



KREAN, S.COOP.



2

Topografía, Replanteo y Trazado

Proyecto • Proiektua

DESGLOSADO Y ACTUALIZACIÓN DEL PROYECTO DE DEFENSA CONTRA INUNDACIONES DEL RÍO NERVIÓN A SU PASO POR EL CASCO URBANO DEL MUNICIPIO DE LLODIO (ARABA)

Promotor • Sustatzailea
URA AGENTZIA

Fecha • Data
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1. TOPOGRAFIA, CARTOGRAFIA Y MODELO

1.1. Sistema de referencia

En este apartado se define el sistema de referencia geográfico adoptado para las coordenadas UTM de este Proyecto.

Según **Real Decreto 1071/2007**, establece el ETRS89 como sistema de referencia geodésico oficial en España para la referenciación geográfica y cartográfica en el ámbito de la Península Ibérica y las Islas Baleares.

1.2. Topografía inicial

Para este Proyecto, así como para la creación de planos base se han empleado la siguiente información:

- Cartografía a escala 1/5.000 en ETRS89, perteneciente a la Diputación Foral de Alava.
- Ortofoto a escala 1/5.000 en ETRS89 perteneciente al Gobierno Vasco año 2012
- Topografía a escala 1/1.000 en ED50 perteneciente al Ayuntamiento de Llodio. Mediante el software del Gobierno Vasco, se ha realizado la transformación de sistemas pasando del ED50 al ETRS89.

1.3. Creación del Modelo Digital del Terreno

Para la creación de un Modelo Digital del terreno que nos sirva de base para proyectar la solución más idónea para este Proyecto se facilitó por parte de URA, el modelo que disponían en la zona de Llodio realizado en su día por la empresa de topografía Garoa.

Este modelo, es una composición del Lidar del Gobierno Vasco, con perfiles del terreno tomados por topografía clásica. Al emplearse el modelo para el estudio de zonas de riesgo de posibles inundaciones, mediante el software Hec-ras, se toman perfiles con una separación del entorno al kilómetro o en puntos críticos.

Tras un análisis de este modelo, vemos que se hace necesario crear un nuevo modelo del terreno más preciso en el entorno de la actuación del río. Marcando como objetivo el tener una buena definición del cauce actual, así como de los muros entre los que discurre. Para ello nos ponemos en contacto con la empresa de topografía Garoa y les pedimos que nos tomen por topografía clásica el entorno del río sobre el cual se va a actuar en este Proyecto. Así también se solicita nos den cota de tapa y fondo del colector de saneamiento que discurre por la margen izquierda del río.

Dejamos claro en este punto que tanto para trabajar en el lecho del río, como en sus riberas, a resultado bastante difícil, al encontrarse la zona con maleza de gran porte, siendo imposible acceder alguno de los puntos. De la misma manera del colector de saneamiento del Ayuntamiento, solo ha sido posible encontrar 6 arquetas de las 26 que tenemos en la zona de actuación, a pesar del apoyo que de la Brigada del Ayuntamiento.

1.4. Topografía GAROA

A partir de este punto se incluye la información del trabajo realizado por la empresa de topografía Garoa



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El INGENIERO EN GEOMÁTICA Y TOPOGRAFÍA
Juan Gallardo Sancha
Colegiado nº 2773

TRABAJOS TOPOGRÁFICOS EN EL RÍO NERVIÓN A SU PASO POR LLODIO (ÁLAVA)

PROMOTOR:	<i>LKS Ingeniería S.Coop.</i>
FECHA:	<i>Diciembre 2014</i>
REFERENCIA TRABAJO:	<i>L1955</i>
DOCUMENTO:	<i>MEMORIA</i>

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1.- MEMORIA

1.-MEMORIA

1.1.- OBJETO

El objeto de la presente Memoria es la descripción detallada de los trabajos topográficos realizados para la medición de un tramo del Río Nervión a su paso por Llodio (Álava).

El trabajo se realiza por encargo de **LKS Ingeniería S. Coop.**

En Vitoria-Gasteiz a 12 de Enero de 2015

El Ingeniero en Geomática y Topografía



Juan Gallardo Sancha
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1.2. – CONSIDERACIONES TÉCNICAS

Es sistema Geodésico de referencia utilizado es ETRS89 y la proyección UTM.

En el caso de la altimetría utilizamos las cotas actuales de la Red de Nivelación de Alta Precisión del THA .

Como bases de partida utilizamos:

PLANIMETRÍA: Antenas GNSS de la Red de estaciones permanentes de GEOEUSKADI.

ALTIMETRÍA: Clavos NAP de la Red de Nivelación de Precisión del Territorio Histórico de Álava, concretamente la señal principal NAP 156.

CÁLCULO: El cálculo GPS se realiza con el programa Leica Geooffice. Se comienza calculando las coordenadas de las estaciones desde las antenas de la Red GEOEUSKADI. Una vez obtenidas las coordenadas precisas de estos puntos se procede a la toma de datos para confección del plano topográfico de estado actual.

La toma de datos se realizó con sistemas GNSS RTK y Estación Total, con medida electrónica de ángulos (precisión de 10 segundos centesimales) y medida electrónica de las distancias (precisión 2 mm. +- 2 p.p.m.), utilizando el método de radiación. El registro de datos se realizó en libreta electrónica, para evitar errores de anotación, almacenando observaciones completas a cada uno de los puntos.

1.3. - CONSIDERACIONES GENERALES

Se adjunta:

1. Listado de observaciones de campo, así como las coordenadas de los puntos que definen el Plano, para que en todo momento pueda replantearse cualquier dato.
2. Planos en Formato Digital *.DWG Versión 14 de AutoCad en codificación Temática.
 - *.DWG (Plano en tres dimensiones.).
 - *.DWG (Plano en 2D).

1.4.- SIMBOLOGÍA

1-PUNTOS DE REFERENCIA	8- LINEAS Y CONDUCCIONES FORZADAS
 Vértice R.U.R.T.  Puntos acotados	 Poste Ferrocarril  Poste Hormigón
2-ALTIMETRIA	 Poste Madera
 Curva de Nivel  Curva Directora	 Poste con Transformador  Antena Emisora o Repetidora
 535.37 Cota de Edificio	 Semáforo
 526.54 Cota de Terreno  Cabeza, Pie de talud	 Arqueta  Arqueta de Gas
3-HIDROGRAFIA	 Arqueta de Abastecimiento
 Río, Lago, Embalse, Piscina  Acequia, Canal	 Arqueta de Saneamiento  Arqueta Eléctrica
 Conducción Subterránea	 Arqueta Teléfonos
 Fuente  Pozo	 Arqueta Tráfico  Boca de Riego
4-LINEAS LIMITES	 Hidrante
 Límite de Municipio  Límite de Cultivo	 Arqueta Pluviales  Arqueta Fibra Optica
5-ESPACIOS CONSTRUIDOS Y LIBRES	 Línea Eléctrica o Telefónica
 Edificio	 Farola Báculo
 Medianería	 Farola Paseo
 División de Volúmenes	
 Edificio en Construcción: Ruinas	
 Cumbresas, Limatesas, Limahoyas	
 Tapia	
 Muro	
 Muro con valla	
 Alameda, Valla	
 Seto	
6-VIAS Y ELEMENTOS DE COMUNICACION	
 Hito Kilométrico	
 Indicativo de dirección	
 Barrera de seguridad	
 Señalización Horizontal	
7-ELEMENTOS URBANOS	
 Bordillo	
 Monumento	
 Banco Fijo	
 Barandilla	
 Buzón	
 Cabina Telefónica	
 Arbol	

3.- CODIFICACIÓN

La creación de planos en formato digital nos exige una clasificación de los diferentes elementos a representar agrupándolos en diferentes capas. Cuando hablamos de CODIFICACIÓN, nos referimos a la relación que existe entre los diferentes elementos que existen en el terreno y el código o nombre que les asignamos en la representación gráfica que nosotros realizamos de ellos en los planos.

- Codificación utilizada en la toma de datos de campo por Garoa: Códigos numéricos de 3 cifras de uso interno de Garoa para la clasificación de Elementos. En el listado de observaciones (columna COD), existe un cuarto número que corresponde a un código interno que servirá para la realización automática del dibujo, a partir de los datos tomados en campo. También existen códigos dobles.

P*: Nos indica que el elemento codificado, es puntual.

1.- RED GEODÉSICA Y TOPOGRÁFICA.
DIVISION ADMINISTRATIVA

100 VERTICE GEODESICO 1º
101 VERTICE GEODESICO 2º
102 VERTICE GEODESICO 3º
103 VERTICE GEODESICO 4º
104 VERTICE RURT
105 VERTICE POLIGONAL
106 BASE DE REPLANTEO
107 PUNTO DE APOYO
108 CLAVO NAP
109 PUNTO NIVELACION
110 PTS
120 HITO AUTONOMIA
121 HITO PROVINCIAL
122 HITO MUNICIPIO
123 HITO MOJON
130 LIMITE DE NACION
131 LIMITE AUTONOMIA
132 LIMITE PROVINCIAL
133 LIMITE DE COMARCA
134 LIMITE MUNICIPIO
135 LIMITE DE ANEJO
136 LIMITE PLAN GENERAL
140 LIMITE POLIGONO URBA
141 LIMITE MANZANA URBA
142 LIMITE PARCELA URBA
143 LIMITE SUBPARCELA URB
144 LIMITE SUELO URBANO
146 LIMITE POLIGONO URBANO
147 LIMITE MANZANA URBANO
148 LIMITE PARCELA URBANO
149 LIMITE SUBPARCELA URBANO
150 LIMITE POLIGONO RUST
151 LIMITE PARCELA RUST
152 LIMITE PARC VISTA RUS
153 LIMITE SUBPARCELA RUS
154 LINDERO
160 ENTRADA PORTAL

2.- EDIFICIOS, CONSTRUCCIONES Y
DELIMITADORES

200 EDIFICACION
201 EDIFICACION EN OBRAS
202 CASETA
203 COBERTIZO TEJAVANA
204 PORCHE SOPORTAL
205 INVERNADERO
206 RUINAS
207 RESTOS ARQUEOLOGICOS
208 RESTOS ARQUEOLOGI P*
210 MEDIANERIAS
211 DIVISION ALTURAS
212 CUMBRERAS
213 ALEROS
214 PATIO INTERIOR
215 BALCON TERRAZA VUELO
216 CLARABOYAS
220 BORDILLO ACERA
221 MURO PARED
222 MURO DE CONTENCION
223 VALLA VERJA
224 ALAMBRADA
225 PUERTA EN CIERRE
226 TAPIA
230 PLATAFORMA
231 RAMPA
232 ESCALERAS
233 BARANDILLA
234 BASCULA
235 PILARES
236 OBRA DE FABRICA
237 LINEAS NO CODIFICADAS
240 IGLESIA
241 CEMENTERIO
242 AYUNTAMIENTO
250 EDIFICIO RUSTICA
251 MEDIANERIAS RUST
252 DIVISION ALTURAS RUS
253 RUINAS RUST
254 COBERTIZO RUST
255 PORCHE SOPORTAL RUS
256 CUMBRERAS RUST
257 PILARES RUST
258 CLARABOYAS RUST
259 CHIMENEA BODEGA

3.- MOBILIARIO URBANO.

300 BANCO P*
301 CABINA TELÉFONO P*
302 KIOSKO P*
303 MARQUESINA BUS P*
304 MONUMENTO P*
305 POSTE PANEL INFORMA P*
306 SURTIDOR GASOLINA P*
307 BARBACOA P*
325 BUZON
326 FAROLA PASEO
327 FAROLA BACULO
328 FAROLA MULTIPLE
329 FAROLA EN EDIFICIO
330 PAPELERA
331 JUEGOS INFANTILES
332 SEMAFORO
350 BANCO
351 CABINA TELEFONOS
352 KIOSKO
353 MARQUESINA BUS PARADA
354 MONUMENTO
355 POSTE PANEL INFORMAT
356 SURTIDOR GASOLINA
357 BARBACOA
375 LINEAS DEPORTE
376 LINEAS JUEGOS

4.- REGISTROS Y CONDUCCIONES.

