# INFORME DE LEVANTAMIENTO TOPOGRÁFICO

MEJORAMIENTO EN PAVIMENTO RIGIDO DE LA VÍA PRINCIPAL DEL CORREGIMIENTO JUAN ARIAS EN EL MUNICIPIO DE MAGANGUÉ, DEPARTAMENTO DE BOLÍVAR

**2026**

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# 1. Generalidades

La información topográfica es ei insumo más importante para reaiizar ei trazado y diseno de proyectos como edificios, parques, puentes, vías, canales, entre otros, por lo tanto, es de vital importancia que se cumplan los criterios establecidos para este tipo de estudios. Con el fin de dar cumplimiento a las especificaciones requeridas en cuanto a precisión v calidad de datos, se optó por realizar la correspondiente topografía mediante estación Total topográfica

El alcance de este proyecto es realizar un levantamiento Topográfico Altimétrico y Planimétrico Georreferenciado; de: detalles principales existentes concretos materializados inamovibles tales como: Puntos de Nivel de Terreno Natural, vértices de cerramientos, linderos, Obras Civiles existentes, Cajas, Postes Eléctricos, Cunetas, Alcantarillas, Puentes, Arboles representativos y vías existentes, puntos críticos, Cotas de terreno representativas, Amarrado al sistema actual de referencia en la Republica de Colombia para así garantizar la correcta y exacta; Actualización, Amarre de la topografía, Detalles influyentes Existentes y pertenecientes a este proyecto; cumpliendo con la Normatividad Aplicable y a su vez, que sirvan como estudio técnico, así mismo para dar aseguramiento y cumplimiento a los requerimientos del cliente.

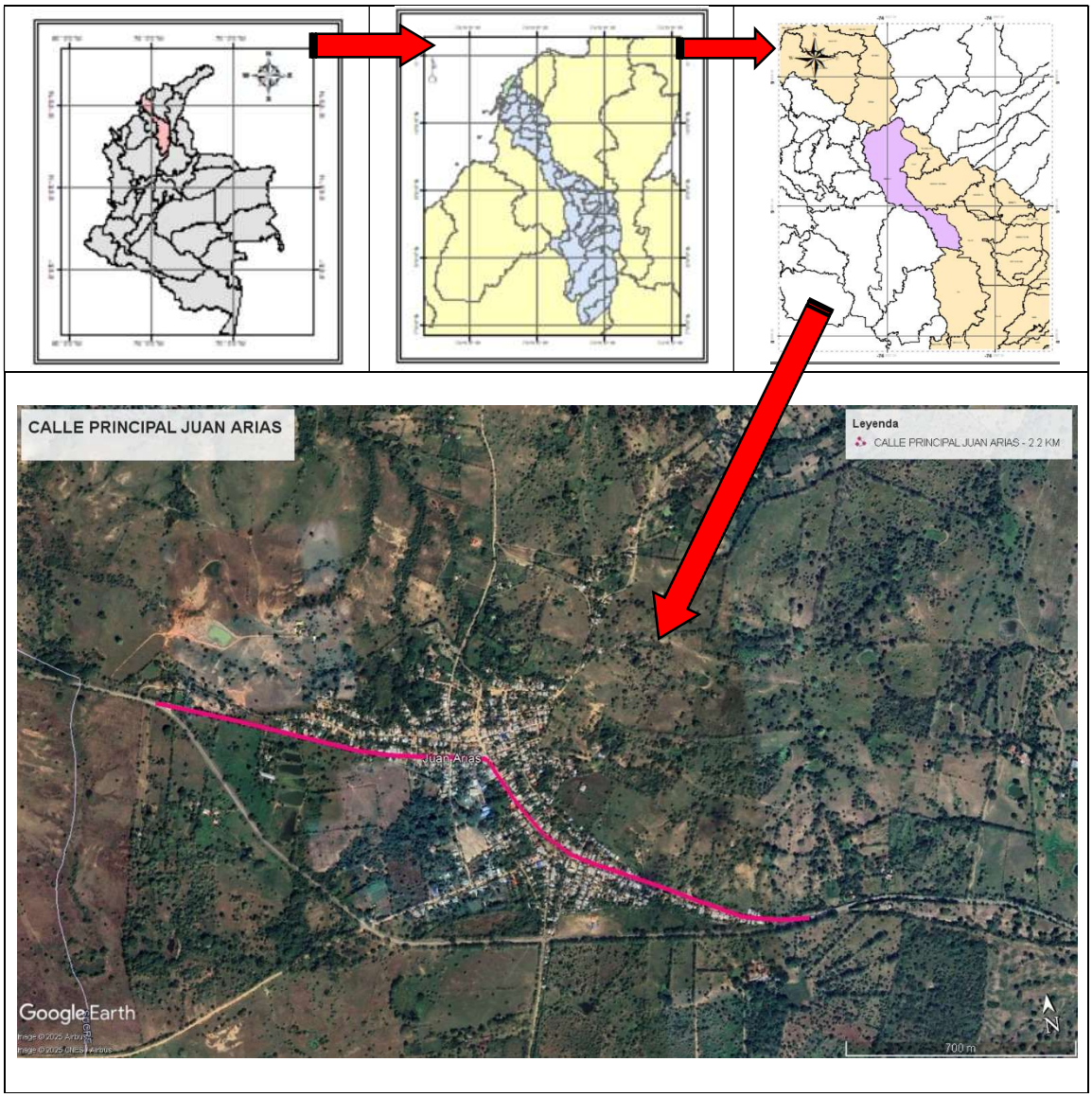
## 2. Objetivos

**General:** realizar el levantamiento topográfico de la vía principal del corregimiento de Juna Arias, jurisdicción del Municipio de Magangué, Bolívar.

**Específicos:**

- Realizar levantamiento planimétrico y altimétrico de la zona de interés para la caracterización sobre el uso actual del territorio y su orografía actual.
- Realizar levantamiento de detalles como linderos, postes, arboles o cualquier objeto que tenga incidencia en el trazado de la via.
- Generar las curvas de nivel del terreno a partir de una nube de puntos levantada con equipos de última tecnología y software de modelamiento ingenieril.
- Realizar planos de planta perfil y de secciones transversales del terreno natural.

