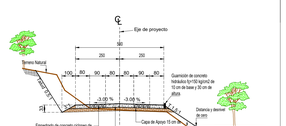
## DATOS DE PROYECTO

CAMINO TIPO " ARTESANAL "

| VELOCIDAD DE PROYECTO | ANCHO DE CORONA | ANCHO DE CALZADA |
|---|---|---|
| 30 km/h | 5.00 m. | 5.00 m. |
| **CURVATURA MAXIMA** | **PENDIENTE MAXIMA** | **PENDIENTE GOBERNADORA** |
| 70°00'00" | 16.0 % | 8.00% |

## S E C C I O N  T I P O




## SIMBOLOGIA

BANCOS DE NIVEL

ORILLA DE CAMINO EXISTENTE

HOMBRO
EJE DEL CAMINO
HOMBRO

OBRA DE DRENAJE

CURVA DE NIVEL ORDINARIA

CURVA DE NIVEL MAESTRA A CADA 5 MTS

NUMERO DE CURVA

KILOMETRAJE

PUNTO DE REFERENCIA

POSTE DE C.F.E.

TIRANTE (ARRIMEITIDA DE POSTE)

Camino: CONSTRUCCIÓN DE LA CARRETERA SIN NOMBRE CON CONCRETO HIDRÁULICO DE SANTA MARÍA TLAHUITOLTEPEC - FLORES, TRAMO DEL KM 0+000 AL KM 10+200, SUBTRAMO DEL KM 0+000 AL KM 1+000, EN EL MUNICIPIO DE SANTA MARÍA TLAHUITOLTEPEC. SUBTRAMO DEL KM 0+695.00 AL KM 1+700.00

# PLANTA TOPOGRÁFICA
# DEL KM. 0+695.00 AL KM. 1+700.00

PROYECTO:

DIRECCION DE PROYECTOS Y CONTROL DE CALIDAD

REVISÓ:

CAMINOS BIENESTAR

| JEFE DE LA UNIDAD DE ESTUDIOS Y PROYECTOS | DIRECTOR DE PROYECTOS Y CONTROL DE CALIDAD | EL DIRECTOR GENERAL |
|---|---|---|
| Cédula Profesional 8652384 ING. JAIRO RAMIREZ REYES | Cédula Profesional 12890930 ING. ALVARO PEREZ HERNANDEZ | ING. MOISES SALAZAR MARTINEZ |

