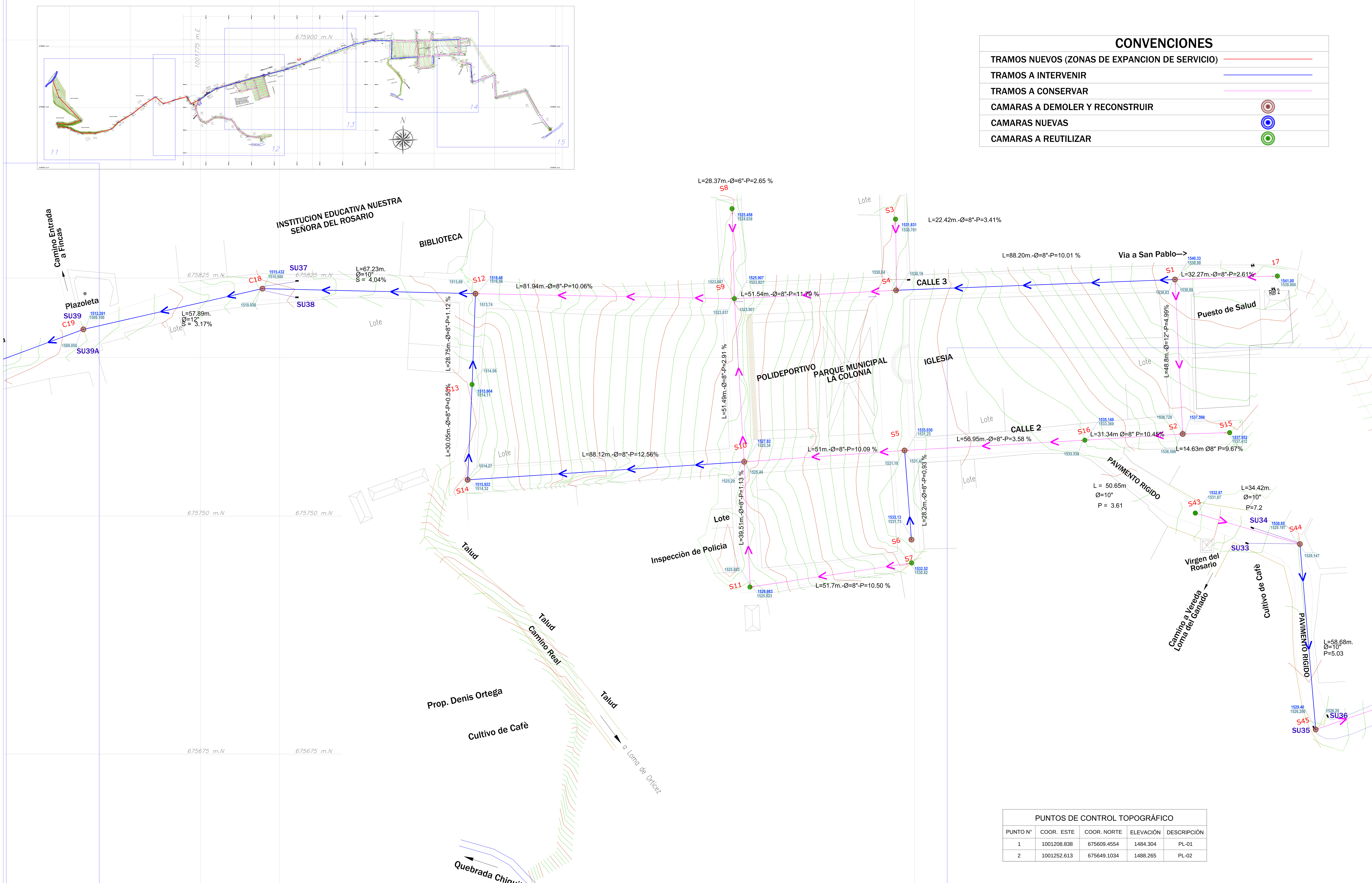


## CONVENCIONES

| | |
|---|---|
| TRAMOS NUEVOS (ZONAS DE EXPANCION DE SERVICIO) | (línea roja) |
| TRAMOS A INTERVENIR | (línea azul) |
| TRAMOS A CONSERVAR | (línea magenta) |
| CAMARAS A DEMOLER Y RECONSTRUIR | (símbolo) |
| CAMARAS NUEVAS | (símbolo) |
| CAMARAS A REUTILIZAR | (símbolo) |

