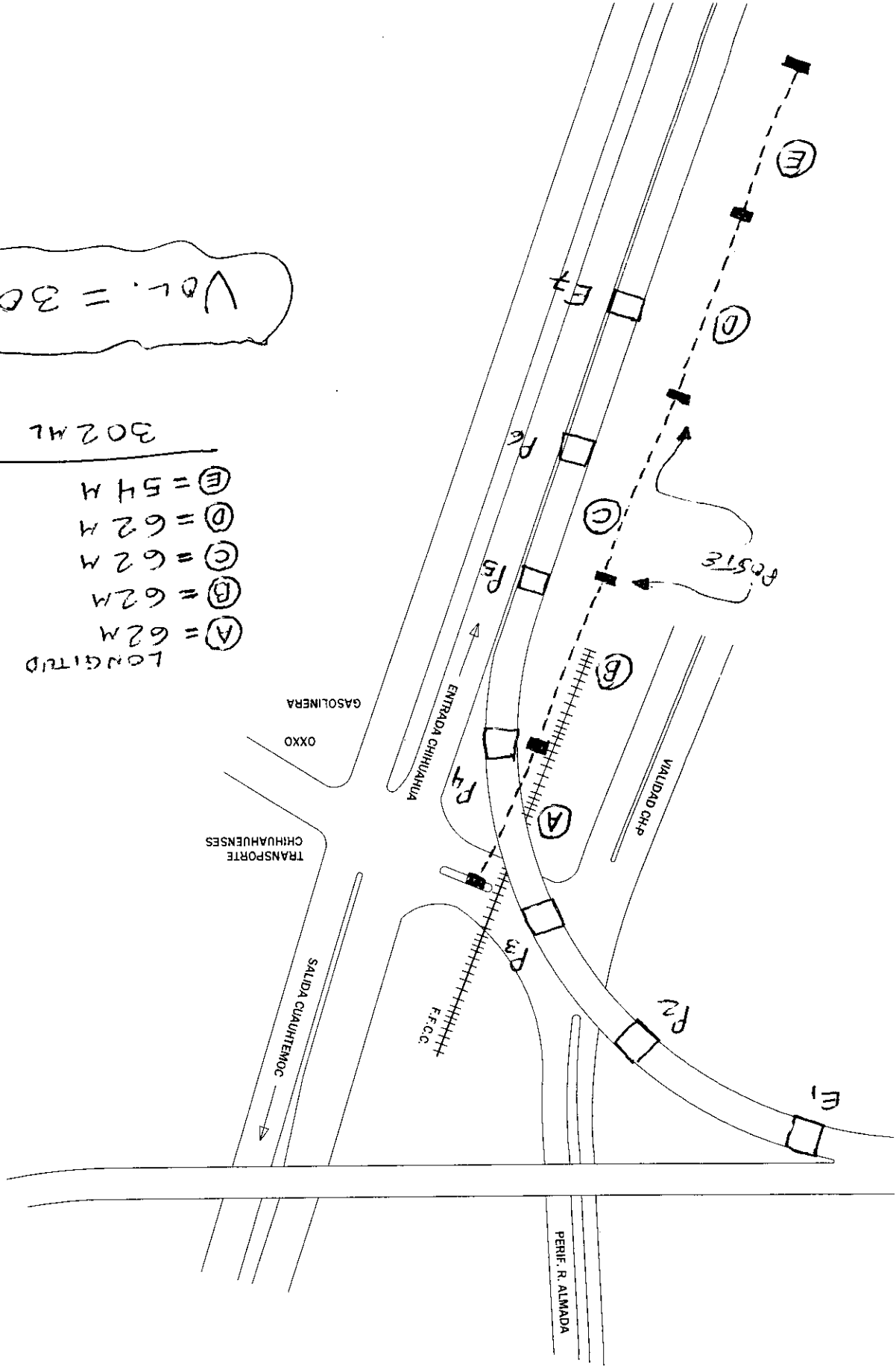
~~RESIDENTE~~

CONSTRUCTORA SANTA ROSALIA SA DE CV

/CONTRATISTA

# GENERADOR DE ESTIMACION

[illegible]



LONGITUD

(A) = 62 M

(B) = 62 M

(C) = 62 M

(D) = 62 M

(E) = 54 M

302 ML

VOL. = 302 ML



## GENERADOR DE ESTIMACION

|            |                                                                                                                                                                                                                             |              |                                                  |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------|
| CONTRATO : | 040/2016                                                                                                                                                                                                                    | TRAMO:       | Perif. Fco. R. Almada y Carretera Cd. Cuauhtemoc |
| OBRA :     | <p>Construccion del Eje Sesenta (60) del Distribuidor Vial Zootecnia, Ubicado en Entronque del Periférico Francisco R. Almada y Carretera a Cd. Cuauhtémoc, Colonia Esperanza y Zootecnia, en esta Ciudad de Chihuahua.</p> | CONTRATISTA: | CONSTRUCTORA SANTA ROSALIA SA DE CV              |

|                   |       |          |                        |
|-------------------|-------|----------|------------------------|
| NO DE ESTIMACION: | No. 6 | PERIODO: | 01 AL 15 DE JULIO 2016 |
|-------------------|-------|----------|------------------------|

[illegible]

~~RESIDENT~~

ING. RODOLFO ARMENDARIZ RONQUILLO

**CONTRATISTA**

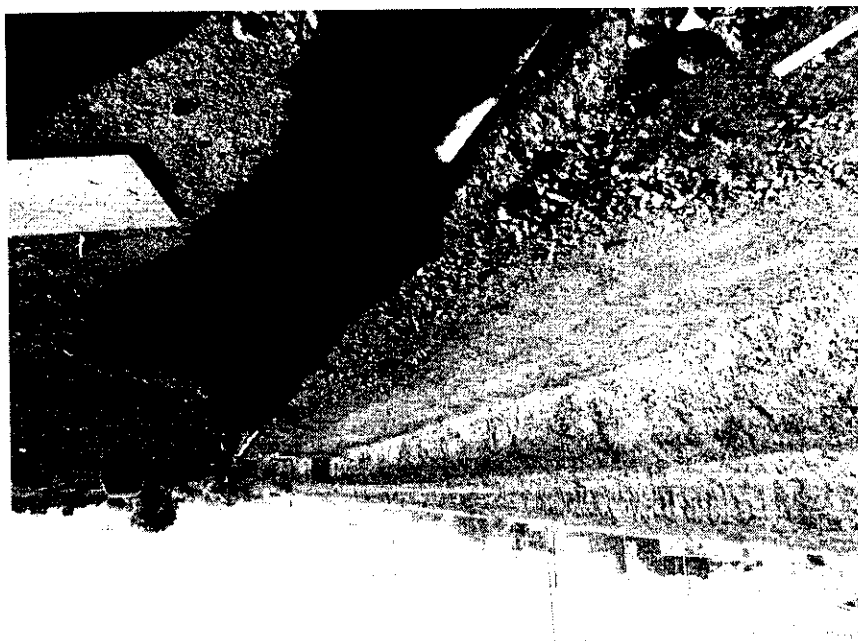
CONSTRUCTORA SANTA ROSALIA SA DE CV

3N 71N3A 03 AGUA 03 18"