| 2025 | Escala 1:1,000 | Plano 1 DE 4 |
|---|---|---|

## COORDENADAS DEL EJE DE TRAZO

| ESTACION | PUNTO OBSERVADO | SUBTANGENTE ATRAS | TANGENTE | SUBTANGENTE ADELANTE | DISTANCIA | DEFLEXIONES ° ' " | SENTIDO | RUMBO ° ' " | COSENO | SENO | +N | −S | +E | −W | PROYECCIONES NORTE | ESTE | COORDENADAS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NORTE | | | | | | | 00° 00' 00.00 " | | | | | | | 1899697.338 | 812050.921 | |
| 0+680.00 | 0+699.61 | -680.000 | 680.600 | 19.015 | 19.615 | | | S 16° 06' 00.00 " E | 0.96078 | 0.27731 | 0.00 | 18.85 | 5.44 | 0.00 | 1899678.488 | 812056.361 | |
| 0+699.61 | 0+724.96 | 19.015 | 1.020 | 6.170 | 26.205 | 29° 44' 14.00 " | DER | S 13° 38' 31.20 " W | 0.97179 | 0.23585 | 0.00 | 25.47 | 6.18 | 0.00 | 1899653.018 | 812050.181 | |
| 0+724.96 | 0+759.50 | 6.170 | 15.390 | 13.173 | 34.733 | 25° 05' 45.00 " | IZQ | S 11° 27' 10.80 " E | 0.98039 | 0.19856 | 0.00 | 34.04 | 6.90 | 0.00 | 1899618.978 | 812057.081 | |
| 0+759.50 | 0+829.07 | 13.173 | 35.640 | 21.455 | 70.268 | 32° 04' 05.00 " | DER | S 20° 36' 54.00 " W | 0.93597 | 0.35209 | 0.00 | 65.77 | 0.00 | 24.74 | 1899553.208 | 812032.341 | |
| 0+829.07 | 0+869.76 | 21.455 | 16.520 | 7.638 | 40.613 | 04° 28' 29.00 " | DER | S 87° 05' 24.00 " W | 0.05577 | 0.99871 | 0.00 | 2.32 | 0.00 | 40.55 | 1899550.888 | 811986.791 | |
| 0+869.76 | 0+911.92 | 7.638 | 16.610 | 17.913 | 42.161 | 03° 49' 04.00 " | IZQ | S 83° 16' 19.20 " W | 0.11716 | 0.99311 | 0.00 | 4.945 | 0.00 | 41.87 | 1899545.948 | 811944.921 | |
| 0+911.92 | 0+957.59 | 17.913 | 8.960 | 28.207 | 55.080 | 99° 04' 30.73 " | IZQ | S 15° 48' 10.80 " E | 0.96220 | 0.27253 | 0.00 | 3.002 | 15.00 | 0.00 | 1899492.948 | 811959.921 | |
| 0+957.59 | 1+007.63 | 28.207 | 16.030 | 17.704 | 59.941 | 80° 51' 00.00 " | DER | S 60° 05' 49.20 " W | 0.42029 | 0.90779 | 0.00 | 5.193 | 0.00 | 54.39 | 1899467.758 | 811905.531 | |
| 1+007.63 | 1+038.40 | 17.704 | 10.250 | 7.666 | 35.620 | 73° 52' 47.00 " | IZQ | S 08° 43' 58.80 " E | 0.98841 | 0.15183 | 0.00 | 5.218 | 5.41 | 0.00 | 1899432.548 | 811910.941 | |
| 1+038.40 | 1+122.51 | 7.666 | 46.030 | 30.444 | 84.120 | 04° 12' 36.00 " | DER | S 04° 31' 08.40 " E | 0.99689 | 0.07879 | 0.00 | 3.865 | 6.63 | 0.00 | 1899348.688 | 811917.571 | |
| 1+122.51 | 1+197.89 | 30.444 | 23.230 | 25.147 | 78.821 | 46° 54' 57.00 " | DER | S 42° 23' 49.20 " W | 0.73849 | 0.67426 | 0.00 | 8.21 | 0.00 | 53.15 | 1899290.478 | 811864.421 | |