## 3. Localización del proyecto



## 4. Procedimiento de ejecución

A continuación, se presentan los pasos realizados para el desarrollo de las actividades para el correcto proceso de levantamiento topográfico:

**ACTIVIDADES EN CAMPO**

- Se realiza un reconocimiento y estudio general de la zona de influencia del Proyecto, se utilizó información geográfica existente como imágenes de satélite, mapas o planos existentes, dicha información fue complementada con visitas al sitio objeto de estudio.
- Con base en la información obtenida durante el recorrido, se define la ruta de levantamiento sobre cada tramo del proyecto y el sistema de coordenadas que sea aplicable
- Se materializan puntos topográficos estratégicos que serán usados como vértices de referencia
- Con equipo GNSS tipo navegador (precisión de hasta 2 m) se procede a levantar los puntos de referencia indicados en el punto anterior. La información es registrada en la memoria del dispositivo en forma ordenada para facilitar su uso en el posicionamiento y orientación de la estación total.
- Se centra y nivela la estación total en el primer vértice, posterior a ello se procede a dar vista atrás para orientar la estación del siguiente vértice que son puntos conocidos.
- Se da inicio a la captura de la nube de puntos de detalle del proyecto, se levantan linderos, estructuras, corrientes de agua y obras de arte existentes, los cuales serán utilizados para crear el modelo y curvas de nivel del terreno. Es importante resaltar que, para este levantamiento, las coordenadas de amarre ingresadas en la estación total fueron obtenidas con GNSS de tipo navegador, con lo cual se logra una ubicación del levantamiento de hasta +o- 2 m con respecto a la plancha del IGAC 44IVC3, razón por la cual no se ejecuta postproceso y tampoco se generan archivos riner del levantamiento. dará la cartera de la nube de puntos, se obtiene una precisión de +o- 3 mm en planta.

**ACTIVIDADES EN OFICINA**

- Se descargan las nubes de puntos levantadas con la estación total. dichas nubes de puntos deben ser transformadas a coordenadas planas del sistema de coordenadas proyectadas. Se escogen los puntos qua sarán utilizados en la elaboración del modelo de terreno y se procede a su construcción y ajuste utilizando un software de interpolación de curvas de nivel y creación de mdt.
- Se genera un archivo de extensión dwg, sobre el cual se podrán dibujar todos los detalles levantados en campo.
- Finalmente se verifica la información obtenida y se elaboran los reportes

## 5. Herramientas utilizadas

**MATERIALES**

- Puntillas
- Estacas de madera
- Pintura

**EQUIPOS Y SOFTWARE**

- Estación total
- Software PC-PORT2V1.2 para la descarga de los datos
- AutoCAD Civil 3D.

## 6. Resultados

Como resultado se tiene lo siguiente:

- Cartera con nube de puntos

| PTO | NORTE | ESTE | COTA | DESCRIPCIÓN |
|---|---|---|---|---|
| 1 | 1523399.559 | 906305.155 | 103.11 | STA 1 |
| 2 | 1523307.501 | 906522.852 | 98.192 | STA 2 |
| 3 | 1523300.591 | 906543.675 | 97.492 | B VIA |
| 4 | 1523306.471 | 906545.979 | 97.501 | B VIA |
| 5 | 1523310.832 | 906534.314 | 97.801 | B VIA |
| 6 | 1523305.352 | 906532.157 | 97.783 | B VIA |
| 7 | 1523309.443 | 906520.425 | 98.105 | B VIA |
| 8 | 1523315.195 | 906522.725 | 98.079 | B VIA |
| 9 | 1523319.531 | 906511.326 | 98.42 | B VIA |
| 10 | 1523313.841 | 906508.795 | 98.415 | B VIA |
| 11 | 1523318.194 | 906497.475 | 98.673 | B VIA |
| 12 | 1523323.966 | 906499.491 | 98.742 | B VIA |
| 13 | 1523328.222 | 906488.449 | 99.016 | B VIA |
| 14 | 1523322.237 | 906485.909 | 99.027 | B VIA |
| 15 | 1523326.607 | 906474.184 | 99.371 | B VIA |
| 16 | 1523332.707 | 906476.496 | 99.35 | B VIA |
| 17 | 1523337.141 | 906464.683 | 99.693 | B VIA |
| 18 | 1523331.184 | 906462.275 | 99.696 | B VIA |
| 19 | 1523335.66 | 906450.539 | 99.959 | B VIA |
| 20 | 1523341.592 | 906452.839 | 99.968 | B VIA |
| 21 | 1523346.529 | 906439.916 | 100.232 | B VIA |
| 22 | 1523340.689 | 906437.32 | 100.282 | B VIA |
| 23 | 1523345.237 | 906425.604 | 100.574 | B VIA |
| 24 | 1523350.963 | 906427.951 | 100.556 | B VIA |
| 25 | 1523355.291 | 906416.276 | 100.845 | B VIA |
| 26 | 1523349.756 | 906413.968 | 100.819 | B VIA |
| 27 | 1523354.185 | 906402.106 | 101.038 | B VIA |
| 28 | 1523359.767 | 906404.255 | 101.077 | B VIA |
| 29 | 1523364.316 | 906392.41 | 101.269 | B VIA |
| 30 | 1523358.577 | 906389.965 | 101.208 | B VIA |
| 31 | 1523363.093 | 906378.147 | 101.486 | B VIA |
| 32 | 1523368.705 | 906380.319 | 101.495 | B VIA |
| 33 | 1523373.213 | 906368.578 | 101.75 | B VIA |
| 34 | 1523367.808 | 906366.311 | 101.743 | B VIA |
| 35 | 1523372.1 | 906354.773 | 102.011 | B VIA |