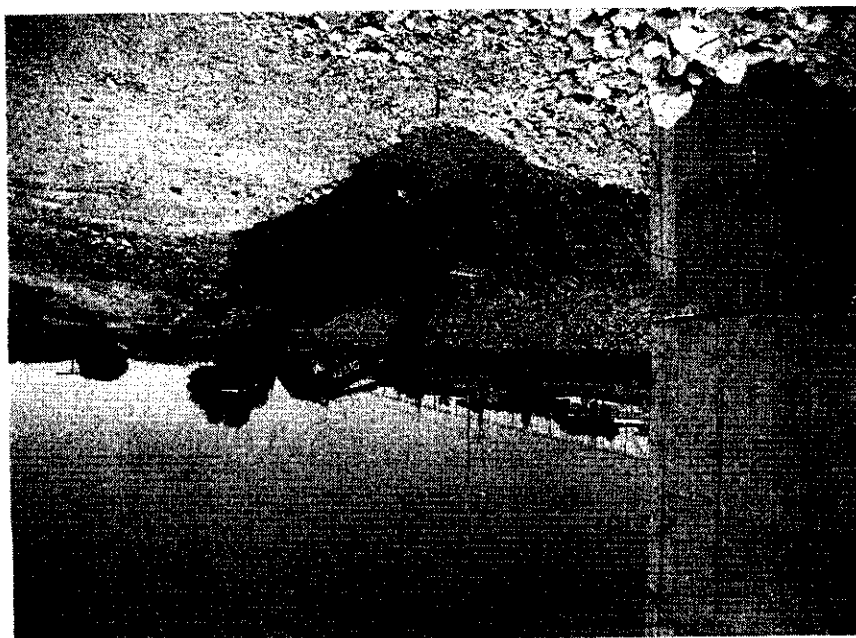


*[Handwritten signature]*

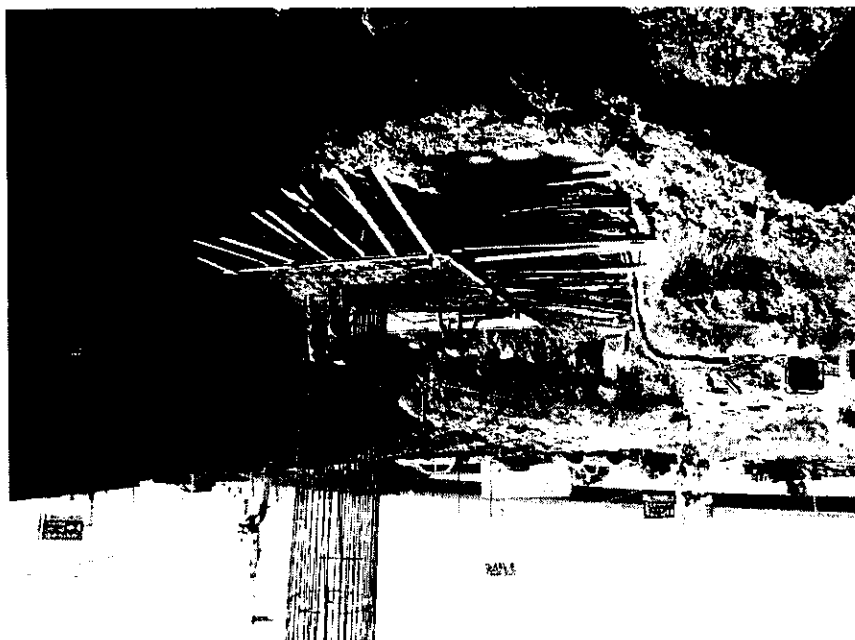
EXCAVACIONES DE ESTRUCTURAS PARA CONSTRUCCION DE DALA



EXCAVACIONES ABAJO DE LA SUBRASANTE



CONCRETO EN ZAPATAS

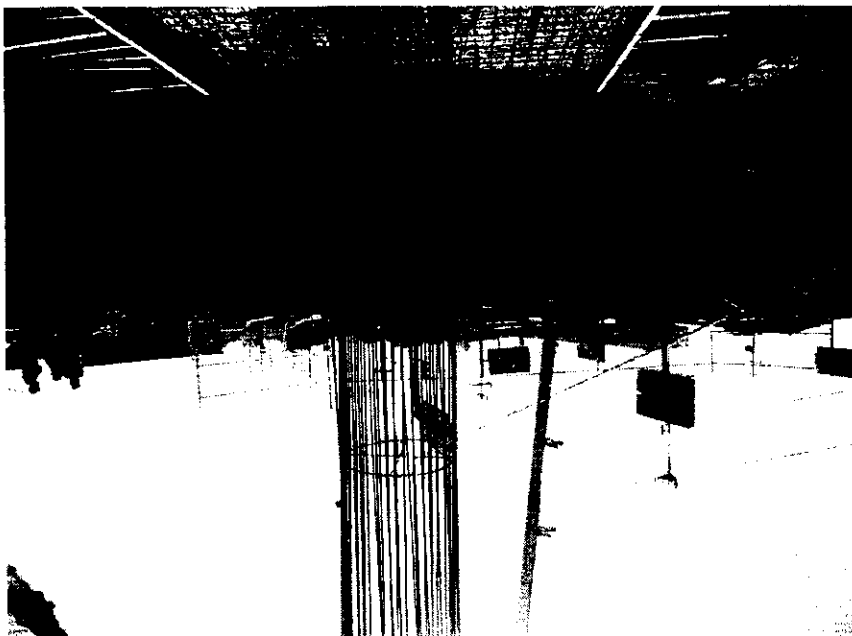


CONCRETO EN COLUMNA

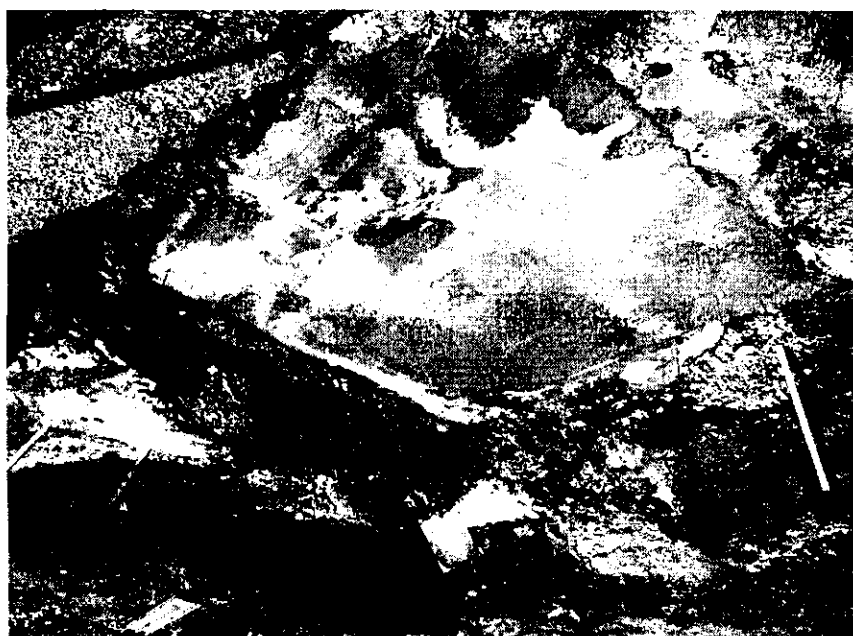


107

