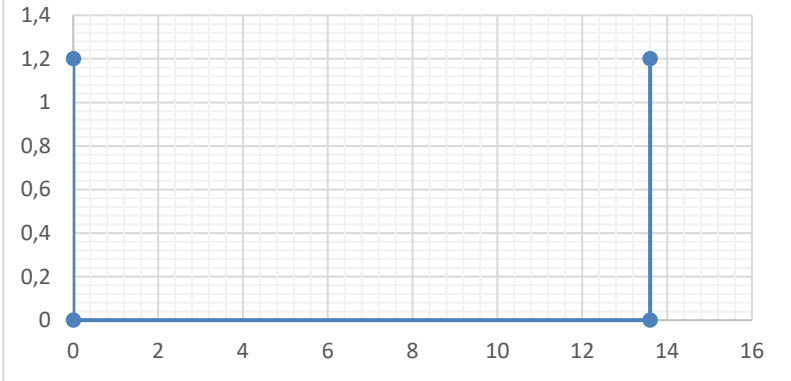
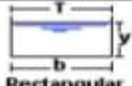
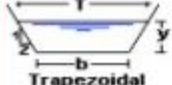


|                                                                                   |                                                                                                                                                                                                                                                                                                       |                                                                                                                                     |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>CONTRATO DE CONSULTORÍA No. 002 DE 2020</p> <p>REVISIÓN EXCEPCIONAL DEL PLAN BÁSICO DE ORDENAMIENTO TERRITORIAL (PBOT) E INCORPORACIÓN DEL POMCA DEL RIO BOGOTÁ, REALIZACIÓN DE LOS ESTUDIOS DE AMENAZA, VULNERABILIDAD Y RIESGO (AVR) E INCORPORACIÓN, DEL MUNICIPIO DE CAJICÁ – CUNDINAMARCA</p> |  <p>Arco Consultorías y Construcciones Ltda.</p> |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|

| <b>NOMBRE PUNTO: P4C Punto Nuevo Rio Frio</b>                                       |                      |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
|-------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|------------|---|---|-----|---|---|---|---|------|---|---|------|-----|
| Barrio/Centro Poblado/Vereda: Canelón                                               |                      |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| Sistema de coordenadas (WGS84)                                                      |                      | <b>REGISTRO HISTÓRICO</b>                                                                                                                                                                                                                                                                                                 |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| Latitud: 4,899345                                                                   | Longitud: -74,039772 | Y- Nivel Actual (cm):                                                                                                                                                                                                                                                                                                     |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| Sistema de coordenadas (CTM12)                                                      |                      | Nivel Observado (cm):                                                                                                                                                                                                                                                                                                     |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| X: 4884759,18846                                                                    | Y: 2099460,20578     | Nivel Observado (cm):                                                                                                                                                                                                                                                                                                     |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| CORRIENTE:                                                                          |                      | Nivel Observado (cm):                                                                                                                                                                                                                                                                                                     |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| <b>ESTRUCTURA HIDRÁULICA:</b>                                                       |                      | <b>REGISTRO FOTOGRÁFICO</b>                                                                                                                                                                                                                                                                                               |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| Tipo: Rectangular                                                                   |                      |                                                                                                                                                                                                                                        |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| <b>Dimensiones</b>                                                                  |                      |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| Altura(H):                                                                          | Base(b):             |                                                                                                                                                                                                                                                                                                                           | Diámetro(D): |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| 1,20 m                                                                              | 13,6 m               |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| <b>Esquema</b>                                                                      |                      | <b>OBSERVACIONES</b><br><br>Drenaje con carga de sedimentos, cobertura adyacente pastos, vegetación acuática en sectores, zona de inundación, zona de pantano                                                                                                                                                             |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
|   |                      |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| <b>SECCIÓN TRANSVERSAL</b>                                                          |                      |                                                                                                                                                                                                                                                                                                                           |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| <b>Dimensiones</b>                                                                  |                      | <b>Esquema</b>                                                                                                                                                                                                                                                                                                            |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
|  |                      | <table border="1"> <thead> <tr> <th>ID</th> <th>DISTANCIA (m)</th> <th>ALTURA (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>1,2</td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> </tr> <tr> <td>3</td> <td>13,6</td> <td>0</td> </tr> <tr> <td>4</td> <td>13,6</td> <td>1,2</td> </tr> </tbody> </table> | ID           | DISTANCIA (m) | ALTURA (m) | 1 | 0 | 1,2 | 2 | 0 | 0 | 3 | 13,6 | 0 | 4 | 13,6 | 1,2 |
| ID                                                                                  | DISTANCIA (m)        | ALTURA (m)                                                                                                                                                                                                                                                                                                                |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| 1                                                                                   | 0                    | 1,2                                                                                                                                                                                                                                                                                                                       |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| 2                                                                                   | 0                    | 0                                                                                                                                                                                                                                                                                                                         |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| 3                                                                                   | 13,6                 | 0                                                                                                                                                                                                                                                                                                                         |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |
| 4                                                                                   | 13,6                 | 1,2                                                                                                                                                                                                                                                                                                                       |              |               |            |   |   |     |   |   |   |   |      |   |   |      |     |