400 REGISTRO ABASTEC
401 BOCA DE RIEGO
402 HIDRANTE INCENDIOS
403 REGISTRO SANEAMIENTO
404 SUMIDERO PLUVIAL
405 REG SUMIDERO
406 REGISTRO ELECT P*
407 TRANSFORMADOR ELEC P*
408 POSTE MADERA ELECT
409 POSTE HORMIGON ELECT
410 TORRE METALICA ELE P*
411 REGISTRO GAS P*
412 POSTE INDICADOR GAS
413 REGISTRO OTROS COMB
414 REGISTRO SIN IDENTI P*
415 REGISTRO TELEFONICO P*
416 POSTE TELEFONO
417 ANTENA REPETIDORA P*
418 ANTENA EMISORA P*
419 REGISTRO TRAFICO P*
420 REGISTRO FIBRA OPTI
421 REJILLA VENTILACION P*
422 INFO GAS FIBRA OPTICA
440 REGISTRO ELECT
441 TRANSFORMADOR ELECT
442 ARMARIO ELECTRICO
443 CASETA TRANSF ELEC
444 TORRE METALICA ELEC
445 REGISTRO GAS
446 REGISTRO SIN IDENTI
447 REGISTRO TELEFONICO
448 ANTENA REPETIDORA
449 ANTENA EMISORA
450 REGISTRO TRAFICO
451 REJILLA VENTILACION
452 SUMIDERO
470 CONDUCCION AGUA SUBT
471 CONDUCCION AGUA SUPE
472 CONDU RESIDUAL SUBTE
473 CONDU RESIDUAL SUPER
474 CONDU AEREA ELECTRICA
475 CONDUCCION GAS
476 CONDUCCION OTROS C
477 COND LINEA TELEFONO
490 DEPOSITO DE AGUA
491 DEPOSITO GAS
492 DEPOSITO OTROS C

5.- VIAS DE COMUNICACIÓN. 500 AUTOPISTA AUTOVIA 501 CARRETERA LI ASFALTO 502 ARCEIN 503 CAMINO 504 CAMINO SIN PAV SENDA 510 EJE AUTOPISTA AUTOVIA 511 EJE CARRETERA VIALES 512 EJE CAMINO 520 BONDAS QUITAMIEDOS 521 ANDEN MUELLE CARRETE 522 SENAL HORIZONTAL 523 HITO KILOMETRICO CARR 524 PIVOTES HUECO PIVOTE 525 INDICADOR DIRECCION 530 FERROCARRIL 531 ANDEN MUELLE FCC 532 HITO KILOMETRICO FCC 533 BALIZA SENALES FCC 534 POSTE METALICO FCC 540 AEROPUERTO PISTAS 541 BALIZA SENALES AEROP 550 PUENTE CARRE Y FCC 551 TUNEL CARRE Y FCC 552 PASO PEATONAL SUBT 553 PASO PEATONAL ELEV 554 CARRIL BICI 555 CARRIL BICI P*	6.- RELIEVE. 600 CURVA NIVEL MAESTRA 601 CURVA NIVEL 602 CABEZA TALUD 603 PIE DE TALUD 610 PUNTO ACOTADO 611 COTA EDIFICIO ALERO 612 COTA DE PORTAL 613 PUNTO ACOTADO OCULTO 620 CANTERA P* 621 MINA P* 622 CUEVA P* 623 CANTERA 624 MINA 625 CUEVA 626 SALINAS 630 VERTEDERO CONTROLA P* 631 VERTEDE INCONTROLA P* 632 VERTEDERO CONTROLADO 633 VERTEDE INCONTROLADO
7.- HIDROGRAFÍA. 700 RIO 701 ARROYO RIACHUELO 702 CANAL 703 ACEQUIA 710 DIQUE EMBALSE PRESA 711 CONTORNO LAGO EMBALSE 712 PISCINA 713 ESTANQUE 714 ABREVEDERO 715 POZO 716 FUENTE 730 POZO P* 731 FUENTE P* 732 BALIZA SENALES MARI 740 ACUEDUCTO 741 LINEA DE COSTA 742 ESPIGON ROMPEOLAS 743 MUELLE PUERTO MARITI 744 MUELLE EMBALSE 745 DIQUE	8.- VEGETACIÓN, JARDINES Y MONTES. 800 ARBOL 801 ALCORQUE REDONDO 802 JARDINERA P* 810 ALCORQUE 811 JARDINERA MURO JARDIN 812 SETO 813 ZONA ARBOLADA 814 ZONA AJARDINADA 820 VINAS HUERTAS VIVEROS 821 CORTAFUEGOS
9.- TEXTOS. 900 TEXT ABREBADERO 901 TEXT ACEQUIA 902 TEXT ACUEDUCTO SIFON 903 TEXT AUTONOMIA 904 TEXT AUTOPISTA AUTOV 905 TEXT BASCULA 906 TEXT CALIFI SUELO 907 TEXT CAMINO 908 TEXT CANAL 909 TEXT CANTERA 910 TEXT CARRIL BICI 911 TEXT CASCO URBANO 912 TEXT CLARABOYAS 913 TEXT COND RESI SUP 914 TEXT CONDUCCION GAS 915 TEXT COND OTRO COMB 916 TEXT COND AGUA SUBT 917 TEXT COND AGUA SUP 918 TEXT COND RESI SUBT 919 TEXT COORDEN ESQUINAS 920 TEXT COTA CURVA MAES 921 TEXT COTA DE ALERO 922 TEXT COTA DE PORTAL 923 TEXT CUEVA 924 TEXT DIVISION ALTURAS 925 TEXT EDIFI MENORES 926 TEXT EDIFICACION 927 TEXT ESCALERA 928 TEXT ESTANQUE 929 TEXT FERROCARRIL 930 TEXT FUENTE 931 TEXT HITO KIL CARR 932 TEXT HITO KIL FCC 933 TEXT HUERTAS VIVEROS 934 TEXT INVERNADERO 935 TEXT JUEGOS INFANTIL 936 TEXT KIOSKO 937 TEXT LAGO EMBALSE 938 TEXT LIMITE ANEJO 939 TEXT CRUCES HOJAS 940 TEXT LIMITE ORTOFOTO 941 TEXT LIM MANZANA URB 942 TEXT LIM PARCELA RUS 943 TEXT LIM PARCELA URB 944 TEXT LIM POLIGONO RUS 945 TEXT LIM POLIGONO URB 946 TEXT LIM SUBPARCE RUS 947 TEXT LIM SUBPARCE URB 948 TEXT LINEAS DEPORTE 949 TEXT MARQUESINA BUS 950 TEXT MINA 951 TEXT MUNICIPIO 952 TEXT NAP 953 TEXT CABINA BUS KIOS 954 TEXT EDIFI CARACTERIS 955 TEXT URBANIZACION 956 TEXT NOMBRE VIA URB 957 TEXT ACCIDENTES GEO 958 TEXT CASERIOS CASAS 959 TEXT PARAJES BARRIOS 960 TEXT NUMERO POLICIA 961 TEXT ORTOFOTOS 962 TEXT PATIOS 963 TEXT PISCINA 964 TEXT POZO 965 TEXT PROVINCIA 966 TEXT PUNTO ACOTADO 967 TEXT PUNTO NIVELACION 968 TEXT RIO 969 TEXT RUINAS 970 TEXT SALINAS 971 TEXT SENDA 972 TEXT SURTIDOR GASOL 973 TEXT TIPO DE CULTIVO 974 TEXT VERTICE RURT 975 TEXT VERTICES 976 TEXT ZONA AJARDINADA 977 TEXT NUMERO PLANTAS 978 TEXT PNT ACOTADO OCUL 979 TEXT TERRAZAS 980 TEXT COTAS GENERALES 999 TEXT OTROS TEXTOS	

2.- ANEXOS

ANEXO 1:
LISTADO DE COORDENADAS

PUNTO	X	Y	Z	CODIGO	PUNTO	X	Y	Z	CODIGO
200	503401.027	4776911.669	121.423	1058200	5241	503321.029	4776800.003	115.415	704
201	503374.351	4776858.293	120.442	1058201	5242	503323.240	4776801.241	116.200	70099882
5000	503382.400	4776899.825	120.935	22709881	5243	503324.023	4776802.204	115.869	70099882
5001	503387.960	4776914.336	120.899	2271	5244	503331.928	4776811.253	115.874	70099882
5002	503388.956	4776915.906	120.897	2271	5245	503332.557	4776811.943	115.592	70099882
5003	503389.325	4776916.451	120.945	22719881	5246	503331.833	4776811.735	115.745	71099882
5004	503381.237	4776911.687	120.934	610	5247	503331.778	4776811.782	115.746	71009881
5005	503386.925	4776921.677	120.983	610	5248	503331.401	4776812.132	115.753	71019881
5006	503406.239	4776899.531	119.504	23000227	5249	503331.684	4776811.810	115.420	22299882
5007	503406.187	4776899.546	118.515	22719881	5250	503332.141	4776812.144	115.002	22299882
5008	503404.866	4776897.849	119.517	2301	5251	503332.744	4776812.157	114.949	704
5009	503391.207	4776880.625	119.788	2301	5252	503331.010	4776810.231	115.123	704
5010	503389.740	4776878.760	119.819	2301	5253	503331.937	4776811.944	115.743	71099882
5011	503387.341	4776875.737	119.831	2301	5254	503332.302	4776811.590	117.281	2271
5012	503381.354	4776868.238	119.879	2301	5255	503333.270	4776811.160	117.669	6021
5013	503375.112	4776860.383	119.940	2301	5256	503339.053	4776814.717	117.636	22299882
5014	503368.086	4776851.435	120.091	23019882	5257	503338.846	4776817.661	117.627	6021
5015	503406.364	4776898.737	119.018	22709881	5258	503340.648	4776820.189	117.394	60219881
5016	503406.348	4776898.721	119.255	22719881	5259	503338.583	4776818.660	117.317	2271
5017	503387.667	4776874.953	117.964	22299882	5260	503336.666	4776817.578	115.451	71009881
5018	503412.738	4776920.699	116.816	22709881	5261	503337.139	4776817.199	115.450	7101
5019	503414.590	4776923.742	116.750	2271	5262	503337.086	4776817.108	114.723	22299882
5020	503415.738	4776925.693	116.715	2271	5263	503337.354	4776817.613	114.723	22299882
5021	503423.143	4776937.862	116.493	2271	5265	503337.171	4776817.502	115.419	71099882
5022	503427.638	4776945.409	116.316	2271	5266	503337.727	4776818.042	114.587	704
5023	503431.605	4776952.354	116.205	2271	5267	503337.713	4776817.781	115.300	70099882
5024	503434.475	4776957.604	116.147	2271	5268	503342.091	4776822.702	117.340	2271
5025	503435.259	4776959.074	116.108	2271	5269	503342.542	4776822.430	117.331	22799882
5026	503441.424	4776971.023	115.909	2271	5270	503343.124	4776822.058	117.229	610
5027	503447.944	4776984.710	115.642	2271	5271	503341.875	4776822.921	114.695	22299882
5028	503446.515	4776981.611	115.696	22719881	5272	503342.331	4776823.231	114.400	22299882
5029	503402.755	4776904.120	114.143	70009881	5273	503342.170	4776823.048	115.112	71099882
5030	503394.415	4776891.187	114.141	7001	5274	503341.609	4776823.193	115.163	71009881
5031	503382.155	4776872.478	114.148	7001	5275	503341.390	4776823.403	115.162	71019881
5032	503378.259	4776866.505	114.135	7001	5276	503342.563	4776823.318	114.980	70099882
5033	503375.562	4776862.368	114.165	7001	5277	503341.796	4776822.477	115.284	70099882
5034	503374.223	4776860.551	114.167	7001	5278	503341.083	4776821.702	114.544	704
5035	503371.203	4776856.551	114.186	7001	5279	503342.616	4776823.435	114.328	704
200	503401.027	4776911.669	121.423	1058200	5280	503347.050	4776828.287	117.369	2271
201	503374.351	4776858.293	120.442	1058201	5281	503346.690	4776828.653	114.198	22299882
202	503278.781	4776740.965	121.188	1058202	5282	503347.160	4776828.885	114.119	22299882
203	503244.545	4776699.564	121.343	1058203	5283	503347.068	4776828.722	114.851	71099882
204	503193.487	4776656.959	122.143	1058204	5284	503346.630	4776828.680	114.846	71009881
205	503181.024	4776644.673	122.721	1058205	5285	503346.267	4776828.985	114.846	71019881
206	503155.901	4776645.874	123.465	1058206	5286	503346.176	4776827.456	114.120	704
207	503098.543	4776571.252	123.543	1058207	5287	503346.210	4776827.453	115.027	70099882
208	503050.427	4776554.880	122.955	1058208	5288	503347.530	4776828.913	114.713	70099882
5200	503387.939	4776896.808	113.084	704	5289	503347.676	4776829.042	114.068	704
5201	503382.822	4776900.837	117.665	222	5290	503351.319	4776833.543	113.846	704
5202	503350.485	4776955.217	139.820	21309887	5291	503351.576	4776833.536	114.752	71099882
5203	503390.471	4776928.025	139.879	2131	5292	503351.754	4776834.123	114.598	71009881
5204	503399.388	4776941.627	139.866	2131	5293	503351.245	4776834.494	114.598	71019881
5205	503399.048	4776941.889	139.870	2131	5294	503351.501	4776834.153	113.928	22299882
5206	503407.360	4776953.749	139.166	2131	5295	503351.988	4776834.442	113.901	22299882
5207	503361.893	4776845.494	114.123	71009881	5296	503352.392	4776834.454	113.827	704
5208	503356.524	4776850.324	114.126	71019881	5297	503352.417	4776834.491	114.453	70099882
5209	503367.396	4776850.550	120.098	23009881	5298	503351.826	4776834.338	114.577	71099882
5210	503370.403	4776854.396	120.003	2301	5299	503352.846	4776834.880	117.397	22719882
5211	503382.423	4776869.559	119.861	2301	5300	503353.580	4776834.361	117.186	610
5212	503389.745	4776878.768	119.817	2301	5301	503357.116	4776839.812	114.397	71099888
5213	503392.633	4776882.461	119.728	2301	5302	503356.693	4776840.114	114.394	71099888
5214	503404.484	4776897.361	119.516	23019881	5303	503272.177	4776769.543	121.175	22709881
5215	503390.901	4776879.096	119.530	22209888	5304	503270.073	4776767.054	121.191	2271
5216	503386.834	4776873.844	119.561	22219888	5305	503266.418	4776762.751	121.211	2271
5217	503380.544	4776866.161	119.669	22219888	5306	503264.257	4776760.230	121.253	22719881
5218	503369.391	4776852.322	119.843	22219888	5307	503247.177	4776754.085	127.311	21309881
5219	503367.530	4776850.455	120.019	22219888	5308	503249.141	4776752.057	127.954	21319882
5220	503356.583	4776840.189	114.402	71009881	5309	503254.162	4776746.635	126.379	2131
5221	503302.543	4776777.591	117.090	22709882	5310	503236.404	4776727.072	126.410	2131
5222	503303.057	4776777.549	117.097	22799882	5311	503235.550	4776727.036	125.725	21309881
5223	503304.132	4776777.858	117.699	60209882	5312	503235.962	4776726.744	125.715	2131
5224	503314.499	4776787.662	117.843	610	5313	503232.334	4776722.667	125.726	21319881
5225	503313.505	4776788.642	117.719	6021	5314	503224.146	4776713.684	124.066	22709881
5226	503312.940	4776789.506	117.178	2271	5315	503225.418	4776715.097	124.063	22719881
5227	503323.846	4776801.900	117.215	2271	5316	503235.932	4776726.688	121.837	22799888
5228	503324.384	4776801.742	117.211	22799882	5317	503203.966	4776726.701	141.504	21309887
5229	503324.867	4776801.410	117.695	6021	5318	503225.067	4776713.225	141.539	2131
5230	503325.827	4776800.432	117.742	610	5319	503220.501	4776705.869	141.538	2131
5231	503323.215	4776801.552	115.807	22299882	5320	503214.097	4776701.539	141.508	21319881
5232	503323.181	4776801.703	116.095	71099882	5321	503224.033	4776713.033	125.367	20009881
5233	503323.562	4776801.654	116.075	7100	5322	503224.019	4776712.992	141.369	2001
5234	503322.926	4776802.162	116.081	71019881	5323	503154.770	4776652.856	119.081	60209881
5235	503323.615	4776801.712	115.975	7100	5324	503166.971	4776661.511	118.906	6021
5236	503323.221	4776802.055	115.976	71019882	5325	503186.586	4776675.981	118.615	6021
5237	503323.849	4776801.991	115.373	704	5326	503192.648	4776680.137	118.626	6021
5238	503322.977	4776801.275	115.792	704	5327	503155.289	4776660.440	123.093	22709881
5239	503321.688	4776799.827	115.422	704	5328	503156.182	4776661.219	123.036	2271
5240	503321.496	4776799.393	115.416	704	5329	503157.892	4776662.560	123.045	22719881