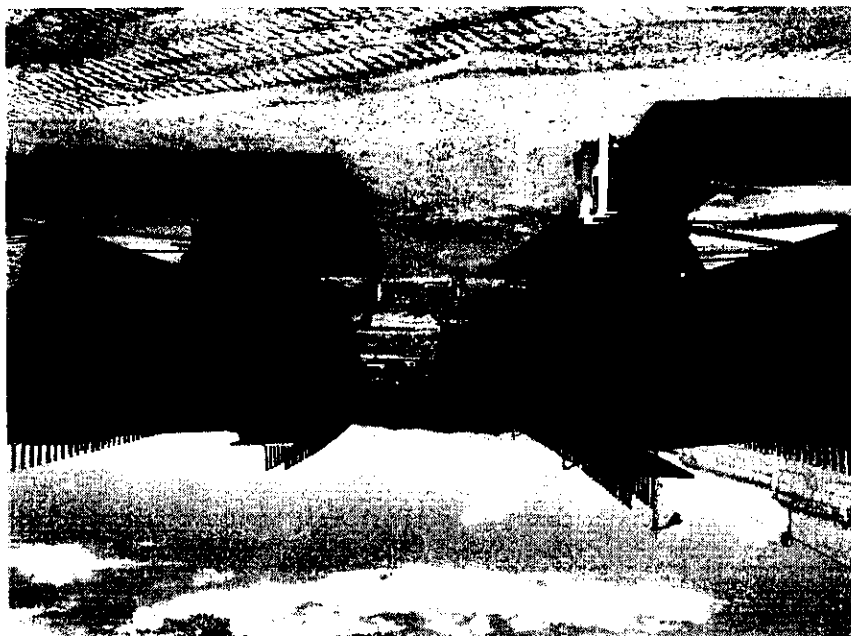
ACERO DE REFUERZO EN ZAPATA Y COLUMNA



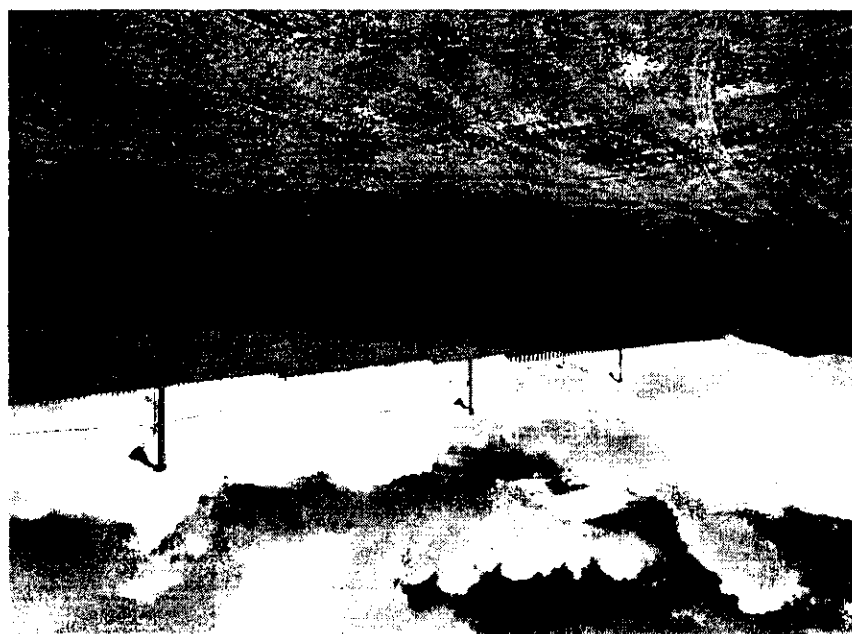
CONCRETO EN PLANTILLA



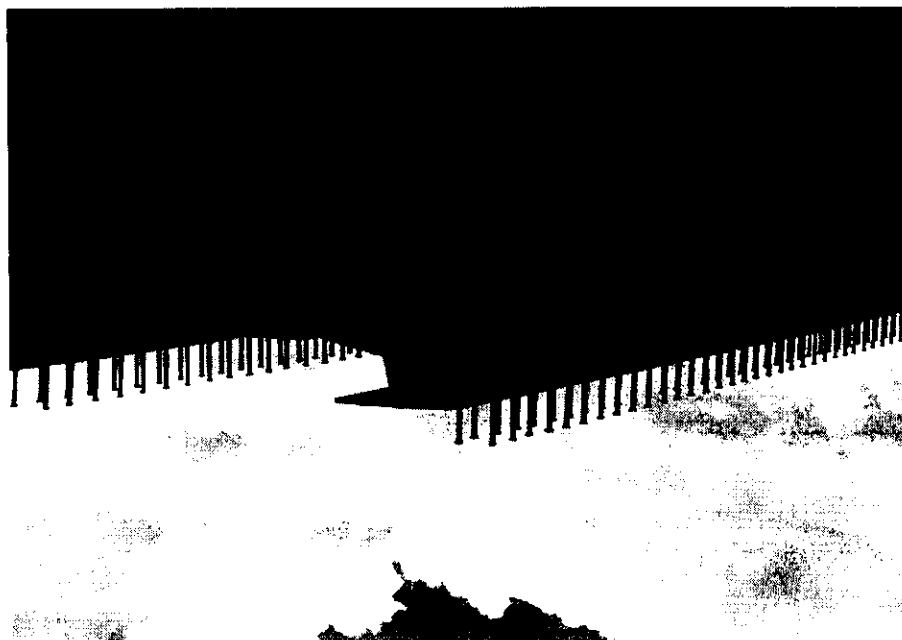
FABRICACION DE VIGAS DE ACERO



FABRICACION DE VIGAS DE ACERO



ELEMENTOS A CORTANTE



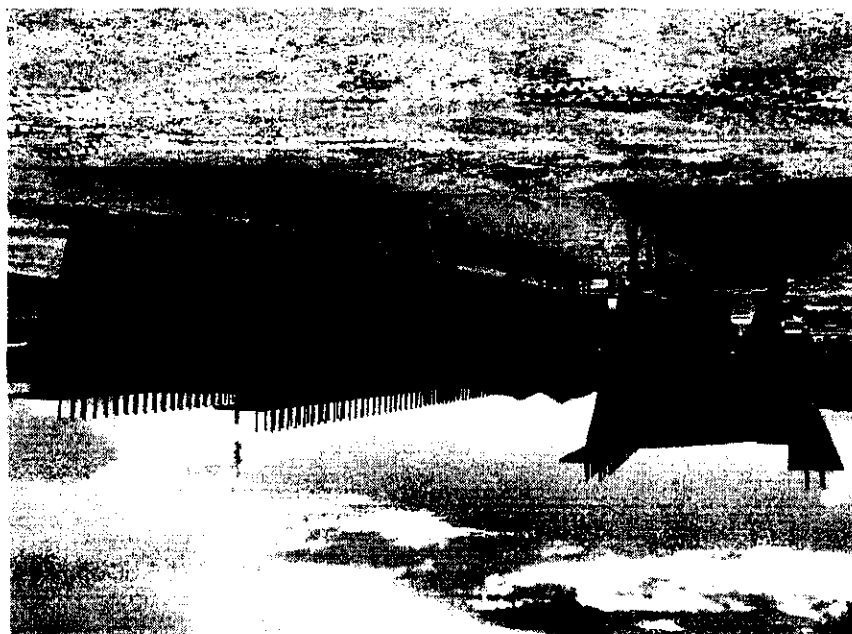
FABRICACION Y MONTAJE DE ELEMENTOS A CORTANTE