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|---|---|---|---|---|
| ***36*** | 1523377.631 | 906356.512 | 101.969 | B VIA |
| ***37*** | 1523382.782 | 906343.064 | 102.201 | B VIA |
| ***38*** | 1523377.518 | 906340.905 | 102.243 | B VIA |
| ***39*** | 1523374.631 | 906340.383 | 102.292 | ALCANTA |
| ***40*** | 1523375.628 | 906337.624 | 102.339 | ALCANTA |
| ***41*** | 1523384.933 | 906343.625 | 102.297 | ALCANTA |
| ***42*** | 1523386.213 | 906340.442 | 102.375 | ALCANTA |
| ***43*** | 1523387.545 | 906330.072 | 102.563 | B VIA |
| ***44*** | 1523382.598 | 906327.788 | 102.515 | B VIA |
| ***45*** | 1523386.7 | 906315.64 | 102.784 | B VIA |
| ***46*** | 1523392.471 | 906317.23 | 102.844 | B VIA |
| ***47*** | 1523396.872 | 906305.918 | 103.045 | B VIA |
| ***48*** | 1523391.142 | 906303.714 | 103 | B VIA |
| ***49*** | 1523395.698 | 906291.332 | 103.231 | B VIA |
| ***50*** | 1523401.546 | 906293.576 | 103.23 | B VIA |
| ***51*** | 1523406.468 | 906280.872 | 103.65 | B VIA |
| ***52*** | 1523399.88 | 906278.278 | 103.688 | B VIA |
| ***53*** | 1523402.671 | 906268.003 | 104.484 | B VIA |
| ***54*** | 1523409.897 | 906271.503 | 104.103 | B VIA |
| ***55*** | 1523414.642 | 906259.256 | 104.557 | B VIA |
| ***56*** | 1523422.319 | 906239.438 | 104.722 | B VIA |
| ***57*** | 1523424.573 | 906233.723 | 104.752 | B VIA |
| ***58*** | 1523423.421 | 906233.282 | 104.829 | B VIA |
| ***59*** | 1523420.016 | 906239.589 | 104.818 | B VIA |
| ***60*** | 1523416.357 | 906246.188 | 104.829 | B VIA |
| ***61*** | 1523412.56 | 906252.887 | 104.726 | B VIA |
| ***62*** | 1523408.516 | 906259.211 | 104.653 | B VIA |
| ***63*** | 1523404.466 | 906265.254 | 104.556 | B VIA |
| ***64*** | 1523422.237 | 906249.637 | 104.266 | POSTE |
| ***65*** | 1523418.177 | 906260.891 | 104.036 | POSTE |
| ***66*** | 1523392.92 | 906328.992 | 102.604 | POSTE |
| ***67*** | 1523366.071 | 906398.725 | 101.401 | POSTE |
| ***68*** | 1523338.333 | 906470.656 | 99.577 | POSTE |
| ***69*** | 1523381.467 | 906308.548 | 102.315 | CERCA |
| ***70*** | 1523363.819 | 906357.262 | 101.005 | CERCA |
| ***71*** | 1523357.605 | 906375.455 | 100.838 | CERCA |
| ***72*** | 1523345.131 | 906407.892 | 100.514 | CERCA |
| ***73*** | 1523326.242 | 906461.301 | 99.397 | CERCA |
| ***74*** | 1523408.258 | 906292.187 | 103.101 | CERCA |
| ***75*** | 1523391.428 | 906339.377 | 101.916 | CERCA |
| ***76*** | 1523399.931 | 906315.742 | 102.564 | CERCA |

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|---|---|---|---|---|
| ***77*** | 1523381.616 | 906365.519 | 101.462 | CERCA |
| ***78*** | 1523318.074 | 906483.768 | 99.077 | CERCA |
| ***79*** | 1523342.808 | 906464.316 | 99.986 | CERCA |
| ***80*** | 1523351.113 | 906442.044 | 100.401 | CERCA |
| ***81*** | 1523328.367 | 906500.179 | 98.853 | CERCA |
| ***82*** | 1523320.584 | 906519.367 | 98.141 | CERCA |
| ***83*** | 1523314.104 | 906535.133 | 97.846 | CERCA |
| ***84*** | 1523302.837 | 906563.427 | 97.195 | CERCA |
| ***85*** | 1523295.996 | 906580.877 | 96.804 | CERCA |
| ***86*** | 1523283.895 | 906616.469 | 96.097 | CERCA |
| ***87*** | 1523290.516 | 906594.842 | 96.375 | CERCA |
| ***88*** | 1523285.509 | 906568.553 | 96.971 | CERCA |
| ***89*** | 1523299.567 | 906532.186 | 97.539 | CERCA |
| ***90*** | 1523304.032 | 906520.478 | 98.043 | CERCA |
| ***91*** | 1523310.016 | 906543.56 | 97.953 | POSTE |
| ***92*** | 1523282.962 | 906616.197 | 96.195 | POSTE |
| ***93*** | 1523295.688 | 906556.789 | 97.16 | B VIA |
| ***94*** | 1523301.319 | 906559.307 | 97.155 | B VIA |
| ***95*** | 1523297.359 | 906570.176 | 96.896 | B VIA |
| ***96*** | 1523291.765 | 906567.706 | 96.857 | B VIA |
| ***97*** | 1523287.794 | 906578.853 | 96.593 | B VIA |
| ***98*** | 1523293.25 | 906581.019 | 96.635 | B VIA |
| ***99*** | 1523288.796 | 906592.658 | 96.355 | B VIA |
| ***100*** | 1523283.502 | 906590.285 | 96.34 | B VIA |
| ***101*** | 1523279.108 | 906601.904 | 96.1 | B VIA |
| ***102*** | 1523284.499 | 906604.617 | 96.118 | B VIA |
| ***103*** | 1523280.365 | 906615.838 | 95.906 | B VIA |
| ***104*** | 1523274.806 | 906613.3 | 95.908 | B VIA |
| ***105*** | 1523270.159 | 906625.119 | 95.695 | B VIA |
| ***106*** | 1523275.906 | 906627.462 | 95.718 | B VIA |
| ***107*** | 1523271.487 | 906639.665 | 95.456 | B VIA |
| ***108*** | 1523265.286 | 906637.193 | 95.486 | B VIA |
| ***109*** | 1523260.115 | 906651.691 | 95.299 | B VIA |
| ***110*** | 1523266.151 | 906653.985 | 95.237 | B VIA |
| ***111*** | 1523261.006 | 906667.036 | 95.16 | B VIA |
| ***112*** | 1523255.501 | 906664.648 | 95.153 | B VIA |
| ***113*** | 1523250.482 | 906678.457 | 95.075 | B VIA |
| ***114*** | 1523256.236 | 906681.371 | 95.121 | B VIA |
| ***115*** | 1523251.508 | 906694.361 | 95.065 | B VIA |
| ***116*** | 1523247.251 | 906686.485 | 94.978 | B VIA |
| ***117*** | 1523245.043 | 906687.549 | 95.051 | STA 3 |