PUNTO	X	Y	Z	CODIGO	PUNTO	X	Y	Z	CODIGO
5330	503168.703	4776670.977	120.297	22209888	5418	503142.476	4776650.261	121.215	2000
5331	503174.900	4776675.868	119.681	22219888	5419	503143.726	4776648.595	122.610	2001
5332	503175.961	4776677.472	124.037	2270	5420	503143.775	4776648.601	122.830	20010200
5333	503176.665	4776678.099	124.043	2271	5421	503143.126	4776648.136	122.610	20099882
5334	503176.968	4776677.801	124.079	22709887	5422	503134.259	4776641.123	122.835	2001
5335	503177.095	4776677.906	124.092	2271	5423	503134.236	4776641.186	122.607	20010200
5336	503181.931	4776681.777	123.853	2271	5424	503126.552	4776634.596	122.724	2001
5337	503187.804	4776686.478	123.924	2271	5425	503118.093	4776625.830	122.732	20019881
5338	503191.523	4776689.484	123.869	22719881	5426	503138.266	4776657.501	143.898	2130
5339	503188.467	4776686.715	119.245	22299882	5427	503144.816	4776649.199	143.884	2131
5340	503188.612	4776682.216	118.963	610	5428	503134.404	4776641.024	143.877	2131
5341	503171.390	4776684.201	134.169	21309887	5429	503134.265	4776641.135	143.009	2130
5342	503178.209	4776675.923	134.265	2131	5430	503134.494	4776640.857	142.987	2131
5343	503159.568	4776661.298	134.139	21319882	5431	503117.283	4776624.433	142.998	21319887
5344	503177.039	4776676.096	123.025	20009887	5432	503108.985	4776612.552	118.890	60209881
5345	503176.488	4776675.546	122.953	20010230	5433	503098.015	4776601.777	119.475	6021
5346	503176.947	4776674.938	122.865	2301	5434	503087.533	4776590.347	119.767	6021
5347	503175.029	4776673.388	122.796	23019887	5435	503079.242	4776580.999	119.857	6021
5348	503174.425	4776673.883	122.821	20009881	5436	503073.707	4776574.353	119.931	6021
5349	503167.917	4776668.745	122.841	20019881	5437	503062.972	4776562.490	120.058	6021
5350	503168.474	4776660.726	116.923	7000	5438	503058.555	4776556.210	120.107	6021
5351	503186.293	4776674.234	116.920	7001	5439	503053.096	4776548.282	120.122	6021
5352	503196.454	4776681.130	116.920	7001	5440	503047.865	4776540.011	120.258	6021
5353	503202.961	4776686.011	116.920	7001	5441	503039.811	4776526.943	120.175	6021
5354	503212.147	4776693.411	116.923	7001	5442	503083.442	4776597.937	123.207	23609881
5355	503181.666	4776662.562	116.702	70499888	5443	503083.434	4776597.971	122.537	23610227
5356	503174.223	4776656.312	116.731	70499888	5444	503082.649	4776596.849	122.494	2271
5357	503213.827	4776701.527	141.681	21309881	5445	503079.924	4776592.738	122.462	2271
5358	503195.434	4776712.764	141.573	21319887	5446	503078.197	4776590.138	122.467	22719881
5359	503191.304	4776693.050	123.093	227998882360	5447	503084.366	4776598.914	121.594	22209881
5360	503192.134	4776692.392	123.148	2361	5448	503083.632	4776597.442	121.270	2221
5361	503191.644	4776691.744	123.204	22799881	5449	503081.078	4776593.499	121.077	2221
5362	503191.587	4776693.223	123.287	22709881	5450	503083.404	4776597.966	122.158	22200227
5363	503192.305	4776694.227	123.274	2271	5451	503082.216	4776596.215	122.235	2221
5364	503193.170	4776693.730	122.682	22719888	5452	503082.424	4776595.936	122.141	2271
5365	503204.824	4776703.609	123.157	22709881	5453	503079.698	4776591.633	122.040	22719881
5366	503205.066	4776703.963	123.157	2271	5454	503079.283	4776591.785	122.204	22219881
5367	503201.357	4776706.479	123.166	2271	5455	503071.674	4776578.379	120.825	22209882
5368	503201.067	4776704.960	123.328	50109888	5456	503067.266	4776573.773	120.613	2221
5369	503197.581	4776707.554	123.515	5011	5457	503056.330	4776560.654	120.217	2221
5370	503198.697	4776708.196	123.375	2271	5458	503054.952	4776559.076	120.184	2221
5371	503199.165	4776708.636	123.272	2271	5459	503050.712	4776553.584	120.522	22219882
5372	503198.937	4776709.329	123.441	50119881	5460	503100.192	4776613.916	123.360	22709881
5373	503205.132	4776703.993	121.476	22209887	5461	503094.456	4776608.448	123.394	2271
5374	503204.415	4776702.889	121.378	22210603	5462	503089.628	4776603.866	123.384	2271
5375	503203.638	4776701.733	121.677	22219888	5463	503083.983	4776598.362	123.356	22719881
5376	503204.430	4776701.788	121.152	6031	5464	503072.639	4776580.224	121.711	22709881
5377	503203.934	4776700.051	121.070	6031	5465	503071.922	4776579.215	121.934	2271
5378	503201.164	4776696.637	121.400	6031	5466	503070.949	4776577.743	122.041	2271
5379	503194.726	4776692.723	120.834	22200227	5467	503069.636	4776576.407	122.069	2271
5380	503196.243	4776691.666	119.256	2221	5468	503068.102	4776574.764	121.861	22719881
5381	503196.210	4776691.719	120.866	2271	5036	503370.658	4776855.814	114.170	7001
5382	503198.286	4776691.923	120.664	22711603	5037	503368.638	4776853.162	114.163	7001
5383	503198.285	4776691.865	119.067	2221	5038	503366.545	4776850.615	114.169	7001
5384	503202.618	4776695.120	119.068	2221	5039	503364.244	4776847.977	114.173	70019881
5385	503200.934	4776694.000	120.842	22710236	5040	503402.004	4776902.860	117.143	22799882
5386	503201.367	4776694.192	121.156	2361	5041	503391.747	4776903.720	117.283	22709882
5387	503203.635	4776695.980	121.139	2361	5042	503395.894	4776910.112	117.157	22719882
5388	503203.872	4776696.182	120.885	23610227	5043	503381.620	4776899.105	122.813	20009881
5389	503207.708	4776699.098	120.983	22719881	5044	503381.621	4776899.106	123.813	2001
5390	503206.778	4776698.215	118.946	22219881	5045	503371.901	4776883.874	123.823	20019881
5391	503152.890	4776669.538	134.090	21399888	5046	503371.786	4776883.601	124.115	20009888
5392	503162.687	4776663.691	122.926	23009887	5047	503373.569	4776882.457	124.092	20019888
5393	503160.894	4776662.309	122.934	2301	5048	503375.047	4776903.731	137.683	21309882
5394	503160.367	4776662.850	123.015	2301	5049	503374.634	4776903.980	137.685	2131
5395	503160.313	4776662.784	122.874	20009881	5050	503374.634	4776903.993	138.303	2131
5396	503159.681	4776662.361	122.843	2001	5051	503375.166	4776903.651	138.484	2131
5397	503159.197	4776662.946	122.868	20019881	5052	503381.802	4776899.408	138.521	2131
5398	503158.628	4776629.812	122.813	222998822300	5053	503382.171	4776899.187	138.347	2131
5399	503157.050	4776631.796	122.908	2301	5054	503382.050	4776898.998	138.349	21319887
5400	503151.365	4776627.309	122.921	2301	5055	503381.882	4776898.692	138.103	21309881
5401	503144.355	4776620.811	122.925	2301	5056	503371.746	4776882.772	138.096	2131
5402	503124.515	4776601.184	123.056	23009881	5057	503372.512	4776882.333	138.088	2131
5403	503118.954	4776595.628	123.085	23019881	5058	503373.610	4776881.544	137.764	21319888
5404	503132.853	4776605.893	119.966	22209888	5059	503414.542	4776923.740	114.744	55000710
5405	503141.025	4776613.966	119.990	22219888	5060	503414.513	4776923.662	116.636	5501
5406	503149.407	4776622.306	119.924	22219888	5061	503414.862	4776924.271	116.630	55019881
5407	503156.068	4776627.806	119.700	22219888	5062	503414.884	4776924.314	114.761	71019881
5408	503162.068	4776633.450	119.889	22219888	5063	503415.345	4776924.568	114.781	22209881
5409	503152.886	4776636.236	116.905	7000	5064	503415.421	4776924.504	114.776	22219881
5410	503145.597	4776628.556	116.906	7001	5065	503417.478	4776922.417	117.333	22709881
5411	503133.858	4776616.614	116.966	7001	5066	503416.961	4776923.047	117.313	22719881
5412	503142.575	4776639.925	116.911	7000	5067	503416.801	4776923.024	117.282	55009881
5413	503137.592	4776635.873	116.915	7001	5068	503416.445	4776922.537	117.303	55019881
5414	503143.934	4776651.200	123.057	22709881	5069	503416.277	4776921.948	117.298	22709881
5415	503142.580	4776650.336	123.007	22719881	5070	503416.719	4776921.335	117.340	22719881
5416	503142.124	4776649.982	120.321	22209888	5072	503419.764	4776917.649	118.640	55009881
5417	503125.008	4776635.997	120.660	22219888	5073	503419.847	4776917.762	118.632	55019881