## ESCAMAS PARA TIERRA ARMADA



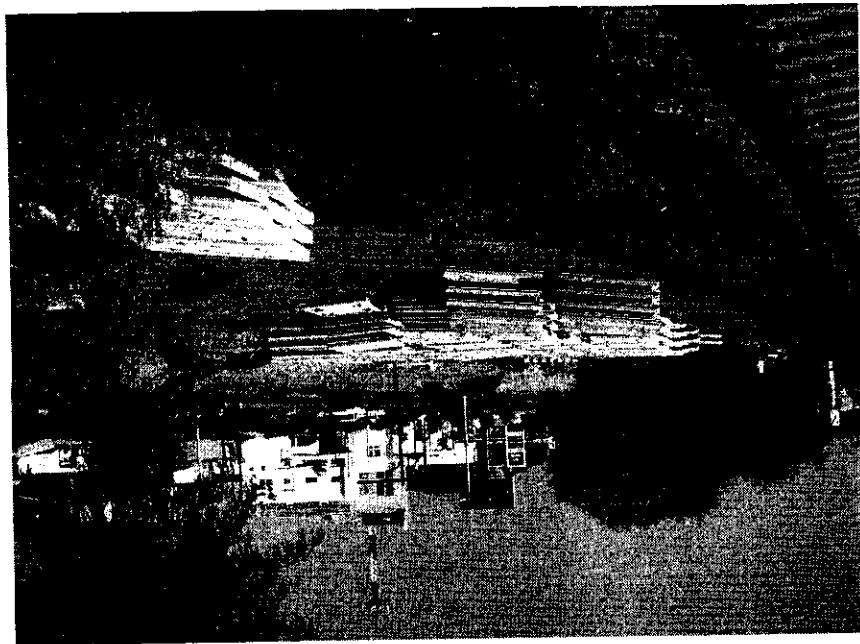
## PINTURA EN VIGAS DE ACERO



SONDEO MANUAL Y A MAQUINARIA



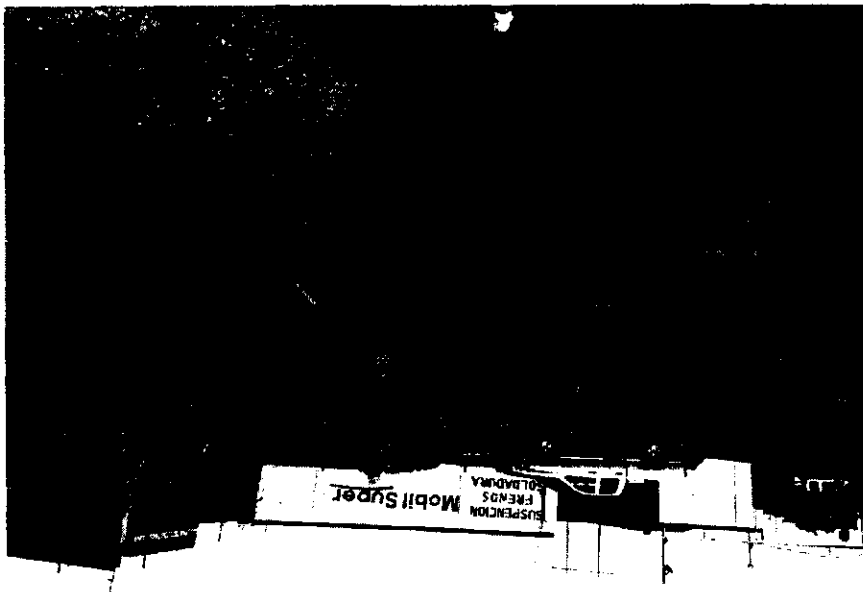
ESCAMAS PARA TIERRA ARMADA



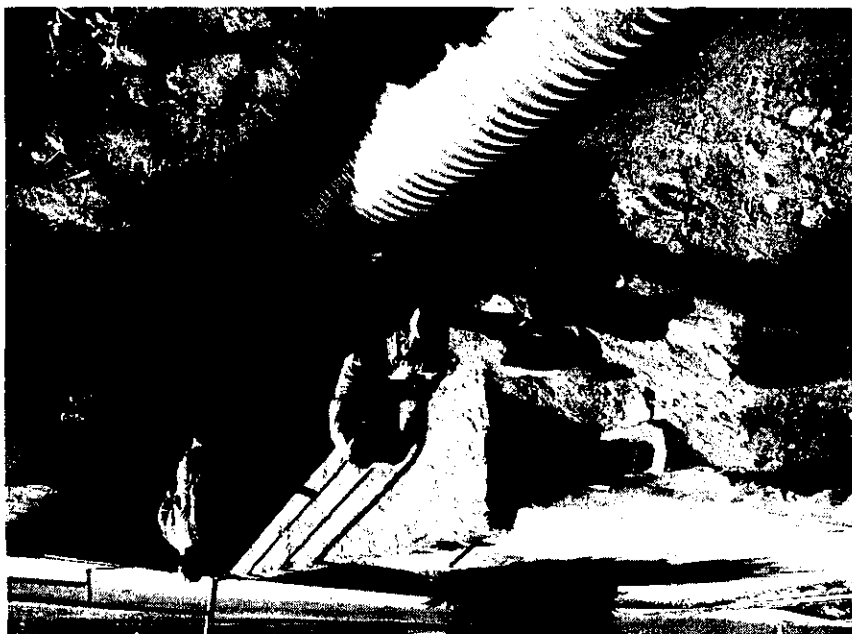
*[Handwritten signature]*

*[Handwritten signature]*

TUBERIA DE PVC DE 8" PARA DRENAJE



INSTALACION DE ALCANTARILLA DE 90 CMS



113

REUBICACION DE SID-14 DOBLE BANDERA



RETIRO DE ANUNCIO DE 6 M X 3 M



*[Handwritten signature]*

PLANTILLA Y ARROPE DE TUBERIA CON ARENA



EXCAVACION EN ZANJA





RELLENO CON MATERIAL PRODUCTO DE BANCO



RELLENO EN ZANJA CON MATERIAL PRODUCTO DE BANCO

*[Handwritten signature]*

*[Handwritten signature]*



SUMINISTRO DE GARZA DE TUBERIA DE 18"

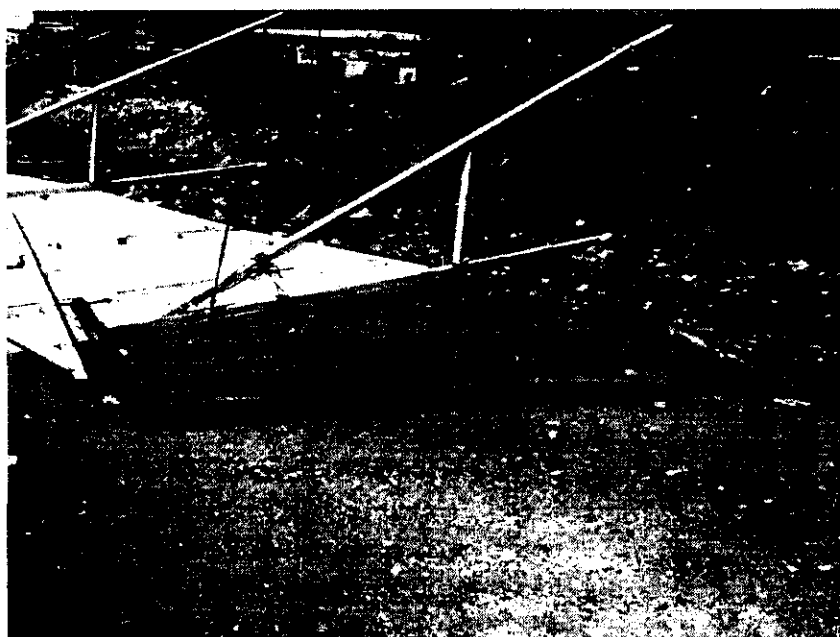


ACABADO EXTERIOR E INTERIOR EN GARZA DE ACERO DE 18"

