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ANEJO 4.- DATOS TOPOGRÁFICOS

1 INTRODUCCIÓN Y OBJETO DEL ANEJO.

Como información de apoyo para la realización del presente proyecto se utilizó la siguiente documentación:

- Ortofotos en formato .jpg, a escala 1:5.000 en proyección UTM (ETRS89) huso 30.
- Cartografía con curvas de nivel cada 5 metros en proyección UTM (ETRS89) huso 30.
- Modelo Digital de Elevaciones LIDAR, nubes de puntos.

Dicha cartografía ha sido completada con la toma directa en campo, por procedimientos de topografía, mediante GPS Leica VIVA CS15, de los distintos elementos que componen la solución proyectada, fundamentalmente, puntos singulares y perfil longitudinal de las redes. Asimismo, se han realizado levantamientos específicos en las zonas de ubicación de la obra de toma, las balsas, estación de bombeo, impulsión y cruce de carretera.

2 METODOLOGÍA EMPLEADA PARA LA MEDICIÓN GPS.

Para la toma de puntos con GPS se utiliza la conexión a La Red de Geodesia Activa de La Rioja (IDErioja) mediante conexión vía modem GPRS/UMTS para obtener las correcciones a tiempo real, consiguiendo un posicionamiento preciso en el mismo instante en que se efectúa el trabajo de campo.

El acceso a los datos en tiempo real se realiza a través del Caster NTRIP (Networked Transport of RTCM via Internet Protocol). NTRIP es un protocolo estándar diseñado para difundir en tiempo real los datos procedentes de receptores GNSS en Internet. Las correcciones suministradas por esta red son recibidas por el receptor GNSS que dispone de un cliente NTRIP, consiguiendo las correcciones diferenciales en tiempo real.

La Red de Geodesia Activa de La Rioja (IDErioja) está compuesta por seis estaciones propias distribuidas por el territorio de la Comunidad Autónoma de La Rioja, dando respuesta a una creciente demanda en servicios de posicionamiento por satélite. Es un servicio libre y gratuito de posicionamiento de alta precisión con receptores GNSS (Sistema de Navegación por Satélite) dentro del territorio de La Rioja en datum ETRS89, dentro de un marco coherente con la Red REGENTE y las estaciones permanentes del IGN y otros suministradores externos pero públicos. Dicha red proporciona correcciones de código y fase para los sistemas de navegación GPS, GLONASS y la futura GALILEO, tanto en tiempo real RTK como en postproceso a través de ficheros RINEX.

Al mismo tiempo, el sistema constituye un marco de referencia geodésico activo en ETRS89, que sustituye y complementa con ventajas a las tradicionales redes geodésicas basadas en vértices fijos.

El vértice empleado para la corrección es el más cercano a la zona de proyecto, estación permanente de Logroño (RIO1).

3 DATOS DE LA ESTACIÓN PERMANENTE EMPLEADA.

A continuación, se incluye la ficha de la estación permanente utilizada como referencia para la corrección topográfica en tiempo real, de la red IDErioja.

GOBIERNO DE ESPAÑA — MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA

Red de Infraestructuras Geodésicas

Subdirección General de Astronomía, Geodesia y Geofísica

Reseña de Estación Permanente - ERGNSS

9-jul-2022

Situación:

Código.....: RIO1
Nombre.....: Rioja 1
Código IERS: 13448M002
Instalación...: 30 de enero de 2012

Municipio: Logroño
Provincia: La Rioja

Localización.: Calle de las Piscinas s/n
26006 Logroño (La Rioja)

Construcción: Pilar de hormigón armado 0.40 m de altura. La marca de coordenadas se encuentra en placa metálica.

Coordenadas ETRS89:

Longitud.....: - 2° 25' 33,95008"
Latitud.....: 42° 27' 51,26701"
Altitud elipsoidal: 450.366 m

X.....: 4708447.182 m
Y.....: -199490.832 m
Z.....: 4284089.318 m

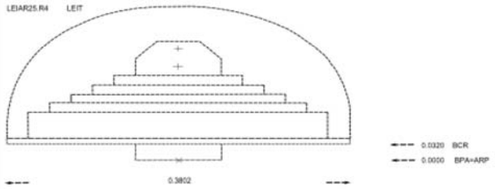
X UTM.....: 547182.301 m
Y UTM.....: 4701481.982 m
Huso.....: 30

Altitud sobre el nivel medio del mar:

Instrumentación:

Receptor: LEICA GR25
Antena: LEIAR25.R4 LEIT **Altura:** 0.0606 m (BPA)
Offset de centros de fase de antena: **L1** 0.158 m **L2** 0.154 m

Esquema antena



Información adicional:

Esta estación permanente, además de a la red ERGNSS, pertenece a la siguiente red:
- Red de EUREF Permanent Network (EPN): http://www.epncb.oma.be