### PUNTOS DE CONTROL TOPOGRÁFICO

| PUNTO N° | COOR. ESTE | COOR. NORTE | ELEVACIÓN | DESCRIPCIÓN |
|---|---|---|---|---|
| 1 | 1001208.838 | 675609.4554 | 1484.304 | PL-01 |
| 2 | 1001252.613 | 675649.1034 | 1488.265 | PL-02 |

### CALCULO DEL CAUDAL DE DISEÑO

| Pozo De [1] | Pozo A [1] | Area Trib. (ha) Parcial [2] | Area Trib. (ha) Total [2] | Dotacion L/Hab.dia [3] | Domestico % Area [4] | Domestico Densid [5] | Domestico Pob. [6] | Domestico L/s.ha [7] | Industrial % Area [8] | Industrial L/s.ha [9] | Comercial % Area [10] | Comercial L/s.ha [11] | Institucional % Area [12] | Institucional L/s.ha [13] | Total Area [14] | Q max. Horario L/s.ha [15] | Q max. Horario L/s [16] | Q max. Horario F [17] | Q max. Horario L/s [18] | Infiltracion L/s.ha [19] | Infiltracion L/s [20] | Conx. Erradas L/s.ha [21] | Conx. Erradas L/s [22] | Q diseño (L/s) Calc. [23] | Q diseño (L/s) Adop. [24] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 1 | 0.0970 | 0.0970 | 90 | 65 | 85.56 | 8 | 0.07 | 0 | 0.6 | 0 | 0.4 | 35 | 0.4 | 100 | 0.19 | 0.018 | 3.80 | 0.07 | 0.2 | 0.02 | 0.1 | 0.010 | 0.10 | 1.50 |
| 1 | 4 | 0.2140 | 0.3110 | 90 | 60 | 85.56 | 27 | 0.07 | 0 | 0.6 | 0 | 0.4 | 40 | 0.4 | 100 | 0.20 | 0.061 | 3.80 | 0.23 | 0.2 | 0.06 | 0.1 | 0.031 | 0.33 | 1.50 |
| 3 | 4 | 0.0810 | 0.0810 | 90 | 100 | 85.56 | 7 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.006 | 3.80 | 0.02 | 0.2 | 0.02 | 0.1 | 0.008 | 0.05 | 1.50 |
| 4 | 9 | 0.1340 | 0.6410 | 90 | 30 | 85.56 | 55 | 0.07 | 0 | 0.6 | 30 | 0.4 | 40 | 0.4 | 100 | 0.30 | 0.054 | 3.80 | 0.21 | 0.2 | 0.13 | 0.1 | 0.064 | 0.40 | 1.50 |
| 8 | 9 | 0.0800 | 0.0800 | 90 | 100 | 85.56 | 7 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.006 | 3.80 | 0.02 | 0.2 | 0.02 | 0.1 | 0.008 | 0.05 | 1.50 |
| 10 | 9 | 0.1690 | 0.1690 | 90 | 50 | 85.56 | 14 | 0.07 | 0 | 0.6 | 0 | 0.4 | 50 | 0.4 | 100 | 0.24 | 0.040 | 3.80 | 0.15 | 0.2 | 0.03 | 0.1 | 0.017 | 0.20 | 1.50 |
| 9 | 12 | 0.2200 | 1.1100 | 90 | 100 | 85.56 | 95 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.074 | 3.80 | 0.28 | 0.2 | 0.22 | 0.1 | 0.111 | 0.61 | 1.50 |
| 7 | 11 | 0.1910 | 0.1910 | 90 | 81 | 85.56 | 16 | 0.07 | 0 | 0.6 | 0 | 0.4 | 19 | 0.4 | 100 | 0.13 | 0.026 | 3.80 | 0.10 | 0.2 | 0.04 | 0.1 | 0.019 | 0.15 | 1.50 |
| 11 | 10 | 0.0520 | 0.2430 | 90 | 100 | 85.56 | 21 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.029 | 3.80 | 0.11 | 0.2 | 0.05 | 0.1 | 0.024 | 0.18 | 1.50 |
| 15 | 2 | 0.0630 | 0.0630 | 90 | 100 | 85.56 | 5 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.004 | 3.80 | 0.02 | 0.2 | 0.01 | 0.1 | 0.006 | 0.04 | 1.50 |
| 1 | 2 | 0.1150 | 0.1150 | 90 | 100 | 85.56 | 10 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.008 | 3.80 | 0.03 | 0.2 | 0.02 | 0.1 | 0.012 | 0.07 | 1.50 |
| 2 | 16 | 0.0680 | 0.2460 | 90 | 100 | 85.56 | 21 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.013 | 3.80 | 0.05 | 0.2 | 0.05 | 0.1 | 0.025 | 0.12 | 1.50 |
| 16 | 5 | 0.1400 | 0.3860 | 90 | 100 | 85.56 | 33 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.023 | 3.80 | 0.09 | 0.2 | 0.08 | 0.1 | 0.039 | 0.20 | 1.50 |
| 6 | 5 | 0.0530 | 0.0530 | 90 | 100 | 85.56 | 5 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.004 | 3.80 | 0.01 | 0.2 | 0.01 | 0.1 | 0.005 | 0.03 | 1.50 |
| 5 | 10 | 0.1340 | 0.5730 | 90 | 100 | 85.56 | 49 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.036 | 3.80 | 0.14 | 0.2 | 0.11 | 0.1 | 0.057 | 0.31 | 1.50 |
| 10 | 14 | 0.3080 | 1.1240 | 90 | 100 | 85.56 | 96 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.088 | 3.80 | 0.33 | 0.2 | 0.22 | 0.1 | 0.112 | 0.67 | 1.50 |
| 14 | 13 | 0.1190 | 1.2430 | 90 | 100 | 85.56 | 106 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.096 | 3.80 | 0.37 | 0.2 | 0.25 | 0.1 | 0.124 | 0.74 | 1.50 |
| 13 | 12 | 0.0890 | 1.3320 | 90 | 100 | 85.56 | 114 | 0.07 | 0 | 0.6 | 0 | 0.4 | 0 | 0.4 | 100 | 0.07 | 0.102 | 3.80 | 0.39 | 0.2 | 0.27 | 0.1 | 0.133 | 0.79 | 1.50 |