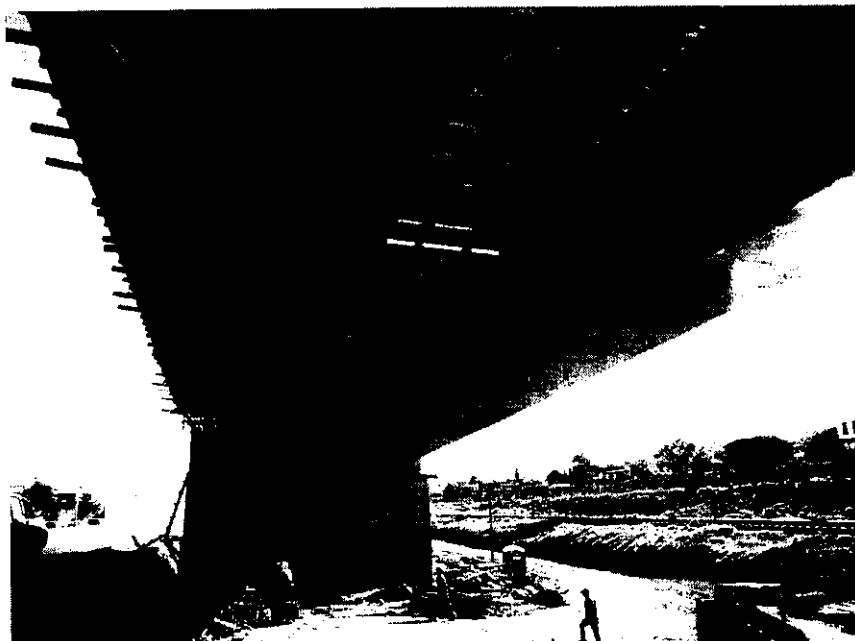
*[Handwritten signature]*



CAJA DE VALVULAS EN PILA 2



BARANDAL RETIRADO DE 2 M X 1 M DE AMPLIACION DE VIALIDAD



FABRICACION DE CONTRAVENTEOS YA INSTALADOS



CONSTRUCCIONES DE POZO DE VISITA



CONSTRUCCION DE POZOS DE VISITA

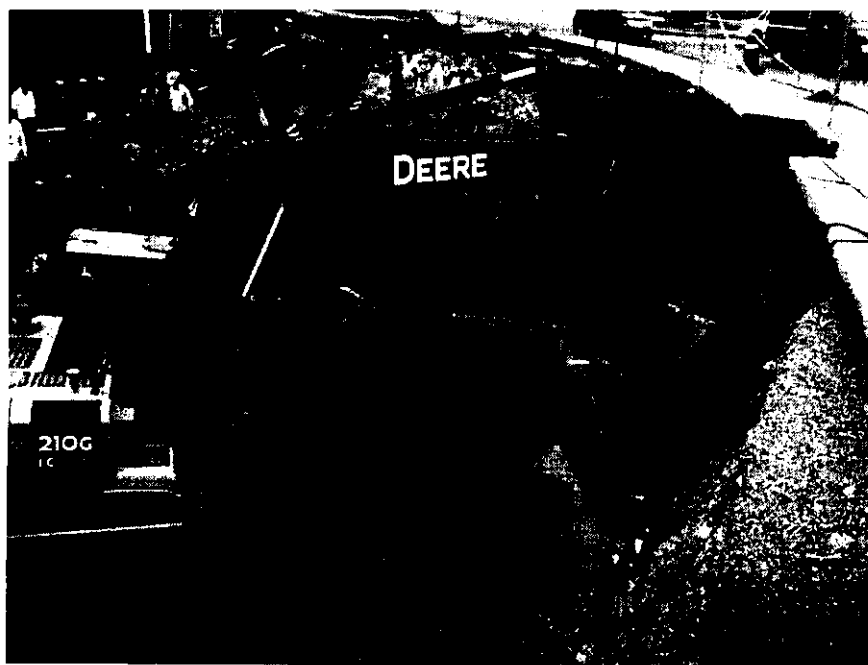


INSTALACION DE GARZA DE 8" DE AGUA POTABLE

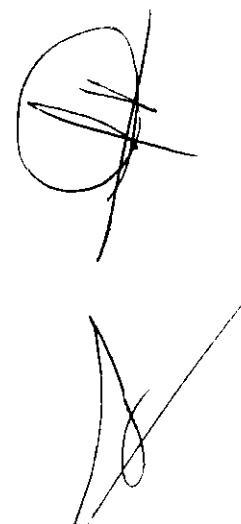




INSTALACION DE GARZA DE 8"



CONEXION DE GARZA DE 18" DE ACERO

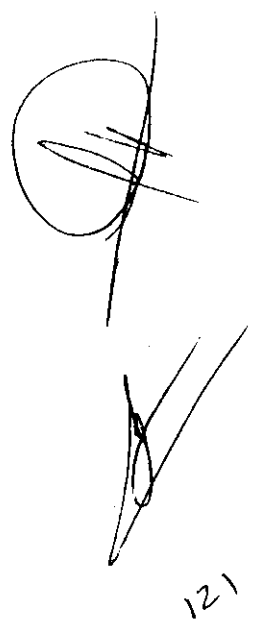
  
120



DEMOLICION DE AMPLIACION DE VIALIDAD



INSTALANDO CARPETA DE ASFALTO EN AMPLIACION

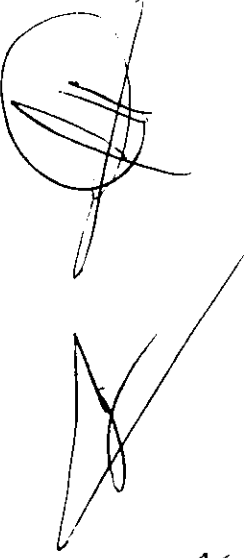
  
121



RETIRO DE ARBOL SOBRE RAMPA



RETIRO DE ARBOLES EN PILA 4

  
122



COLOCACION DE PIEDRAPLEN EN RAMPA



RETIRO DE CABLE DE TELEGRAFOS

Handwritten signature and the number 123.



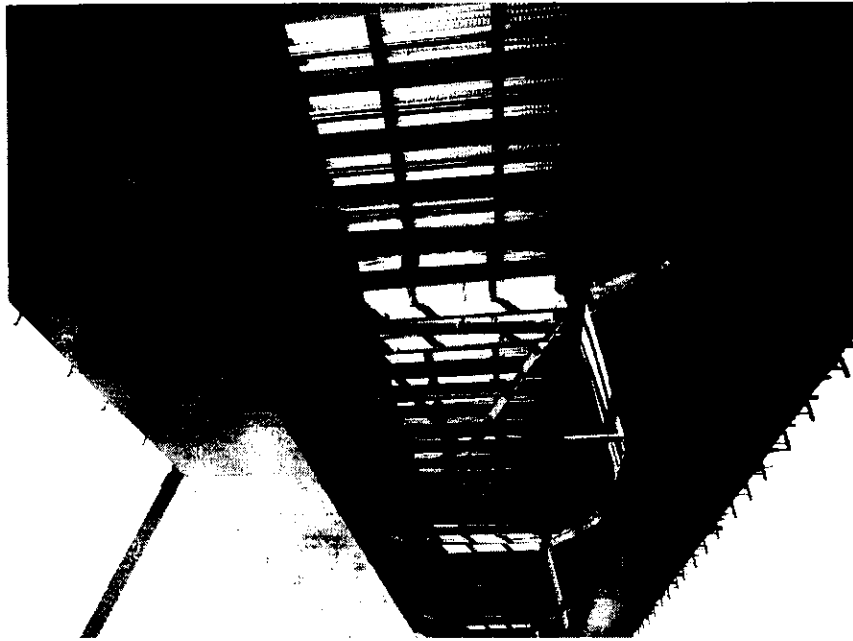
ATRAQUES DE CONCRETO EN TUBO DE 18" DE ACERO