| 1+197.89 | 1+239.64 | 25.147 | 7.210 | 15.834 | 48.191 | 70° 09' 23.00 " | IZQ | N 67° 28' 49.20 " W | 0.38354 | 0.92353 | 18.48 | 0.00 | 0.00 | 44.51 | 1899308.958 | 811819.911 | |
| 1+239.64 | 1+289.19 | 15.834 | 12.270 | 22.719 | 50.823 | 39° 31' 18.00 " | IZQ | N 73° 07' 51.60 " W | 0.29185 | 0.95646 | 0.00 | 14.83 | 0.00 | 48.61 | 1899294.128 | 811771.301 | |
| 1+289.19 | 1+376.20 | 22.719 | 52.840 | 16.070 | 91.629 | 62° 35' 59.00 " | DER | N 44° 22' 08.40 " W | 0.71485 | 0.69928 | 65.50 | 0.00 | 0.00 | 64.07 | 1899359.628 | 811707.231 | |
| 1+376.20 | 1+410.73 | 16.070 | 7.429 | 15.196 | 38.506 | 69° 52' 24.00 " | IZQ | N 59° 45' 24.00 " W | 0.35651 | 0.91803 | 0.00 | 15.27 | 0.00 | 35.35 | 1899344.358 | 811671.881 | |
| 1+410.73 | 1+444.15 | 15.196 | 8.110 | 11.151 | 34.457 | 36° 27' 17.00 " | DER | N 76° 54' 18.00 " W | 0.22657 | 0.97400 | 7.81 | 0.00 | 0.00 | 33.56 | 1899352.168 | 811638.321 | |
| 1+444.15 | 1+471.28 | 11.151 | 7.900 | 8.520 | 27.471 | 24° 09' 59.00 " | DER | S 78° 55' 44.40 " W | 0.19203 | 0.98139 | 0.00 | 5.28 | 0.00 | 26.96 | 1899346.888 | 811611.361 | |
| 1+471.28 | 1+518.90 | 8.520 | 25.430 | 13.677 | 47.627 | 05° 57' 30.00 " | DER | S 84° 53' 13.20 " W | 0.08912 | 0.96602 | 0.00 | 4.24 | 0.00 | 47.44 | 1899342.648 | 811563.921 | |
| 1+518.90 | 1+568.23 | 13.677 | 24.360 | 11.907 | 49.944 | 29° 25' 33.00 " | IZQ | S 55° 27' 39.60 " W | 0.56697 | 0.82374 | 0.00 | 28.32 | 0.00 | 41.14 | 1899314.328 | 811522.781 | |
| 1+568.23 | 1+620.67 | 11.907 | 26.100 | 15.028 | 53.035 | 31° 20' 38.00 " | DER | S 86° 48' 18.00 " W | 0.05573 | 0.99845 | 0.00 | 2.96 | 0.00 | 52.95 | 1899311.368 | 811469.831 | |
| 1+620.67 | 1+671.43 | 15.028 | 16.410 | 20.484 | 51.922 | 38° 59' 48.00 " | DER | N 54° 11' 52.80 " W | 0.58499 | 0.81104 | 30.37 | 0.00 | 0.00 | 42.11 | 1899341.738 | 811427.721 | |
| 1+671.43 | 1+704.80 | 20.484 | 10.350 | 7.567 | 38.351 | 69° 22' 30.00 " | IZQ | S 57° 25' 37.20 " W | 0.53837 | 0.84271 | 0.00 | 20.65 | 0.00 | 32.32 | 1899321.088 | 811395.401 | |
| 1+704.80 | 1+727.98 | 7.567 | 7.350 | 6.287 | 23.204 | 08° 18' 34.00 " | DER | S 65° 44' 09.60 " W | 0.41094 | 0.91166 | 0.00 | 9.54 | 0.00 | 21.15 | 1899311.548 | 811374.251 | |
| 1+727.98 | 1+767.42 | 6.287 | 31.160 | 0.000 | 39.447 | 02° 54' 00.00 " | IZQ | S 62° 50' 09.60 " W | 0.45654 | 0.88970 | 0.00 | 18.01 | 0.00 | 35.10 | 1899293.538 | 811339.151 | |