| Pozo De | Pozo A | L. Proyec. Colector (m) [26] | L. real Colector (m) [27] | Pendiente Colector (%) [28] | Diametro Nominal (pulg.) [29] | Diametro Nominal (mm) [30] | Diametro Interno (m) [31] | n [32] | $Q_o$ (L/s) [33] | $V_o$ (m/s) [34] | $Q/Q_o$ <= 0.85 [35] | $V/V_o$ [36] | d/D [37] | $r/R_o$ [38] | H/D [39] | V (m/s) [40] | $V^2/2g$ (m) [41] | Radio Hidraulico (m) [42] | Fuerza Tractiva >=0.15 kg/m² (kg/m²) [43] | CHEQUEO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 1 | 32.26 | 32.27 | 3.32 | 8.00 | 203.2 | 0.182 | 0.013 | 46.47 | 1.79 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.72 | 0.03 | 0.02 | 0.56 | OK |
| 1 | 4 | 87.84 | 88.19 | 10.01 | 8.00 | 203.2 | 0.182 | 0.013 | 80.70 | 3.10 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.09 | 0.06 | 0.01 | 1.43 | OK |
| 3 | 4 | 22.41 | 22.42 | 3.32 | 8.00 | 203.2 | 0.182 | 0.013 | 46.50 | 1.79 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.72 | 0.03 | 0.02 | 0.56 | OK |
| 4 | 9 | 51.12 | 51.54 | 11.79 | 8.00 | 203.2 | 0.182 | 0.013 | 87.59 | 3.37 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.18 | 0.07 | 0.01 | 1.69 | OK |
| 8 | 9 | 28.37 | 28.37 | 2.47 | 8.00 | 203.2 | 0.182 | 0.013 | 40.09 | 1.54 | 0.04 | 0.43 | 0.17 | 0.41 | 0.10 | 0.65 | 0.02 | 0.02 | 0.46 | OK |
| 10 | 9 | 51.47 | 51.49 | 2.87 | 8.00 | 203.2 | 0.182 | 0.013 | 43.22 | 1.66 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.67 | 0.02 | 0.02 | 0.48 | OK |
| 9 | 12 | 81.60 | 81.94 | 10.14 | 8.00 | 203.2 | 0.182 | 0.013 | 81.21 | 3.12 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.09 | 0.06 | 0.01 | 1.45 | OK |
| 7 | 11 | 51.40 | 51.70 | 9.60 | 8.00 | 203.2 | 0.182 | 0.013 | 79.03 | 3.04 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.06 | 0.06 | 0.01 | 1.38 | OK |
| 11 | 10 | 39.51 | 39.51 | 1.08 | 8.00 | 203.2 | 0.182 | 0.013 | 26.55 | 1.02 | 0.06 | 0.47 | 0.20 | 0.48 | 0.13 | 0.48 | 0.01 | 0.02 | 0.24 | OK |
| 15 | 2 | 14.63 | 14.63 | 5.29 | 8.00 | 203.2 | 0.182 | 0.013 | 58.66 | 2.25 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.91 | 0.04 | 0.02 | 0.89 | OK |
| 1 | 2 | 48.72 | 48.80 | 4.89 | 8.00 | 203.2 | 0.182 | 0.013 | 56.38 | 2.17 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.88 | 0.04 | 0.02 | 0.82 | OK |
| 2 | 16 | 30.91 | 31.34 | 10.54 | 8.00 | 203.2 | 0.182 | 0.013 | 82.82 | 3.18 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.11 | 0.06 | 0.01 | 1.51 | OK |
| 16 | 5 | 56.91 | 56.95 | 3.64 | 8.00 | 203.2 | 0.182 | 0.013 | 48.63 | 1.87 | 0.03 | 0.41 | 0.15 | 0.37 | 0.09 | 0.76 | 0.03 | 0.02 | 0.61 | OK |
| 6 | 5 | 28.20 | 28.20 | 0.93 | 8.00 | 203.2 | 0.182 | 0.013 | 24.58 | 0.94 | 0.06 | 0.47 | 0.20 | 0.48 | 0.13 | 0.44 | 0.01 | 0.02 | 0.20 | OK |
| 5 | 10 | 50.67 | 51.00 | 10.13 | 8.00 | 203.2 | 0.182 | 0.013 | 81.19 | 3.12 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.09 | 0.06 | 0.01 | 1.45 | OK |
| 10 | 14 | 87.31 | 88.12 | 12.67 | 8.00 | 203.2 | 0.182 | 0.013 | 90.80 | 3.49 | 0.02 | 0.35 | 0.13 | 0.32 | 0.07 | 1.22 | 0.08 | 0.01 | 1.82 | OK |
| 14 | 13 | 30.05 | 30.05 | 1.53 | 8.00 | 203.2 | 0.182 | 0.013 | 31.56 | 1.21 | 0.05 | 0.45 | 0.18 | 0.45 | 0.12 | 0.55 | 0.02 | 0.02 | 0.31 | OK |
| 13 | 12 | 28.64 | 28.75 | 1.47 | 8.00 | 203.2 | 0.182 | 0.013 | 30.89 | 1.19 | 0.05 | 0.45 | 0.18 | 0.45 | 0.12 | 0.53 | 0.01 | 0.02 | 0.30 | OK |