ATRAQUES EN TUBERIA DE 18" DE ACERO

11

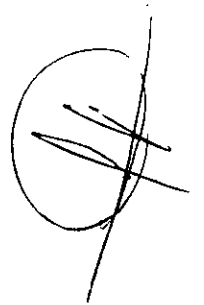
124



INSTALACION DE LAMINA PARA CIMBRA EN LOSA



CIMBRA DE LAMINA EN LOSA DE PUENTE



125



# LABORATORIO Y CONSULTORIA SA DE CV

CALLE MANUEL GARCIA GARCIA NO. 10102 COL. COL.DEPORTISTAS 6144170033 Chihuahua Chihuahua. 31125

## INFORME DE COMPACTACIONES

METODOS DE PRUEBA EMPLEADOS: ASTM-D-690, 698, 1557, 2216, 2922, 3017 VIGENTES

OBRA: 92 DISTRIBUIDOR ZOOTECHNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

REPRESENTANTE: ING. JUAN MANUEL RUACHO

LOCALIDAD: Chihuahua Chihuahua

CONTRATISTA:

Fecha de muestreo: 2016-06-23

Fecha de Informe: 2016-06-24

| No. | Ensaye                    | Estación | Lado | Profundidad<br>Sondeo (cm) | MASA VOLUMÉTRICA                |        | Humedad (%) |           | %<br>Compactación |
|-----|---------------------------|----------|------|----------------------------|---------------------------------|--------|-------------|-----------|-------------------|
|     |                           |          |      |                            | Del Lugar                       | Máxima | Optima      | Del Lugar |                   |
| 1   | Prueba: 1                 |          |      | Tipo de Capa:              | TERRENO NATURAL                 |        |             |           |                   |
|     | % Especificado: 90        |          |      | Localización:              | RAMPA ESTRIBO NO. 7 0+308 0+380 |        |             |           |                   |
|     | A                         |          | D    | 20                         | 1741                            | 1920   | 12,5        | 9,0       | 90,70             |
|     | B                         |          | C    | 20                         | 1747                            | 1920   | 12,5        | 8,7       | 91,00             |
|     | C                         |          | I    | 20                         | 1752                            | 1920   | 12,5        | 8,4       | 91,30             |
|     | Promedio de Compactación: |          |      |                            |                                 |        |             |           | 91,00             |
|     |                           |          |      |                            |                                 |        |             |           |                   |

LOS GRADOS DE COMPACTACION OBTENIDOS CUMPLEN CON EL ESPECIFICADO.

OBS:

ATENTAMENTE:

ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

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### INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

METODOS DE PRUEBA EMPLEADOS: NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

OBRA: 92 DISTRIBUIDOR ZOOTECHNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

REPRESENTANTE: ING. JUAN MANUEL RUACHO

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

CONTRATISTA:

Fecha Informe:

2016-06-24

Fecha Ruptura:

2016-06-23

| No. | CIL                                             | Edad (días) | Diam (cm) | Altura (cm) | Masa (kg) | Localidad Area (cm²) | Rev (cm) | Carga (kgf)     | Carga (N) | Resistencia (kgf/cm²) | Resistencia (kPa) | f'c Proy (kgf/cm²) | % Resis | Aditivo | Fecha      | Vibrado Tipo de Falla |
|-----|-------------------------------------------------|-------------|-----------|-------------|-----------|----------------------|----------|-----------------|-----------|-----------------------|-------------------|--------------------|---------|---------|------------|-----------------------|
| 15  | ESCAMAS                                         |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |
|     | C                                               | 28          | 15,0      | 30,0        | 12,5      | 176,6                | 11,0     | 45438           | 445610    | 257,25                | 25227,61          | 250                | 102,9   | NO      | 2016-05-26 | Si 0                  |
|     | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |
|     | RN:                                             | SI(X) NO(I) | BOMBEADO: | SI(I) NO(X) | T. MAX.:  | 19,00                | mm       | VOLUMEN COLADO: | 7,00      | m³                    | REV PROY.:        | 10+-2              | cm      |         |            |                       |
|     | 30°C                                            |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |
| 19  | ESCAMAS                                         |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |
|     | B                                               | 14          | 15,0      | 30,0        | 12,5      | 176,6                | 10,0     | 38173           | 374362    | 216,12                | 21194,13          | 250                | 86,4    | NO      | 2016-05-09 | Si 0                  |
|     | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |
|     | RN:                                             | SI(X) NO(I) | BOMBEADO: | SI(I) NO(X) | T. MAX.:  | 19,00                | mm       | VOLUMEN COLADO: | 7,00      | m³                    | REV PROY.:        | 10+-2              | cm      |         |            |                       |
|     | 33°C                                            |             |           |             |           |                      |          |                 |           |                       |                   |                    |         |         |            |                       |

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ATENTAMENTE:



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ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

## INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

METODOS DE PRUEBA EMPLEADOS: NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

REPRESENTANTE: ING. JUAN MANUEL RUACHO

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

CONTRATISTA:

Elemento

| No.                                             | CIL     | Elemento    |           | Localidad   |             |            | Equipo de Mezclado |             |          |                       | Aditivo         | Vibrado Tipo de Falla |          |                    |                    |       |
|-------------------------------------------------|---------|-------------|-----------|-------------|-------------|------------|--------------------|-------------|----------|-----------------------|-----------------|-----------------------|----------|--------------------|--------------------|-------|
|                                                 |         | Edad (días) | Diam (cm) | Altura (cm) | Masa (kg)   | Area (cm²) | Rev (cm)           | Carga (kgf) | (N)      | Resistencia (kgf/cm²) |                 |                       | (kPa)    | f'c Proy (kgf/cm²) | % Resis            | Fecha |
| 22                                              |         |             |           |             |             |            |                    |             |          |                       |                 |                       |          |                    |                    |       |
|                                                 | ESCAMAS |             |           |             |             |            |                    |             |          |                       |                 |                       |          |                    |                    |       |
|                                                 | A       | 7           | 15.0      | 30.0        | 12.5        | 176.6      | 11.0               | 29873       | 292964   | 169,13                | 16585.99        | 250                   | 67.7     | NO                 | 2016-06-14         | Si 0  |
| LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |         |             |           |             |             |            |                    |             |          |                       |                 |                       |          |                    |                    |       |
| RN:                                             |         | SI(X) NO(I) | BOMBEADO: |             | SI(I) NO(X) |            | T. MAX.:           |             | 19.00 mm |                       | VOLUMEN COLADO: |                       | 70.00 m³ |                    | REV PROY.: 10+2 cm |       |