## DATOS DE CURVAS HORIZONTALES

| CURVA | P.I. | Def. ↑ | Gc | Rc | St/Ste | Lc | Øe | Le | Xc | Yc | k | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0+699.613 | 29° 44' 14" DER | 16°00'00" | 71.820m | 19.015m | 37.172m | | | | | | |
| 2 | 0+724.960 | 25° 05' 45" IZQ | 41°30'00" | 27.724m | 6.170m | 12.143m | | | | | | |
| 3 | 0+759.496 | 32° 04' 05" DER | 25°00'00" | 45.837m | 13.173m | 25.854m | | | | | | |
| 4 | 0+829.068 | 69° 28' 29" DER | 35°00'00" | 32.742m | 21.455m | 37.985m | | | | | | |
| 5 | 0+869.758 | 4° 44' 04" IZQ | 5°00'00" | 229.183m | 7.638m | 15.271m | | | | | | |
| 6 | 0+911.918 | 99° 04' 01" IZQ | 70°00'00" | 15.278m | 17.913m | 26.420m | | | | | | |
| 7 | 0+957.594 | 80° 51' 01" DER | 34°40'00" | 33.055m | 28.207m | 46.702m | | | | | | |
| 8 | 1+007.626 | 73° 52' 47" IZQ | 48°40'00" | 23.564m | 17.705m | 30.362m | | | | | | |
| 9 | 1+038.398 | 4° 32' 51" DER | 5°30'00" | 208.346m | 7.666m | 15.324m | | | | | | |
| 10 | 1+122.511 | 46° 54' 57" DER | 32°30'00" | 52.746m | 30.444m | 53.148m | | | | | | |
| 11 | 1+197.893 | 42° 23' 39" DER | 32°30'00" | 52.746m | 23.230m | 43.164m | | | | | | |
| 12 | 1+239.688 | 70° 09' 23" DER | 32°30'00" | 52.746m | 25.147m | 44.019m | | | | | | |
| 13 | 1+289.191 | 62° 35' 59" DER | 37°30'00" | 45.736m | 27.767m | 49.192m | | | | | | |
| 14 | 1+376.204 | 69° 56' 24" IZQ | 49°00'00" | 35.088m | 22.719m | 42.826m | | | | | | |
| 15 | 1+410.725 | 36° 27' 17" DER | 24°50'00" | 69.144m | 15.196m | 29.539m | | | | | | |
| 16 | 1+444.146 | 24° 09' 59" IZQ | 22°50'00" | 75.156m | 7.900m | 15.751m | | | | | | |
| 17 | 1+471.281 | 5° 57' 30" IZQ | 5°10'00" | 221.837m | 11.151m | 21.969m | | | | | | |
| 18 | 1+518.895 | 29° 25' 33" IZQ | 22°50'00" | 75.156m | 13.677m | 26.751m | | | | | | |
| 19 | 1+568.232 | 31° 20' 38" DER | 22°50'00" | 75.156m | 15.028m | 29.539m | | | | | | |
| 20 | 1+620.669 | 38° 59' 48" DER | 37°50'00" | 45.441m | 16.410m | 30.909m | | | | | | |
| 21 | 1+671.425 | 69° 22' 30" IZQ | 49°00'00" | 35.088m | 20.484m | 42.826m | | | | | | |
| 22 | 1+704.798 | 8° 18' 34" DER | 1°00'00" | 1146.74m | 7.567m | 15.108m | | | | | | |