| Pozo De | Pozo A | d (m) [44] | Caida Tramo (m) [45] | Energia Especifica (m) [46] | Prof. Hidraulica (m) [47] | Num. de Froude [48] | Cota Clave Superior (msnm) [49] | Cota Clave Inferior (msnm) [50] | Cota Rasante Origen (msnm) [51] | Cota Rasante Extremo (msnm) [52] | RECUBRIMIENTO Superior (m) [53] | RECUBRIMIENTO Inferior (m) [54] | Cota Batea Superior (msnm) [55] | Cota Batea Inferior (msnm) [56] | Prof. Batea Inicial (m) [57] | Prof. Batea Final. (m) [58] | Prof. (m) [59] | Ancho (m) [60] | Excav. (m³) [61] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 1 | 0.03 | 1.07 | 0.05 | 0.02 | 1.85 | 1540.153 | 1539.082 | 1541.000 | 1540.329 | 0.85 | 1.25 | 1539.95 | 1538.88 | 1.05 | 1.45 | 1.35 | 0.85 | 37.03 |
| 1 | 4 | 0.02 | 8.83 | 0.08 | 0.01 | 3.14 | 1539.032 | 1530.239 | 1540.329 | 1532.486 | 1.30 | 2.25 | 1538.829 | 1530.036 | 1.50 | 2.45 | 2.08 | 0.85 | 155.54 |
| 3 | 4 | 0.03 | 0.75 | 0.05 | 0.02 | 1.85 | 1530.934 | 1530.189 | 1531.831 | 1532.486 | 0.90 | 2.30 | 1530.73 | 1529.99 | 1.10 | 2.50 | 1.90 | 0.85 | 36.21 |
| 4 | 9 | 0.02 | 6.08 | 0.09 | 0.01 | 3.41 | 1530.139 | 1524.110 | 1532.486 | 1525.907 | 2.35 | 1.80 | 1529.94 | 1523.91 | 2.55 | 2.00 | 2.38 | 0.85 | 104.05 |
| 8 | 9 | 0.03 | 0.70 | 0.05 | 0.02 | 1.53 | 1524.811 | 1524.110 | 1525.458 | 1525.907 | 0.65 | 1.80 | 1524.61 | 1523.91 | 0.85 | 2.00 | 1.53 | 0.85 | 36.78 |
| 10 | 9 | 0.03 | 1.48 | 0.05 | 0.02 | 1.72 | 1525.618 | 1524.140 | 1527.215 | 1525.907 | 1.60 | 1.77 | 1525.42 | 1523.94 | 1.80 | 1.97 | 1.98 | 0.85 | 86.87 |
| 9 | 12 | 0.02 | 8.31 | 0.08 | 0.01 | 3.16 | 1523.950 | 1515.678 | 1525.907 | 1518.475 | 1.96 | 2.80 | 1523.75 | 1515.48 | 2.16 | 3.00 | 2.68 | 0.85 | 186.65 |