Datos horarios a 1 y 30 segundos y diarios a 30 segundos
https://datos-geodesia.ign.es/ERGNSS/

Emite correcciones diferenciales a través del Caster http://ergnss-ip.ign.es a través de los puntos de montaje:
- RIO10 formato de la corrección RTCM versión RTCM 3.1
- RIO11 formato de la corrección RTCM versión RTCM 2.3

E-mail de contacto: buzon-geodesia@fomento.es

Observaciones:

4 LISTADO DE PUNTOS

Las coordenadas (ETRS89 UTM-Huso 30) de los puntos utilizados en el Modelo Digital del Terreno generado para el presente proyecto son las relacionadas en la siguiente tabla:

NUMERO	X	Y	Z	CODIGO
1	527.816,045	4.700.691,309	578,040	
2	527.828,900	4.700.686,543	578,310	
3	527.843,480	4.700.680,780	578,580	
4	527.857,133	4.700.675,234	578,530	
5	527.872,947	4.700.669,100	578,620	
6	527.891,989	4.700.661,698	578,960	
7	527.905,224	4.700.656,141	579,120	
8	527.909,767	4.700.654,506	579,060	FI
9	527.912,358	4.700.661,711	578,970	FI
10	527.915,709	4.700.671,096	578,920	FI
11	527.909,401	4.700.673,542	578,710	
12	527.898,237	4.700.677,375	578,650	
13	527.884,593	4.700.682,832	578,530	
14	527.869,308	4.700.688,935	578,200	
15	527.850,164	4.700.696,233	578,180	
16	527.837,679	4.700.701,151	578,230	
17	527.825,887	4.700.705,586	578,060	
18	527.817,372	4.700.708,788	578,080	
19	527.818,220	4.700.724,644	577,770	FI
20	527.825,150	4.700.722,647	577,640	FI
21	527.837,927	4.700.717,793	577,840	FI
22	527.848,868	4.700.713,234	577,790	FI
23	527.859,403	4.700.709,489	577,830	FI
24	527.870,659	4.700.705,367	577,870	FI
25	527.883,802	4.700.699,723	578,050	FI
26	527.896,825	4.700.695,462	578,260	FI
27	527.906,004	4.700.691,475	578,260	FI
28	527.915,387	4.700.688,752	578,300	FI
29	527.920,250	4.700.683,762	578,340	FI
30	527.922,612	4.700.688,763	578,290	FI
31	527.927,653	4.700.690,616	578,320	FI
32	527.932,084	4.700.696,758	578,170	FI
33	527.925,879	4.700.699,243	578,040	
34	527.913,905	4.700.703,326	578,000	
35	527.894,921	4.700.710,446	577,870	
36	527.879,301	4.700.716,462	577,620	
37	527.867,074	4.700.720,973	577,400	

NUMERO	X	Y	Z	CODIGO
38	527.853,213	4.700.726,283	577,410	
39	527.840,353	4.700.731,062	577,470	
40	527.828,416	4.700.734,113	577,510	
41	527.821,785	4.700.734,786	577,480	
42	527.819,760	4.700.730,717	577,830	GAS
43	527.819,206	4.700.747,317	577,490	GAS
44	527.821,197	4.700.752,312	577,230	
45	527.830,884	4.700.747,832	577,040	
46	527.840,862	4.700.746,967	576,920	
47	527.850,857	4.700.743,126	576,980	
48	527.862,540	4.700.738,903	577,050	
49	527.871,943	4.700.734,914	577,220	
50	527.892,805	4.700.728,245	577,450	
51	527.905,280	4.700.721,960	577,610	
52	527.916,505	4.700.717,939	577,700	
53	527.930,208	4.700.712,516	577,640	
54	527.935,977	4.700.700,399	577,980	FI
55	527.938,515	4.700.704,159	577,820	FI
56	527.940,325	4.700.709,581	577,770	FI
57	527.943,189	4.700.714,952	577,500	FI
58	527.945,468	4.700.719,920	577,540	FI
59	527.946,265	4.700.726,526	577,230	FI
60	527.939,370	4.700.730,053	577,400	
61	527.928,049	4.700.735,403	577,410	
62	527.918,444	4.700.739,566	577,410	
63	527.904,025	4.700.744,703	577,330	
64	527.888,775	4.700.750,226	577,110	
65	527.875,260	4.700.755,414	576,870	
66	527.862,126	4.700.760,437	576,670	
67	527.847,524	4.700.765,933	576,490	
68	527.831,676	4.700.771,811	576,410	
69	527.822,411	4.700.774,697	576,180	
70	527.819,675	4.700.775,556	576,120	EDI
71	527.820,146	4.700.776,966	576,080	EDI
72	527.830,324	4.700.774,365	576,660	
73	527.832,195	4.700.775,239	576,060	
74	527.825,198	4.700.778,179	576,180	
75	527.824,520	4.700.777,126	576,810	
76	527.823,256	4.700.781,596	575,950	
77	527.821,027	4.700.780,917	576,730	
78	527.820,151	4.700.778,860	576,900	
79	527.817,913	4.700.781,488	577,520	
80	527.816,772	4.700.785,818	577,230	