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|---|---|---|---|---|
| ***118*** | 1523265.383 | 906666.621 | 95.062 | CERCA |
| ***119*** | 1523272.163 | 906648.137 | 95.285 | CERCA |
| ***120*** | 1523275.462 | 906638.434 | 95.479 | CERCA |
| ***121*** | 1523258.211 | 906641.36 | 95.387 | CERCA |
| ***122*** | 1523247.683 | 906667.072 | 94.457 | CERCA |
| ***123*** | 1523241.135 | 906686.674 | 94.596 | CERCA |
| ***124*** | 1523234.293 | 906706.17 | 94.387 | CERCA |
| ***125*** | 1523254.688 | 906697.755 | 94.75 | CERCA |
| ***126*** | 1523243.62 | 906726.456 | 94.88 | CERCA |
| ***127*** | 1523229.209 | 906766.028 | 94.655 | CERCA |
| ***128*** | 1523253.208 | 906697.362 | 95.269 | POSTE |
| ***129*** | 1523229.344 | 906758.983 | 95.042 | POSTE |
| ***130*** | 1523240.443 | 906703.751 | 94.955 | B VIA |
| ***131*** | 1523246.63 | 906706.945 | 94.949 | B VIA |
| ***132*** | 1523242.213 | 906719.281 | 94.914 | B VIA |
| ***133*** | 1523235.664 | 906716.934 | 94.933 | B VIA |
| ***134*** | 1523230.851 | 906730.608 | 94.986 | B VIA |
| ***135*** | 1523236.648 | 906732.941 | 94.959 | B VIA |
| ***136*** | 1523231.392 | 906746.771 | 94.968 | B VIA |
| ***137*** | 1523225.691 | 906744.372 | 94.953 | B VIA |
| ***138*** | 1523220.918 | 906757.702 | 94.939 | B VIA |
| ***139*** | 1523226.53 | 906759.789 | 94.985 | B VIA |
| ***140*** | 1523218.526 | 906780.621 | 95.056 | B VIA |
| ***141*** | 1523213.087 | 906778.068 | 95.043 | B VIA |
| ***142*** | 1523205.569 | 906797.028 | 95.048 | B VIA |
| ***143*** | 1523211.465 | 906799.903 | 95.05 | B VIA |
| ***144*** | 1523203.959 | 906818.83 | 95.121 | B VIA |
| ***145*** | 1523198.272 | 906816.574 | 95.115 | B VIA |
| ***146*** | 1523192.749 | 906831.239 | 95.199 | B VIA |
| ***147*** | 1523198.547 | 906833.515 | 95.129 | B VIA |
| ***148*** | 1523191.143 | 906853.425 | 95.339 | B VIA |
| ***149*** | 1523185.427 | 906850.895 | 95.353 | B VIA |
| ***150*** | 1523178.984 | 906868.176 | 95.522 | B VIA |
| ***151*** | 1523184.879 | 906870.692 | 95.393 | B VIA |
| ***152*** | 1523179.263 | 906886.752 | 95.474 | B VIA |
| ***153*** | 1523173.351 | 906884.783 | 95.644 | B VIA |
| ***154*** | 1523170.794 | 906892.899 | 95.697 | B VIA |
| ***155*** | 1523176.81 | 906894.846 | 95.571 | B VIA |
| ***156*** | 1523166.643 | 906908.321 | 95.928 | B VIA |
| ***157*** | 1523164.083 | 906919 | 96.03 | B VIA |
| ***158*** | 1523161.645 | 906931.312 | 96.097 | B VIA |

| | | | | |
|---|---|---|---|---|
| ***159*** | 1523159.271 | 906943.218 | 96.163 | B VIA |
| ***160*** | 1523157.41 | 906948.058 | 96.322 | B VIA,STA 4 |
| ***161*** | 1523225.628 | 906736.812 | 95.094 | ALCANTA |
| ***162*** | 1523226.847 | 906734.019 | 95.066 | ALCANTA |
| ***163*** | 1523235.885 | 906741.728 | 95.018 | ALCANTA |
| ***164*** | 1523234.531 | 906745.17 | 94.982 | ALCANTA |
| ***165*** | 1523202.865 | 906839.771 | 94.969 | CERCA |
| ***166*** | 1523214.349 | 906800.496 | 95.022 | POSTE |
| ***167*** | 1523202.521 | 906790.693 | 94.521 | CERCA |
| ***168*** | 1523193.967 | 906812.634 | 94.831 | CERCA |
| ***169*** | 1523201.332 | 906832.119 | 95.12 | POSTE |
| ***170*** | 1523175.227 | 906900.333 | 95.647 | B VIA |
| ***171*** | 1523171.668 | 906914.168 | 95.755 | B VIA |
| ***172*** | 1523167.705 | 906932.771 | 95.978 | B VIA |
| ***173*** | 1523164.229 | 906950.743 | 96.204 | B VIA |
| ***174*** | 1523155.206 | 906964.005 | 96.325 | B VIA |
| ***175*** | 1523161.132 | 906965.016 | 96.326 | B VIA |
| ***176*** | 1523158.391 | 906980.243 | 96.475 | B VIA |
| ***177*** | 1523152.471 | 906979.128 | 96.522 | B VIA |
| ***178*** | 1523149.322 | 906994.772 | 96.661 | B VIA |
| ***179*** | 1523155.231 | 906996.222 | 96.646 | B VIA |
| ***180*** | 1523152.375 | 907011.847 | 96.84 | B VIA |
| ***181*** | 1523146.11 | 907010.318 | 96.884 | B VIA |
| ***182*** | 1523149.635 | 907024.632 | 97.201 | STA 5 |
| ***183*** | 1523145.265 | 907010.207 | 96.941 | POSTE |
| ***184*** | 1523148.191 | 906992.468 | 97.048 | POSTE |
| ***185*** | 1523151.605 | 906978.239 | 96.684 | POSTE |
| ***186*** | 1523157.816 | 906946.362 | 96.21 | POSTE |
| ***187*** | 1523175.225 | 906866.097 | 95.493 | POSTE |
| ***188*** | 1523142.901 | 907026.679 | 97.186 | B VIA |
| ***189*** | 1523149.244 | 907027.565 | 97.227 | B VIA |
| ***190*** | 1523146.427 | 907041.996 | 97.4 | B VIA |
| ***191*** | 1523140.323 | 907040.487 | 97.455 | B VIA |
| ***192*** | 1523137.659 | 907053.254 | 97.652 | B VIA |
| ***193*** | 1523143.886 | 907053.972 | 97.6 | B VIA |
| ***194*** | 1523141.954 | 907064.88 | 97.731 | B VIA |
| ***195*** | 1523135.521 | 907063.297 | 97.809 | B VIA |
| ***196*** | 1523133.059 | 907077.274 | 98.103 | B VIA |
| ***197*** | 1523139.165 | 907078.313 | 98.04 | B VIA |
| ***198*** | 1523136.795 | 907090.22 | 98.161 | B VIA |
| ***199*** | 1523130.557 | 907088.717 | 98.16 | B VIA |