| 7 | 11 | 0.02 | 4.96 | 0.08 | 0.01 | 3.07 | 1531.021 | 1526.086 | 1532.518 | 1526.983 | 1.50 | 0.90 | 1530.82 | 1525.88 | 1.70 | 1.10 | 1.50 | 0.85 | 65.91 |
| 11 | 10 | 0.04 | 0.43 | 0.05 | 0.02 | 1.00 | 1526.066 | 1525.638 | 1526.983 | 1527.215 | 0.92 | 1.58 | 1525.86 | 1525.44 | 1.12 | 1.78 | 1.55 | 0.85 | 52.06 |
| 15 | 2 | 0.03 | 0.77 | 0.07 | 0.02 | 2.33 | 1537.555 | 1536.781 | 1537.952 | 1537.598 | 0.40 | 0.82 | 1537.35 | 1536.58 | 0.60 | 1.02 | 0.91 | 0.85 | 11.32 |
| 1 | 2 | 0.03 | 2.38 | 0.07 | 0.02 | 2.24 | 1539.282 | 1536.901 | 1540.329 | 1537.598 | 1.05 | 0.70 | 1539.08 | 1536.70 | 1.25 | 0.90 | 1.17 | 0.85 | 48.74 |
| 2 | 16 | 0.02 | 3.30 | 0.09 | 0.01 | 3.22 | 1536.781 | 1533.522 | 1540.329 | 1535.149 | 3.55 | 1.63 | 1536.58 | 1533.32 | 3.75 | 1.83 | 2.89 | 0.85 | 77.00 |
| 16 | 5 | 0.03 | 2.07 | 0.06 | 0.02 | 1.93 | 1533.502 | 1531.433 | 1535.149 | 1533.030 | 1.65 | 1.60 | 1533.30 | 1531.23 | 1.85 | 1.80 | 1.92 | 0.85 | 93.18 |
| 6 | 5 | 0.04 | 0.26 | 0.05 | 0.02 | 0.93 | 1531.935 | 1531.673 | 1533.132 | 1533.030 | 1.20 | 1.36 | 1531.732 | 1531.470 | 1.40 | 1.56 | 1.58 | 0.85 | 37.87 |
| 5 | 10 | 0.02 | 5.17 | 0.08 | 0.01 | 3.16 | 1530.903 | 1525.768 | 1533.030 | 1527.215 | 2.13 | 1.45 | 1530.70 | 1525.57 | 2.33 | 1.65 | 2.09 | 0.85 | 90.61 |
| 10 | 14 | 0.02 | 11.17 | 0.10 | 0.01 | 3.53 | 1525.588 | 1514.523 | 1527.815 | 1515.922 | 2.23 | 1.40 | 1525.385 | 1514.320 | 2.43 | 1.60 | 2.12 | 0.85 | 158.49 |
| 14 | 13 | 0.03 | 0.46 | 0.05 | 0.02 | 1.20 | 1514.473 | 1514.013 | 1515.922 | 1515.964 | 1.45 | 1.95 | 1514.270 | 1513.810 | 1.65 | 2.15 | 2.00 | 0.85 | 51.16 |
| 13 | 12 | 0.03 | 0.42 | 0.05 | 0.02 | 1.17 | 1513.963 | 1513.543 | 1515.964 | 1518.475 | 2.00 | 4.93 | 1513.760 | 1513.340 | 2.20 | 5.13 | 3.77 | 0.85 | 92.12 |