NUMERO	X	Y	Z	CODIGO
81	527.817,281	4.700.788,930	577,170	
82	527.817,234	4.700.792,317	577,150	
83	527.821,126	4.700.793,007	575,840	
84	527.827,794	4.700.790,444	575,790	
85	527.832,181	4.700.784,549	575,900	
86	527.839,980	4.700.779,789	576,080	
87	527.849,666	4.700.774,732	576,250	
88	527.864,536	4.700.773,067	576,480	
89	527.877,838	4.700.768,699	576,630	
90	527.891,251	4.700.762,543	576,810	
91	527.902,312	4.700.759,884	576,890	
92	527.912,150	4.700.753,251	577,040	
93	527.926,692	4.700.747,255	577,110	
94	527.937,542	4.700.743,887	576,940	
95	527.949,407	4.700.748,743	576,520	
96	527.954,600	4.700.743,673	576,360	FI
97	527.958,810	4.700.748,852	576,060	FI
98	527.962,861	4.700.755,836	575,930	FI
99	527.969,179	4.700.762,278	575,460	FI
100	527.973,054	4.700.766,157	575,120	FI
101	527.965,710	4.700.765,481	575,430	
102	527.959,639	4.700.769,262	575,590	
103	527.952,017	4.700.773,472	575,900	
104	527.943,766	4.700.765,260	576,480	
105	527.940,801	4.700.767,431	576,490	
106	527.931,526	4.700.762,225	576,680	
107	527.917,923	4.700.766,513	576,630	FI
108	527.912,383	4.700.766,177	576,810	FI
109	527.908,320	4.700.764,997	576,780	FI
110	527.902,994	4.700.764,229	576,860	FI
111	527.890,383	4.700.768,923	576,760	FI
112	527.884,169	4.700.771,140	576,590	FI
113	527.880,695	4.700.773,362	576,540	
114	527.871,121	4.700.777,727	576,420	FI
115	527.861,947	4.700.781,454	576,210	FI
116	527.852,456	4.700.787,087	575,990	FI
117	527.846,749	4.700.794,574	575,730	FI
118	527.844,853	4.700.801,349	575,460	FI
119	527.845,482	4.700.810,429	575,080	
120	527.836,253	4.700.811,871	574,880	
121	527.827,668	4.700.817,088	574,670	
122	527.819,200	4.700.814,538	574,740	
123	527.816,289	4.700.814,863	575,930	

NUMERO	X	Y	Z	CODIGO
124	527.812,480	4.700.821,685	574,910	CA
125	527.813,817	4.700.821,114	574,910	EDI
126	527.813,080	4.700.809,126	575,350	CA
127	527.814,168	4.700.809,229	575,320	
128	527.813,540	4.700.793,811	575,930	CA
129	527.815,051	4.700.789,565	576,010	
130	527.813,923	4.700.782,282	576,300	CA
131	527.814,403	4.700.773,650	576,590	CA
132	527.815,876	4.700.760,503	577,020	CA
133	527.816,707	4.700.747,152	577,400	CA
134	527.816,352	4.700.736,099	577,670	CA
135	527.815,515	4.700.726,221	577,900	CA
136	527.813,726	4.700.711,558	578,070	CA
137	527.811,830	4.700.693,689	578,230	CA
138	527.810,382	4.700.674,319	578,370	CA
139	527.810,194	4.700.657,901	578,550	CA
140	526.300,172	4.701.760,519	514,210	FI
141	526.307,253	4.701.770,603	513,210	FI
142	526.313,575	4.701.779,183	512,290	FI
143	526.318,006	4.701.784,069	512,030	FI
144	526.320,807	4.701.789,528	511,460	FI
145	526.317,526	4.701.793,998	511,210	FI
146	526.313,957	4.701.799,170	510,990	FI
147	526.306,916	4.701.814,355	510,540	FI
148	526.304,945	4.701.822,454	510,440	FI
149	526.301,939	4.701.825,469	510,210	FI
150	526.294,490	4.701.817,121	510,810	FI
151	526.288,777	4.701.810,868	511,440	FI
152	526.279,272	4.701.799,781	512,340	FI
153	526.271,693	4.701.790,860	513,210	FI
154	526.265,733	4.701.783,918	513,700	FI
155	526.270,876	4.701.773,372	514,180	
156	526.285,579	4.701.788,035	512,920	
157	526.298,430	4.701.800,743	511,430	
158	526.304,100	4.701.790,758	511,630	
159	526.295,995	4.701.778,535	513,100	
160	526.290,314	4.701.769,634	514,000	
161	526.285,306	4.701.760,081	514,520	
162	526.279,205	4.701.751,322	514,900	
163	526.288,839	4.701.745,009	515,080	FI
164	526.269,234	4.701.716,303	515,900	CA
165	526.267,519	4.701.713,596	515,900	CA
166	526.271,830	4.701.706,150	516,290	CA