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|---|---|---|---|---|
| ***200*** | 1523128.219 | 907100.751 | 98.193 | B VIA |
| ***201*** | 1523134.431 | 907101.947 | 98.261 | B VIA |
| ***202*** | 1523132.154 | 907113.556 | 98.292 | B VIA |
| ***203*** | 1523126.091 | 907111.279 | 98.089 | B VIA |
| ***204*** | 1523123.892 | 907123.474 | 98.127 | B VIA |
| ***205*** | 1523129.755 | 907125.202 | 98.212 | B VIA |
| ***206*** | 1523127.422 | 907136.8 | 98.247 | B VIA |
| ***207*** | 1523119.349 | 907145.834 | 98.251 | B VIA |
| ***208*** | 1523125.491 | 907147.285 | 98.271 | B VIA |
| ***209*** | 1523123.008 | 907160.523 | 98.271 | B VIA |
| ***210*** | 1523116.989 | 907159.068 | 98.324 | B VIA |
| ***211*** | 1523115.394 | 907171.626 | 98.347 | B VIA |
| ***212*** | 1523110.713 | 907211.618 | 98.166 | STA 6 |
| ***213*** | 1523132.764 | 907116.321 | 98.162 | VALVU AGUA |
| ***214*** | 1523131.412 | 907118.775 | 98.254 | VALVU AGUA |
| ***215*** | 1523121.549 | 907172.418 | 98.331 | B VIA |
| ***216*** | 1523115.448 | 907171.689 | 98.357 | B VIA |
| ***217*** | 1523114.213 | 907183.621 | 98.358 | B VIA |
| ***218*** | 1523120.495 | 907184.677 | 98.369 | B VIA |
| ***219*** | 1523119.714 | 907198.179 | 98.486 | B VIA |
| ***220*** | 1523113.02 | 907198.363 | 98.333 | B VIA |
| ***221*** | 1523111.299 | 907201.907 | 98.216 | HIDRANTE |
| ***222*** | 1523112.414 | 907208.148 | 98.267 | B VIA |
| ***223*** | 1523118.996 | 907208.605 | 98.542 | B VIA |
| ***224*** | 1523118.499 | 907215.387 | 98.52 | B VIA |
| ***225*** | 1523117.181 | 907221.306 | 98.546 | B VIA |
| ***226*** | 1523114.764 | 907226.338 | 98.523 | B VIA |
| ***227*** | 1523111.276 | 907231.523 | 98.436 | B VIA |
| ***228*** | 1523107.296 | 907235.392 | 98.357 | B VIA |
| ***229*** | 1523108.542 | 907224.16 | 98.045 | B VIA |
| ***230*** | 1523110.615 | 907219.334 | 98.148 | B VIA |
| ***231*** | 1523111.817 | 907213.911 | 98.237 | B VIA |
| ***232*** | 1523110.237 | 907213.955 | 98.195 | POSTE |
| ***233*** | 1523116.62 | 907225.956 | 98.402 | STA 7 |
| ***234*** | 1523106.74 | 907226.739 | 98.008 | B VIA |
| ***235*** | 1523103.668 | 907229.723 | 97.984 | B VIA |
| ***236*** | 1523099.116 | 907232.739 | 97.942 | B VIA |
| ***237*** | 1523093.826 | 907235.881 | 97.893 | B VIA |
| ***238*** | 1523086.408 | 907239.69 | 97.831 | B VIA |
| ***239*** | 1523088.787 | 907245.893 | 97.964 | B VIA |
| ***240*** | 1523093.724 | 907243.539 | 98.114 | B VIA |

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| ***241*** | 1523102.171 | 907239.23 | 98.273 | B VIA |
| ***242*** | 1523087.342 | 907248.255 | 98.206 | POSTE |
| ***243*** | 1523122.029 | 907126.274 | 97.946 | POSTE |
| ***244*** | 1523125.955 | 907107.617 | 98.039 | POSTE |
| ***245*** | 1523075.062 | 907245.179 | 97.675 | B VIA |
| ***246*** | 1523078.377 | 907250.651 | 97.784 | B VIA |
| ***247*** | 1523066.671 | 907256.273 | 97.581 | B VIA |
| ***248*** | 1523063.925 | 907250.502 | 97.588 | B VIA |
| ***249*** | 1523052.718 | 907256.039 | 97.443 | B VIA |
| ***250*** | 1523055.285 | 907261.535 | 97.418 | B VIA |
| ***251*** | 1523043.868 | 907267.132 | 97.337 | B VIA |
| ***252*** | 1523041.312 | 907261.452 | 97.367 | B VIA |
| ***253*** | 1523030.525 | 907266.565 | 97.366 | B VIA |
| ***254*** | 1523033.495 | 907272.243 | 97.335 | B VIA |
| ***255*** | 1523022.15 | 907278.089 | 97.363 | B VIA |
| ***256*** | 1523018.579 | 907272.647 | 97.321 | B VIA |
| ***257*** | 1523008.616 | 907277.735 | 97.316 | B VIA |
| ***258*** | 1523011.403 | 907283.632 | 97.351 | B VIA |
| ***259*** | 1523001.772 | 907288.641 | 97.356 | B VIA |
| ***260*** | 1522998.876 | 907283.059 | 97.38 | B VIA |
| ***261*** | 1522994.712 | 907292.277 | 97.392 | B VIA |
| ***262*** | 1522991.93 | 907286.449 | 97.349 | B VIA |
| ***263*** | 1522980.19 | 907292.816 | 97.36 | B VIA |
| ***264*** | 1522982.865 | 907298.461 | 97.246 | B VIA |
| ***265*** | 1522971.829 | 907304.21 | 97.255 | B VIA |
| ***266*** | 1522968.845 | 907298.682 | 97.329 | B VIA |
| ***267*** | 1522961.066 | 907309.854 | 97.341 | B VIA |
| ***268*** | 1522949.727 | 907315.812 | 97.487 | B VIA |
| ***269*** | 1522874.068 | 907353.503 | 98.886 | STA 8 |
| ***270*** | 1522997.886 | 907292.887 | 97.317 | ALCANTA |
| ***271*** | 1522993.439 | 907295.17 | 97.032 | ALCANTA |
| ***272*** | 1522989.908 | 907285.649 | 97.163 | ALCANTA |
| ***273*** | 1522994.453 | 907283.275 | 97.306 | ALCANTA |
| ***274*** | 1522960.867 | 907302.727 | 97.44 | B VIA |
| ***275*** | 1522946.764 | 907310.096 | 97.569 | B VIA |
| ***276*** | 1522949.729 | 907315.837 | 97.499 | B VIA |
| ***277*** | 1522940.325 | 907320.885 | 97.599 | B VIA |
| ***278*** | 1522936.788 | 907315.446 | 97.65 | B VIA |
| ***279*** | 1522926.698 | 907321.15 | 97.782 | B VIA |
| ***280*** | 1522929.662 | 907327 | 97.744 | B VIA |
| ***281*** | 1522920.678 | 907332.295 | 97.871 | B VIA |