## GEOMETRIA DEL ALINEAMIENTO HORIZONTAL

| CURVA | PC/TE X | PC/TE Y | EC X | EC Y | PI/PST X | PI/PST Y | CE X | CE Y | PT/ET X | PT/ET Y |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0+699.613 | 0+717.170 | | | | |
| 1 | 812,051.087 | 1,897,698.743 | | | 812,056.362 | 1,897,678.494 | | | 812,051.881 | 1,897,660.015 |
| | 0+680.000 | | | | 0+724.960 | | | | 0+759.496 | |
| 2 | 812,051.881 | 1,897,660.015 | | | 812,053.182 | 1,897,597.794 | | | 812,051.047 | 1,897,549.027 |
| | 0+744.323 | | | | 0+794.458 | | | | 0+829.068 | |
| 3 | 812,054.471 | 1,897,512.663 | | | 812,057.099 | 1,897,418.987 | | | 812,052.463 | 1,897,406.657 |
| | 0+807.813 | | | | 0+829.068 | | | | 0+869.758 | |
| 4 | 812,059.813 | 1,897,373.301 | | | 812,052.562 | 1,897,353.218 | | | 812,013.935 | 1,897,352.135 |
| | 0+863.120 | | | | 0+869.758 | | | | 0+877.391 | |
| 5 | 811,994.935 | 1,897,351.283 | | | 811,986.856 | 1,897,350.894 | | | 811,979.221 | 1,897,349.997 |
| | 0+894.005 | | | | 0+911.918 | | | | 0+925.425 | |
| 6 | 811,962.721 | 1,897,348.046 | | | 811,944.612 | 1,897,345.946 | | | 811,946.814 | 1,897,328.711 |
| | 0+929.397 | | | | 0+957.594 | | | | 0+978.089 | |
| 7 | 811,930.256 | 1,897,320.088 | | | 811,958.843 | 1,897,480.499 | | | 811,934.293 | 1,897,481.089 |
| | 0+980.121 | | | | 1+007.626 | | | | 1+022.465 | |
| 8 | 811,905.521 | 1,897,475.189 | | | 811,905.521 | 1,897,457.745 | | | 811,904.580 | 1,897,450.246 |
| | 1+038.398 | | | | 1+038.398 | | | | 1+038.398 | |
| 9 | 811,909.804 | 1,897,440.115 | | | 811,910.969 | 1,897,432.539 | | | 811,911.575 | 1,897,424.897 |
| | 1+052.067 | | | | 1+122.511 | | | | 1+193.513 | |
| 10 | 811,915.208 | 1,897,379.031 | | | 811,917.612 | 1,897,348.682 | | | 811,887.089 | 1,897,326.195 |
| | 1+172.746 | | | | 1+197.893 | | | | 1+216.563 | |
| 11 | 811,881.428 | 1,897,309.036 | | | 811,864.478 | 1,897,290.462 | | | 811,841.250 | 1,897,300.102 |
| | 1+223.856 | | | | 1+239.688 | | | | 1+254.207 | |
| 12 | 811,834.543 | 1,897,302.886 | | | 811,819.819 | 1,897,308.956 | | | 811,804.776 | 1,897,304.333 |
| | 1+289.191 | | | | 1+289.191 | | | | 1+307.238 | |
| 13 | 811,763.063 | 1,897,300.785 | | | 811,771.164 | 1,897,294.130 | | | 811,783.474 | 1,897,310.568 |
| | 1+376.204 | | | | 1+380.769 | | | | 1+398.204 | |
| 14 | 811,718.520 | 1,897,348.131 | | | 811,707.254 | 1,897,359.810 | | | 811,682.529 | 1,897,353.242 |
| | 1+410.725 | | | | 1+444.146 | | | | 1+471.281 | |
| 15 | 811,684.861 | 1,897,350.372 | | | 811,681.132 | 1,897,344.344 | | | 811,681.132 | 1,897,341.784 |
| | 1+482.066 | | | | 1+494.965 | | | | 1+494.965 | |
| 16 | 811,646.218 | 1,897,348.618 | | | 811,638.378 | 1,897,352.144 | | | 811,627.436 | 1,897,352.000 |
| | 1+482.761 | | | | 1+471.281 | | | | 1+478.785 | |
| 17 | 811,616.785 | 1,897,348.502 | | | 811,611.424 | 1,897,346.884 | | | 811,602.939 | 1,897,346.103 |
| | 1+520.217 | | | | 1+518.895 | | | | 1+551.868 | |
| 18 | 811,577.808 | 1,897,343.632 | | | 811,563.585 | 1,897,342.611 | | | 811,552.720 | 1,897,334.804 |
| | 1+556.325 | | | | 1+568.232 | | | | 1+579.542 | |
| 19 | 811,520.859 | 1,897,321.041 | | | 811,522.852 | 1,897,314.289 | | | 811,513.963 | 1,897,313.623 |
| | 1+620.661 | | | | 1+620.669 | | | | 1+634.528 | |
| 20 | 811,484.665 | 1,897,312.163 | | | 811,488.801 | 1,897,320.112 | | | 811,467.711 | 1,897,328.928 |
| | 1+652.941 | | | | 1+671.416 | | | | 1+688.928 | |
| 21 | 811,444.980 | 1,897,329.711 | | | 811,427.719 | 1,897,341.691 | | | 811,410.521 | 1,897,330.656 |
| | 1+671.425 | | | | 1+704.798 | | | | 1+737.170 | |
| 22 | 811,431.840 | 1,897,325.111 | | | 811,395.463 | 1,897,321.036 | | | 811,388.585 | 1,897,317.929 |