NUMERO	X	Y	Z	CODIGO
167	526.276,483	4.701.696,361	516,300	CA
168	526.282,126	4.701.683,561	516,430	CA
169	526.286,156	4.701.673,277	516,520	CA
170	526.288,982	4.701.666,635	516,570	CA
171	526.290,439	4.701.663,697	516,660	CA
172	526.295,313	4.701.656,086	516,830	CA
173	526.300,600	4.701.649,908	517,040	CA
174	526.308,358	4.701.641,943	517,350	CA
175	526.319,175	4.701.631,425	517,540	CA
176	526.329,146	4.701.621,692	517,780	CA
177	526.338,343	4.701.611,647	518,050	CA
178	526.347,357	4.701.602,046	518,360	CA
179	526.356,915	4.701.591,852	518,650	CA
180	526.366,536	4.701.582,230	518,900	CA
181	526.359,312	4.701.572,027	518,980	
182	526.352,297	4.701.560,746	519,230	
183	526.343,644	4.701.547,499	519,130	
184	526.335,778	4.701.535,487	519,020	
185	526.326,411	4.701.533,398	518,820	
186	526.316,160	4.701.525,563	518,620	
187	526.306,460	4.701.517,547	518,400	
188	526.296,769	4.701.509,518	517,950	
189	526.290,853	4.701.504,389	517,720	
190	526.279,777	4.701.507,831	517,370	
191	526.271,747	4.701.500,240	517,420	
192	526.263,818	4.701.492,562	517,470	
193	526.252,343	4.701.496,556	517,370	
194	526.241,061	4.701.489,468	517,350	
195	526.231,395	4.701.480,194	517,300	AC
196	526.227,225	4.701.486,972	517,320	FI
197	526.233,094	4.701.491,865	517,370	FI
198	526.242,852	4.701.497,110	517,400	FI
199	526.249,672	4.701.500,246	517,350	FI
200	526.256,586	4.701.496,734	517,380	FI
201	526.258,943	4.701.496,070	517,440	FI
202	526.264,747	4.701.500,576	517,370	FI
203	526.270,332	4.701.505,285	517,190	FI
204	526.268,641	4.701.504,886	517,040	FI
205	526.264,366	4.701.502,579	516,970	FI
206	526.259,264	4.701.499,761	517,020	FI
207	526.253,023	4.701.501,592	516,920	FI
208	526.246,945	4.701.507,135	516,740	FI
209	526.242,069	4.701.510,237	516,700	FI

NUMERO	X	Y	Z	CODIGO
210	526.238,066	4.701.510,388	516,690	FI
211	526.229,804	4.701.505,271	516,790	FI
212	526.223,899	4.701.498,843	516,940	FI
213	526.218,449	4.701.490,697	516,950	AR
214	526.218,443	4.701.490,701	516,940	AC
215	526.227,198	4.701.480,073	517,320	
216	526.217,071	4.701.475,793	517,210	
217	526.209,618	4.701.467,410	517,170	
218	526.202,243	4.701.458,173	516,940	
219	526.194,557	4.701.465,500	516,710	
220	526.180,107	4.701.475,905	516,400	
221	526.167,425	4.701.484,938	516,120	
222	526.154,694	4.701.494,373	515,760	
223	526.145,495	4.701.500,856	515,600	
224	526.132,190	4.701.510,070	515,330	
225	526.120,109	4.701.518,635	515,020	
226	526.107,541	4.701.527,446	514,750	
227	526.097,609	4.701.534,468	514,550	
228	526.082,236	4.701.545,474	514,310	
229	526.069,846	4.701.553,714	513,940	
230	526.065,599	4.701.557,962	513,920	
231	526.075,295	4.701.566,877	514,200	
232	526.083,453	4.701.580,156	514,510	
233	526.090,946	4.701.584,731	514,470	
234	526.092,859	4.701.585,712	514,590	AC
235	526.096,245	4.701.589,686	514,640	
236	526.127,127	4.701.568,857	515,150	
237	526.132,955	4.701.578,017	515,100	
238	526.140,280	4.701.586,337	515,090	
239	526.147,848	4.701.593,661	514,590	
240	526.152,701	4.701.604,256	514,140	
241	526.153,097	4.701.613,502	513,960	
242	526.154,153	4.701.617,470	514,660	
243	526.157,186	4.701.622,378	514,420	
244	526.166,834	4.701.631,794	514,660	
245	526.174,693	4.701.640,369	514,830	
246	526.177,880	4.701.638,812	515,080	FI
247	526.178,106	4.701.636,867	515,220	FI
248	526.183,490	4.701.633,066	515,320	FI
249	526.187,110	4.701.633,337	515,330	FI
250	526.188,035	4.701.640,094	515,520	FI
251	526.191,790	4.701.645,867	515,600	FI
252	526.200,049	4.701.652,284	515,600	FI