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| ***282*** | 1522917.163 | 907326.989 | 97.978 | B VIA |
| ***283*** | 1522907.666 | 907332.813 | 98.197 | B VIA |
| ***284*** | 1522910.384 | 907338.679 | 98.059 | B VIA |
| ***285*** | 1522902.429 | 907344.126 | 98.281 | B VIA |
| ***286*** | 1522898.634 | 907338.91 | 98.482 | B VIA |
| ***287*** | 1522889.805 | 907345.546 | 98.788 | B VIA |
| ***288*** | 1522893.441 | 907350.911 | 98.543 | B VIA |
| ***289*** | 1522883.295 | 907358.947 | 98.902 | B VIA |
| ***290*** | 1522878.727 | 907354.136 | 99.026 | B VIA |
| ***291*** | 1522868.952 | 907362.361 | 99.355 | B VIA |
| ***292*** | 1522873.215 | 907367.516 | 99.178 | B VIA |
| ***293*** | 1522864.791 | 907374.667 | 99.45 | B VIA |
| ***294*** | 1522860.74 | 907369.805 | 99.61 | B VIA |
| ***295*** | 1522851.971 | 907377.846 | 99.907 | B VIA |
| ***296*** | 1522856.636 | 907382.22 | 99.691 | B VIA |
| ***297*** | 1522847.597 | 907391.527 | 99.981 | B VIA |
| ***298*** | 1522843.104 | 907386.578 | 100.195 | B VIA |
| ***299*** | 1522835.143 | 907395.264 | 100.455 | B VIA |
| ***300*** | 1522840.107 | 907399.404 | 100.268 | B VIA |
| ***301*** | 1522830.517 | 907410.089 | 100.624 | B VIA |
| ***302*** | 1522825.723 | 907405.637 | 100.817 | B VIA |
| ***303*** | 1522817.191 | 907415.311 | 101.118 | B VIA |
| ***304*** | 1522822.177 | 907419.767 | 101.043 | B VIA |
| ***305*** | 1522815.003 | 907428.198 | 101.235 | B VIA |
| ***306*** | 1522809.975 | 907423.563 | 101.365 | B VIA |
| ***307*** | 1522803.157 | 907431.346 | 101.648 | B VIA |
| ***308*** | 1522808.323 | 907435.888 | 101.497 | B VIA |
| ***309*** | 1522801.533 | 907444.133 | 101.728 | B VIA |
| ***310*** | 1522796.355 | 907439.447 | 101.89 | B VIA |
| ***311*** | 1522789.774 | 907447.722 | 102.244 | B VIA |
| ***312*** | 1522795.252 | 907451.858 | 101.972 | B VIA |
| ***313*** | 1522769.714 | 907471.773 | 102.47 | STA 9 |
| ***314*** | 1522815.532 | 907415.416 | 101.139 | ALCANTA |
| ***315*** | 1522814.008 | 907414.141 | 101.112 | ALCANTA |
| ***316*** | 1522808.245 | 907421.142 | 101.247 | ALCANTA |
| ***317*** | 1522809.368 | 907422.267 | 101.301 | ALCANTA |
| ***318*** | 1522789.763 | 907447.682 | 102.246 | B VIA |
| ***319*** | 1522795.075 | 907452.135 | 101.984 | B VIA |
| ***320*** | 1522787.445 | 907461.927 | 102.344 | B VIA |
| ***321*** | 1522782.115 | 907458.095 | 102.642 | B VIA |
| ***322*** | 1522780.231 | 907457.159 | 102.467 | REGISTRO |

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| ***323*** | 1522775.523 | 907464.254 | 102.529 | ALCANTA |
| ***324*** | 1522773.879 | 907467.059 | 102.495 | ALCANTA |
| ***325*** | 1522782.212 | 907471.968 | 102.412 | ALCANTA |
| ***326*** | 1522783.682 | 907469.533 | 102.314 | ALCANTA |
| ***327*** | 1522782.145 | 907469.321 | 102.512 | B VIA |
| ***328*** | 1522776.149 | 907466.15 | 102.757 | B VIA |
| ***329*** | 1522770.343 | 907474.848 | 102.909 | B VIA |
| ***330*** | 1522776.172 | 907478.257 | 102.719 | B VIA |
| ***331*** | 1522770.255 | 907488.841 | 102.817 | B VIA |
| ***332*** | 1522764.711 | 907485.033 | 103.001 | B VIA |
| ***333*** | 1522759.047 | 907495.67 | 103.098 | B VIA |
| ***334*** | 1522764.865 | 907498.59 | 102.86 | B VIA |
| ***335*** | 1522760.419 | 907507.471 | 102.953 | B VIA |
| ***336*** | 1522754.621 | 907504.125 | 103.103 | B VIA |
| ***337*** | 1522749.666 | 907514.082 | 103.103 | B VIA |
| ***338*** | 1522755.314 | 907517.089 | 102.992 | B VIA |
| ***339*** | 1522748.952 | 907510.598 | 103.102 | HIDRANTE |
| ***340*** | 1522744.359 | 907524.198 | 103.127 | B VIA |
| ***341*** | 1522750.281 | 907527.127 | 103.111 | B VIA |
| ***342*** | 1522744.965 | 907537.308 | 103.203 | B VIA |
| ***343*** | 1522739.491 | 907534.333 | 103.21 | B VIA |
| ***344*** | 1522734.482 | 907543.589 | 103.257 | B VIA |
| ***345*** | 1522740.032 | 907546.328 | 103.3 | B VIA |
| ***346*** | 1522734.925 | 907556.671 | 103.392 | B VIA |
| ***347*** | 1522729.187 | 907554.059 | 103.302 | B VIA |
| ***348*** | 1522724.479 | 907563.164 | 103.397 | B VIA |
| ***349*** | 1522730.284 | 907565.696 | 103.422 | B VIA |
| ***350*** | 1522724.605 | 907576.773 | 103.455 | B VIA |
| ***351*** | 1522718.908 | 907574.066 | 103.453 | B VIA |
| ***352*** | 1522713.889 | 907583.502 | 103.403 | B VIA |
| ***353*** | 1522719.84 | 907586.27 | 103.416 | B VIA |
| ***354*** | 1522714.202 | 907597.103 | 103.362 | B VIA |
| ***355*** | 1522708.729 | 907593.921 | 103.379 | B VIA |
| ***356*** | 1522703.104 | 907604.891 | 103.373 | B VIA |
| ***357*** | 1522709.401 | 907606.713 | 103.333 | B VIA |
| ***358*** | 1522704.317 | 907616.719 | 103.315 | B VIA |
| ***359*** | 1522698.534 | 907614.048 | 103.315 | B VIA |
| ***360*** | 1522693.018 | 907624.622 | 103.215 | B VIA |
| ***361*** | 1522699.076 | 907627.168 | 103.285 | B VIA |
| ***362*** | 1522693.411 | 907638.164 | 103.173 | B VIA |
| ***363*** | 1522687.873 | 907634.977 | 103.144 | B VIA |