PUNTO	X	Y	Z	CODIGO	PUNTO	X	Y	Z	CODIGO
5074	503419.203	4776917.320	117.504	22709881	5163	503355.278	4776859.575	120.497	22709881
5075	503419.244	4776917.349	117.199	7100	5164	503354.587	4776858.729	120.427	2271
5076	503419.890	4776918.035	117.176	71019881	5165	503354.552	4776858.680	120.420	22719881
5077	503419.224	4776917.368	116.986	22209882	5166	503372.746	4776857.313	120.481	23009881
5078	503418.561	4776918.502	116.669	2221	5167	503364.837	4776847.345	120.586	2301
5079	503416.643	4776921.643	116.170	22210710	5168	503367.173	4776838.838	120.534	610
5080	503416.370	4776922.282	115.721	71099882	5169	503353.980	4776833.551	120.752	2301
5081	503417.331	4776922.608	116.161	222998827101	5170	503355.620	4776834.607	120.696	1058411
5082	503416.571	4776921.665	117.285	2271	5171	503365.052	4776846.776	120.560	1058412
5083	503416.160	4776922.087	117.289	22710550	5172	503352.491	4776831.691	120.780	23010227
5084	503416.863	4776923.198	117.299	55010227	5174	503346.516	4776824.111	120.865	2271
5085	503417.491	4776922.450	117.323	2271	5175	503355.290	4776822.358	120.804	610
5086	503418.045	4776921.647	117.382	2271	5176	503335.945	4776810.673	120.952	22719881
5087	503418.549	4776920.907	117.435	22719881	5177	503337.857	4776802.299	120.928	610
5088	503418.360	4776923.652	117.250	610	5178	503355.220	4776852.809	114.123	70009881
5089	503416.697	4776922.896	117.036	55099882	5179	503361.903	4776860.465	114.124	7001
5090	503415.738	4776923.203	117.090	610	5180	503364.918	4776863.940	114.129	7001
5091	503414.784	4776924.291	112.995	704	5181	503366.415	4776865.791	114.119	7001
5092	503415.726	4776920.695	117.254	610	5182	503368.967	4776869.050	114.146	7001
5093	503419.087	4776916.980	118.620	22709881	5183	503370.521	4776871.260	114.126	7001
5094	503419.001	4776917.053	118.611	2271	5184	503372.047	4776873.484	114.130	7001
5095	503419.198	4776917.260	118.614	2271	5185	503375.509	4776878.740	114.149	7001
5096	503419.310	4776917.121	118.629	550998882271	5186	503379.801	4776885.348	114.134	7001
5097	503420.186	4776918.319	118.604	550998882270	5187	503385.204	4776893.589	114.134	7001
5098	503420.074	4776918.470	118.579	2271	5188	503394.000	4776907.079	114.135	70019881
5099	503420.338	4776918.667	118.630	22719882	120	502982.781	4776412.802	124.743	1058120
5100	503381.549	4776898.853	120.998	22299882	121	502978.534	4776435.332	123.714	1058121
5101	503381.812	4776898.953	121.392	22299882	122	503208.218	4776668.926	121.760	1058122
5102	503381.573	4776898.844	121.389	22799882	123	503446.458	4777027.481	120.176	1058123
5103	503381.751	4776899.003	121.978	22709881	205	503181.037	4776644.684	122.732	1058205
5104	503381.829	4776898.960	121.983	22719882	207	503098.567	4776571.244	123.534	1058207
5105	503382.101	4776899.183	120.925	227998822220	208	503050.431	4776554.881	122.951	1058208
5106	503381.791	4776899.367	120.932	2221	15000	502991.922	4776399.547	124.505	22700222
5107	503381.296	4776901.696	121.040	610	15001	502992.669	4776397.637	124.489	610
5108	503375.053	4776903.706	120.943	22219887	15002	502988.230	4776394.290	124.566	2271
5109	503392.267	4776888.317	113.132	704	15003	502982.836	4776386.647	124.637	2271
5110	503387.307	4776881.305	113.032	704	15004	502975.389	4776376.023	124.791	22719881
5111	503383.031	4776874.208	113.147	704	15005	502979.312	4776374.405	124.843	610
5112	503381.746	4776899.295	121.990	22700200	15006	502978.132	4776375.135	124.776	22999882
5113	503382.050	4776899.114	121.989	22719888	15007	502976.286	4776376.915	124.811	22799882
5114	503381.875	4776899.339	137.696	20019888	15008	502976.741	4776376.310	124.791	2200
5115	503381.945	4776898.943	121.990	22709881	15009	502983.968	4776386.585	124.612	2201
5116	503379.984	4776895.697	121.989	2271	15010	502988.793	4776393.434	124.571	2201
5117	503378.731	4776893.627	121.979	2271	15011	502991.982	4776398.035	124.498	2201
5118	503376.870	4776890.588	121.981	2271	15012	502991.814	4776398.150	124.485	22019881
5119	503375.779	4776888.768	121.978	2271	15013	502992.101	4776401.825	124.515	610
5120	503373.646	4776885.164	121.976	2271	15014	502991.474	4776403.412	124.471	2270
5121	503372.610	4776883.419	121.984	2271	15015	502989.857	4776401.107	124.483	22710231
5122	503371.793	4776882.048	121.972	2271	15016	502989.690	4776400.867	124.397	2311
5123	503370.096	4776879.212	121.993	2271	15017	502987.280	4776397.466	123.250	2311
5125	503368.470	4776876.494	122.007	2271	15018	502988.949	4776395.477	123.182	2221
5126	503366.776	4776873.683	121.988	2271	15019	502987.648	4776393.577	122.603	22219881
5127	503364.896	4776870.826	121.997	22710200	15020	502983.169	4776391.633	121.233	23110222
5128	503364.897	4776870.813	123.823	2001	15021	502984.188	4776390.888	121.349	23119881
5129	503366.661	4776873.684	123.819	20010213	15022	502981.737	4776389.962	121.317	610
5130	503367.601	4776873.101	123.794	2131	15023	502983.573	4776392.262	121.105	2221
5131	503367.695	4776873.263	123.791	2131	15024	502984.864	4776394.078	121.103	2221
5132	503367.707	4776873.275	124.089	2131	15025	502987.014	4776397.207	121.206	22219882
5133	503373.525	4776882.379	124.077	21319881	15026	502984.769	4776398.078	121.240	610
5134	503373.603	4776881.514	137.760	21309881	15027	502988.720	4776402.366	121.170	610
5135	503369.529	4776875.187	137.757	2131	15028	502993.532	4776411.967	121.121	610
5136	503368.642	4776875.725	138.143	2131	15029	502997.382	4776417.935	121.003	610
5137	503365.244	4776870.240	138.113	21319881	15030	502994.335	4776418.800	121.000	60209881
5138	503365.866	4776869.539	137.970	21309887	202	503278.781	4776740.965	121.188	1058202
5139	503361.452	4776864.211	137.897	2131	203	503244.545	4776699.564	121.343	1058203
5140	503360.783	4776864.739	137.885	2131	204	503193.487	4776656.959	122.143	1058204
5141	503358.942	4776862.540	137.897	21319887	205	503181.024	4776644.673	122.721	1058205
5142	503364.527	4776870.325	121.938	22700200	206	503155.901	4776645.874	123.465	1058206
5143	503364.511	4776870.329	123.836	2001	207	503098.543	4776571.252	123.543	1058207
5144	503358.882	4776863.658	123.846	2001	208	503050.427	4776554.880	122.955	1058208
5145	503363.055	4776868.613	121.923	2271	408	503270.057	4776730.088	121.178	1058408
5146	503360.889	4776866.050	121.916	2271	15000	503258.177	4776741.058	115.811	704
5147	503358.893	4776863.640	121.922	22711200	15001	503265.218	4776749.329	115.771	704
5148	503364.712	4776870.527	124.125	2130	15002	503257.887	4776740.997	116.152	70009881
5149	503365.474	4776869.898	124.135	2131	15003	503258.958	4776742.165	116.210	7001
5150	503361.429	4776865.048	124.113	2131	15004	503261.625	4776745.510	116.197	7001
5151	503360.706	4776865.684	124.129	2133	15005	503260.783	4776744.309	115.901	704
5152	503356.627	4776864.884	124.105	22209881	15006	503269.996	4776755.608	116.221	7001
5153	503356.251	4776865.116	124.107	2221	15007	503270.238	4776755.434	115.839	704
5154	503358.708	4776868.822	124.130	22219881	15008	503270.980	4776754.620	115.821	704
5155	503358.313	4776863.404	121.094	22709881	15009	503271.563	4776754.167	115.613	704
5156	503350.452	4776865.508	120.996	610	15010	503274.150	4776760.998	116.967	22799882
5157	503356.809	4776861.528	121.073	2271	15011	503273.881	4776760.509	116.974	22709881
5158	503355.360	4776859.718	121.075	2271	15012	503274.016	4776760.376	116.991	2271
5159	503355.264	4776860.040	121.090	222998822271	15013	503274.162	4776760.559	116.937	22719888
5160	503355.296	4776860.060	122.532	22709882	15014	503273.315	4776761.024	117.991	60209881
5161	503355.390	4776860.217	122.528	2271	15015	503273.019	4776760.812	117.966	6021
5162	503346.943	4776865.551	122.529	22719881	15016	503274.046	4776760.311	115.538	704