NUMERO	X	Y	Z	CODIGO
253	526.210,483	4.701.660,981	515,700	FI
254	526.217,585	4.701.668,351	515,750	FI
255	526.217,027	4.701.669,771	515,510	FI
256	526.211,931	4.701.667,205	515,390	FI
257	526.203,061	4.701.660,575	515,290	FI
258	526.193,327	4.701.653,127	515,160	FI
259	526.183,999	4.701.645,861	515,040	FI
260	526.180,329	4.701.646,707	514,820	
261	526.189,543	4.701.655,602	514,970	
262	526.198,157	4.701.664,837	515,110	
263	526.205,346	4.701.672,370	515,200	
264	526.211,222	4.701.680,359	515,270	FI
265	526.217,244	4.701.676,397	515,460	FI
266	526.221,592	4.701.674,475	515,650	FI
267	526.228,298	4.701.675,303	515,640	FI
268	526.233,724	4.701.674,996	515,720	FI
269	526.230,223	4.701.672,647	515,780	FI
270	526.233,749	4.701.668,472	515,810	FI
271	526.242,587	4.701.661,686	515,990	FI
272	526.253,434	4.701.653,913	516,270	FI
273	526.264,522	4.701.645,151	516,460	FI
274	526.271,261	4.701.640,542	516,620	FI
275	526.276,974	4.701.645,475	516,740	FI
276	526.278,896	4.701.637,370	516,770	FI
277	526.275,395	4.701.630,726	516,850	FI
278	526.265,738	4.701.618,622	516,760	FI
279	526.260,146	4.701.612,026	516,800	FI
280	526.253,968	4.701.605,661	516,750	FI
281	526.249,494	4.701.597,439	516,750	FI
282	526.246,205	4.701.592,602	516,600	FI
283	526.251,662	4.701.588,083	516,750	FI
284	526.254,731	4.701.586,940	517,130	FI
285	526.261,782	4.701.591,969	517,240	
286	526.263,747	4.701.597,611	517,190	
287	526.272,268	4.701.606,787	517,180	
288	526.276,756	4.701.613,703	517,180	
289	526.279,501	4.701.620,306	517,140	
290	526.287,153	4.701.620,100	517,240	
291	526.294,670	4.701.619,897	517,330	FI
292	526.300,917	4.701.618,233	517,620	FI
293	526.302,702	4.701.621,414	517,430	FI
294	526.301,630	4.701.623,817	517,140	FI
295	526.293,494	4.701.628,684	517,110	FI

NUMERO	X	Y	Z	CODIGO
296	526.285,230	4.701.634,762	516,820	FI
297	526.280,251	4.701.637,710	516,830	FI
298	526.279,002	4.701.649,265	516,790	FI
299	526.283,737	4.701.654,540	516,660	FI
300	526.287,124	4.701.653,851	516,720	FI
301	526.291,387	4.701.650,148	516,720	FI
302	526.286,792	4.701.662,601	516,540	FI
303	526.277,122	4.701.654,139	516,450	FI
304	526.269,632	4.701.648,460	516,400	FI
305	526.264,116	4.701.649,957	516,330	FI
306	526.254,538	4.701.658,467	515,980	FI
307	526.243,753	4.701.666,665	515,910	FI
308	526.234,924	4.701.674,367	515,660	FI
309	526.235,161	4.701.680,543	515,600	
310	526.245,313	4.701.691,112	515,670	
311	526.255,402	4.701.702,873	515,750	
312	526.262,929	4.701.712,444	515,810	
313	526.428,868	4.701.537,806	519,740	CA
314	526.431,657	4.701.535,535	519,730	CA
315	526.429,694	4.701.536,922	518,490	CA
316	527.901,130	4.700.562,660	581,550	
317	527.860,800	4.700.578,680	580,550	
318	527.873,350	4.700.573,190	581,030	
319	527.894,690	4.700.565,520	581,480	
320	527.882,940	4.700.570,350	581,280	
321	527.901,120	4.700.572,160	581,330	
322	527.901,120	4.700.581,840	581,000	
323	527.905,240	4.700.572,170	581,290	
324	527.906,260	4.700.581,790	581,080	
325	527.819,170	4.700.593,660	579,510	CA
326	527.826,080	4.700.592,360	579,420	
327	527.836,570	4.700.588,540	579,650	
328	527.847,720	4.700.583,830	580,020	
329	527.854,750	4.700.601,230	580,210	
330	527.869,430	4.700.596,140	580,690	
331	527.883,980	4.700.590,210	580,920	
332	527.906,220	4.700.592,180	580,720	
333	527.902,760	4.700.595,210	580,540	
334	527.905,530	4.700.600,670	580,390	
335	527.816,870	4.700.605,910	579,420	CA
336	527.814,710	4.700.616,190	579,290	CA
337	527.821,900	4.700.617,800	579,220	
338	527.837,650	4.700.608,370	579,690	