**NOTA:** grilla a 0.5 cm

| Tipo de sección                                                                                  | Área A (m2)                              | Perimetro mojado P (m) | Radio hidráulico Rh (m)                          | Espejo de agua T (m)                                   |
|--------------------------------------------------------------------------------------------------|------------------------------------------|------------------------|--------------------------------------------------|--------------------------------------------------------|
| <br>Rectangular | $by$                                     | $b+2y$                 | $\frac{by}{b+2y}$                                | $b$                                                    |
| <br>Trapezoidal | $(b+zy)y$                                | $b+2y\sqrt{1+z^2}$     | $\frac{(b+zy)y}{b+2y\sqrt{1+z^2}}$               | $b+2zy$                                                |
| <br>Triangular  | $zy^2$                                   | $2y\sqrt{1+z^2}$       | $\frac{zy}{2\sqrt{1+z^2}}$                       | $2zy$                                                  |
| <br>Circular    | $\frac{(\theta-\text{sen}\theta)D^2}{8}$ | $\frac{\theta D}{2}$   | $(1-\frac{\text{sen}\theta}{\theta})\frac{D}{4}$ | $\frac{(\text{sen}\frac{\theta}{2})D}{2\sqrt{y(D-y)}}$ |
| <br>Parabólica  | $\frac{2}{3}Ty$                          | $T+\frac{8y^2}{3T}$    | $\frac{2T^2y}{3T+8y^2}$                          | $\frac{3A}{2y}$                                        |

| <b>NOMBRE PUNTO:</b> Aroma 2                                                                                                                                                                       |                         | <b>REGISTRO FOTOGRÁFICO</b>                                                                                                                                                 |  |              |            |      |    |      |   |      |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|------------|------|----|------|---|------|---|
| <b>Municipio:</b> DUITAMA <b>Barrio/Centro Poblado/Vereda:</b> Barrio La Perla                                                                                                                     |                         | <br> |  |              |            |      |    |      |   |      |   |
| <b>Sistema de coordenadas:</b> WGS 84                                                                                                                                                              |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <b>X:</b> 5°49'1.1" N                                                                                                                                                                              | <b>Y:</b> 73°01'38.0" W |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <b>Z:</b> 2504 m.s.n.m.                                                                                                                                                                            |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <b>CORRIENTE:</b> Quebrada La Aroma                                                                                                                                                                |                         | <b>OBSERVACIONES</b><br><br>Estructura Hidráulica- Muro de Contención – limita la vía de la Aroma.                                                                          |  |              |            |      |    |      |   |      |   |
| <b>DIMENSIONES:</b>                                                                                                                                                                                |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| Nivel Actual: cm/Nivel Observado: cm                                                                                                                                                               |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <table><tr><th>DISTANCIA(m)</th><th>ALTURA (m)</th></tr><tr><td>1. 0</td><td>14</td></tr><tr><td>2. 0</td><td>0</td></tr><tr><td>3. 6</td><td>0</td></tr><tr><td>4. 6</td><td>14</td></tr></table> |                         |                                                                                                                                                                             |  | DISTANCIA(m) | ALTURA (m) | 1. 0 | 14 | 2. 0 | 0 | 3. 6 | 0 |
| DISTANCIA(m)                                                                                                                                                                                       | ALTURA (m)              |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| 1. 0                                                                                                                                                                                               | 14                      |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| 2. 0                                                                                                                                                                                               | 0                       |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| 3. 6                                                                                                                                                                                               | 0                       |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| 4. 6                                                                                                                                                                                               | 14                      |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <b>ESTRUCTURA HIDRÁULICA:</b>                                                                                                                                                                      |                         |                                                                                          |  |              |            |      |    |      |   |      |   |
| Largo: 13 metros<br>Ancho: 0,3 metros<br>Alto: 6 metros<br>Muro de contención                                                                                                                      |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |
| <b>ESQUEMA:</b>                                                                                                                                                                                    |                         |                                                                                                                                                                             |  |              |            |      |    |      |   |      |   |

Ilustración 5. Ejemplo de bitácoras utilizadas en la labor de campo.