PUNTO	X	Y	Z	CODIGO	PUNTO	X	Y	Z	CODIGO
15017	503274.629	4776759.818	115.606	704	5501	502988.836	4776446.800	120.080	47199888
15018	503274.038	4776760.306	116.192	70019882	5502	502989.253	4776446.993	121.475	2366
15019	503287.499	4776775.591	116.231	7001	5503	502989.032	4776446.383	121.477	2366
15020	503287.464	4776775.544	115.601	704	5504	502988.718	4776446.831	121.482	2366
15021	503288.088	4776775.028	115.563	704	5505	502989.040	4776446.733	121.485	403
15022	503288.853	4776774.172	115.556	704	5506	503002.128	4776473.534	123.407	
15023	503290.340	4776773.033	115.538	704	2270988823000232				
15024	503291.385	4776772.096	115.539	704	5507	503002.628	4776473.227	123.404	23211230
15025	503292.992	4776770.495	115.515	704	5508	503002.225	4776473.173	123.249	23299882
15026	503294.479	4776768.676	115.541	704	5509	503000.457	4776469.690	120.992	23219887
15027	503299.285	4776788.994	116.221	7001	5510	502998.910	4776468.083	120.948	22209881
15028	503299.316	4776788.998	115.592	704	5511	502990.012	4776444.085	120.880	60209881
15029	503298.796	4776788.592	117.076	22719882	5512	502983.619	4776434.064	121.009	602
200	503401.027	4776911.669	121.424	1058200	5513	502999.621	4776460.724	120.808	6021
201	503374.363	4776858.271	120.397	1058201	5514	503003.413	4776472.798	123.392	2301
300	503381.868	4776867.125	120.325	1058300	5515	503005.401	4776476.153	123.348	2301
301	503448.302	4777032.738	120.130	1058301	5516	503004.147	4776476.882	123.372	23010227
302	503442.402	4777016.044	120.291	1058302	5517	502999.132	4776477.202	123.438	610
15013	503499.308	4777181.303	120.321	2366	5518	503010.703	4776487.616	123.303	2271
15014	503499.349	4777181.932	120.309	2366	5519	503019.919	4776503.030	123.190	22710230
15015	503499.689	4777181.680	120.297	2366	5520	503021.143	4776502.320	123.190	2301
15016	503503.771	4777190.074	120.417	2366	5521	503023.107	4776505.691	123.169	2301
15017	503503.197	4777190.137	120.415	2366	5522	503021.924	4776506.435	123.162	23010227
15018	503503.459	4777189.669	120.417	2366	5523	503016.796	4776507.345	123.237	610
15019	503499.670	4777181.734	114.791	610	5524	503029.221	4776518.524	123.102	2271
15020	503504.124	4777189.701	120.374	332	5525	503037.530	4776532.525	122.984	22710230
15021	503503.534	4777189.675	111.710	610	5526	503038.790	4776531.809	122.955	2301
15022	503503.471	4777189.990	120.427	403	5527	503040.770	4776535.147	122.952	2301
15023	503499.376	4777181.609	120.231	403	5528	503039.528	4776535.880	122.972	23010227
15047	503532.265	4777176.054	111.434	610	5529	503043.399	4776541.860	122.937	2271
15048	503532.198	4777176.056	119.137	2366	5530	503048.372	4776549.763	122.942	2271
15049	503531.851	4777175.683	119.147	2366	5531	503051.973	4776555.682	122.983	22719881
15050	503532.457	4777175.652	119.166	2366	5532	503042.083	4776548.576	122.938	610
15051	503532.264	4777172.042	119.134	2366	5533	503037.672	4776532.422	122.816	23099882
15052	503531.841	4777171.816	119.160	2366	5534	503020.059	4776502.924	123.034	23099882
15053	503532.299	4777171.527	119.072	2366	5535	503002.810	4776473.101	123.227	23099882
15054	503540.348	4777166.633	119.592	2366	5536	502985.081	4776443.664	123.505	23099882
15055	503540.257	4777166.053	119.593	2366	5537	503180.157	4776677.204	117.665	610
15056	503539.882	4777166.216	119.588	2366	5538	503180.493	4776677.108	119.254	2366
15057	503540.172	4777166.373	119.595	403	5539	503179.979	4776676.924	119.255	2366
15058	503532.142	4777171.759	119.186	403	5540	503180.154	4776677.529	119.261	2366
15059	503532.268	4777171.503	119.191	2366	5541	503180.175	4776677.175	119.270	403
15060	503531.850	4777171.794	119.173	2366	5542	503445.222	4777032.226	120.263	2366
15061	503532.283	4777172.033	119.191	2366	5543	503445.629	4777031.804	120.244	2366
15062	503532.160	4777175.738	119.162	403	5544	503445.130	4777031.643	120.259	2366
15031	502989.778	4776411.583	121.130	6021	5545	503445.317	4777031.917	120.252	403
15032	502981.893	4776399.017	121.274	6021	10000	503371.704	4776878.171	116.308	610
15033	502978.741	4776393.568	121.380	6021	10001	503371.391	4776878.245	117.739	2366
15034	502978.819	4776386.190	121.351	610	10002	503372.038	4776878.217	117.740	2366
15035	502974.737	4776387.328	121.245	60219881	10003	503371.621	4776877.773	117.741	2366
15036	502976.258	4776383.840	121.529	610	10004	503355.507	4776857.495	116.983	610
15037	502981.407	4776384.823	121.308	22299882	10005	503355.533	4776857.335	116.923	610
15038	502993.770	4776405.782	124.423	2270	10006	503355.286	4776857.256	118.153	2366
15039	502999.580	4776406.889	124.444	610	10007	503355.744	4776857.281	117.995	2366
15040	503001.339	4776418.727	124.254	2271	10008	503355.746	4776857.780	118.100	2366
15041	503004.099	4776423.442	124.230	22710230	10009	503371.737	4776878.112	117.746	403
15042	503003.214	4776423.977	124.219	2301	10010	503355.469	4776857.515	118.134	403
15043	503004.086	4776423.425	124.104	23099882	10011	503445.505	4777031.848	118.791	610
15044	503007.587	4776431.509	124.161	2301					
15045	503003.209	4776423.986	124.219	23009888					
15046	503007.599	4776431.519	124.169	2301					
15047	503006.936	4776431.924	124.157	2301					
15048	503007.201	4776431.722	124.031	23099882					
5500	502989.021	4776446.712	119.791	610					

ANEXO 2: INSTRUMENTACIÓN

• **EQUIPOS TAQUIMÉTRICOS**

Equipo: Estación total. **N ° serie:** 360495

Marca: Leica. **Modelo:** TS30

Con medida electrónica de ángulos (precisión de 0,5 segundos centesimales) y medida electrónica de las distancias (precisión 0,6mm.+/- 1 p.p.m.).

El registro de datos se realiza con libreta electrónica, para evitar errores de anotación, almacenando observaciones completas a cada uno de los puntos.

Equipo: 2 Estaciones totales **N ° serie:** 254773 y 1329295

Marca: LEICA **Modelos:** TCR805 ULTRA y TS06 POWER

Con medida electrónica de ángulos (precisión de 10 segundos centesimales) y medida electrónica de las distancias (precisión 3mm.+/- 3 p.p.m.).

El registro de datos se realiza con libreta electrónica, para evitar errores de anotación, almacenando observaciones completas a cada uno de los puntos.

Ofrece la opción de medir sin Prisma, útil para levantamientos de fachadas y elementos inaccesibles.

• **EQUIPO DE GPS**

Equipo: 3 Receptores GPS GX 1230+

Números de Serie: 481320, 481054 y 481587

Marca: LEICA

Permiten obtener puntos en Tiempo Real con una Precisión de 0,020 m.

Disponen de múltiples aplicaciones encaminadas a la toma de datos y a obra civil.

Aseguramos la adecuación y correcto estado de este equipo mediante verificaciones y calibraciones periódicas siguiendo el procedimiento PG17 "Control de dispositivos de seguimiento y medición" de nuestro Sistema de Gestión de la Calidad UNE-EN-ISO-9001:2000, implantado en esta Empresa desde el 3 de septiembre de 2.003.

ANEXO 3:

RESEÑAS

BASE 120

Coordenadas : UTM ETRS89
(Z referida a la nueva Red NAP del THA)

X = 502982.781

Y = 4776412.802

Z = 124.743

ANAMORFOSIS = 0.99960011

FECHA: Diciembre 2014

ZONA: Llodio



FOTOGRAFÍA



RESEÑA LITERAL : Clavo colocado en el pavimento de la pasarela.

BASE 208

Coordenadas : UTM ETRS89
(Z referida a la nueva Red NAP del THA)

X = 503050.427

Y = 4776554.880

Z = 122.955

ANAMORFOSIS = 0.99960011

FECHA: Diciembre 2014

ZONA: Llodio



FOTOGRAFÍA



RESEÑA LITERAL : Clavo situado en acera.

BASE 206

Coordenadas : UTM ETRS89
(Z referida a la nueva Red NAP del THA)

X = 503155.901

Y = 4776645.874

Z = 123.465

ANAMORFOSIS = 0.99960012

FECHA: Diciembre 2014

ZONA: Llodio



FOTOGRAFÍA



RESEÑA LITERAL : Clavo insertado en la acera del puente.

BASE 200

Coordenadas : UTM ETRS89
(Z referida a la nueva Red NAP del THA)

X = 503401.027

Y = 4776911.669

Z = 121.423

ANAMORFOSIS = 0.99960955

FECHA: Diciembre 2014

ZONA: Llodio



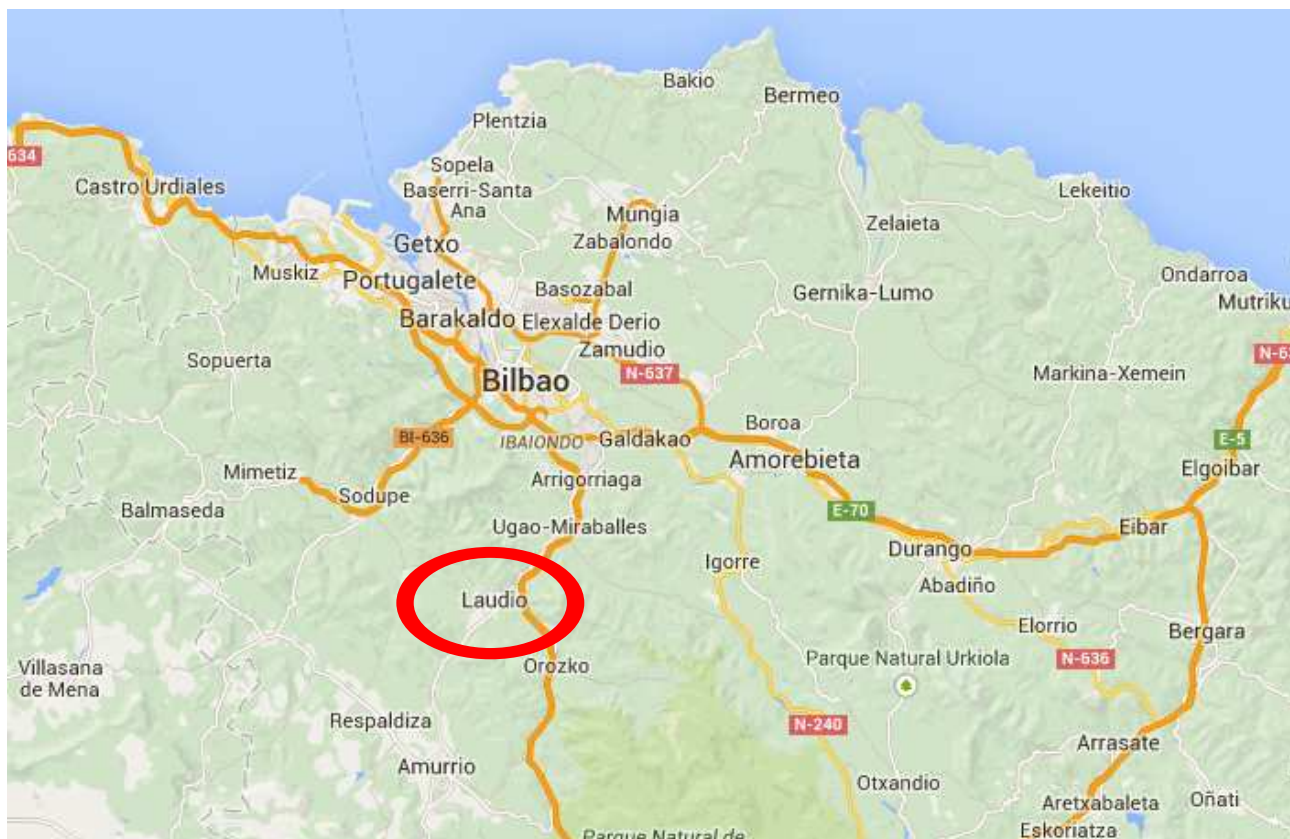
FOTOGRAFÍA



RESEÑA LITERAL : Clavo colocado en el pavimento de la pasarela.

3.- PLANOS

3.1.- PLANO DE SITUACIÓN



4.- INFORMACIÓN EN FORMATO DIGITAL

2. REPLANTEO Y TRAZADO

En este apartado se incluyen tres listados; eje, borde derecho e izquierdo del cauce de aguas bajas. Este listado recoge la información de todos los puntos, coordenadas X-Y-Z.

Para el replanteo de los taludes emplear criterios marcados en los planos 2.3 SECCIONES TIPO.