NUMERO	X	Y	Z	CODIGO
339	527.855,730	4.700.619,440	579,960	
340	527.877,380	4.700.610,740	580,370	
341	527.893,960	4.700.604,410	580,360	
342	527.905,600	4.700.609,030	580,180	
343	527.902,670	4.700.612,920	580,070	
344	527.903,440	4.700.615,730	580,050	
345	527.820,850	4.700.633,200	578,990	
346	527.811,490	4.700.635,740	578,980	CA
347	527.838,630	4.700.626,440	579,510	
348	527.862,610	4.700.634,360	579,710	
349	527.874,940	4.700.629,940	579,790	
350	527.890,860	4.700.623,480	579,860	
351	527.898,920	4.700.623,790	579,790	
352	527.896,400	4.700.629,810	579,690	
353	527.900,640	4.700.634,350	579,590	
354	527.816,640	4.700.652,430	578,600	
355	527.831,980	4.700.646,400	579,070	
356	527.846,620	4.700.640,730	579,460	
357	527.864,820	4.700.654,350	579,130	
358	527.892,760	4.700.640,850	579,420	
359	527.883,430	4.700.644,100	579,380	
360	527.901,730	4.700.644,250	579,350	
361	527.820,570	4.700.671,700	578,390	
362	527.844,910	4.700.662,610	579,060	
363	527.837,070	4.700.665,530	578,910	
364	527.829,780	4.700.668,330	578,680	
365	527.853,980	4.700.658,600	579,120	
366	527.908,940	4.700.663,590	579,050	
367	527.855,130	4.700.776,820	576,270	
368	527.836,560	4.700.792,990	575,780	
369	527.829,620	4.700.798,640	575,470	
370	526.203,070	4.701.463,760	516,940	
371	526.178,580	4.701.482,840	516,410	
372	526.192,010	4.701.475,490	516,680	
373	526.195,410	4.701.481,290	516,720	
374	526.209,200	4.701.471,900	517,200	
375	526.214,650	4.701.479,140	517,130	
376	526.219,430	4.701.486,310	517,160	
377	526.167,590	4.701.490,880	516,190	
378	526.151,120	4.701.500,990	515,780	
379	526.184,390	4.701.491,150	516,500	
380	526.171,550	4.701.497,910	516,260	
381	526.202,260	4.701.490,840	516,770	

NUMERO	X	Y	Z	CODIGO
382	526.190,170	4.701.501,170	516,550	
383	526.206,920	4.701.495,850	516,750	
384	526.225,030	4.701.502,900	516,810	
385	526.125,870	4.701.519,780	515,230	
386	526.129,980	4.701.525,110	515,310	
387	526.136,450	4.701.511,800	515,480	
388	526.141,730	4.701.516,610	515,580	
389	526.157,200	4.701.507,390	515,940	
390	526.167,340	4.701.519,320	515,970	
391	526.179,350	4.701.508,850	516,270	
392	526.182,960	4.701.513,280	516,150	
393	526.172,270	4.701.522,250	515,920	
394	526.192,190	4.701.506,730	516,380	
395	526.192,320	4.701.519,440	516,250	
396	526.209,170	4.701.506,840	516,630	
397	526.222,550	4.701.514,780	516,590	
398	526.243,110	4.701.520,010	516,600	
399	526.259,470	4.701.507,830	516,840	
400	526.274,330	4.701.510,500	517,230	
401	526.269,310	4.701.517,740	517,000	
402	526.298,290	4.701.515,080	517,960	
403	526.291,380	4.701.520,310	517,880	
404	526.110,700	4.701.531,170	514,920	
405	526.096,590	4.701.541,270	514,650	
406	526.116,060	4.701.537,070	515,070	
407	526.139,460	4.701.537,930	515,430	
408	526.147,180	4.701.539,490	515,490	
409	526.153,250	4.701.527,650	515,800	
410	526.159,480	4.701.530,940	515,700	
411	526.169,470	4.701.536,740	515,720	
412	526.204,900	4.701.527,950	516,100	
413	526.190,880	4.701.539,110	515,720	
414	526.221,270	4.701.536,340	516,140	
415	526.233,830	4.701.544,100	516,250	
416	526.253,480	4.701.529,810	516,620	
417	526.279,510	4.701.529,600	517,600	
418	526.266,890	4.701.539,160	517,280	
419	526.291,720	4.701.542,480	518,000	
420	526.312,170	4.701.526,920	518,510	
421	526.302,370	4.701.535,260	518,210	
422	526.310,560	4.701.542,180	518,410	
423	526.320,060	4.701.533,190	518,650	
424	526.324,900	4.701.539,670	518,830	