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| ***364*** | 1522682.889 | 907644.728 | 103.098 | B VIA |
| ***365*** | 1522688.81 | 907647.122 | 103.163 | B VIA |
| ***366*** | 1522683.214 | 907658.119 | 103.087 | B VIA |
| ***367*** | 1522677.843 | 907655.047 | 103.033 | B VIA |
| ***368*** | 1522672.407 | 907665.347 | 102.984 | B VIA |
| ***369*** | 1522677.931 | 907667.964 | 103.058 | B VIA |
| ***370*** | 1522672.401 | 907679.177 | 103.006 | B VIA |
| ***371*** | 1522667.247 | 907676.054 | 102.908 | B VIA |
| ***372*** | 1522661.762 | 907686.984 | 102.881 | B VIA |
| ***373*** | 1522667.456 | 907689.225 | 102.877 | B VIA |
| ***374*** | 1522662.47 | 907699.067 | 102.795 | B VIA |
| ***375*** | 1522656.87 | 907696.128 | 102.843 | B VIA |
| ***376*** | 1522651.264 | 907707.527 | 102.787 | B VIA |
| ***377*** | 1522656.704 | 907710.788 | 102.708 | B VIA |
| ***378*** | 1522657.167 | 907714.101 | 102.758 | POSTE |
| ***379*** | 1522795.405 | 907433.078 | 101.702 | ARBOL |
| ***380*** | 1522802.129 | 907424.708 | 101.49 | ARBOL |
| ***381*** | 1522813.986 | 907409.1 | 101.068 | ARBOL |
| ***382*** | 1522845.658 | 907379.113 | 99.965 | ARBOL |
| ***383*** | 1522836.99 | 907388.197 | 100.365 | ARBOL |
| ***384*** | 1522776.045 | 907455.715 | 102.491 | POSTE |
| ***385*** | 1522784.686 | 907468.693 | 102.282 | POSTE |
| ***386*** | 1522781.276 | 907474.195 | 102.369 | POSTE |
| ***387*** | 1522760.449 | 907516.157 | 102.144 | POSTE |
| ***388*** | 1522754.324 | 907523.541 | 102.559 | POSTE |
| ***389*** | 1522726.877 | 907576.874 | 103.071 | POSTE |
| ***390*** | 1522739.929 | 907551.504 | 103.067 | POSTE |
| ***391*** | 1522709.233 | 907609.772 | 103.052 | POSTE |
| ***392*** | 1522644.535 | 907721.18 | 102.75 | STA 10 |
| ***393*** | 1522657.471 | 907689.287 | 102.663 | ARBOL |
| ***394*** | 1522645.379 | 907714.48 | 102.294 | ARBOL |
| ***395*** | 1522646.831 | 907710.685 | 102.425 | ARBOL |
| ***396*** | 1522642.782 | 907719.535 | 102.613 | ARBOL |
| ***397*** | 1522683.486 | 907661.18 | 103.12 | POSTE |
| ***398*** | 1522673.609 | 907680.717 | 103.338 | POSTE |
| ***399*** | 1522641.62 | 907745.721 | 102.398 | POSTE |
| ***400*** | 1522624.674 | 907779.447 | 102.109 | POSTE |
| ***401*** | 1522592.416 | 907844.36 | 102.506 | POSTE |
| ***402*** | 1522624.038 | 907759.321 | 102.115 | ARBOL |
| ***403*** | 1522646.212 | 907717.385 | 102.737 | B VIA |
| ***404*** | 1522651.553 | 907720.56 | 102.671 | B VIA |

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| ***405*** | 1522646.661 | 907730.55 | 102.648 | B VIA |
| ***406*** | 1522640.994 | 907727.879 | 102.716 | B VIA |
| ***407*** | 1522636.469 | 907736.946 | 102.657 | B VIA |
| ***408*** | 1522641.968 | 907739.728 | 102.586 | B VIA |
| ***409*** | 1522637.216 | 907749.154 | 102.598 | B VIA |
| ***410*** | 1522631.912 | 907745.998 | 102.621 | B VIA |
| ***411*** | 1522627.032 | 907755.822 | 102.587 | B VIA |
| ***412*** | 1522632.271 | 907758.999 | 102.564 | B VIA |
| ***413*** | 1522627.898 | 907767.504 | 102.509 | B VIA |
| ***414*** | 1522622.861 | 907764.01 | 102.569 | B VIA |
| ***415*** | 1522618.081 | 907773.555 | 102.485 | B VIA |
| ***416*** | 1522623.486 | 907776.504 | 102.449 | B VIA |
| ***417*** | 1522618.626 | 907786.083 | 102.384 | B VIA |
| ***418*** | 1522613.187 | 907783.176 | 102.396 | B VIA |
| ***419*** | 1522608.208 | 907792.85 | 102.366 | B VIA |
| ***420*** | 1522613.948 | 907795.711 | 102.384 | B VIA |
| ***421*** | 1522608.516 | 907806.184 | 102.249 | B VIA |
| ***422*** | 1522602.95 | 907803.332 | 102.274 | B VIA |
| ***423*** | 1522598.087 | 907812.821 | 102.281 | B VIA |
| ***424*** | 1522604.269 | 907815.216 | 102.26 | B VIA |
| ***425*** | 1522598.792 | 907825.36 | 102.238 | B VIA |
| ***426*** | 1522593.347 | 907822.42 | 102.394 | B VIA |
| ***427*** | 1522588.912 | 907831.5 | 102.325 | B VIA |
| ***428*** | 1522594.869 | 907834.401 | 102.326 | B VIA |
| ***429*** | 1522589.256 | 907844.4 | 102.401 | B VIA |
| ***430*** | 1522583.946 | 907841.086 | 102.522 | B VIA |
| ***431*** | 1522578.796 | 907850.995 | 102.604 | B VIA |
| ***432*** | 1522584.546 | 907853.747 | 102.493 | B VIA |
| ***433*** | 1522579.17 | 907864.429 | 102.562 | B VIA |
| ***434*** | 1522573.963 | 907860.755 | 102.644 | B VIA |
| ***435*** | 1522570.14 | 907868.441 | 102.755 | B VIA |
| ***436*** | 1522575.676 | 907871.354 | 102.562 | B VIA |
| ***437*** | 1522570.848 | 907881.227 | 102.576 | B VIA |
| ***438*** | 1522565.466 | 907878.118 | 102.783 | B VIA |
| ***439*** | 1522561.038 | 907887.889 | 102.729 | B VIA |
| ***440*** | 1522566.825 | 907890.346 | 102.548 | B VIA |
| ***441*** | 1522562.505 | 907899.852 | 102.469 | B VIA |
| ***442*** | 1522556.939 | 907896.6 | 102.7 | B VIA |
| ***443*** | 1522552.747 | 907906.575 | 102.621 | B VIA |
| ***444*** | 1522558.386 | 907909.649 | 102.415 | B VIA |
| ***445*** | 1522553.683 | 907920.048 | 102.4 | B VIA |