2.1. Eje

PTO	PK	X	Y	Z	Azimut
1	4437.86	502912.076	4776298.857	118.83	34.5847
2	4430.00	502916.139	4776305.585	118.75	34.5847
3	4420.00	502921.308	4776314.145	118.64	34.5847
4	4410.00	502926.477	4776322.706	118.53	34.5847
5	4400.00	502931.647	4776331.266	118.42	34.5847
6	4390.00	502936.816	4776339.826	118.31	34.5847
7	4380.00	502941.985	4776348.387	118.20	34.5847
8	4370.00	502947.154	4776356.947	118.09	34.5847
9	4360.00	502952.324	4776365.507	117.98	34.5847
10	4350.00	502957.493	4776374.068	117.87	34.5847
11	4340.00	502962.662	4776382.628	117.76	34.5847
12	4330.00	502967.831	4776391.188	117.65	34.5847
13	4320.00	502973.001	4776399.749	117.55	34.5847
14	4310.00	502978.170	4776408.309	117.44	34.5847
15	4306.32	502980.070	4776411.456	117.40	34.5847
16	4302.74	502981.921	4776414.520	117.36	34.5847
17	4300.00	502983.339	4776416.869	117.33	34.5847
18	4298.41	502984.163	4776418.233	117.31	34.5847
19	4290.00	502988.508	4776425.429	117.26	34.5847
20	4280.00	502993.678	4776433.990	117.20	34.5847
21	4270.00	502998.847	4776442.550	117.14	34.5847
22	4260.00	503004.016	4776451.110	117.08	34.5847
23	4250.00	503009.185	4776459.671	117.02	34.5847
24	4240.00	503014.355	4776468.231	116.96	34.5847
25	4237.73	503015.528	4776470.174	116.94	34.5847
26	4230.00	503019.524	4776476.791	116.90	34.5847
27	4220.00	503024.693	4776485.352	116.84	34.5847
28	4210.00	503029.862	4776493.912	116.78	34.5847
29	4200.00	503035.032	4776502.472	116.72	34.5847
30	4190.00	503040.201	4776511.033	116.66	34.5847
31	4180.00	503045.370	4776519.593	116.60	34.5847
32	4178.13	503046.339	4776521.197	116.59	34.5847
33	4172.63	503049.178	4776525.899	116.55	34.5847
34	4170.00	503050.547	4776528.149	116.54	34.9888
35	4160.00	503055.872	4776536.612	116.48	36.5235

36	4150.00	503061.401	4776544.945	116.42	38.0583
37	4148.28	503062.383	4776546.351	116.41	38.8257
38	4140.00	503067.128	4776553.142	116.36	39.5931
39	4138.62	503067.943	4776554.250	116.35	40.3605
40	4130.00	503073.052	4776561.199	116.30	41.1279
41	4120.00	503079.167	4776569.110	116.24	42.6626
42	4110.00	503085.472	4776576.872	116.18	44.1974
43	4100.00	503091.962	4776584.479	116.12	45.7322
44	4090.00	503098.634	4776591.928	116.06	47.2669
45	4080.00	503105.483	4776599.214	116.00	48.8017
46	4070.00	503112.506	4776606.332	115.94	50.3365
47	4068.52	503113.573	4776607.363	115.93	51.1133
48	4068.37	503113.681	4776607.467	115.93	51.1039
49	4060.00	503119.699	4776613.280	115.88	51.8713
50	4050.00	503127.056	4776620.051	115.82	53.4060
51	4040.00	503134.575	4776626.644	115.76	54.9408
52	4030.00	503142.251	4776633.053	115.70	56.4756
53	4020.00	503150.079	4776639.276	115.64	58.0103
54	4011.43	503156.916	4776644.446	115.59	58.7848
55	4011.34	503156.988	4776644.501	115.59	58.7777
56	4010.00	503158.054	4776645.308	115.58	59.5451
57	4000.00	503166.173	4776651.146	115.52	61.0799
58	3999.23	503166.807	4776651.589	115.51	61.1986
59	3999.22	503166.815	4776651.595	115.21	61.2001
60	3998.91	503167.066	4776651.769	115.21	61.2350
61	3998.76	503167.188	4776651.855	115.21	61.2699
62	3990.00	503174.334	4776656.925	115.16	60.1542
63	3980.00	503182.379	4776662.864	115.10	58.8810
64	3970.00	503190.304	4776668.963	115.04	57.6077
65	3960.00	503198.105	4776675.219	114.98	56.3345
66	3950.00	503205.780	4776681.629	114.92	55.0613
67	3943.43	503210.735	4776685.939	114.88	54.4246
68	3940.00	503213.325	4776688.192	114.86	53.7880
69	3930.00	503220.737	4776694.904	114.80	52.5148
70	3920.00	503228.013	4776701.764	114.74	51.2415
71	3910.00	503235.151	4776708.767	114.68	49.9683
72	3900.00	503242.148	4776715.912	114.62	48.6951
73	3890.00	503249.000	4776723.195	114.56	47.4218
74	3880.00	503255.705	4776730.614	114.50	46.1486
75	3874.10	503259.591	4776735.054	114.46	45.3973
76	3872.24	503260.805	4776736.457	114.45	45.3973
77	3870.70	503261.816	4776737.627	114.44	45.3973
78	3870.00	503262.273	4776738.155	114.44	45.3973

79	3860.00	503268.814	4776745.718	114.38	45.3973
80	3850.00	503275.356	4776753.281	114.32	45.3973
81	3845.63	503278.213	4776756.585	114.29	45.3973
82	3840.00	503281.898	4776760.845	114.26	45.3973
83	3830.00	503288.440	4776768.408	114.20	45.3973
84	3827.66	503289.969	4776770.176	114.18	45.3973
85	3820.00	503294.982	4776775.971	114.14	45.3973
86	3810.00	503301.524	4776783.535	114.08	45.3973
87	3800.00	503308.065	4776791.098	114.02	45.3973
88	3790.00	503314.607	4776798.662	113.96	45.3973
89	3780.00	503321.149	4776806.225	113.90	45.3973
90	3772.44	503326.095	4776811.943	113.85	45.3973
91	3770.00	503327.691	4776813.788	113.84	45.3973
92	3760.00	503334.233	4776821.352	113.78	45.3973
93	3750.00	503340.774	4776828.915	113.72	45.3973
94	3741.38	503346.415	4776835.436	113.67	45.3973
95	3740.00	503347.316	4776836.479	113.66	45.3973
96	3735.68	503350.145	4776839.750	113.63	45.3973
97	3730.00	503353.838	4776844.059	113.60	44.7951
98	3723.13	503358.251	4776849.321	113.56	44.0665
99	3723.12	503358.257	4776849.329	113.26	44.0654
100	3720.00	503360.244	4776851.738	113.25	43.7341
101	3711.38	503365.657	4776858.450	113.22	43.2036
102	3710.00	503366.521	4776859.522	113.22	42.6731
103	3700.00	503372.668	4776867.410	113.19	41.6120
104	3690.00	503378.682	4776875.399	113.16	40.5510
105	3687.72	503380.036	4776877.235	113.15	40.3089
106	3680.00	503384.563	4776883.487	113.15	39.4900
107	3670.00	503390.307	4776891.672	113.14	38.4289
108	3660.00	503395.915	4776899.952	113.14	37.3679
109	3653.61	503399.428	4776905.295	113.13	36.6894
110	3650.00	503401.384	4776908.324	113.10	36.3069
111	3648.31	503402.287	4776909.758	113.09	35.7764
112	3644.64	503404.238	4776912.857	113.05	35.7764
113	3640.00	503406.712	4776916.786	113.01	35.2458
114	3630.00	503411.899	4776925.335	112.93	34.1848
115	3621.70	503416.096	4776932.498	112.85	33.3039
116	3620.00	503416.942	4776933.970	112.85	33.1238
117	3610.00	503421.841	4776942.688	112.84	32.0628
118	3600.00	503426.594	4776951.486	112.82	31.0017
119	3590.15	503431.130	4776960.227	112.80	30.4712
120	3590.00	503431.200	4776960.362	112.80	29.9407
121	3580.00	503435.657	4776969.314	112.79	28.8797

122	3570.00	503439.964	4776978.338	112.77	27.8186
123	3560.00	503444.121	4776987.434	112.76	26.7576
124	3550.00	503448.125	4776996.597	112.74	25.6966
125	3540.47	503451.796	4777005.396	112.72	25.1660
126	3540.00	503451.976	4777005.825	112.72	24.6355
127	3530.00	503455.672	4777015.117	112.71	23.5745
128	3520.00	503459.213	4777024.469	112.69	22.5135
129	3513.72	503461.359	4777030.376	112.68	21.8466
130	3510.00	503462.609	4777033.875	112.68	21.8466
131	3500.00	503465.974	4777043.292	112.66	21.8466
132	3490.00	503469.339	4777052.709	112.64	21.8466
133	3482.39	503471.900	4777059.877	112.63	21.8466
134	3480.00	503472.703	4777062.125	112.63	21.8466
135	3470.00	503476.068	4777071.542	112.61	21.8466
136	3464.41	503477.950	4777076.810	112.60	21.8466
137	3460.00	503479.433	4777080.959	112.60	21.8466
138	3450.00	503482.797	4777090.376	112.58	21.8466
139	3447.44	503483.659	4777092.788	112.58	21.8466
140	3440.00	503486.162	4777099.793	112.56	21.8466
141	3435.00	503487.845	4777104.502	112.56	21.8466
142	3430.00	503489.527	4777109.210	112.55	21.8466
143	3428.47	503490.043	4777110.655	112.54	21.8466
144	3420.00	503492.891	4777118.627	112.53	21.8466
145	3419.74	503492.978	4777118.869	112.53	21.8466
146	3415.39	503494.473	4777122.962	112.52	22.2897
147	3410.00	503496.320	4777128.021	112.51	22.7327
148	3400.00	503499.882	4777137.365	112.50	23.6422
149	3395.38	503501.588	4777141.654	112.49	24.0969
150	3390.00	503503.577	4777146.657	112.48	24.5516
151	3380.00	503507.405	4777155.895	112.47	25.4611
152	3372.87	503510.230	4777162.447	112.46	25.9158
153	3370.00	503511.365	4777165.078	112.45	26.3706
154	3360.00	503515.455	4777174.203	112.43	27.2800
155	3350.00	503519.675	4777183.269	112.42	28.1895
156	3340.00	503524.024	4777192.274	112.40	29.0989
157	3335.86	503525.862	4777195.984	112.40	29.4755
158	3332.83	503527.297	4777198.647	112.39	31.4676
159	3330.00	503528.641	4777201.141	112.39	33.4597
160	3325.00	503531.264	4777205.397	112.38	36.8595
161	3320.00	503534.111	4777209.507	112.37	40.2594
162	3315.00	503537.172	4777213.459	112.36	43.6592
163	3310.00	503540.440	4777217.243	112.35	47.0591
164	3305.00	503543.906	4777220.846	112.35	50.4589

165	3300.00	503547.559	4777224.259	112.34	53.8588
166	3295.00	503551.389	4777227.473	112.33	57.2586
167	3290.00	503555.385	4777230.477	112.32	60.6584
168	3285.00	503559.535	4777233.264	112.31	64.0583
169	3280.00	503563.829	4777235.825	112.31	67.4581
170	3277.95	503565.646	4777236.781	112.30	69.1581
171	3275.00	503568.253	4777238.153	112.30	70.8580
172	3270.00	503572.795	4777240.242	112.29	74.2578
173	3265.00	503577.442	4777242.086	112.28	77.6577
174	3260.00	503582.181	4777243.679	112.27	81.0575
175	3255.00	503586.998	4777245.016	112.27	84.4574
176	3250.00	503591.880	4777246.095	112.26	87.8572
177	3245.00	503596.812	4777246.911	112.25	91.2571
178	3240.00	503601.781	4777247.463	112.24	94.6569
179	3235.29	503606.483	4777247.740	112.23	97.8597
180	3230.00	503611.763	4777248.042	112.23	94.8616
181	3225.00	503616.736	4777248.556	112.22	92.0278
182	3220.00	503621.682	4777249.290	112.21	89.1940
183	3218.13	503623.520	4777249.648	112.21	87.7771
184	3215.00	503626.590	4777250.245	112.20	86.3602
185	3210.00	503631.450	4777251.416	112.19	83.5264
186	3205.00	503636.253	4777252.803	112.19	80.6926
187	3200.00	503640.990	4777254.401	112.18	77.8588
188	3198.42	503642.475	4777254.952	112.18	76.9615
189	3190.00	503650.347	4777257.931	112.16	76.9615
190	3180.00	503659.699	4777261.472	112.15	76.9615
191	3170.00	503669.051	4777265.012	112.13	76.9615
192	3166.20	503672.608	4777266.359	112.12	76.9615
193	3160.00	503678.462	4777268.390	112.11	80.5106
194	3154.08	503684.149	4777270.022	112.10	83.8994
195	3151.98	503686.185	4777270.549	112.10	83.8994
196	3150.00	503688.101	4777271.044	112.10	83.8994
197	3140.00	503697.783	4777273.546	112.08	83.8994
198	3130.00	503707.465	4777276.048	112.07	83.8994
199	3120.00	503717.147	4777278.551	112.05	83.8994
200	3116.31	503720.720	4777279.474	112.04	83.8994
201	3110.00	503726.846	4777280.986	112.03	85.2901
202	3100.00	503736.618	4777283.107	112.02	87.4942
203	3099.61	503737.005	4777283.184	112.02	87.5811