NUMERO	X	Y	Z	CODIGO
425	526.330,620	4.701.542,650	519,030	
426	526.085,450	4.701.550,270	514,460	
427	526.089,110	4.701.556,810	514,560	
428	526.102,770	4.701.545,090	514,810	
429	526.126,480	4.701.548,080	515,240	
430	526.113,760	4.701.558,330	515,100	
431	526.121,130	4.701.558,750	515,260	
432	526.135,660	4.701.549,200	515,290	
433	526.147,190	4.701.553,280	515,440	
434	526.173,050	4.701.552,680	515,390	
435	526.206,300	4.701.547,680	515,820	
436	526.188,470	4.701.561,130	515,480	
437	526.227,190	4.701.545,880	516,160	
438	526.239,790	4.701.558,630	516,590	
439	526.254,300	4.701.548,330	516,980	
440	526.274,050	4.701.556,210	517,520	
441	526.265,190	4.701.562,400	517,250	
442	526.282,730	4.701.549,810	517,780	
443	526.298,750	4.701.551,280	518,160	
444	526.286,730	4.701.560,150	517,850	
445	526.290,050	4.701.562,130	517,950	
446	526.316,950	4.701.545,030	518,640	
447	526.302,920	4.701.553,960	518,240	
448	526.315,960	4.701.559,080	518,500	
449	526.308,270	4.701.562,230	518,350	
450	526.323,000	4.701.549,820	518,870	
451	526.337,160	4.701.552,600	519,170	
452	526.330,600	4.701.561,850	518,940	
453	526.099,040	4.701.570,340	514,740	
454	526.128,900	4.701.567,020	515,230	
455	526.120,530	4.701.574,190	515,050	
456	526.126,370	4.701.580,130	515,010	
457	526.138,550	4.701.579,450	515,050	
458	526.153,790	4.701.566,090	515,120	
459	526.161,730	4.701.581,700	514,950	
460	526.178,020	4.701.568,980	515,280	
461	526.206,390	4.701.564,250	515,810	
462	526.189,460	4.701.577,500	515,550	
463	526.216,270	4.701.577,360	516,140	
464	526.226,980	4.701.568,780	516,390	
465	526.257,090	4.701.569,420	517,070	
466	526.247,140	4.701.576,770	516,810	
467	526.259,630	4.701.577,550	517,160	

NUMERO	X	Y	Z	CODIGO
468	526.270,070	4.701.571,540	517,400	
469	526.276,890	4.701.580,220	517,590	
470	526.284,390	4.701.576,000	517,720	
471	526.301,460	4.701.570,900	518,220	
472	526.315,000	4.701.572,470	518,350	
473	526.307,780	4.701.580,910	518,170	
474	526.323,030	4.701.569,880	518,530	
475	526.338,800	4.701.574,310	518,930	
476	526.345,120	4.701.564,490	519,140	
477	526.351,160	4.701.574,970	519,010	
478	526.110,390	4.701.582,430	514,870	
479	526.099,500	4.701.594,460	514,680	
480	526.129,570	4.701.584,250	514,890	
481	526.114,710	4.701.590,270	514,830	
482	526.117,030	4.701.595,000	514,780	
483	526.128,740	4.701.593,730	514,760	
484	526.138,970	4.701.588,980	514,900	
485	526.147,230	4.701.589,380	514,870	
486	526.169,750	4.701.595,440	514,960	
487	526.205,570	4.701.584,920	515,990	
488	526.196,490	4.701.592,070	515,790	
489	526.224,170	4.701.594,430	516,300	
490	526.234,490	4.701.586,040	516,530	
491	526.246,990	4.701.587,280	516,720	
492	526.242,640	4.701.595,730	516,520	
493	526.265,090	4.701.585,870	517,290	
494	526.293,940	4.701.586,120	517,780	
495	526.284,000	4.701.592,220	517,540	
496	526.301,900	4.701.595,740	517,850	
497	526.315,900	4.701.593,960	518,100	
498	526.331,490	4.701.583,110	518,500	
499	526.323,920	4.701.585,810	518,350	
500	526.344,900	4.701.583,810	518,660	
501	526.350,080	4.701.592,200	518,560	
502	526.341,040	4.701.596,400	518,340	
503	526.358,270	4.701.584,280	518,840	
504	526.108,390	4.701.602,090	514,710	
505	526.155,720	4.701.608,200	514,460	
506	526.165,960	4.701.614,830	514,780	
507	526.158,540	4.701.619,890	514,620	
508	526.179,930	4.701.604,120	515,320	
509	526.205,580	4.701.607,530	515,820	
510	526.196,210	4.701.614,610	515,560	