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| ***446*** | 1522548.305 | 907917.27 | 102.571 | B VIA |
| ***447*** | 1522529.115 | 907974.011 | 102.114 | STA 11 |
| ***448*** | 1522551.532 | 907930.38 | 102.915 | ARBOL |
| ***449*** | 1522547.226 | 907942.392 | 102.681 | ARBOL |
| ***450*** | 1522543.806 | 907950.923 | 102.293 | ARBOL |
| ***451*** | 1522542.116 | 907957.671 | 102.2 | ARBOL |
| ***452*** | 1522553.289 | 907923.904 | 102.939 | ARBOL |
| ***453*** | 1522533.282 | 907986.813 | 102.395 | POSTE |
| ***454*** | 1522529.123 | 908010.805 | 101.616 | POSTE |
| ***455*** | 1522513.766 | 908061.99 | 101.197 | POSTE |
| ***456*** | 1522525.33 | 908029.883 | 102.268 | ARBOL |
| ***457*** | 1522548.282 | 907917.33 | 102.584 | B VIA |
| ***458*** | 1522554.121 | 907920.073 | 102.409 | B VIA |
| ***459*** | 1522551.176 | 907926.218 | 102.369 | B VIA |
| ***460*** | 1522545.71 | 907924.142 | 102.552 | B VIA |
| ***461*** | 1522541.854 | 907933.855 | 102.415 | B VIA |
| ***462*** | 1522546.927 | 907936.034 | 102.254 | B VIA |
| ***463*** | 1522542.952 | 907948.145 | 102.164 | B VIA |
| ***464*** | 1522537.031 | 907946.761 | 102.333 | B VIA |
| ***465*** | 1522533.786 | 907956.804 | 102.258 | B VIA |
| ***466*** | 1522539.328 | 907958.643 | 102.098 | B VIA |
| ***467*** | 1522536.037 | 907969.376 | 102.003 | B VIA |
| ***468*** | 1522530.547 | 907968.09 | 102.135 | B VIA |
| ***469*** | 1522527.98 | 907977.735 | 102.092 | B VIA |
| ***470*** | 1522533.396 | 907979.036 | 101.919 | B VIA |
| ***471*** | 1522531.275 | 907989.907 | 101.874 | B VIA |
| ***472*** | 1522525.577 | 907988.547 | 102.015 | B VIA |
| ***473*** | 1522526.811 | 907982.657 | 102.064 | B VIA |
| ***474*** | 1522526.625 | 907982.598 | 102.076 | PARAMENTO |
| ***475*** | 1522524.659 | 907982.058 | 102.07 | PARAMENTO |
| ***476*** | 1522524.979 | 907989.042 | 101.89 | PARAMENTO |
| ***477*** | 1522524.272 | 907988.916 | 101.886 | PARAMENTO |
| ***478*** | 1522522.766 | 907998.33 | 101.705 | PARAMENTO |
| ***479*** | 1522523.568 | 907998.503 | 101.928 | B VIA |
| ***480*** | 1522529.546 | 907999.685 | 101.735 | B VIA |
| ***481*** | 1522527.702 | 908010.073 | 101.498 | B VIA |
| ***482*** | 1522521.721 | 908008.437 | 101.803 | B VIA |
| ***483*** | 1522520.699 | 908010.289 | 101.67 | PARAMENTO |
| ***484*** | 1522520.111 | 908010.244 | 101.636 | PARAMENTO |
| ***485*** | 1522520.47 | 908015.653 | 101.73 | B VIA |
| ***486*** | 1522526.267 | 908016.738 | 101.472 | B VIA |

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| ***487*** | 1522524.23 | 908028.021 | 101.401 | B VIA |
| ***488*** | 1522518.671 | 908026.708 | 101.683 | B VIA |
| ***489*** | 1522518.686 | 908020.716 | 101.549 | PARAMENTO |
| ***490*** | 1522518.462 | 908025.063 | 101.64 | CERCA |
| ***491*** | 1522517.262 | 908036.926 | 101.651 | B VIA |
| ***492*** | 1522522.97 | 908037.999 | 101.346 | B VIA |
| ***493*** | 1522516.548 | 908038.78 | 101.487 | CERCA |
| ***494*** | 1522515.847 | 908050.004 | 101.505 | B VIA |
| ***495*** | 1522522.166 | 908050.792 | 101.188 | B VIA |
| ***496*** | 1522514.584 | 908061.823 | 101.395 | B VIA |
| ***497*** | 1522520.868 | 908063.089 | 101.112 | B VIA |
| ***498*** | 1522519.328 | 908078.985 | 101.055 | B VIA |
| ***499*** | 1522513.04 | 908078.218 | 101.238 | B VIA |
| ***500*** | 1522512.145 | 908089.325 | 101.032 | B VIA |
| ***501*** | 1522518.371 | 908090.539 | 100.871 | B VIA |
| ***502*** | 1522517.07 | 908101.872 | 100.707 | B VIA |
| ***503*** | 1522510.827 | 908100.07 | 100.662 | B VIA |
| ***504*** | 1522509.758 | 908103.047 | 100.721 | B VIA |
| ***505*** | 1522516.535 | 908109.468 | 100.69 | B VIA |
| ***506*** | 1522515.025 | 908127.373 | 100.711 | B VIA |