## POLIGONAL DE CONTROL TERRESTRE

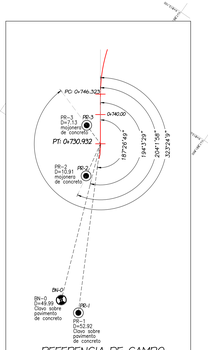
| VERTICE | X | Y | Z | OBSERVACIONES |
|---|---|---|---|---|
| PA1 | 812,048.198 | 1,897,719.309 | 2,217.807 | S/MOJONERA DE CONCRETO |
| PA2 | 812,053.787 | 1,897,057.633 | 2,283.536 | S/MOJONERA DE CONCRETO |
| PA3 | 812,053.182 | 1,897,597.794 | 2,291.221 | S/MOJONERA DE CONCRETO |
| PA4 | 811,980.235 | 1,897,594.005 | 2,293.217 | S/MOJONERA DE CONCRETO |
| PA5 | 811,991.891 | 1,897,491.571 | 2,285.805 | S/MOJONERA DE CONCRETO |
| PA6 | 811,915.484 | 1,897,494.958 | 2,287.357 | S/MOJONERA DE CONCRETO |
| PA7 | 811,916.424 | 1,897,393.832 | 2,308.584 | S/MOJONERA DE CONCRETO |
| PA8 | 811,867.454 | 1,897,295.028 | 2,318.012 | S/MOJONERA DE CONCRETO |
| PA9 | 811,851.863 | 1,897,350.581 | 2,321.364 | S/MOJONERA DE CONCRETO |
| PA10 | 811,769.160 | 1,897,297.612 | 2,326.743 | S/MOJONERA DE CONCRETO |
| PA11 | 811,723.794 | 1,897,346.075 | 2,333.478 | S/MOJONERA DE CONCRETO |
| PA12 | 811,689.763 | 1,897,348.291 | 2,332.951 | S/MOJONERA DE CONCRETO |
| PA13 | 811,577.488 | 1,897,346.986 | 2,328.128 | S/MOJONERA DE CONCRETO |
| PA14 | 811,530.674 | 1,897,315.259 | 2,324.102 | S/MOJONERA DE CONCRETO |
| PA15 | 811,451.335 | 1,897,319.926 | 2,321.204 | S/MOJONERA DE CONCRETO |

## REFERENCIAS DEL TRAZO (EJE DE CAMPO)

Pto.Referenciado (P) Singulos (#) a lo derecha desde la tangente de atrás y distancias (D) de P o R

| PUNTO Punto | Azimuth (AZ) | DRJ/DRS EN | Ubicación Angulo (AZ) | DRZ/DRX EN | Ubicación |
|---|---|---|---|---|---|
| PT | 0+730.832 | 187°29'48" | 52.92 | R1=812,047.710 2047'08" | 10.91 | R2=812,053.787 |
| | | | (LAS S/MOJON DE CONCRETO | Y1=1,897,699.707 | S/MOJONERA DE CONCRETO | Y2=1,897,657.653 |
| PT | 0+730.832 | 312°24'9" | 52.92 | R1=812,047.710 2047'08" | 10.91 | R2=812,053.787 |
| | | | S/MOJONERA DE CONCRETO | Y1=1,897,699.707 | S/MOJONERA DE CONCRETO | Y2=1,897,657.653 |
| PC | 0+894.005 | 188°22'12" | 53.87 | R1=811,985.582 0°26'30" | 16.53 | R2=811,946.298 |
| | | | S/MOJONERA DE CONCRETO | Y1=1,897,341.381 | S/MOJONERA DE CONCRETO | Y2=1,897,346.228 |
| PC | 0+894.005 | 307°17'44" | 17.04 | X3=811,954.576 | | |
| | | | S/MOJONERA DE CONCRETO | Y3=1,897,333.981 | | |
| PC | 1+092.067 | 184°54'32" | 58.60 | R1=811,915.387 188°17'2" | 31.07 | R2=811,916.589 |
| | | | S/MOJONERA DE CONCRETO | Y1=1,897,457.832 | S/MOJONERA DE CONCRETO | Y2=1,897,400.058 |
| PC | 1+092.067 | 338°38'8" | 7.22 | X5=811,918.362 | | |
| | | | S/MOJONERA DE CONCRETO | Y5=1,897,373.534 | | |
| PC | 1+307.298 | 151°28'8" | 61.49 | R1=811,795.105 162°21'4" | 28.61 | R2=811,791.270 |
| | | | S/MOJONERA DE CONCRETO | Y1=1,897,288.185 | S/MOJONERA DE CONCRETO | Y2=1,897,296.015 |
| PT | 1+307.298 | 340°42'28" | 13.20 | X6=811,943.943 | | |
| | | | S/MOJONERA DE CONCRETO | Y6=1,897,314.541 | | |
| PC | 1+482.761 | 220°41'5" | 8.30 | R1=811,823.339 340°1'1" | 13.58 | R2=811,807.088 |
| | | | S/MOJONERA DE CONCRETO | Y1=1,897,346.040 | S/MOJONERA DE CONCRETO | Y2=1,897,362.535 |
| PC | 1+482.761 | 355°39'38" | 23.44 | X5=811,827.211 | | |
| | | | (LAS S/CRUZ DE MADERA | Y5=1,897,342.202 | | |
| PC | 1+650.941 | 10°26'18" | 8.60 | R1=811,828.488 342°48'54" | 28.10 | R2=811,816.810 |
| | | | (LAS S/MOJONERA DE CONCRETO | Y1=1,897,335.926 | S/MOJONERA DE CONCRETO | Y2=1,897,338.976 |
| PC | 1+650.941 | 317°15'16" | 43.44 | X5=811,841.752 | | |
| | | | S/MOJONERA DE CONCRETO | Y5=1,897,321.457 | | |