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

**MÉTODOS DE PRUEBA EMPLEADOS:** NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

**CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.**

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

**CONTRATISTA:**

**Fecha Informe:**

2016-06-22

**Fecha Ruptura:**

2016-06-21

| No. | Elemento | Edad (días)                                     | Diam (cm) | Altura (cm) | Masa (kg)   | Localidad | Rev (cm) | Carga (kgf) | Carga (N)       | Resistencia (kgf/cm²) | Resistencia (kPa) | f'c Proy (kgf/cm²) | % Resis    | Aditivo | Fecha      | Vibrado Tipo de Falla |
|-----|----------|-------------------------------------------------|-----------|-------------|-------------|-----------|----------|-------------|-----------------|-----------------------|-------------------|--------------------|------------|---------|------------|-----------------------|
| 13  | CIL      |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | ESCAMAS  |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | C        | 28                                              | 15,0      | 30,0        | 12,5        | 176,6     | 11,0     | 45978       | 450906          | 260,31                | 25527,69          | 250                | 104,1      | NO      | 2016-05-24 | Si                    |
|     |          | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | RN:      | SI(X) NO(I)                                     | BOMBEADO: |             | SI(I) NO(X) | T. MAX.:  | 19,00    | mm          | VOLUMEN COLADO: |                       | 7,00              | m³                 | REV PROY.: | 10+-2   | cm         |                       |
|     | 30°C     |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
| 18  | CABEZAL  |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | B        | 14                                              | 15,0      | 30,0        | 12,5        | 176,6     | 10,0     | 39415       | 386542          | 223,15                | 21883,54          | 250                | 89,3       | NO      | 2016-06-07 | Si                    |
|     |          | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | RN:      | SI(X) NO(I)                                     | BOMBEADO: |             | SI(X) NO(I) | T. MAX.:  | 19,00    | mm          | VOLUMEN COLADO: |                       | 35,00             | m³                 | REV PROY.: | 14      | cm         |                       |
|     | 32°C     |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
| 20  | ZAPATA   |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | A        | 7                                               | 15,0      | 30,0        | 12,5        | 176,6     | 10,0     | 31003       | 304046          | 175,53                | 17213,61          | 250                | 70,2       | NO      | 2016-06-14 | Si                    |
|     |          | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | RN:      | SI(X) NO(I)                                     | BOMBEADO: |             | SI(I) NO(X) | T. MAX.:  | 19,00    | mm          | VOLUMEN COLADO: |                       | 70,00             | m³                 | REV PROY.: | 10+-2   | cm         |                       |
|     | 38°C     |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
| 21  | ZAPATA   |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | A        | 7                                               | 15,0      | 30,0        | 12,5        | 176,6     | 11,0     | 30761       | 301673          | 174,16                | 17079,26          | 250                | 69,7       | NO      | 2016-06-14 | Si                    |
|     |          | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |
|     | RN:      | SI(X) NO(I)                                     | BOMBEADO: |             | SI(I) NO(X) | T. MAX.:  | 19,00    | mm          | VOLUMEN COLADO: |                       | 70,00             | m³                 | REV PROY.: | 10+-2   | cm         |                       |
|     | 38°C     |                                                 |           |             |             |           |          |             |                 |                       |                   |                    |            |         |            |                       |

ATENTAMENTE:

Este informe solo afecta a los especímenes y/o muestras sometidas a prueba.

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ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

**MÉTODOS DE PRUEBA EMPLEADOS:** NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

**CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.**

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

**LOCALIDAD: CHIHUAHUA, CHIHUAHUA.**

**CONTRATISTA:**

**Fecha Informe:**

2016-06-17

**Fecha Ruptura:**

2016-06-16

| No. | CIL | Elemento                                       | Edad (días) | Diam (cm) | Altura (cm) | Masa (kg) | Localidad | Rev (cm) | Carga (kgf)     | Carga (N) | Resistencia (kgf/cm²) | Resistencia (kPa) | f'c Proy (kgf/cm²) | % Resis | Aditivo | Fecha      | Vibrado Tipo de Falla |
|-----|-----|------------------------------------------------|-------------|-----------|-------------|-----------|-----------|----------|-----------------|-----------|-----------------------|-------------------|--------------------|---------|---------|------------|-----------------------|
| 17  |     | ESCAMAS                                        | 14          | 15,0      | 30,0        | 12,5      | 176,6     | 11,0     | 39100           | 383453    | 221,37                | 21708,98          | 250                | 88,5    | NO      | 2016-06-02 | 0                     |
|     |     | B                                              |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |
|     |     | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |
|     |     | RN:                                            | SI(X) NO()  | BOMBEADO: | SI() NO(X)  | T. MAX.:  |           | 19,00 mm | VOLUMEN COLADO: | 5,00 m³   | REV PROJ.:            | 10+2 cm           |                    |         |         |            |                       |
|     |     | 31°C                                           |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |
| 19  |     | ESCAMAS                                        | 7           | 15,0      | 30,0        | 12,5      | 176,6     | 10,0     | 30154           | 295720    | 170,72                | 16741,91          | 250                | 68,3    | NO      | 2016-06-09 | 0                     |
|     |     | A                                              |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |
|     |     | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |
|     |     | RN:                                            | SI(X) NO()  | BOMBEADO: | SI() NO(X)  | T. MAX.:  |           | 19,00 mm | VOLUMEN COLADO: | 7,00 m³   | REV PROJ.:            | 10+2 cm           |                    |         |         |            |                       |
|     |     | 33°C                                           |             |           |             |           |           |          |                 |           |                       |                   |                    |         |         |            |                       |

**ATENTAMENTE:**

Este informe solo afecta a los especímenes y/o muestras sometidas a prueba.

Prohibida la reproducción total o parcial de este informe sin la autorización del laboratorio.

**ING. MYRNA IBARRA APARICIO**  
**GERENTE TECNICO**

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

**MÉTODOS DE PRUEBA EMPLEADOS: NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE**

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

**CONTRATISTA:**

**Fecha Informe:**

2016-06-15

**Fecha Ruptura:**

2016-06-14

| No.                                             | CIL       | Elemento  | Edad<br>(días) | Diam<br>(cm) | Altura<br>(cm) | Masa<br>(kg) | Localidad      | Rev<br>(cm) | Carga<br>(kgf)  | Carga<br>(N) | Resistencia<br>(kgf/cm²) | Resistencia<br>(kPa) | f'c Proy<br>(kgf/cm²) | % Resis | Aditivo | Fecha      | Vibrado<br>Tipo de<br>Falla |
|-------------------------------------------------|-----------|-----------|----------------|--------------|----------------|--------------|----------------|-------------|-----------------|--------------|--------------------------|----------------------|-----------------------|---------|---------|------------|-----------------------------|
| 18                                              |           | CABEZAL   |                |              |                |              | PILA 5         |             |                 |              |                          | GCC                  |                       |         | NO      |            | Si                          |
| A                                               |           | 7         |                | 15,0         | 30,0           | 12,5         | 176,6          | 10,0        | 29475           | 289061       | 166,87                   | 16364,36             | 250                   | 66,7    |         | 2016-06-07 | 0                           |
| LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |           |           |                |              |                |              |                |             |                 |              |                          |                      |                       |         |         |            |                             |
| RN:                                             | SIX) NO() | BOMBEADO: |                |              | SI(X) NO()     |              | T. MAX.: _____ | 19,00 mm    | VOLUMEN COLADO: |              | 35,00 m³                 | REV PROY.: _____     |                       | 14 cm   |         |            |                             |
| 32°C                                            |           |           |                |              |                |              |                |             |                 |              |                          |                      |                       |         |         |            |                             |

ATENTAMENTE:

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ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

**MÉTODOS DE PRUEBA EMPLEADOS: NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE**

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

**CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.**

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

**LOCALIDAD: CHIHUAHUA, CHIHUAHUA.**

**CONTRATISTA:**

**Fecha Informe:**

2016-06-23

**Fecha Ruptura:**

2016-06-22

| No.  | Elemento                                        |             | Localidad |             |            | Equipo de Mezclado |          |             |           | Aditivo               |                   | Vibrado Tipo de Falla |                    |            |            |
|------|-------------------------------------------------|-------------|-----------|-------------|------------|--------------------|----------|-------------|-----------|-----------------------|-------------------|-----------------------|--------------------|------------|------------|
|      | CIL                                             | Edad (días) | Diam (cm) | Altura (cm) | Masa (kg)  | Area (cm²)         | Rev (cm) | Carga (kgf) | Carga (N) | Resistencia (kgf/cm²) | Resistencia (kPa) |                       | f'c Proy (kgf/cm²) | % Resis    | Fecha      |
| 14   | ESTRIBO 1                                       |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |
|      | C                                               | 28          | 15,0      | 30,0        | 12,5       | 176,6              | 10,0     | 47003       | 460958    | 266,11                | 26096,48          | 250                   | 106,4              | 2016-05-25 |            |
|      | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |
|      | RN:                                             | SI(X) NO()  | BOMBEADO: |             | SI() NO(X) | T. MAX.:           |          | 19,00       | mm        | VOLUMEN COLADO:       |                   | 7,00                  | m³                 | REV PROJ.: | 10+-2      |
| 30°C |                                                 |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |
| 23   | SECCION 1 PILA 4                                |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |
|      | COLUMNA                                         | A           | 7         | 15,0        | 30,0       | 12,5               | 176,6    | 12,0        | 32075     | 314559                | 181,59            | 17807,90              | 250                | 72,6       | 2016-06-15 |
|      | LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |
|      | RN:                                             | SI(X) NO()  | BOMBEADO: |             | SI(X) NO() | T. MAX.:           |          | 19,00       | mm        | VOLUMEN COLADO:       |                   | 9,00                  | m³                 | REV PROJ.: | 14         |
| 40°C |                                                 |             |           |             |            |                    |          |             |           |                       |                   |                       |                    |            |            |