2.2. Borde derecho

PK	X	Y	Z	Distancia
4437.86	502915.671	4776296.686	118.83	4.20
4430.00	502920.022	4776303.240	118.75	4.54
4420.00	502925.557	4776311.580	118.64	4.96
4410.00	502931.092	4776319.919	118.53	5.39
4400.00	502936.346	4776328.428	118.42	5.49
4390.00	502941.601	4776336.937	118.31	5.59
4380.00	502946.855	4776345.446	118.20	5.69
4370.00	502952.109	4776353.955	118.09	5.79
4360.00	502957.363	4776362.464	117.98	5.89
4350.00	502962.618	4776370.973	117.87	5.99
4340.00	502967.872	4776379.482	117.76	6.09
4330.00	502973.126	4776387.991	117.65	6.19
4320.00	502978.380	4776396.500	117.54	6.28
4310.00	502983.634	4776405.009	117.44	6.38
4306.32	502985.566	4776408.137	117.40	6.42
4302.74	502987.416	4776411.202	117.36	6.42
4300.00	502988.818	4776413.561	117.33	6.40
4298.41	502989.632	4776414.931	117.31	6.39
4290.00	502993.925	4776422.158	117.26	6.33
4280.00	502999.033	4776430.756	117.20	6.26
4270.00	503004.140	4776439.354	117.14	6.18
4260.00	503009.247	4776447.951	117.08	6.11
4250.00	503014.355	4776456.549	117.02	6.04
4240.00	503019.462	4776465.147	116.96	5.97
4237.73	503020.622	4776467.098	116.94	5.95
4230.00	503024.620	4776473.714	116.90	5.95
4220.00	503029.794	4776482.272	116.84	5.96
4210.00	503034.967	4776490.830	116.78	5.96
4200.00	503040.140	4776499.388	116.72	5.97
4190.00	503045.313	4776507.945	116.66	5.97
4180.00	503050.486	4776516.503	116.60	5.98
4178.13	503051.456	4776518.107	116.59	5.98
4172.63	503054.298	4776522.808	116.55	5.98
4170.00	503055.646	4776525.025	116.54	5.98
4160.00	503060.937	4776533.339	116.48	6.03
4150.00	503066.427	4776541.523	116.42	6.08
4148.28	503067.375	4776542.864	116.41	6.09
4139.93	503072.111	4776549.570	116.36	6.13
4138.62	503072.888	4776550.615	116.35	6.14
4130.00	503077.987	4776557.477	116.30	6.18
4120.00	503084.261	4776565.073	116.24	6.50

4110.00	503090.621	4776572.586	116.18	6.70
4100.00	503097.158	4776579.938	116.12	6.90
4090.00	503103.791	4776587.195	116.06	7.00
4080.00	503110.453	4776594.428	116.00	6.90
4070.00	503117.066	4776601.724	115.94	6.48
4068.52	503118.081	4776602.694	115.93	6.49
4068.37	503118.190	4776602.798	115.93	6.49
4060.00	503124.028	4776608.688	115.88	6.31
4050.00	503131.129	4776615.517	115.82	6.09
4040.00	503138.398	4776622.177	115.76	5.88
4030.00	503145.828	4776628.663	115.70	5.66
4020.00	503153.417	4776634.970	115.64	5.45
4011.43	503160.090	4776640.248	115.59	5.26
4011.34	503160.161	4776640.305	115.59	5.26
4010.06	503161.160	4776641.097	115.58	5.23
4000.00	503169.053	4776647.038	115.52	5.02
3999.23	503169.669	4776647.489	115.51	5.00
3999.23	503169.669	4776647.489	115.51	5.00
3999.22	503169.677	4776647.495	115.21	5.00
3998.91	503169.925	4776647.668	115.21	5.00
3998.76	503170.046	4776647.752	115.21	5.00
3990.00	503177.263	4776652.873	115.16	5.00
3980.00	503185.389	4776658.871	115.10	5.00
3970.00	503193.393	4776665.031	115.04	5.00
3960.00	503201.272	4776671.349	114.98	5.00
3950.00	503209.023	4776677.824	114.92	5.00
3943.43	503214.016	4776682.167	114.88	5.00
3940.00	503216.636	4776684.462	114.86	4.99
3930.00	503224.097	4776691.268	114.80	4.95
3920.00	503231.421	4776698.221	114.74	4.92
3910.00	503238.603	4776705.319	114.68	4.88
3900.00	503245.642	4776712.558	114.62	4.84
3890.00	503252.534	4776719.936	114.56	4.81
3880.00	503259.276	4776727.450	114.50	4.77
3874.10	503263.184	4776731.947	114.46	4.75
3872.24	503264.397	4776733.350	114.45	4.75
3870.70	503265.390	4776734.535	114.44	4.73
3870.00	503265.839	4776735.070	114.44	4.71
3860.00	503272.261	4776742.737	114.38	4.56
3850.00	503278.683	4776750.404	114.32	4.40
3845.63	503281.488	4776753.752	114.29	4.33
3840.00	503285.194	4776757.994	114.26	4.36
3830.00	503291.774	4776765.524	114.20	4.41

3827.66	503293.312	4776767.284	114.18	4.42
3820.00	503298.370	4776773.041	114.14	4.48
3810.00	503304.971	4776780.553	114.08	4.56
3800.00	503311.571	4776788.066	114.02	4.64
3790.00	503318.172	4776795.578	113.96	4.71
3780.00	503324.773	4776803.091	113.90	4.79
3772.44	503329.763	4776808.771	113.85	4.85
3770.00	503331.379	4776810.598	113.84	4.88
3760.00	503338.004	4776818.090	113.78	4.99
3750.00	503344.629	4776825.581	113.72	5.10
3741.38	503350.341	4776832.040	113.67	5.19
3740.00	503351.254	4776833.073	113.66	5.21
3735.68	503354.119	4776836.313	113.63	5.25
3730.00	503357.891	4776840.620	113.60	5.32
3723.13	503362.402	4776845.880	113.56	5.39
3723.12	503362.408	4776845.888	113.26	5.39
3720.00	503364.439	4776848.297	113.25	5.43
3711.38	503369.954	4776854.984	113.22	5.52
3710.00	503370.815	4776856.118	113.22	5.48
3700.00	503376.776	4776864.263	113.19	5.17
3690.00	503382.597	4776872.502	113.16	4.87
3687.72	503383.905	4776874.395	113.15	4.80
3680.00	503388.277	4776880.833	113.15	4.57
3670.00	503393.815	4776889.253	113.14	4.26
3660.00	503399.209	4776897.761	113.14	3.96
3653.60	503402.582	4776903.246	113.13	3.76
3650.00	503404.457	4776906.352	113.10	3.65
3648.30	503405.333	4776907.840	113.09	3.60
3644.64	503407.285	4776910.939	113.05	3.60
3640.00	503409.915	4776914.806	113.01	3.77
3630.00	503415.442	4776923.226	112.93	4.12
3621.70	503419.925	4776930.291	112.85	4.42
3620.00	503420.830	4776931.743	112.85	4.48
3610.00	503426.078	4776940.353	112.84	4.84
3600.00	503431.185	4776949.055	112.82	5.19
3590.15	503436.053	4776957.672	112.80	5.55
3590.00	503436.145	4776957.848	112.80	5.55
3580.00	503440.701	4776966.854	112.79	5.61
3570.00	503445.108	4776975.936	112.77	5.68
3560.00	503449.362	4776985.091	112.76	5.74
3550.00	503453.464	4776994.316	112.74	5.81
3540.47	503457.212	4777003.136	112.72	5.87
3540.00	503457.406	4777003.613	112.72	5.86

3530.00	503461.049	4777013.030	112.71	5.77
3520.00	503464.534	4777022.505	112.69	5.67
3513.72	503466.643	4777028.488	112.68	5.61
3510.00	503467.859	4777031.999	112.67	5.58
3500.00	503471.134	4777041.448	112.66	5.48
3490.00	503474.408	4777050.897	112.64	5.38
3482.39	503476.900	4777058.090	112.63	5.31
3480.00	503477.748	4777060.323	112.63	5.36
3470.00	503481.300	4777069.673	112.61	5.56
3460.00	503484.851	4777079.023	112.59	5.75
3450.00	503488.403	4777088.373	112.58	5.95
3440.00	503491.954	4777097.724	112.56	6.15
3435.00	503493.730	4777102.399	112.55	6.25
3430.00	503495.412	4777107.107	112.55	6.25
3428.47	503495.929	4777108.552	112.54	6.25
3420.00	503498.774	4777116.525	112.53	6.25
3419.74	503498.860	4777116.767	112.53	6.25
3410.02	503502.169	4777125.839	112.51	6.24
3400.00	503505.697	4777135.101	112.50	6.24
3390.02	503509.356	4777144.311	112.48	6.24
3380.00	503513.146	4777153.469	112.47	6.23
3372.87	503515.951	4777159.980	112.45	6.23
3370.03	503517.032	4777162.586	112.45	6.19
3360.00	503520.963	4777171.687	112.43	6.06
3350.00	503525.024	4777180.732	112.42	5.92
3340.00	503529.215	4777189.721	112.40	5.79
3335.86	503530.988	4777193.425	112.40	5.73
3332.83	503532.304	4777195.948	112.39	5.69
3330.10	503533.529	4777198.306	112.39	5.65
3325.00	503535.936	4777202.343	112.38	5.58
3320.00	503538.558	4777206.248	112.37	5.51
3315.00	503541.387	4777210.010	112.36	5.45
3310.00	503544.416	4777213.619	112.35	5.38
3305.00	503547.634	4777217.063	112.35	5.31
3300.00	503551.035	4777220.334	112.34	5.24
3295.00	503554.609	4777223.420	112.33	5.18
3290.00	503558.344	4777226.314	112.32	5.11
3285.00	503562.232	4777229.005	112.31	5.04
3280.00	503566.262	4777231.488	112.31	4.97
3277.95	503567.949	4777232.405	112.30	4.95
3275.06	503570.438	4777233.718	112.30	4.94
3270.00	503574.740	4777235.697	112.29	4.94
3265.00	503579.142	4777237.443	112.28	4.94

3260.00	503583.631	4777238.952	112.27	4.94
3255.00	503588.193	4777240.219	112.27	4.94
3250.00	503592.817	4777241.241	112.26	4.94
3245.00	503597.489	4777242.015	112.25	4.94
3240.00	503602.195	4777242.538	112.24	4.94
3235.29	503606.649	4777242.800	112.23	4.94
3230.00	503612.162	4777243.116	112.23	4.94
3225.00	503617.354	4777243.653	112.22	4.94
3220.00	503622.516	4777244.420	112.21	4.94
3218.13	503624.463	4777244.798	112.21	4.94
3215.00	503627.635	4777245.438	112.20	4.92
3210.00	503632.699	4777246.695	112.19	4.88
3205.00	503637.701	4777248.176	112.19	4.85
3200.00	503642.630	4777249.878	112.18	4.81
3198.42	503644.175	4777250.462	112.17	4.80
3190.00	503652.025	4777253.498	112.16	4.74
3180.00	503661.352	4777257.105	112.15	4.67
3170.00	503670.679	4777260.712	112.13	4.60
3166.20	503674.226	4777262.083	112.12	4.57
3160.00	503679.826	4777264.073	112.11	4.53
3154.08	503685.271	4777265.680	112.10	4.48
3151.98	503687.303	4777266.221	112.10	4.47
3150.00	503689.220	4777266.715	112.10	4.47
3140.00	503698.904	4777269.212	112.08	4.48
3130.00	503708.587	4777271.708	112.06	4.48
3120.00	503718.270	4777274.205	112.05	4.49
3116.31	503721.844	4777275.126	112.04	4.49
3110.00	503727.875	4777276.611	112.03	4.49
3100.00	503737.496	4777278.694	112.02	4.50
3099.61	503737.877	4777278.769	112.02	4.50