Libertad y Orden
**Ministerio de Vivienda, Ciudad y Territorio**
República de Colombia
ALCALDÍA MUNICIPAL DE COLÓN GÉNOVA

ALCALDE MUNICIPAL:
OSCAR FERNANDO CERÓN ORTEGA
PERÍODO 2011 - 2015

PROYECTO:
OPTIMIZACIÓN SISTEMA DE ALCANTARILLADO CENTRO POBLADO POBLADO DE VILLANUEVA MUNICIPIO DE COLÓN - ETAPA 1

CONTIENE:
REDUCIDO DISEÑO POBLADO DE VILLANUEVA MUNICIPIO DE COLÓN

CONTRATISTA:
Ing. LUIS CARLOS CHAMORRO ENRIQUEZ
Matricula Profesional: 52202-209702 NRÑ

DISEÑÓ:
Ing. LUIS CARLOS CHAMORRO ENRIQUEZ
Matricula Profesional: 52202-209702 NRÑ

LEVANTÓ:
Top. VICENTE JAVIER APRÁEZ RODRÍGUEZ
L.P. No. 01-11058 C.P.N.T.

| Revisión No. | DESCRIPCIÓN | FECHA | REVISÓ |
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LOCALIZACIÓN

APROBÓ:
ING. GEOVANNY CASTRO ORDÓÑEZ
SECRETARIO DE OBRAS PÚBLICAS
M.P. 1920-2211965 CAU

JUNIO / 2015

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Alcaldía de Colón Génova
Departamento de Nariño