NUMERO	X	Y	Z	CODIGO
511	526.190,130	4.701.619,290	515,390	
512	526.214,580	4.701.601,150	516,060	
513	526.213,670	4.701.617,310	515,900	
514	526.228,830	4.701.605,570	516,300	
515	526.236,590	4.701.610,310	516,450	
516	526.226,970	4.701.617,140	516,240	
517	526.247,590	4.701.602,170	516,670	
518	526.252,510	4.701.611,760	516,650	
519	526.271,810	4.701.597,570	517,330	
520	526.291,780	4.701.601,300	517,640	
521	526.282,100	4.701.602,480	517,440	
522	526.289,640	4.701.613,030	517,430	
523	526.312,030	4.701.603,000	517,940	
524	526.305,320	4.701.608,250	517,700	
525	526.310,400	4.701.615,640	517,580	
526	526.332,500	4.701.599,740	518,180	
527	526.324,670	4.701.603,110	518,050	
528	526.321,140	4.701.611,530	517,900	
529	526.332,190	4.701.610,210	518,060	
530	526.326,140	4.701.616,440	517,870	
531	526.164,180	4.701.623,290	514,850	
532	526.179,670	4.701.627,530	515,130	
533	526.171,920	4.701.630,520	514,980	
534	526.204,020	4.701.624,530	515,660	
535	526.194,440	4.701.631,970	515,450	
536	526.218,410	4.701.624,290	516,010	
537	526.208,640	4.701.633,900	515,730	
538	526.223,160	4.701.633,690	515,970	
539	526.236,870	4.701.623,440	516,290	
540	526.240,550	4.701.632,650	516,280	
541	526.257,900	4.701.621,140	516,630	
542	526.249,670	4.701.626,490	516,480	
543	526.261,510	4.701.634,600	516,540	
544	526.269,040	4.701.629,400	516,690	
545	526.275,210	4.701.637,660	516,770	
546	526.317,340	4.701.623,140	517,560	
547	526.309,650	4.701.629,050	517,390	
548	526.301,730	4.701.634,030	517,120	
549	526.200,220	4.701.643,640	515,520	
550	526.214,700	4.701.641,810	515,730	
551	526.220,460	4.701.650,270	515,760	
552	526.207,600	4.701.651,120	515,600	
553	526.233,550	4.701.639,290	516,080	

NUMERO	X	Y	Z	CODIGO
554	526.227,850	4.701.643,190	515,940	
555	526.238,320	4.701.650,700	516,010	
556	526.252,780	4.701.640,230	516,340	
557	526.245,860	4.701.645,330	516,200	
558	526.291,600	4.701.641,990	516,880	
559	526.283,030	4.701.646,550	516,730	
560	526.214,330	4.701.655,500	515,710	
561	526.222,370	4.701.662,620	515,700	
562	526.230,200	4.701.656,350	515,820	
563	526.241,600	4.701.673,680	515,770	
564	526.252,110	4.701.664,060	516,020	
565	526.263,150	4.701.655,390	516,210	
566	526.271,590	4.701.667,100	516,250	
567	526.255,610	4.701.682,000	515,970	
568	526.250,370	4.701.687,580	515,830	
569	526.263,060	4.701.676,330	516,130	
570	526.277,030	4.701.675,520	516,370	
571	526.270,930	4.701.686,430	516,280	
572	526.266,160	4.701.694,030	516,140	
573	526.262,850	4.701.702,530	515,970	
574	526.273,530	4.701.716,040	515,950	
575	526.271,690	4.701.720,490	515,750	
576	526.276,940	4.701.720,380	515,820	
577	526.277,600	4.701.728,470	515,660	
578	526.281,830	4.701.728,380	515,660	
579	526.282,260	4.701.735,020	515,510	
580	526.294,910	4.701.737,400	515,250	
581	526.298,210	4.701.743,100	515,030	
582	526.303,780	4.701.750,590	514,600	
583	526.309,070	4.701.758,130	513,980	
584	526.314,630	4.701.765,660	513,240	
585	526.259,500	4.701.783,240	513,970	
586	526.318,250	4.701.771,370	512,690	
587	526.325,190	4.701.778,530	512,230	
588	526.335,330	4.701.778,640	508,600	
589	526.330,570	4.701.784,830	508,760	
590	526.338,180	4.701.780,260	508,660	
591	526.343,300	4.701.785,550	508,470	
592	526.263,500	4.701.789,050	513,600	
593	526.268,800	4.701.795,580	513,130	
594	526.276,250	4.701.802,550	512,470	
595	526.318,210	4.701.799,940	508,550	
596	526.324,770	4.701.792,590	508,510	

NUMERO	X	Y	Z	CODIGO
597	526.349,350	4.701.793,230	508,240	
598	526.351,780	4.701.794,800	507,930	
599	526.281,740	4.701.810,150	511,880	
600	526.289,300	4.701.819,020	511,110	
601	526.312,760	4.701.809,150	508,380	
602	526.309,650	4.701.821,020	508,090	
603	526.297,110	4.701.827,720	510,360	
604	526.306,080	4.701.833,750	507,950	