**ATENTAMENTE:**

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ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

**MÉTODOS DE PRUEBA EMPLEADOS:** NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

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LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE.

|     |             |           |             |          |       |    |                 |      |    |            |      |    |
|-----|-------------|-----------|-------------|----------|-------|----|-----------------|------|----|------------|------|----|
| RN: | SI(X) NO(I) | BOMBEADO: | SI( ) NO(X) | T. MAX.: | 19,00 | mm | VOLUMEN COLADO: | 7,00 | m³ | REV PROJ.: | 10+2 | cm |
|-----|-------------|-----------|-------------|----------|-------|----|-----------------|------|----|------------|------|----|

32°C

**ATENTAMENTE:**

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**ING. MYRNA IBARRA APARICIO**  
**GERENTE TECNICO**

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

**MÉTODOS DE PRUEBA EMPLEADOS:** NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCE

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

**CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.**

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

**CONTRATISTA:**

**Fecha Informe:**

2016-06-28

**Fecha Ruptura:**

2016-06-27

| No.                                             | Elemento | Localidad   |           |                       | Equipo de Mezclado |                   |          |                         | Aditivo | Vibrado             |          |                       |                    |            |       |
|-------------------------------------------------|----------|-------------|-----------|-----------------------|--------------------|-------------------|----------|-------------------------|---------|---------------------|----------|-----------------------|--------------------|------------|-------|
|                                                 |          | Edad (días) | Diam (cm) | Altura (cm)           | Masa (kg)          | Area (cm²)        | Rev (cm) | Carga (kgf)             |         |                     | (N)      | Resistencia (kgf/cm²) | f'c Proy (kgf/cm²) | % Resis    | Fecha |
| 24                                              | CIL      |             |           |                       |                    |                   |          |                         |         |                     |          |                       |                    |            |       |
|                                                 | ESCAMAS  |             |           |                       |                    |                   |          |                         |         |                     |          |                       |                    |            |       |
|                                                 | A        | 7           | 15,0      | 30,0                  | 12,5               | 176,6             | 10,0     | 29077                   | 285158  | 164,62              | 16143,71 | 250                   | 65,8               | 2016-06-20 | 0     |
| LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE. |          |             |           |                       |                    |                   |          |                         |         |                     |          |                       |                    |            |       |
| RN:                                             |          | S(X) NO( )  |           | BOMBEADO: SI( ) NO(X) |                    | T. MAX.: 19,00 mm |          | VOLUMEN COLADO: 7,00 m³ |         | REV PROY.: 10+-2 cm |          |                       |                    |            |       |
| 33°C                                            |          |             |           |                       |                    |                   |          |                         |         |                     |          |                       |                    |            |       |

**ATENTAMENTE:**

Este informe tiene anexa a los suplementos, y materiales complementarios a prueba.

Prohibida la reproducción total o parcial de este informe sin la autorización del laboratorio.

ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

# INFORME DE RESISTENCIA A LA COMPRESION DE CILINDROS DE CONCRETO

MÉTODOS DE PRUEBA EMPLEADOS: NMX-C-083-2014, 109-2013, 156-2010, 160-2004, 161-2013, 435-2010 ONNCCCE

OBRA: 92 DISTRIBUIDOR ZOOTECNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

**REPRESENTANTE: ING. JUAN MANUEL RUACHO**

LOCALIDAD: CHIHUAHUA, CHIHUAHUA.

**CONTRATISTA:**

**Elemento**

| No. | CIL    | Edad<br>(días) | Diam<br>(cm) | Altura<br>(cm) | Masa<br>(kg) | LOCANDIA | Rev<br>(cm) | Carga<br>(kgf) | Carga<br>(N) | Resistencia<br>(kgf/cm <sup>2</sup> ) | kPa    | f c Proy<br>(kgf/cm <sup>2</sup> ) | % Resis | Aditivo | Fecha      | Vibrado<br>Tipo de<br>Falla |
|-----|--------|----------------|--------------|----------------|--------------|----------|-------------|----------------|--------------|---------------------------------------|--------|------------------------------------|---------|---------|------------|-----------------------------|
| 20  | ZAPATA | B              | 14           | 15,0           | 30,0         | 12,5     | 176,6       | 10,0           | 38368        | 376274                                | 217,22 | 21302,01                           | 250     | NO      | 2016-06-14 | Si                          |
|     |        |                |              |                |              |          | PILA 2      |                |              |                                       | GCC    |                                    |         |         |            | 0                           |

38°C

21

**ZAPATA**



PILA 2

176.6

LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE.

RN:  
38°C

22

**ESCAMAS**



176,6

LA RESISTENCIA OBTENIDA SE CONSIDERA ACEPTABLE

38°C  
RN:

38°C

ATENTAMENTE.

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ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO

### INFORME DE COMPACTACIONES

METODOS DE PRUEBA EMPLEADOS: ASTM-D-690, 698, 1557, 2216, 2922, 3017 VIGENTES

OBRA: 85 DISTRIBUIDOR VIAL ZOOTECHNIA EJE 60

CLIENTE: CONSTRUCTORA SANTA ROSALIA S.A. DE C.V.

REPRESENTANTE: ING. JUAN MANUEL RUACHO

LOCALIDAD: Chihuahua Chihuahua

CONTRATISTA:

Fecha de muestreo: 2016-06-02

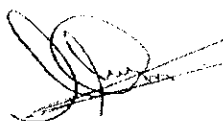
Fecha de Informe: 2016-06-03

| No.                       | Ensaye             | Estación | Lado | Profundidad<br>Sondeo (cm) | MASA VOLUMÉTRICA                 |        | Humedad (%) |           | %<br>Compactación |
|---------------------------|--------------------|----------|------|----------------------------|----------------------------------|--------|-------------|-----------|-------------------|
|                           |                    |          |      |                            | Del Lugar                        | Máxima | Optima      | Del Lugar |                   |
| 3                         | Prueba: 1          |          |      |                            | Tipo de Capa: TERRENO NATURAL    |        |             |           |                   |
|                           | % Especificado: 95 |          |      |                            | Localización: AMPLIACION DE VIAS |        |             |           |                   |
|                           | A                  |          | D    | 20                         | 1830                             | 1900   | 10,9        | 8,2       | 96,30             |
|                           | B                  |          | C    | 20                         | 1820                             | 1900   | 10,9        | 8,7       | 95,80             |
| Promedio de Compactación: |                    |          |      |                            |                                  |        | 96,05       |           |                   |

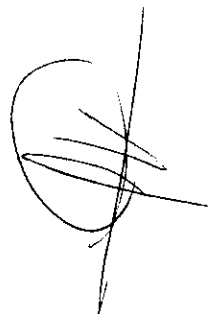
LOS GRADOS DE COMPACTACION OBTENIDOS CUMPLEN CON EL ESPECIFICADO.

AS:

ATENTAMENTE:



ING. MYRNA IBARRA APARICIO  
GERENTE TECNICO




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