2.3. Borde Izquierdo

PK	X	Y	Z	Distancia
4437.86	502907.710	4776301.493	118.83	5.10
4430.00	502911.773	4776308.221	118.75	5.10
4420.00	502916.942	4776316.782	118.64	5.10
4410.00	502922.112	4776325.342	118.53	5.10
4400.00	502927.318	4776333.880	118.42	5.06
4390.00	502932.524	4776342.418	118.31	5.01
4380.00	502937.731	4776350.956	118.20	4.97
4370.00	502942.937	4776359.494	118.09	4.93
4360.00	502948.144	4776368.031	117.98	4.88
4350.00	502953.350	4776376.569	117.87	4.84
4340.00	502958.557	4776385.107	117.76	4.80
4330.00	502963.763	4776393.645	117.65	4.75
4320.00	502968.969	4776402.183	117.54	4.71
4310.00	502974.176	4776410.721	117.44	4.67
4306.32	502976.090	4776413.859	117.40	4.65
4302.74	502977.940	4776416.924	117.36	4.65
4300.00	502979.338	4776419.285	117.33	4.67
4298.41	502980.149	4776420.657	117.31	4.69
4290.00	502984.431	4776427.891	117.26	4.76
4280.00	502989.525	4776436.497	117.20	4.85
4270.00	502994.618	4776445.103	117.14	4.94
4260.00	502999.712	4776453.709	117.08	5.03
4250.00	503004.806	4776462.316	117.02	5.12
4240.00	503009.899	4776470.922	116.96	5.20
4237.73	503011.055	4776472.875	116.94	5.23
4230.00	503015.079	4776479.475	116.90	5.19
4220.00	503020.285	4776488.014	116.84	5.15
4210.00	503025.490	4776496.552	116.78	5.11
4200.00	503030.695	4776505.091	116.72	5.07
4190.00	503035.901	4776513.629	116.66	5.02
4180.00	503041.106	4776522.168	116.60	4.98
4178.13	503042.082	4776523.768	116.59	4.97
4172.63	503044.941	4776528.458	116.55	4.95
4170.00	503046.326	4776530.734	116.54	4.95
4160.00	503051.772	4776539.262	116.48	4.88
4150.00	503057.421	4776547.655	116.42	4.81
4148.28	503058.447	4776549.102	116.41	4.80
4140.00	503063.270	4776555.907	116.36	4.75
4138.62	503064.126	4776557.056	116.35	4.74
4130.00	503069.316	4776564.015	116.30	4.68
4120.00	503075.955	4776571.657	116.24	4.10

4110.00	503082.475	4776579.367	116.18	3.90
4100.00	503089.101	4776586.980	116.12	3.80
4090.00	503095.908	4776594.430	116.06	3.70
4080.00	503102.674	4776601.919	116.00	3.90
4070.00	503109.502	4776609.368	115.94	4.27
4068.52	503110.613	4776610.428	115.93	4.26
4068.37	503110.721	4776610.531	115.93	4.26
4060.00	503116.673	4776616.488	115.88	4.41
4050.00	503123.989	4776623.466	115.82	4.59
4040.00	503131.475	4776630.267	115.76	4.77
4030.00	503139.125	4776636.889	115.70	4.95
4020.00	503146.937	4776643.328	115.64	5.13
4011.43	503153.731	4776648.659	115.59	5.28
4011.34	503153.801	4776648.714	115.59	5.28
4010.00	503154.905	4776649.579	115.58	5.31
4000.00	503163.024	4776655.638	115.52	5.49
3999.23	503163.659	4776656.099	115.51	5.50
3999.23	503163.659	4776656.099	115.51	5.50
3999.22	503163.667	4776656.104	115.21	5.50
3998.91	503163.922	4776656.278	115.21	5.50
3998.76	503164.047	4776656.364	115.21	5.50
3990.00	503171.170	4776661.302	115.16	5.40
3980.00	503179.193	4776667.091	115.10	5.29
3970.00	503187.100	4776673.041	115.04	5.19
3960.00	503194.889	4776679.148	114.98	5.08
3950.00	503202.555	4776685.412	114.92	4.97
3943.43	503207.519	4776689.636	114.88	4.90
3940.03	503210.028	4776691.907	114.86	4.97
3930.00	503217.234	4776698.695	114.80	5.16
3920.00	503224.301	4776705.624	114.74	5.36
3910.00	503231.224	4776712.690	114.68	5.55
3900.00	503238.002	4776719.891	114.62	5.75
3890.00	503244.632	4776727.222	114.56	5.94
3880.00	503251.112	4776734.682	114.50	6.14
3874.10	503254.864	4776739.143	114.46	6.25
3872.24	503256.078	4776740.546	114.45	6.25
3870.70	503257.034	4776741.763	114.44	6.32
3870.00	503257.466	4776742.312	114.44	6.36
3860.00	503263.652	4776750.183	114.38	6.83
3850.00	503270.062	4776757.860	114.32	7.00
3845.63	503272.919	4776761.164	114.29	7.00
3840.00	503276.604	4776765.424	114.26	7.00
3830.00	503282.858	4776773.235	114.20	7.38

3827.66	503284.296	4776775.082	114.18	7.50
3820.00	503289.309	4776780.878	114.14	7.50
3810.00	503295.851	4776788.441	114.08	7.50
3800.00	503302.393	4776796.005	114.02	7.50
3790.00	503308.935	4776803.568	113.96	7.50
3780.00	503315.476	4776811.131	113.90	7.50
3772.44	503320.422	4776816.850	113.85	7.50
3770.00	503322.079	4776818.642	113.84	7.42
3760.00	503328.871	4776825.989	113.78	7.09
3750.00	503335.663	4776833.336	113.72	6.76
3741.38	503341.519	4776839.670	113.67	6.47
3740.00	503342.455	4776840.683	113.66	6.43
3735.68	503345.393	4776843.860	113.63	6.28
3730.00	503349.189	4776848.004	113.60	6.10
3723.13	503353.733	4776853.067	113.56	5.87
3723.12	503353.739	4776853.074	113.26	5.87
3720.00	503355.786	4776855.394	113.25	5.77
3711.38	503361.391	4776861.890	113.22	5.48
3710.04	503362.212	4776862.938	113.22	5.50
3700.00	503368.197	4776870.834	113.19	5.63
3690.00	503374.048	4776878.827	113.16	5.76
3687.72	503375.364	4776880.664	113.15	5.80
3680.00	503379.296	4776887.249	113.15	6.47
3670.00	503384.717	4776895.527	113.14	6.79
3660.00	503389.512	4776904.211	113.14	7.69
3653.60	503393.458	4776909.175	113.13	7.12
3650.00	503395.668	4776911.990	113.10	6.79
3648.30	503396.662	4776913.300	113.09	6.65
3644.64	503398.890	4776916.225	113.05	6.32
3640.03	503401.398	4776920.070	113.01	6.25
3630.00	503406.666	4776928.451	112.93	6.09
3621.70	503410.934	4776935.476	112.85	5.96
3620.00	503411.794	4776936.920	112.85	5.93
3610.00	503416.782	4776945.476	112.84	5.78
3600.00	503421.628	4776954.116	112.82	5.62
3590.15	503426.279	4776962.744	112.80	5.47
3590.05	503426.327	4776962.839	112.80	5.47
3580.00	503430.635	4776971.762	112.79	5.59
3570.00	503434.794	4776980.754	112.77	5.71
3560.00	503438.801	4776989.811	112.76	5.83
3550.00	503442.655	4776998.933	112.74	5.95
3540.47	503446.202	4777007.730	112.72	6.06
3540.05	503446.368	4777008.111	112.72	6.06

3530.00	503450.158	4777017.258	112.71	5.92
3520.00	503453.795	4777026.469	112.69	5.78
3513.72	503456.003	4777032.290	112.68	5.69
3510.00	503457.302	4777035.771	112.67	5.64
3500.00	503460.798	4777045.141	112.66	5.50
3490.00	503464.294	4777054.511	112.64	5.36
3482.39	503466.956	4777061.643	112.63	5.25
3480.00	503467.780	4777063.885	112.63	5.23
3470.00	503471.232	4777073.270	112.61	5.14
3460.00	503474.684	4777082.656	112.59	5.04
3450.00	503478.136	4777092.042	112.58	4.95
3440.00	503481.588	4777101.427	112.56	4.86
3435.00	503483.315	4777106.121	112.55	4.81
3430.00	503485.040	4777110.813	112.55	4.76
3428.47	503485.570	4777112.254	112.54	4.75
3420.00	503488.475	4777120.205	112.53	4.69
3419.74	503488.563	4777120.446	112.53	4.69
3410.00	503491.992	4777129.636	112.51	4.62
3400.00	503495.643	4777139.016	112.50	4.55
3390.00	503499.428	4777148.341	112.48	4.48
3380.00	503503.346	4777157.611	112.47	4.41
3372.87	503506.229	4777164.172	112.45	4.36
3370.00	503507.334	4777166.850	112.45	4.40
3360.00	503511.303	4777176.100	112.43	4.56
3350.00	503515.404	4777185.294	112.42	4.73
3340.00	503519.638	4777194.431	112.40	4.89
3335.86	503521.429	4777198.197	112.40	4.95
3332.83	503522.893	4777201.021	112.39	5.00
3330.00	503524.274	4777203.674	112.39	5.05
3325.00	503526.970	4777208.204	112.38	5.13
3320.00	503529.907	4777212.587	112.37	5.21
3315.00	503533.077	4777216.811	112.36	5.29
3310.00	503536.470	4777220.862	112.35	5.37
3305.00	503540.078	4777224.730	112.35	5.45
3300.00	503543.890	4777228.402	112.34	5.53
3295.00	503547.896	4777231.869	112.33	5.61
3290.00	503552.085	4777235.119	112.32	5.70
3285.00	503556.445	4777238.143	112.31	5.78
3280.00	503560.964	4777240.933	112.31	5.86
3277.95	503562.903	4777241.994	112.30	5.89
3275.00	503565.647	4777243.442	112.30	5.90
3270.00	503570.472	4777245.672	112.29	5.91
3265.00	503575.408	4777247.641	112.28	5.92

3260.00	503580.444	4777249.344	112.27	5.93
3255.00	503585.563	4777250.776	112.27	5.94
3250.00	503590.753	4777251.933	112.26	5.95
3245.00	503595.997	4777252.811	112.25	5.96
3240.00	503601.281	4777253.408	112.24	5.97
3235.29	503606.282	4777253.712	112.23	5.98
3230.00	503611.281	4777254.009	112.23	5.99
3225.00	503615.988	4777254.505	112.22	6.00
3220.00	503620.667	4777255.210	112.21	6.01
3218.13	503622.373	4777255.547	112.21	6.01
3215.05	503625.306	4777256.141	112.20	6.03
3210.00	503629.896	4777257.288	112.19	6.07
3205.00	503634.428	4777258.637	112.19	6.11
3200.00	503638.893	4777260.186	112.18	6.15
3198.42	503640.292	4777260.717	112.17	6.16
3190.00	503648.141	4777263.759	112.16	6.23
3180.00	503657.465	4777267.373	112.15	6.31
3170.00	503666.789	4777270.987	112.13	6.39
3166.20	503670.335	4777272.361	112.12	6.42
3160.00	503676.513	4777274.556	112.11	6.47
3154.08	503682.519	4777276.329	112.10	6.51
3151.98	503684.551	4777276.871	112.10	6.53
3150.00	503686.490	4777277.281	112.10	6.44
3140.00	503696.283	4777279.352	112.08	6.00
3130.00	503706.076	4777281.424	112.06	5.55
3120.00	503715.869	4777283.495	112.05	5.11
3116.31	503719.483	4777284.260	112.04	4.94
3110.00	503725.778	4777285.524	112.03	4.66
3100.00	503735.794	4777287.244	112.02	4.22
3099.61	503736.190	4777287.304	112.02	4.20