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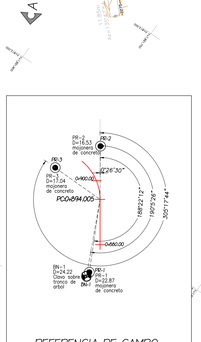


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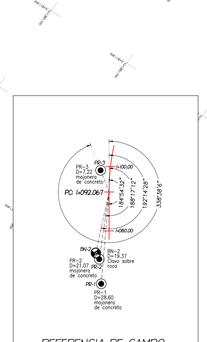


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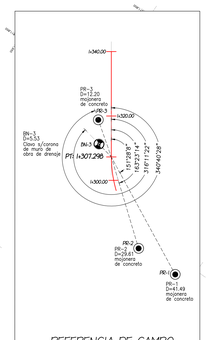


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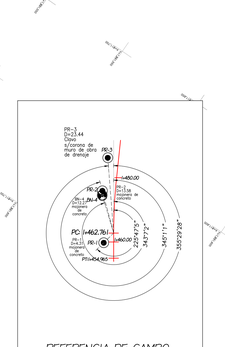


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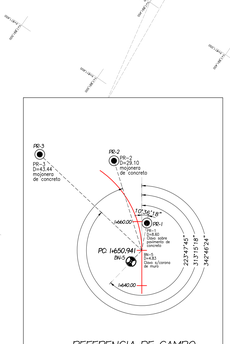


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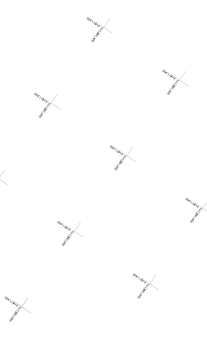

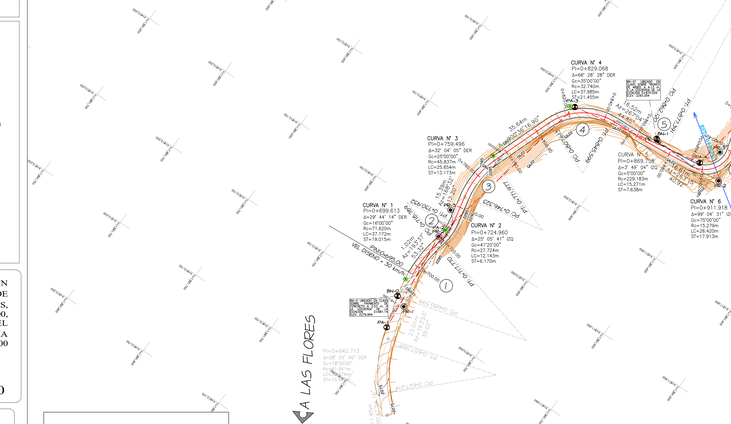
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